



UNIVERSITY OF AGDER

## Master Thesis

FROM SUSTAINABILITY TO SUSTAINABLE  
DEVELOPMENT: THE ROLE OF FOOD BANKS IN FOOD  
SECURITY IN UGANDA  
A CASE STUDY OF THE HUNGER PROJECT FOOD BANK – MBALE  
EPICENTER

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*This Master's Thesis is carried out as a part of the education at the University of Agder and is therefore approved as a part of this education. However, this does not imply that the University answers for the methods that are used or the conclusions that are drawn.*

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**JOSEPH WATULEKE**

**04<sup>th</sup> June 2014**

## DECLARATION

I **Joseph Watuleke** declare that this report on the topic: “*From sustainability to sustainable development: the role of food banks in food security, a case study of the Hunger Project food bank, Mbale epicenter, Uganda*” is my original piece of work and has never been submitted for any academic award to any institution of learning other than the University of Agder.

**KRISTIANSAND**

A handwritten signature in blue ink, reading 'J. Watuleke', is written over a horizontal line.

**4<sup>th</sup> June 2014**

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Place

Signature

Date

## ABSTRACT

The purpose of this study is to identify the role the food bank plays for food security, sustainable livelihoods and building resilience to climate change among smallholder farmers in Uganda. The aim is to investigate how the food bank in Uganda operates in relation to food security and smallholder farmers. Much of the studies on food banks reveal that food banks are merely institutions that offer emergency food supplies to the hungry and are not agencies aiming at food security. These studies have, however, been based on the context of developed countries and no study has been conducted to establish the role of food banks in the context of developing countries.

This study was based in the eastern region of Uganda, and used a sample of eighty respondents to examine the role of food banks. The study was conducted qualitatively, guided by the sustainable livelihood framework adapted from the Institute of Development Studies (IDS). The results reveal that, much as it is currently hard to measure the socioeconomic impact of the food bank on smallholder farmers in the area of study because of the difficulty in isolating its contribution from that of interrelated programs and activities farmers are involved in; it is evident that the food bank was playing a significant role in improving the smallholder farmers' food production and incomes. The food bank is actively engaged in training smallholder farmers in modern farming methods, provision of improved seeds and safe storage facilities for farmers produce, as well as helping farmers do diversify their livelihood sources, and providing climate-related information.

Prolonged droughts and lack of access to quality and sufficient seeds are among the main sources of food insecurity among smallholder farmers. Distance to the food bank and lack of access to information are some of the factors that affect many farmers abilities to participate in the food bank activities. Community ownership of the food bank is still lacking and provides a long term threat to the sustainability of the project if not well handled. The study recommends: establishment of community-managed food banks at lower levels to ensure community ownership; ensuring equitable distribution of benefits among all target farmers; encouraging seed saving by farmers; initiation of a community supported agriculture program to reduce the problem of lack of farm credit; and investing in rainwater harvesting facilities.

**Key Words:** Food security, Food bank, Sustainable livelihoods, and Climate change, Smallholder farmers

## TABLE OF CONTENTS

ACKNOWLEDGEMENT .....	I
DECLARATION .....	II
<b>ABSTRACT</b> .....	<b>III</b>
TABLE OF CONTENTS .....	IV
<b>LIST OF TABLES</b> .....	<b>VI</b>
<b>LIST OF FIGURES</b> .....	<b>VII</b>
<b>LIST OF MAPS</b> .....	<b>VII</b>
<b>LIST OF BOXES</b> .....	<b>VII</b>
<b>LIST OF ACRONYMS</b> .....	<b>VIII</b>
<b>1. INTRODUCTION: SUMMARY OF THE RESEARCH PROJECT</b> .....	<b>1</b>
1.1 TITLE OF THE RESEARCH PROJECT .....	1
1.2. MOTIVATION FOR RESEARCH AND RESEARCH OBJECTIVES .....	1
1.3 PROBLEM STATEMENT .....	3
1.4 SIGNIFICANCE OF THE STUDY .....	5
<b>2. RESEARCH BACKGROUND</b> .....	<b>7</b>
2.1 INTRODUCTION .....	7
2.2 UGANDA AS RESEARCH LOCATION .....	7
2.3 UGANDA’S ECONOMY AND THE SMALLHOLDER FARMERS .....	7
2.4 UGANDA’S POPULATION AND CHARACTERISTIC .....	8
2.5 ETHNICITY AND ETHNIC DISTRIBUTION IN UGANDA .....	9
2.6 UGANDA’S CLIMATE AND CLIMATIC ZONES .....	11
2.7 OVERVIEW OF MBALE DISTRICT .....	14
2.8 OVERVIEW OF THE HUNGER PROJECT AND THE FOOD BANK .....	17
2.9. SUBJECTS OF THE STUDY .....	17
<b>3. LITERATURE REVIEW AND THEORETICAL FRAMEWORK</b> .....	<b>19</b>
3.1 INTRODUCTION .....	19
3.2 SUSTAINABILITY AND SUSTAINABLE DEVELOPMENT .....	19
3.3 WORLD FOOD SECURITY AT CROSSROADS .....	21
3.4 FOOD SECURITY IN UGANDA: GENERAL OVERVIEW .....	42
3.5 CLIMATE CHANGE AND FOOD SECURITY .....	54
3.6 THE FOOD BANKS AND FOOD SECURITY .....	57

3.7. THEORETICAL FRAMEWORK.....	69
<b>4. RESEARCH METHODOLOGY .....</b>	<b>73</b>
4.1 INTRODUCTION.....	73
4.2 EMPIRICAL CONTEXT AND DATA COLLECTION.....	73
4.2.1 RESEARCH DESIGN .....	73
4.2.2 SAMPLING .....	73
4.2.3 DATA COLLECTION METHODS & TOOLS .....	75
4.3 DATA ANALYSIS .....	76
4.4 ETHICAL CONSIDERATION.....	76
<b>5. RESULTS .....</b>	<b>78</b>
5.1 INTRODUCTION.....	78
5.2 DESCRIPTIVE STATISTICS .....	78
5.3 SOURCES OF FOOD AND SEED FOR SMALLHOLDER FARMERS.....	80
5.4 THE ROLE OF THE FOOD BANK FOR FOOD SECURITY .....	83
5.5 FUNDING AND SUSTAINABILITY FOR THE FOOD BANK.....	89
5.6. THE FOOD BANK AS A MECHANISM FOR ACHIEVING SUSTAINABLE LIVELIHOODS .....	98
5.6.1LIVELIHOOD RESOURCES AND STRATEGIES .....	98
5.6.2 BUILDING RESILIENCE TO CLIMATE CHANGE.....	108
<b>6. CONCLUSION .....</b>	<b>118</b>
6.1 CONCLUDING REMARKS .....	118
6.2 CONTRIBUTION OF THE STUDY .....	122
6.3 IMPLICATIONS OF THE STUDY .....	122
6.4 LIMITATIONS OF THE STUDY.....	123
6.5 RECOMMENDATIONS .....	124
<b>REFERENCES.....</b>	<b>128</b>
<b>APPENDICES .....</b>	<b>146</b>
APPENDIX 1: DATA COLLECTION TOOLS USED .....	146
APPENDIX 2: RESEARCH ETHICS: CONSENT FORM .....	151

## LIST OF TABLES

Table 1: World food emergencies, 2005 .....	24
Table 2: Initiatives related to food security, 1943 -1992, 2014.....	26
Table 3: Difference between narrow ‘food first’ approach and a wide ‘sustainable livelihood’ approach to household food security. ....	35
Table 4: Undernourishment around the world, 1990-92 and 2011-13.....	41
Table 5: Sectoral real GDP growth rates .....	46
Table 6: Production of major crops (‘000 metric tons) by region .....	49
Table 7: Distribution of households that took one meal a day (%) .....	51
Table 8: Seed security framework: Basic parameters .....	72
Table 9: The demographic profile of respondents .....	79
Table 10: Food bank role in food security and name of FGD cross-tabulation.....	88
Table 11: Farmers’ suggestions for improvement in food security by the food bank and name of FGD cross-tabulation .....	95
Table 12: How key informants suggest food banks should improve food security .....	97
Table 13: How farmers suggest food bank could help achieving sustainable livelihoods .....	107

## **LIST OF FIGURES**

Figure 1: Population Pyramid in Five-Year Age Groups .....	9
Figure 2: Climatic zones of Uganda .....	13
Figure 3: Per capita food losses and waste, at consumption and pre-consumption stages, in different regions .....	23
Figure 4: Flowchart for analyzing the determinants of food security.....	38
Figure 5: Food production and dietary energy supply in Uganda between 1990-2012.....	42
Figure 6: Food production and dietary energy supply per person in Uganda.....	43
Figure 7: GDP growth rate of agriculture sub-sector in Uganda .....	46
Figure 8: Per capita food production variability in Uganda .....	48
Figure 9: Percentage of households engaged in livestock farming by region (%). .....	50
Figure 10: The food market structure in Uganda .....	52
Figure 11: Hunger – alleviation model .....	62
Figure 12: Sustainable Livelihoods Framework .....	71
Figure 13: Food bank hunger-alleviation model for smallholder farmers in Uganda .....	121

## **LIST OF MAPS**

Map 1: Ethnic groups of Uganda .....	10
Map 2: Map of Mbale District showing sub-counties .....	15
Map 3: Map of Uganda showing Districts .....	16

## **LIST OF BOXES**

Box 1: Definitions of food security 1975 – 1996 .....	31
Box 2: Summary of food security situation in Uganda.....	54



## **LIST OF ACRONYMS**

AMCEN	African Ministerial Conference on the Environment
ATAAS	Agriculture Technology and Agribusiness Advisory Services
BUTUMFA	Busoba Tubaana Mixed Farmers Association
CAADP	Comprehensive Africa Agriculture Development Programme
CBOs	Community Based Organizations
CFSM	Core Food Security Measure
CFSVA	Comprehensive Food Security and Vulnerability Analysis
CIGI	Center for International Governance
CSA	Community Supported Agriculture Program
DAFF	Department of Agriculture, Forestry and Fisheries
EFPs	Emergency Food Providers
FEWS NET	Famine Early Warning Systems Network
GDP	Gross Domestic Product
GEO5	Global Environment Outlook
GOU	Government of Uganda
HLPE	High Level Panel of Experts
ICN2	Second International Conference on Nutrition
IFNS	Inter-agency Food and Nutrition Surveillance Programme
IPC	Integrated Food Security Phase Classification
IPCC	Intergovernmental Panel on Climate Change
ITCZ	Inter-Tropical Convergence Zone
JICA	Japan International Cooperation Agency
MAAIF	Ministry of Agriculture, Animal Industry and Fisheries
MDG	Millennium Development Goal
MoFPED	Ministry of Finance, Planning and Economic Development

MoH	Ministry of Health
MWLE	Ministry of Water, Land and Environment
NAADS	National Agriculture Advisory Services
NARO	National Agriculture Research Organization
NEMA	National Environment Management Authority
NGO	Non-Governmental Organizations
NRDC	Natural Resource Defense Council
NZCCSS	New Zealand Council of Christian Social Services
PEAP	Poverty Eradication Action Plan
SACCO	Savings and Credit Cooperative
SNAP	Supplemental Nutrition Assistance Program
THP	The Hunger Project
UBOS	Uganda Bureau of Statistics
UCSCU	Uganda Savings and Credit Cooperation Union Ltd
UFNC	Food and Nutrition Council
UFNP	Food and Nutrition Policy
UNCBD	United Nations Convention on Biological Diversity
UNFCCC	UN Framework Convention on Climate Change
UNHS	Uganda National Household Survey
WCED	World Commission on Environment and Development
WFC	World Food Conference
WFS	World Food Summit
WSSD	World Summit on Sustainable Development

# 1. INTRODUCTION: SUMMARY OF THE RESEARCH PROJECT

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## 1.1 Title of the research project

*From sustainability to sustainable development: the role of food banks in food security, the case study of the Hunger Project food banks, Mbale epicenter, Uganda.*

## 1.2. Motivation for research and research objectives

Following the food price crisis of 2008, debates about global food security have become increasing (Wiggins, 2008). The worry about the impact of the food crisis on the prospects for achieving the first Millennium Development Goal (MDG) “to end poverty and hunger” is also high (Ludi, 2009). Research shows that the soaring food prices affect mainly three categories of groups, namely: the poor whose ability to buy food is undermined; the governments of low-income countries that face higher import bills, soaring costs for safety net programs and political instabilities; and aid agencies that battle increased demands for food, cash and technical assistance (Wiggins 2008, p. 1).

Searching for the direct answers to the causes of hunger reveals that most hunger is caused by a failure to gain access to the locally available supplies of food or to the means to produce the food directly (Timmer et al. 1983, p. 4). However, droughts in major wheat-producing countries in 2005-2006; low grain reserves; high oil prices; a doubling of per-capita meat consumption in some developing countries and a diversion of 5% of the world’s cereals to agro-fuels have been held as the immediate factors that led to food price crisis of 2008 (Shah, 2008). The effect of food insecurity, nonetheless hits hard the people with low or insecure access to food, the very poor, the landless and near-landless, the disadvantaged groups of children, pregnant and lactating women and the elderly who have lost a productive role in their societies (Timmer et al, 1983).

Although the food prices normalized after 2008, the United Nations Development Programme (UNDP) still warns that in a long-term perspective, climate change will undermine the international efforts to combat poverty (UNDP 2008, p. 1). It is also observed that climate change will steadily increase the exposure of poor and vulnerable households to climate-shocks,

thus placing increased pressure on coping strategies, which over time, could steadily erode human capabilities (UNDP 2008, p. 10). Two of the five mechanisms identified by UNDP through which climate change could stall and reverse human development directly affect food security. These include: first, the effect on 'agricultural production and food security', through affecting rainfall, temperature and water availability for agriculture in vulnerable areas; and secondly, the effect of 'water stress and water insecurity' due to changed run-off patterns and glacial melt, compromising flows of water for irrigation and human settlement in the process (UNDP 2008, p. 10).

When talking about the climate change effect on agriculture, it should be remembered that the agriculture sector constitutes the backbone of a majority of African economies (Ludi 2009, p.1). It is still the largest contributor to GDP, the biggest source of foreign exchange, and the main generator of the continent's savings and tax revenue (NEPAD 2002, p. 7). Agriculture employs over 80 percent of Africa's workforce, and at the same time, farming and agribusiness together forms nearly 50 percent of Africa's economic activity (World Bank, 2013a). This implies that the vulnerability of the agriculture sector due to climate change will likely cripple the economies of a majority of the African countries including Uganda. Improvements in agricultural performance on the other hand have the potential to uplift majority of the African population from poverty through increased rural incomes and purchasing power (NEPAD 2002, p. 7).

Although it forms the backbone of the African economies, Africa's agriculture faces serious challenges, including land degradation, inadequate irrigation, rural-urban migration, political instability and stagnant economies (Dinar 2007). Agriculture production is sensitive to climate, and research shows that the effects of climate change on the African continent may force large regions of marginal agriculture out of production by the end of this century (Dinar 2007, FAO 2003).

In 2003, the United Nation's Food and Agriculture Organization (FAO) indicated that there existed large uncertainties as to when and where climate change would impact on agriculture and food security (FAO, 2003). The intergovernmental panel on climate change (IPCC), however, notes that the multiple stresses such as limited availability of water resources, loss of biodiversity, and air pollution have already increased sensitivity to climate change and reduced resilience in the agriculture sector (IPCC 2007, p. 277). Given agriculture's salient role in

sustaining the economy of Uganda, it is clear that agriculture failure emasculates the health and productivity of individuals thus impeding social and economic development (Wahlberg 2008).

One astounding fact in the literature that generated the motivation, as well as forming the problem of this study was that, throughout much of the world, there is enough food produced to feed everyone (FAO 2011a, Leathers and Foster, 2009). Yet, 842 million people around the world go hungry today (FAO, IFAD and WFP 2013). Each year, millions of tons of consumable surplus food and grocery products are lost through waste. Much of the food grown, processed, produced and manufactured is never consumed due to: “failure to harvest; post-harvest losses; product disposal due to expiration, overproduction, damage and market” (Klein, 2013).

The United Nations World Food Programme on June 4, 2009 published that hunger kills more people every year than AIDS, malaria and tuberculosis combined; and that hunger (underweight) was number one on the list of the world's top ten health risks, while one in seven people (adults and children) goes to bed hungry each night (WFP 2009). Why is this so? How can this situation be reversed? What is already being done about it? How can the food bank help? These and many more remain questions everyone around the world would love to see answered.

Therefore, the findings of this study will provide food security stakeholders with better understanding of how the food bank can best be used as a tool to reduce food insecurity, malnutrition and poverty among smallholder farmers who are the most vulnerable to hunger, poverty, and climate change.

### **1.3 Problem statement**

Research on food banks and food security has focused on understanding why the number of food bank users is on the increase, and on improving diets at food banks through serving nutritious foods (O'Brien 2004, Moldofsky 2000, Handforth et al., 2013, McPherson 2006). But none of these studies establish how food bank users could be reduced and their ability to meet their food requirements in a sustainable manner improved. Moreover, most of these researches have been conducted in developed countries whose context is different from that of developing countries. Therefore, current and past studies suggest that there is a need for

further research that examines the role of food banks in the context of developing countries like Uganda.

A number of studies also suggest that the problem of food security can be reduced if investment in smallholder farmers is increased. Given that, the food bank in Uganda is actively engaged with smallholder farmers in rural areas, there is need to establish how it supports food security. The current study investigates issues related to access to financial capital, human capital, physical capital as well as social capital in pursuance of food security and sustainable livelihood among smallholder farmers. It also explores the sources of smallholder farmers' food security and livelihoods as well as their adaptability to climate variability. In the next sub-section, the main research question that guided this study is presented.

### **Main research questions**

The main research question of this study is: “what role does the food bank play in addressing the challenge of food insecurity among smallholder farmers in Uganda?” This study is going to answer the main research question using three sub-questions guided by the sustainable livelihood framework. The three sub-questions are indicated below:

#### **Sub-questions:**

- i. To what degree do food banks help in addressing the challenge of food insecurity among smallholder farmers in Uganda?
- ii. Could food banks be a means for transforming smallholder farmers from a state of vulnerability to a state of sustainable livelihoods?
- iii. How can food banks help local farmers to build resilience to the negative shocks of climate change?

### **Main research objectives**

- i. To assess the extent to which food banks help in addressing the challenge of food insecurity among smallholder farmers in Uganda.
- ii. To establish how food banks could be used as a mechanism to achieve sustainable livelihoods among smallholder farmers in Uganda.

- iii. To establish how food banks could help smallholder farmers to build resilience to the negative shocks of climate change.

## **1.4 Significance of the study**

This research will provide a broad framework for understanding the operation of food banks in Uganda in relation to smallholder farmers and food security, sustainable livelihoods and resilience to climate change. The findings will also be useful in identifying the strengths and gaps in the service provision of the food bank to the smallholder farmers and providing a framework for devising well-informed strategies to support food security among smallholder farmers.

Additionally, the results of this study can also be used as relevant guidelines for developing future community food banks, especially at the village level and / or making improvements in the current activities and services of the food bank in Uganda. The study highlights areas that need emphasis for better performance as well as areas already well performed that can be replicated in other areas by other farmers or service providers.

## **1.5 Organization of the thesis**

The rest of the thesis is structured as follows:

Chapter 2 presents information related to research background; for example, an overview of Uganda in terms of location, climate, ethnicity, population, and economy. It also presents an overview of the Mbale district where the sample population was selected and looks at its location and the main economic activities in the area. It further presents a brief overview of the Hunger Project where the case for this study is selected. The chapter ends with presenting the subjects of the study.

Chapter 3 presents a literature review and theoretical framework by exploring a wide array of scholarly publications on food security, sustainable livelihoods, climate change, and the concept of the food bank. The framework for analyzing sustainable livelihoods was adopted for the purpose of this study. The chapter provides a deeper understanding of the problem of study.

Chapter 4 discusses the research methodology. It includes a detailed discussion on the research process, including, research design; procedure; and study population and sampling; and the method which I chose for this research and explaining of why I chose such procedure and methods.

Chapter 5 consists of the analysis of the results of the collected data and will also present the findings of the research with the help of descriptive and interpretive methods. The presentation of findings is done concurrently with a discussion of the findings in line with the literature.

Finally, Chapter 6 concludes the thesis by summarizing the main findings of the analysis. The chapter also reflects on the contributions and implications of this study. It further tries to reflect on the limitations of this study and makes suggestions for future research. The chapter concludes the study by suggesting three recommendations for the food bank service providers in Uganda.



## 2. RESEARCH BACKGROUND

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### 2.1 Introduction

*This part of the study provides general information related to the research context, for example, information about the location of the research, that is Uganda in general and Mbale district in particular, climatic conditions, the economy, population and ethnicity, as well as an overview of the Hunger Project from which a food bank was selected as the case for this study. This chapter will increase the reader's knowledge of the context of the study and increase interest in the subject of this study.*

### 2.2 Uganda as research location

Geographically, Uganda is a landlocked country located in East Africa. It lies astride the equator on latitude  $4^{\circ} 12'N$  &  $1^{\circ} 29'S$  and, longitude  $29^{\circ} 34'E$  &  $35^{\circ} 0'$  (Uganda Bureau of Statistics 2002). It is bordered by the Democratic Republic of Congo to the west, Kenya to the east, Rwanda and Tanzania to the south, and South Sudan to the north. Uganda is divided into three main environmental/geographical areas: swampy lowlands, a fertile plateau with wooded hills, and a desert region (Game Plan Africa 2012).

Uganda occupies an area of 241,038 square kilometers (sq. Kms) of which 43,941 sq. Kms are open water and swamps, and 197,097 sq. Kms is land (Uganda Bureau of Statistics 2002, p. 1). The Mbale district where the study was conducted occupies 0.27% (534.4 sq km) of this the total land area. The district falls under the fertile plateau at the slopes of Mount Elgon (Uganda Bureau of Statistics, 2002).

### 2.3 Uganda's economy and the smallholder farmers

Socioeconomically, Uganda is a developing country with considerable natural resources; including, fertile soils, regular rainfall, small deposits of copper, gold and other minerals and recently discovered oil. Uganda's Growth Domestic Product (GDP) by the end of 2012 according to the World Bank was estimated at \$51.27 billion, with a GDP real growth rate of 2.6% (World Bank, 2013a). Agriculture is the most important sector of the economy of Uganda,

employing over 80% of the work force, and over (MoFPED, 2012). Agriculture in Uganda constitutes a mainly crop production, livestock production, fishery and forestry. This study, however, concentrated on farmers involved in crop production and mixed enterprise (crop and animal production) farmers.

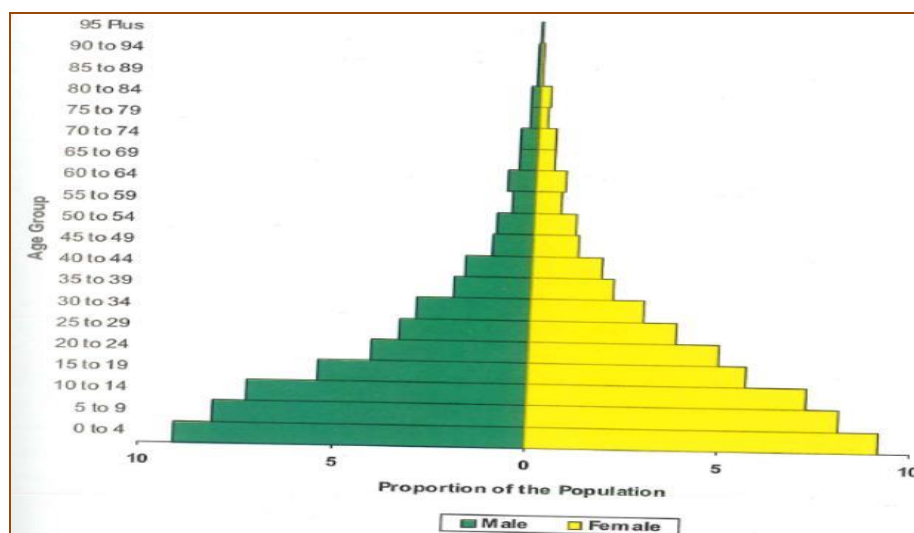
The common type of the crops grown include: coffee, beans, plantain (matooke), maize, onions, carrots, cassava and Irish and sweet potatoes (MoFPED 2012, Ssewanyana and Kasirye, 2010). A majority of Uganda's population constituting over 80 percent is involved in subsistence agriculture commonly referred to as smallholder farming. They rely on the use of family labor, simple farming tools and methods and face several challenges in their farming related to access to quality and adequate seed, storage facilities, adapting to climate variability and low yields with limited use of fertilizers (Kasule et al, 2011).

## **2.4 Uganda's population and characteristic**

The population of Uganda was estimated at about 36 million people in 2012 (World Bank 2013a) with a population growth rate of 3.32 percent, being one of the highest population growth rate in the world. Of this total, the population of the Mbale district where the study was conducted was estimated at approximately 410,300, approximately 1.14 percent of the total population of Uganda.

The highest percentage of the country's population comprising 48.9% (male 8,467,172 and female 8,519,723) is below the age of 15 years; and 4.4% of the population is 55 above years of age (UBOS, 2010). That means the country's productive population between the age of 15 and 54 is only 46.7 percent (Refer to Figure 1).

**Figure 1: Population Pyramid in Five-Year Age Groups**



**Source: UBOS (2006, p. 39)**

The pyramid of Uganda's population signifies a huge dependent population of 53.3 percent, and its implication on the economy of the country. About 85 percent of the country's total population is rural based and engaged in smallholder agriculture, and in Mbale District, 92 percent of the population is found in rural areas (UBOS 2010, p. 6)

## 2.5 Ethnicity and ethnic distribution in Uganda

Ethnically, Ugandans can be classified into several broad linguistic groups: the Bantu-speaking majority, who live in the central, southern, western and some parts of Eastern Uganda; and non-Bantu speakers who occupy the majority of the eastern, northern and northwestern portions of the country (who may in turn be sub-divided into Nilotic and Central Sudanic peoples).

The Bantu category includes the large and historically highly centralized kingdom of Buganda, the smaller western Ugandan kingdoms of Bunyoro, Nkore and Toro, and the Busoga states and Bugisu to the east of Buganda. The peoples in the second category include the Iteso, Langi, Acholi, Alur, Karamojong, Jie, Madi, and Lugbara in the north and a number of other smaller societies in the eastern part of the country (Nyeko, 1996).

Generally, the Baganda in the central region comprise the largest ethnic group constituting 16.9% of the total population, followed by the Banyakole 9.5%, Basoga 8.4%, Bakiga 6.9%, Iteso 6.4%, Langi 6.1%, Acholi 4.7%, Bagisu 4.6%, Lugubara 4.2%, Bunyoro 2.7%, the other 29.6 % (UBOS, 2002). The original inhabitants of Mbale district are the Bagisu, part of the Bantu speaking group.

The Bagisu of Mbale where this study was conducted, speak Lu'Masaba also known as 'Lugishu' or 'Gishu', language. The author is a native speaker of Gishu. However English is the official and uniting language and Luganda is another commonly spoken language in Uganda. Swahili is also being promoted in the spirit of regional socioeconomic integration of the East African Community and it is hoped that soon, Swahili will be used as Uganda's National Language. (See Map 1 for distribution of the ethnic groups in Uganda.)

**Map 1: Ethnic groups of Uganda**



Source: Uganda at a glance, 2007 cited in NEMA (2009, p. 164)

This research was conducted in the Bugisu ethnic region in Mbale district among the Bagisu. The majority of the participants in this research were Bagisu, except for only two members of the project staff who were Non-Bagisu.

## 2.6 Uganda's climate and climatic zones

Climatically, Uganda experiences the equatorial type of climate, with plenty of rains and sunshine moderated by the relatively high altitude. In most parts of the country, the mean annual temperatures range from 16° C to 30° C; although, the Northern and Eastern regions sometimes experience relatively high temperatures exceeding 30° C and the South Western region sometimes have temperatures below 16° C (UBOS 2002, p. 3).

Uganda's rainfall and climatic patterns are influenced by variations in altitude and, the Inter-Tropical Convergence Zone (ITCZ), and the air currents such as the South-East and North-East Monsoons (National Environment Management Authority – NEMA, 2009). Uganda is divided into six climatic zones, mainly based on rainfall patterns (NEMA, 2009) refer to Figure 1.1.

They include:

### **Zone I: Lake Victoria Basin**

This zone is located around Lake Victoria and extends for a distance varying between 48–64 km inland from the lake shore. The rainfall in this zone varies from 1250 mm to over 2000 mm per annum and it is received throughout the year with two rainfall peaks in April-May and October-December.

### **Zone II: Karamoja**

This zone is characterized by long and hot, dry season lasting from November to March being the driest region in the country. It has a single rainy season from April to August with average annual rainfall between 300 mm and 600 mm.

### **Zone III: Western Uganda**

The Western Uganda zone forms a relatively narrow belt along the entire western extremities of the country. It includes the highland areas of the West Nile region, the escarpments of the

Albertine rift valley, the rift valley, the South Western highland region and the mountains of Rwenzori and Muhavura. On the plateau, escarpment and highlands, rainfall is about 1250 mm, while in the mountains; it rises to over 2000 mm. The rift valley area receives relatively low rainfall, with an average of 875 mm.

#### **Zone IV: Acholi-Kyoga**

This zone includes much of the northern and part of eastern Uganda and it receives an average rainfall of between 1250 mm to 1500 mm which occurs mainly between April and October (wet season). The dry season usually extends from November to March. The type of rainfall experienced in this area is mainly convectional and it is characterized by afternoon and evening's occurrences.

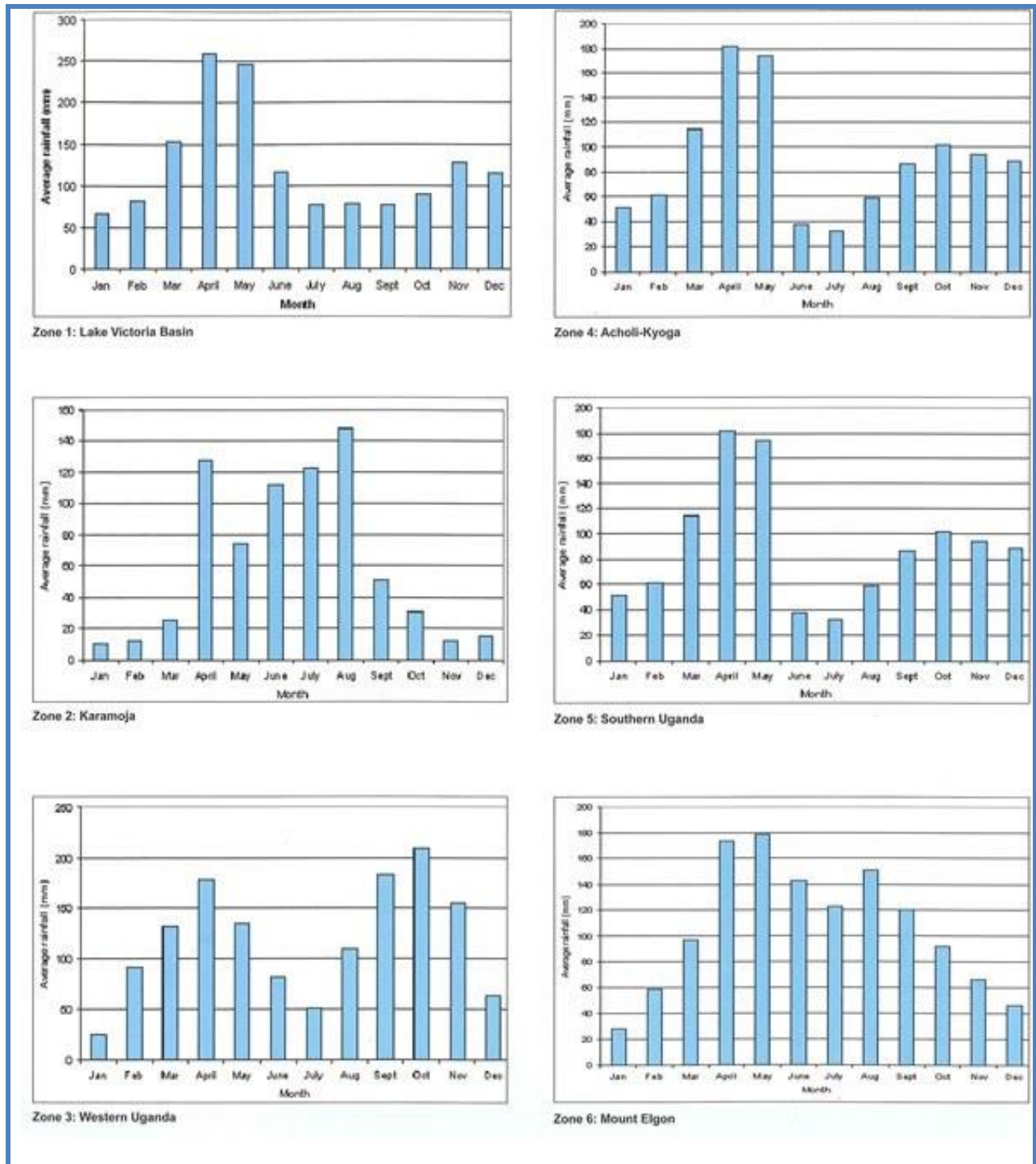
#### **Zone V: Southern Uganda**

This zone stretches from east to southwestern Uganda, up to Rakai District. The zone receives a double maxima rainfall pattern with averages ranging from 875 mm to 1125 mm. Rainy season is between April-May and September-November with each of these periods followed by a dry season. The rainfall pattern of this area is majorly influenced by the maritime Lake Victoria conditions and the Inter-tropical Convergence Zone (ITCZ). The rainfall in this area is mainly characterized by the thunderstorms of convectional nature.

#### **Zone VI: Mount Elgon**

This zone experiences the main rains between March to September but with a sharp, dry spell in June, and with a dry season from December to February. The rainfall patterns are influenced by both orographic effects of the mountains and the proximity to Lake Victoria. On the mountain foothills and slopes, rainfall decreases from south (1250-1500 mm) to north (1000 mm) with the northern slopes falling within the rain shadow of the mountain. The Mbale district where this research was conducted falls in the Mount Elgon zone.

Figure 2: Climatic zones of Uganda



Atlas of Uganda, 1987

Source: NEMA (2009, p. 4)



## 2.7 Overview of Mbale District

Mbale and Sironko Districts formerly constituted Bugisu District at independence in 1962 and in 1980. Bugisu District was re-named Mbale, and later Sironko broke off and became an independent district (Uganda, 2005). The Mbale district borders Sironko in the north, Tororo in the south-west, Manafawa and Bududa in the south, Kumi in the north-west, Pallisa in the west and the Republic of Kenya in the east. After the separation of the Bududa and Manafwa districts from the Mbale in 2011, Mbale has remained with one county (Bugokho County) and a Municipality (Mbale Municipality). The research was conducted in the Bugokho County in mainly three sub-counties of Busoba, Nyondo and Lukhonge. Nyondo sub-county was formerly part of Busoba, while Lukhonge was part of the Bukiende sub - county before the split of the sub-counties in 2010/11.

The Mbale district lies in the Mt. Elgon climatic zone. The main economic activities of the people of Mbale are mainly agriculture related and emphasis is put on:

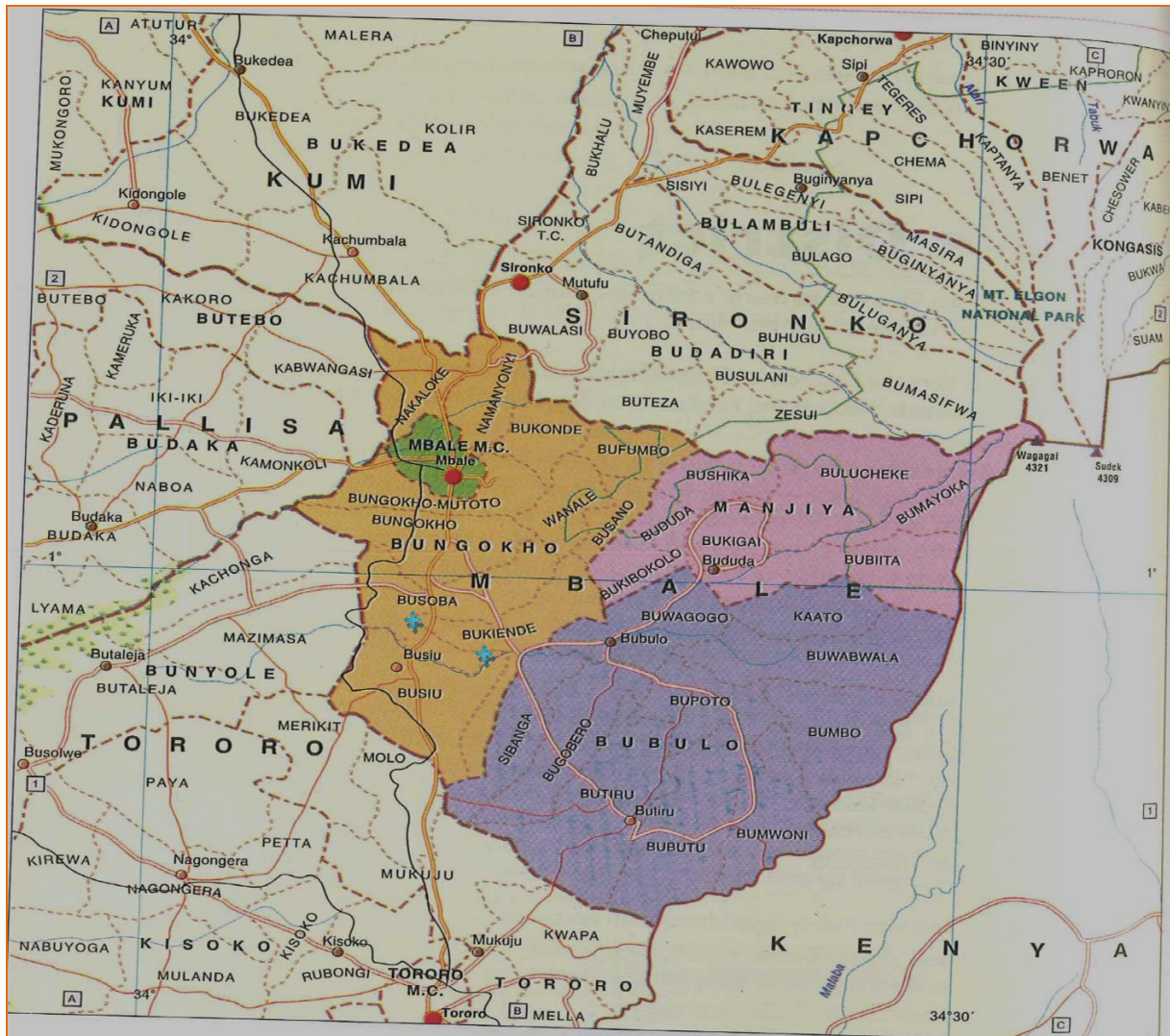
- a) A food crop production, which includes: beans, maize, groundnuts, sweet potatoes, cassava, bananas, soya beans, sorghum, yams, and rice on a small scale.
- b) A cash crop production, which includes: coffee and cotton
- c) Vegetables, which include: Tomatoes, onions, carrots and cabbages

Source: (Uganda 2005, p. 71).

Some farmers are involved in livestock production alongside crop production; however, this is on a small scale. The urban population and those along busy roads are also involved in business and small-scale entrepreneurship. This study, however, paid attention to the population involved in smallholder farming because the interest was in investigating the concept of food security and sustainable livelihoods among smallholder farmers.



Map 2: Map of Mbale District showing sub-counties



**Sub-counties of study**

NB: Busoba constitutes Busoba sub-county and the new Nyondo sub-county and Bukiende constitutes the new Lukhonge sub-county

Source: Uganda (2005, p. 72)



## 2.8 Overview of the Hunger Project and the food bank

The Hunger Project was established in 1977 with a purpose of generating a global context of individual will and commitment to ending hunger on the planet by the end of the century (Lofchie and Commins, 1984 and Susan, 1987). The Hunger Project is currently active in South Asia, Sub-Saharan Africa and Latin America, where the highest concentrations of hungry people live (The Hunger Project 2013a). The Hunger Project provides the tools and training to increase farm production at the local level; empowers partners to create, stock and manage their own food banks; and encourages clusters of rural villages to develop sustainable, self-reliant, hunger-free communities.

Among the programs of the Hunger Project include: empowering people to create, stock and manage their own food banks at the community level; train partners to develop and implement income-generating activities. This enables the women and men of the participating communities to increase their incomes so that they can purchase the food they need. They also promote sustainable farming practices, for example, local agricultural experts teach the Hunger Project partners how to create and manage community farms. In this program, villagers learn techniques to sustainably improve crop yields, and providing entire communities with increased access to food.

The Hunger Project also ensures access to microfinance. It runs a microfinance program which trains and empowers villagers, with a special focus on women food, farmers, who grow 80 percent of the household food in Uganda. In this program, partners learn how to increase their incomes and use their savings to improve the health, education and nutrition of their families. This research was interested in the aspect of food security in the Hunger Project and concentrated in food banks taking a case study of the Mbale epicenter food bank as earlier mentioned.

## 2.9. Subjects of the study

The subjects of the study that were contacted for interviews and relevant data collection included:

- Smallholder farmers in the food bank operation areas that included Busoba, Nyondo and Lukhonge sub-counties;



- The Hunger Project staff and volunteers;
- The Busoba sub-county technical team and other key informants;
- The community animators (change agents) trained by and working for the Hunger Project

### Exterior view of Mbale epicenter food bank building



Photo: Author, (March, 2014)

### 3. LITERATURE REVIEW AND THEORETICAL FRAMEWORK

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#### 3.1 Introduction

*The purpose of this section is to provide literature and theoretical discussion regarding food banks, food security, sustainable livelihoods and climate change. In the end a selected sample of food banks is presented, discussing their best practices and how the food bank in Uganda would learn from them.*

The nature of this research study is focused on ‘improving food security among smallholder farmers in Uganda’. The food bank was taken as a sample of institutions geared toward ending hunger in Uganda although its operation in Uganda varies from the operation of food banks in developed countries. To understand the concept of food banking and food security and its related sub-themes like sustainable livelihoods and climate change, the researcher searched university library databases such as, Ebsco as well as using the Nordic Africa Institute Library.

The research was limited to publications made on the concepts of sustainability and sustainable development, smallholder farming, food security and effects of climate change on food security as well as the operation of food banks in their different forms, including ‘community-managed rice banks’ and ‘community grain banks’. The sustainable livelihood framework of the Institute of Development Studies (IDS) from Scoones (1998) was adopted to guide the study.

Accordingly, the researcher surveyed a wide array of publications on food security, climate change and food banks that offered a theoretical background to this study’s research problem.

#### 3.2 Sustainability and sustainable development

Since the first time the concept of sustainable development was used in the Brundtland Report of 1987 by the World Commission on Environment and Development (WCED), the concept of sustainability has caused numerous debates. Questions have emerged on what should be regarded as sustainable development and what should not. It is therefore important to look at the concept of sustainability before sustainable development to get a clear picture of the subject.

Of course, like other complex subjects, sustainability does not have a universal definition. Some organizations like the U.S Environmental Protection Agency (EPA) derive their explanation from the WCED definition of sustainable development. To them, sustainability is based on a simple principle: “everything that we need for our survival and well-being depends, either directly or indirectly on our environment” (EPA, n.d.). They therefore argue that sustainability creates and maintains the conditions under which humans and nature can exist in productive harmony, that permit the fulfillment of the social, economic and other requirements of present and future generation.

At the United Nations conference – Earth Summit that took place in 1992 in Rio, participants representing governments, private sector and civil society held discussions on themes: ‘how to build a green economy to achieve sustainable development and lift people out of poverty’; and ‘how to improve international coordination for sustainable development’ (ISGN Insights 2012). This resulted into the Agenda 21, the Rio Declaration on Environment and Development, the Statement of Forest Principles, the United Nations Framework Convention on Climate Change and the United Nations Convention on Biological Diversity (UN, 1997).

From this time, several other international agreements have been signed in different international summits with different targets set to be achieved as they strive toward the sustainability goal. Some of these agreements and summits include: the Commission on Sustainable Development – December 1992; Millennium Development Goals – agreed on at the Millennium Summit in 2000; the Johannesburg Plan of Implementation – the World Summit on Sustainable Development (WSSD) in 2002; Rio – Convention on Biological Diversity (UNCBD), Kyoto Protocol to the UN Framework Convention on Climate Change (UNFCCC) in 1998 (see Hannah Stoddert – Stakeholder Forum, n.d.; UN Kyoto Protocol 1998; UN Sustainable Development platform, n.d.).

These targets and goals shaped the United Nations’ understanding of the concept of sustainability and thus to them, sustainability calls for a decent standard of living for everyone today without compromising the needs of future generations (UN Rio+20, 2013). The realization of these targets and goals, however, call for identification of appropriate ways to help the poor to ascend out of poverty and to get decent jobs without harming the environment. It also requires providing clean energy to everyone while at the same time ensuring that this does not contribute

to climate change. It should be ensured that everyone has access to water, food and nutrition. Shaping our cities so that everyone enjoys a decent quality of life, including, building better transport systems that allow all to get where they want to go while avoiding too much overcrowding and pollution are other requirements for achieving the sustainability goals. Ensuring that our oceans are healthy and that marine life is not threatened by pollution and climate change due to mankind's activities and making sure that our communities are resilient in the face of natural calamities are also important.

The main message in the GEO-5 chapter 16: '*Scenarios and sustainability transformation*', indicates that meeting an ambitious set of sustainability targets in the middle of the century was possible. The challenge, however, is the lack of adequate supporting policies and strategies to achieve it (GEO5 2012, p. 420 - 422). However, one would ask, how easy it will be to achieve sustainable development amidst great poverty in many developing countries, and the global food insecurity where currently about 842 million people around the world are suffering from chronic hunger (FAO, IFAD and WFP 2013).

As we strive to achieve sustainable development, we also need to consider that majority of the population in developing countries is still poor and engaged in subsistence agriculture using simple farming techniques. How the livelihoods of such people can be improved and sustained at the time when the world's food security is at the crossroads, remain the question researchers need to investigate.

### **3.3 World food security at crossroads**

The world is experiencing rising demands for food, stemming from three key forces: increasing human population, meat and dairy consumption from growing affluence, and biofuel consumption (Ray, Mueller, West, and Foley, 2013). The cost of food importation and factory farming are becoming increasing outwardly and the world food security is at crossroads. In October 2009 during the FAO's 'High-Level Expert Forum' in Rome, the UN Food and Agriculture Organization (FAO) predicted that the world population by the 2050 would reach 9.1 billion, 34 percent higher than it was in 2009. This would increase food production (including net of food used for biofuel) by 70 percent. Annual cereal production will need to rise to about 3 billion tons from 2.1 billion produced by 2009 (FAO 2009), and the global food demand will

increase by 60 percent (IFAD, WFP and FAO 2012, p. 30). This will be a challenging state, especially in Sub-Saharan Africa in general and Uganda in particular, a country experiencing highest population growth rates (at 3.2% per annum) amidst severe impacts of climate change, land and water degradation as well as the burden of HIV/AIDS.

The increasing food demand is not meeting the production because globally, food insecurity today is largely a problem of access to the resources or services needed by families to produce, purchase, or otherwise obtain enough nutritious food (FAO, 2014a). Possibilities for increasing food production seem to be inadequate owing to the fact that the natural resource factor on which agriculture depends has degenerated faster in the past 50 years than ever before in human history (Neely and Fynn, n.d. P. 5). This state has divided the world into the 'have' and the 'have not'. As poor countries are suffering from lack of food and malnutrition, obesity and overweight remain a challenge among high and middle-income countries, accounting for 2.8 million deaths among adults each year (UN 2013). At the same time, one-third of food produced for human consumption is wasted (Ken 2013). FAO researchers learned that every year, consumers in rich countries waste about 222 million metric tons of food, almost as much as the entire net food production of Sub-Saharan Africa. Of these, fruits and vegetables, roots and tubers have the highest wastage rates of any foods (FAO, 2014b).

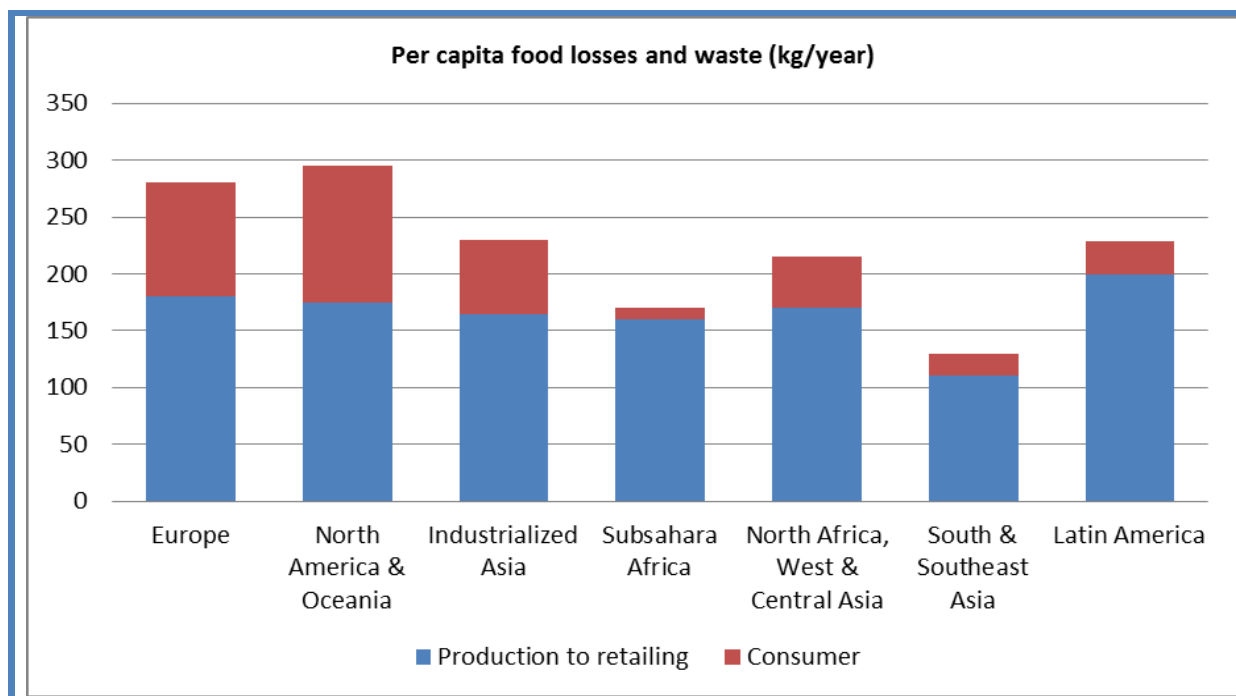
In financial terms, food losses and waste amounts to roughly US\$ 680 billion in industrialized countries and US\$ 310 billion in developing countries (FAO, 2014b). FAO also indicates that food waste per capita by consumers is between 95-115 kg a year in Europe and North America, while consumers in Sub-Saharan Africa, South and Southeastern Asia, each throw away only 6-11 kg a year, as shown in Figure 3.

Food waste in developing countries generally results from premature harvesting, of poor postharvest handling due to poor storage facilities and infrastructure; lack of processing facilities; and lack of adequate markets systems. Generally food waste at consumer level is minimal in developing countries (FAO, 2011a). On the other hand, food waste in industrialized countries results when production exceeds demand; high 'appearance quality standards' from supermarkets for fresh products, unsafe food not fit for human consumption resulting from failure to comply with food safety standards; 'disposing is cheaper than using or re-using'



attitude; large quantities on display and a wide range of products/brands; and abundance and consumer attitudes (FAO, 2011a).

**Figure 3: Per capita food losses and waste, at consumption and pre-consumption stages, in different regions**



Adapted from: FAO (2014b)

The concept of food insecurity and food security, however, is not new to the public; it has its historical origins. The proper intervention in the food security matters of a country requires a clear understanding of the historical perspectives, global and national concerns, as well as schools of thought on increasing food production. This information is presented in the next subsection.

*“Here are two facts that should not both be true: There is sufficient food produced in the world every year to feed every human being on the planet. Nearly 800 million people literally go hungry every day, with more than a third of the earth's population -- 2 billion men and women -- malnourished one way or another, according to the United Nations Food and Agriculture Organization.” — (Michael Dorris, 1993)*

## The concept of food security

Food security is widely being discussed in global fora. Although food security affects almost everyone on the globe, Sub-Saharan Africa has the widespread chronic food insecurity. As of May 2006, for example, out of thirty nine countries in the world which were experiencing serious food emergencies and required external assistance for dealing with critical food insecurity: twenty five were in Africa, eleven in Asia and Near East, two in Latin America and one in Europe, as reflected in table 1 below:

**Table 1: World food emergencies, 2005**

Dominant variable	Africa	Asia	Latin America	Europe	Total
<b>Human</b>	10	3	1	1	15
<b>Natural</b>	8	7	1	0	16
<b>Combined</b>	7	1	0	0	8
<b>Total</b>	25	11	2	1	39

Source: FAO (2006)

The Food and Agriculture Organization of the United Nations (FAO) observed that in the last few decades, the number of food emergencies has risen from an average of 15 per year in the 1980s to more than 30 per year from 2000 onwards (FAO 2006). Major human induced food emergencies persisting for several years are known as protracted emergencies. These crises, however, affect Africa more than any other region. In Africa, the average number of crises has tripled in the last two and half decades. Why is this so? What has been done? And what can be done?

FAO (2006) established that these food crises are fuelled by mainly armed conflict, often compounded by drought, floods and the effects of the AIDS pandemic. These have vast impact on food production and food security as millions of people who are driven from their homes are unable to work their fields; they are also cut off from markets for their produce and from commercial supplies of seed, fertilizer and credit.

This study brings together the perspective of food banking in food security in relation to Ugandan context. It is argued in this study that food security in Uganda is not the question of

limited food production. It is rather the question of livelihood security guaranteeing the ability to purchase available food on the market.

### **Historical perspective food security**

Historically, food security a subject that has made a serious impact on global development debate since 1970s has been in the public eye for a long time. The historical perspective of food security can be traced far back in the Bible in the book of Genesis, Chapter 41 from verse one up to forty one. In this book, while interpreting Pharaoh's two dreams, Joseph predicted seven years of abundant harvest to be followed by seven years of famine. He thus advised Pharaoh on food saving. People all over Egypt were asked to save a fifth of their grain harvest in the grain stores established in their respective cities. In this story, we see the component of planning for food security, as well as food banking where food stores worked as food banks.

As noted above, grain has been the principal food stored to ensure food security, historically, and this is true today as well (The Hunger Project 1985, p. 94). However, the grain system by which grain is bought, sold and stored today is subject to severe fluctuations, especially when major producers like the US and the former USSR have bad harvests. This can be evidenced in the 1972-74 and the 1979 USSR reduced production (THP, 1985) and the 2005 – 2007 production failures in major producing countries due to bad weather (OECD, 2008). These resulted into worldwide food price increase, and many people in third world countries suffered more.

### **Global Perspective of Food Security**

At a global level, the discussion about food security and response to it can be traced back in the 1943 Hot Springs Conference on Food and Agriculture, the establishment of Food and Agriculture Organization (FAO) in 1945 and the Universal declaration of human rights in 1948 which made access to adequate food a human right. Several global initiatives related to food security have since then been pursued as shown in table 2. All these aimed at finding a global solution to hunger and creating food security.

Because man needs food every day of his life, yet the harvest is only at infrequent times each year, increasing production and effective food storage have been considered critical to any program striving to end hunger (The Hunger Project 1985).

**Table 2: Initiatives related to food security, 1943 -1992, 2014.**

Year	Initiative
1943	The Hot Spring Conference of Food and Agriculture is convened where the hot freedom from want in relation to food and agriculture is defined as “a secure, an adequate and a suitable supply of food for every man”.
1944	The International Bank for Reconstruction and Development (World Bank) and the International Monetary Fund (IMF) are established.
1945	The Food and Agriculture Organization of the United Nations (FAO, Rome) is founded
1946	The United Nations International Children’s Emergency Fund (UNICEF) is established. The General Agreement on Tariffs and trade (GATT) is also established.
1948	Freedom from Hunger and Malnutrition are recognized as a basic human right in the Universal Declaration of Human rights
1951	Canada provides first food aid to India on a bilateral basis
1954	The US Agriculture, Trade, Development and Assistance Act 1954 (Food for Peace) (P.L.480) is signed which allows the selling and bartering of agriculture surplus commodities for overseas development
1954	The FAO Committee on Commodity Problems Consultative Subcommittee on Surplus Disposal (CSD) is established to examine and regulate the impact of surplus disposal programs.
1963	The World Food Program (WFP) is set up by the UN and FAO to use food aid for economic and social development, as well as for emergency relief.
1965	The United Nations Development Program (UNDP) is established.
1966	A DAC high-level meeting adopts recommendation on food problems or less-developed countries, stressing the need for higher food production and increased capital and technical assistance designed to support effective domestic agricultural policies
1967	The International Grains Arrangement includes a Food Aid Convention (FAC) of 4.2 million tons of cereal aid
1971	A consultative Group on the International Agricultural Research (CGIAR) is established under the sponsorship of the World Bank, FAO, and UNDP
1972	The World Food Crisis marks the transition from an era of abundant export supplies of cheap food and excess production capacity to one of highly unstable food supplies and prices
1974	A World Food Conference convenes in Rome. This is the first UN sponsored meeting at the ministerial level of world food problems since the Hot Spring Conference in 1943. Food Security is defined as ensuring the physical availability of food supplies in the event of widespread crop failure.
1974	The World Food Council is Established
1975	The FAO Global Information and Early Warning System (GIEWS) is established
1975	The International Emergency Food Reserve (IEFR) is established with a minimum annual emergency food aid reserve of 500,000 tons.
1975	Food and Nutrition Surveillance (FNS) activities are initiated
1976	The Food Security Assistance Scheme (FSAS) is established
1977	The International Fund for Agriculture Development (IFAD) is established by Canada an original member

- 1979** The WFC endorses a new Food Strategy Approach to food problems at the national level. CIDA commits one million to National Food Strategies but spends less than 100 thousand
- 1980** The FAC committee is enlarged to 7.6 million tons of cereal aid annually.
- 1981** The Pisani Memorandum outlines the European Community's commitment to National Food Strategies
- 1981** The IMF Compensatory Financing Facility is enlarged to assist countries that encounter balance of payments difficulties arising from rising costs in cereal imports.
- 1984** The FAO endorses a broader definition of food security as ensuring that all people at all times have both physical and economic access to the basic food they need.
- 1984** Canada announces the creation of a Special Fund for Africa to address drought and famine.
- 1985** The USDA Economic Research Services releases the first World Food Needs and Availability report
- 1985** The Compact on Food Security Receives support from the majority of members during the 23<sup>rd</sup> Session of the FAO Conference
- 1986** The World Bank publishes the policy study "Poverty and Hunger: Issues and Options for Food Security in Developing Countries" in which food security is defined as access by all people at all times to enough food for an active, healthy life.
- 1987** The Inter-agency Food and Nutrition Surveillance Programme (IFNS) is initiated jointly by FAO, WHO, and UNICEF.
- 1987** The WFP establishes the International Food Aid Information System (INTERFAIS) to assist in the international coordination of food aid operations and policies.
- 1987** The USAID Development Fund for Africa (DFA) is established and improving food security is identified as one of the four key strategic objectives. In addition, USAID initiates Famine Early Warning Systems (FEWS) in eight African countries.
- 1987** The first meeting of the WFC/UNICEF/ILO Consultation on the Impact of Economic Adjustment on People's Food Security and Nutritional Levels in Developing Countries was held in Rome.
- 1988** The World Bank establishes a Food Security Unit within the Africa Regional Technical Department
- 1990** The United Nations General Assembly unanimously adopts the International Development Strategy for 1990s whose first priority is the eradication of poverty and hunger to be achieved through the implementation of four hunger-alleviation goals
- 1990** The US Food, Agriculture, Conservation and Trade Act of 1990 (P.L. 101-624) is signed which states the primary motivating force for the use of food aid is food security.
- 1991** The Food Security Unit of the World Bank completes eight food security action plans. The FAO FSAS completes Phase I of four food security country studies
- 1992** The first joint FAO/WHO International Conference on Nutrition is planned for December and Improving household food security is identified as a central theme of the conference.
- The second International Conference on Nutrition (ICN2) is planned for 19-21 November 2014 as a positive, pro-active global policy response to tackle unacceptably high and persistent levels of malnutrition*

Source: Adapted from Phillips et al (1991) and FAO (2014c)

## **Increasing food production**

Many ideas have come up to explain how global food production can be increased using the basic resources to grow more food efficiently. Some scientists like Norman Borlaug advocated for adoption of the “Green Revolution” in increasing food production (Brown 1970, Borlaug et al, 1969). The Green revolution has been considered the most successful introduction of newly developed high-yielding varieties of grain (wheat, rice, and others) in third world countries (THP 1985, p. 110). Norman Borlaug in 1970 received the Nobel peace prize for his work in breeding the first high-yielding wheat varieties (Nobel Peace Prize, 1970). Today, the term “Green Revolution” refers to almost any package of modern agricultural technologies introduced in the Third World.

This approach of the Green Revolution has, however, created a number controversies with skeptics like Raj Patel (2011), seeing the system as a cause of social upheavals in peasant culture. They argue that the views of the Green Revolution have not only failed to improve the lot of the poor, but have also caused ecological problems. Green Revolution involves the use of modern technology, which the poor cannot afford, and although poor farmers could eventually catch up with the larger farmers (Eicher, 1995, Herath and Jayasuriya, 1996); Lipton recognizes that poverty delays adoption of technology by smallholder farmers (Lipton 1989, p. 118). Therefore, whereas, some people recommend for Green Revolution to increase food production, others advocate for organic appropriate technologies (THP, 1985).

## **Schools of thought on food production**

Two main schools of thought on food production have been popular since the 1940s (THP, 1985, p. 112-120). The first school of thought- proposes that modern technologies provide an effective way of ending hunger. This school of thought is represented by several points of view. They include; a). Modern technology is the best method of food production; b). Science and technology offer particular advantages to agricultural modernization; c). New technologies can promote positive social and political change; and d). Technology can have a beneficial effect on the environment (THP, 1985). It is at this school of thought that approaches like the Green Revolution is based.

The second school of thought argues to the contrary. It agrees that food production is a key ingredient in ending hunger. However, it promotes different agricultural methods. For example, it advocates for use of more organic methods of production than do “Green Revolution” technologies, ones that do not depend upon the intensive use of energy, chemicals or pesticides. The proponents of this alternative school of thought of agricultural production contend that it has the merit of being ecologically sound, sustainable over a long period of time, and potential as productive as more mechanized forms of farming (THP, 1985).

In my point of view, much as there is increased adoption of agricultural technology in Uganda, given the poverty conditions of many smallholder farmers in the country, the adoption of the second school of thought would be more efficient. Farmers only need to be trained in how they can use locally available resources to boost production. For example, during field work, I found out that many smallholders could not afford pesticides or artificial fertilizers, they were however, mixing different shrubs and with hot pepper and animal urine as pesticides and urea and it was working for them. Others were using organic and compost manure to add nutrients to their gardens. This is particularly important given the changing trends and shifts in the understanding of food security with focus narrowing down on individuals and households as the key units of analysis.

### **The changing trends in food security**

It should be acknowledged that the subject of food security has kept changing in the past as a result of the emergence of global development as well as the dynamic nature of food problems around the world. Even the thinking about food security has also gradually shifted away from issues of global and national food supply to concerns of household and individual access to food (Devereux, 2001). There is, however, an issue of the swinging pendulum between food supply and food consumption, implying a debate on whether the main focus of food security should be put on food production and supply or, accessibility to food and consumption. Details on this subject will be discussed further in the next sections of this report where we shall look at the non-agricultural population and its food consumption demands. This has led to what I may call an evolution of food security concerns.

## **The evolution of food security concerns**

It is important to note that as the understanding of the subject of food security has evolved over time, so has its definition by different authors. The definition and concepts of food security have undergone substantial evolution. For example, the definition derived from the World Bank conference of 1974 paid attention on food supply and focused mainly on food availability and stable food prices.

Time over, however, the definition has shifted to include multidimensional concepts such as food accessibility, food utilization and food stability; as well as bringing on board the importance of households and individuals in food security concerns. Writers like Sen (1981) have been dominating in this debate, bringing in the issue of entitlement. The debate resulted in the shift of focus from the global and national concerns to include individual and households. In 1983, FAO modified the definition of food security to: “Ensuring that all people at all times have both physical and economic access to the basic food they need” (FAO, 1983).

In this definition, two important concepts can be derived: first, the concept of sustainable food production and second, sustainable livelihood enabling people to access food at all times. Maxwell presents these distinctive variables clearly in his 1988 definition of food security: “A country and people are food secure when their food system operates efficiently in such a way as to remove the fear that there will not be enough to eat” (Maxwell, 1988). It can therefore be deduced that the understanding of food security and its definition has evolved a lot since the 1974 world food conference. Some of the definitions of food security and food insecurity are presented in Box 1.



### Box 1: Definitions of food security 1975 – 1996

Author	Definition
United Nations, 1975	'Availability at all times of adequate world supplies of basic food-stuffs...,to sustain a steady expansion of food consumption ... and to offset fluctuations in production and prices.'
Reutlinger and Knapp, 1980.	'A condition in which the probability of a country's citizens falling below a minimal level of food consumption is low.'
Siamwalla and Valdes, 1980	'The ability to meet target levels of consumption on a yearly basis.'
Kracht, 1981	'Everyone has enough to eat at any time - enough for life, health and growth of the young, and for productive effort.'
Valdes and Konandreas, 1981	'The certain ability to finance needed imports to meet immediate targets for consumption <i>levels</i> .'
Reutlinger, 1982	'Freedom from food deprivation for all of the world's people all of the time.'
FAO, 1983	'Ensuring that all people at all times have both physical and economic access to the basic food they need.'
Heald and Lipton, 1984	The stabilization of access, or of proportionate shortfalls in access, to calories by <i>a</i> population.'
Oshaug 1985, in Eide et al., 1985	'A basket of food, nutritionally adequate, culturally acceptable, procured in keeping with human dignity and enduring <i>over</i> time.'
Reutlinger 1985	'Access by all people at all times to enough food for an active and healthy life.'
World Bank, 1986	'Access by all people at all times to enough food for an <i>active</i> , healthy life'
Zipperer, 1987	'Always having enough to eat.'
Barracough and Utting, 1987	'An assured supply and distribution of food for all social groups and individuals adequate in quality and quantity to <i>meet</i> their nutritional needs.'
Falcon et al., 1987	'Both physical and economic access to food for all citizens <i>over</i> both the short and the long run.'
Maxwell, 1988	'A country and people are food secure when their food system operates efficiently in such a way as to <i>remove</i> the fear that there will not be enough to eat.'
UN World Food Council, 1988	'Adequate food available to all people on a regular basis.'
Sahn, 1989	'Adequate access to enough food to supply energy needed for all family members to live healthy, <i>active</i> and productive lives.'
Reardon and Matlon, 1989	'Consumption of less than 80% of WHO <i>average</i> daily caloric intake.'
Sarris, 1989	'The ability... to satisfy adequately food consumption needs for a normal and healthy life at <i>all</i> times.'
Eide, 1990	'Access to adequate food by and for households <i>over</i> time.'
Phillips and Taylor, 1990	Food insecurity exists when members of a household <i>have</i> an inadequate diet for part or <i>all</i> of the year or face the possibility of an inadequate diet in the future.'
Staatz, 1990	'The ability... to assure, on a long-term basis, that the food system <i>provides</i> the total population access to a timely, <i>reliable</i> and nutritionally adequate supply of food.'

Kennes, 1990	'The absence of hunger and malnutrition.'
UNICEF, 1990	'The assurance of food to meet needs throughout <i>every</i> season of the year.'
Mellor, 1990	'The inability... to purchase sufficient quantities of food from existing suppliers.'
Gillespie and Mason, 1991	'The <i>self-perceived</i> ability of <i>household</i> members to provision <i>themselves</i> with adequate food through whatever means.'
Von Braun, 1991	'(Low) risk of on-going lack of access by people to the food they need to lead healthy lives.'
Weber and Jayne, 1991	'A situation in which an individual in a population possesses the resources to assure access to enough food for an active and healthy life.'
Jonsson and Toole, 1991	'Access to food, adequate in quantity and quality, to fulfil <i>all</i> nutritional requirements for <i>all</i> household members throughout the year.'
ACC/SCN, 1991.	'Access to the food needed for a healthy life for <i>all</i> its members and...not at undue risk of losing such access.'
Alamgir and Arora, 1991	'Enough food available to ensure a minimum necessary intake by all members.'
Frankenberger and Goldstein, 1991	'The viability of the household as a productive and a reproductive unit (not) threatened by food shortage.'
FAO, 1993	'Ensuring that all people at all times have both physical and economic access to the basic food they need.'
FAO, 1996	'Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life.'

To bridge the gap in the different dimensions of the understanding food security, Maxwell (1998) identifies three main shifts in the trends in food security. These include: a shift from the global and national to the household and individual; from a food first perspective to a livelihood perspective and from objective indicators to subjective perspective. He establishes that there is consistency between these shifts with the post-modern thinking in other spheres. For purposes of this study, only two of these spheres will be elaborated in this paper; that is, a shift of the global and national to the household and individual; and a shift from a food first perspective to a livelihood perspective.

### **A shift from the global and national to the household and individual**

In this shift, Maxwell suggests that there needs to be a shift in focus from supply as reflected in the 1975 UN definition to the concerns of nation self-sufficiency. It can, however, be argued that it is possible for wide spread hunger to co-exist with adequate food supply at both national and international levels (Devereux 2001). This means that the argument that food security results

from poor food supply might not hold water if not interlinked with the importance of access and entitlement as suggested by Sen (1981).

The argument that arises from this shift from the global and the national to the household and individual is, what should be the center of focus, the household or an individual? Some researchers have argued for focusing on the households as the unit of analysis (Eide 1990, Frankenberger and Goldstein 1991), while others (Gittinger et al, 1990, Reutlinger 1985) have pushed for individuals as the unit of analysis arguing that there is an issue of power and control in resource allocation which makes individuals, the unit of analysis. With this argument, however, it would also be of interest to establish who between the male and female individuals should be the center of interest as the drivers of food security.

In Uganda for example, men have the dominance in determining how resources are allocated and control the output, yet women have access to productive resources, spend more time than men in household farming activities but have limited power and control over resources and output. This is, however, not subject of this paper, but can be investigated independently at a later time. Many definitions, including the commonly cited definitions by the World Bank (1986) and FAO (1996) begin with the individual entitlement, implying the inevitable inter-linkage between the individuals and households, national and global economics.

### **A shift from the ‘food first perspective’ to the ‘livelihood perspective’**

This shift brings in a change from the conventional view of looking at food as a primary need, a lower order needs as proposed by Abraham Maslow (1954) on his hierarchy of needs. The shift focuses on building resilience of livelihoods that can ensure that individuals and families can have the economic base that allows them to have access to and consumption of quality food all year round.

In the shift from food first perspective to a livelihood perspective, food security is looked at as building security for future access and availability of food. Sen argues in his entitlement approach that people sometimes choose to starve rather than sell their productive assets in order to build livelihood for the future (Sen 1981, p. 80). In the 1984–1985 famine in Sudan in which over 100,000 people were killed, De Waal (1991, p. 68) also argues for livelihood security. He points out that in the Darfur region, people chose to go hungry in order to preserve seed for

planting, cultivate their own fields or avoid selling an animal. He concluded that avoiding hunger is not a policy priority for rural people faced with famine. These findings show that some people can choose to go hungry today in order to have something to eat tomorrow. This is a common practice, especially for women in Uganda who will skip meals in times of scarcity in order to provide for the other members of the family.

This perspective has however not gone without criticism from some scholars like Chambers (1997; Davies 1993, 1996). Chambers argues that people going hungry today in order to avoid going hungry later puts the subject of livelihood at stake as it focuses on objectives other than nutritional adequacy to be pursued. Davies (1996) pointed out, these differences existing between the food first perspective and sustainable livelihood perspective as summarized in table 3. This notion can be questioned further, for example, for how long should people go hungry in order to build resilient livelihoods tomorrow? It brings in the question of time in analyzing food security which I shall however not consider in details in this study.

Table 3: Difference between narrow ‘food first’ approach and a wide ‘sustainable livelihood’ approach to household food security.

<b>Livelihood</b>	<b>‘Food first’ approach</b>	<b>‘Sustainable livelihood’ approach</b>
<b>Objective</b>	Access to food	Secure and sustainable livelihood
<b>Point of departure</b>	Failure to subsist	Success in feeding, living
<b>Priorities</b>	Food at the top of top of the hierarchy or needs	Food one part of a jigsaw of livelihood needs
<b>Time preferences</b>	Food needs to be met before and in preference to all others	Food needs met to the extent possible given immediate and future livelihood needs
<b>Entitlements</b>	Narrow entitlement base (current and past consumption)	Broad entitlement base (includes future claims, access to common property resources, etc.)
<b>Vulnerability</b>	Lack or want of food	Defenselessness, insecurity, exposure to risk, shocks and stress
<b>Security</b>	Opposite of vulnerability is enough food, irrespective of the terms and conditions to which it is acquired	Opposite of vulnerability is security
<b>Vulnerable groups</b>	Based on social, medical criteria	Also based on economic, cultural criteria
<b>Coping strategies</b>	Designed to maximize immediate consumption	Designed to preserve livelihoods
<b>Measuring and monitoring</b>	Present and past consumption	Livelihood security and sustainability
<b>Relationship to food security and environment</b>	Degrade environment to meet immediate food needs	Preserve environment to secure the future

Source: Davies (1996)

### Common forms of food insecurity

The work of the World Bank (1986) has brought a conventional agreement about the existence of a distinction between chronic and transitory food insecurity. According to the International Fund for Agriculture Development - IFAD (2014), chronic food insecurity is a trend in food consumption that involves an inability to meet food requirements over a long period, while transitory food insecurity concerns *shocks* that briefly push the *level* of food consumption below the requirements. A household can be said to be food secure only if it has protection against both

kinds of insecurity. In my opinion, therefore, the question of going hungry today in order to avoid going hungry tomorrow can be applicable to transitory food insecurity and not chronic food insecurity. Choosing to go hungry in chronic food insecurity weakens the ability of individuals and households to manage risks and vulnerability.

Analyses of transitory food insecurity looks at the intra and inter annual variations in household access to food, which according to CIDA (1989, p. 21) can be categorized under two:

- Temporary food insecurity; occurring in a short time as a result of unforeseen and unpredictable causes; and two:
- Cyclical or seasonal food insecurity; occurring when there is a regular pattern in the periodicity of inadequate food access, which could result from a limited financial base or poor storage facilities for a household.

As a result of these differences in food insecurity and variations in the impacts and risks they cause to different individuals and households, coping strategies also differ accordingly. Frankenberger and Goldstein (1990, p. 22) argue that people have different patterns of responding/coping depending on the nature of risk involved<sup>1</sup>. They suggest that different household assets will play different roles in the process of coping. They thus argue that small farming households are in a fixed dilemma that involves a trade-off between immediate subsistence and long-term sustainability.

IFAD (2014) however, established that the household asset base will play an instrumental role in deciding the acquisition and utilization of food. It indicates that a household with several assets can more effectively maintain its consumption level by disposing of some of these assets. Its ability to do so increases, according to the proportion of assets held in liquid form. Thus, the value and liquidity of assets are important determinants of a household's ability to cope with shocks to acquirement.

Scholars like Oshaug (1985) have thus categorized households into three kinds: first, the *enduring households*, which maintain their household food security on a continuous basis; second, the *resilient households* which suffer shocks, but recover quickly; and third, the *fragile households*, which become increasingly insecure in response to shocks. However, it can also be

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<sup>1</sup> Risks could involve asset depletion and/or breakdown of community reciprocity.

argued that hunger/food insecurity has a seasonal pattern, it follows the rhythms of harvest, seasonal availability and food price rises, as more and more partly self-provisioning people come on to the market (Kessy et al, 2013, p. 99). When food is short, the number of meals eaten a day is reduced as is the quality of the meals consumed. This happens until some days pass without anything to eat.

Kessy and others observed that small farmers either do well or badly out of the highs and lows of seasonal prices. For example, those who can store food till prices are high do well, while those who have to buy when prices are high do badly (Kessy et al, 2013). This has an implication that being able to produce food for the year and sell some, or to market cash crops, remains a key indicator of household well-being; a situation that makes households to be able to acquire and utilize food, or not be able to do so depending how they are prepared.

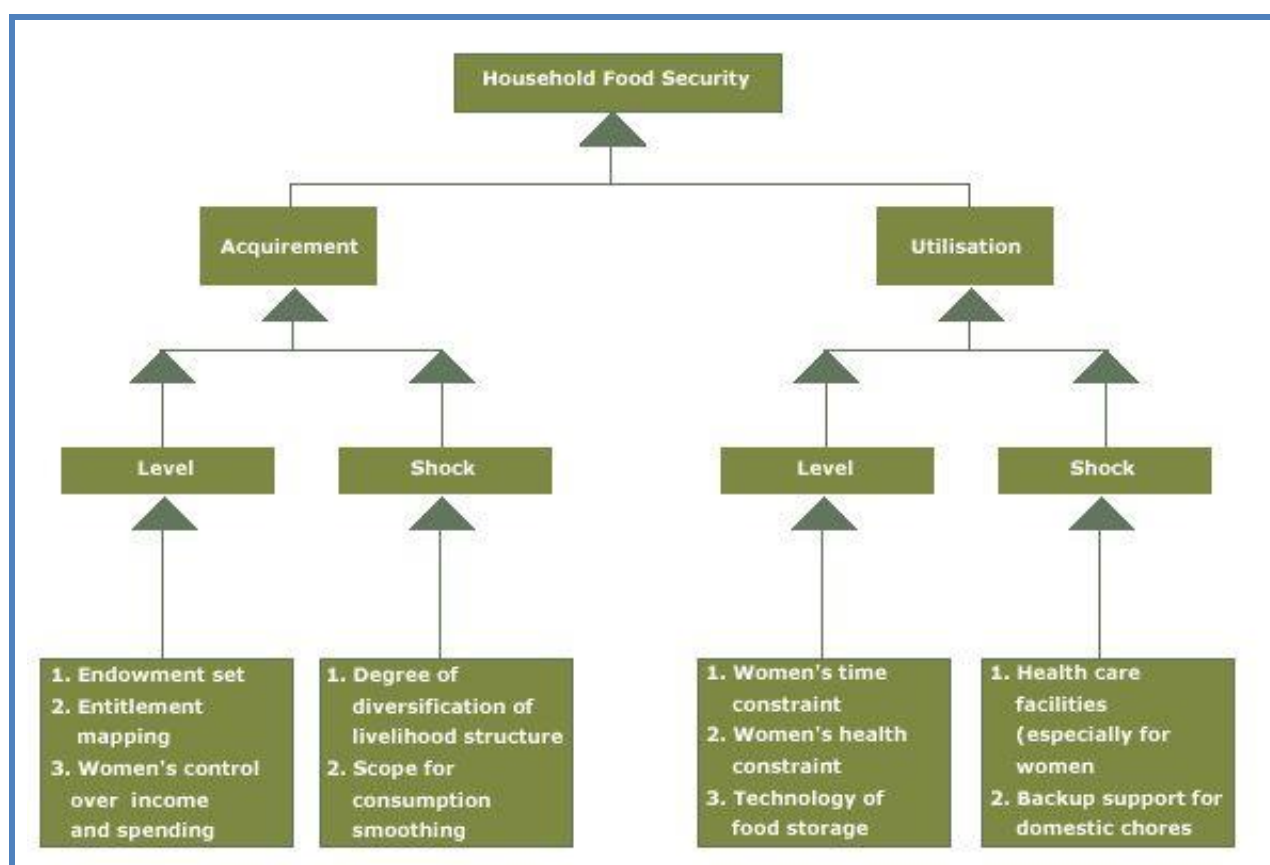
Food insecurity in a household according to IFAD (2014) can be understood as a combination of two distinctive problems: a problem of *acquisition* and a problem of *utilization*. With acquisition, it refers to the ability of a household and its members to acquire enough food through production, exchange or transfer. It should however be noted that acquisition is only one aspect of food security or insecurity. A household that has the capacity to *acquire* all the food it needs may not always have the ability to *utilize* that capacity to the fullest (IFAD, 2014). For example, in Uganda, if a woman who is vested with the role of preparing and serving food to the families finds herself pressed with a lot of responsibilities and has no time to prepare and serve food in a manner that yields the best nutritional value, it may throw the family into transitory food insecurity. Yet in a country like Norway where both husband and wife share the responsibility of preparing meals, this may not be a problem.

Alternatively, if the household does not have sufficient storage facilities to maintain adequate quantities of food in good conditions outside the harvest time, even if they had solved the problem of acquisition by producing much, there is a likelihood that that household may become food insecure. Just like, this study established that access to proper food storage facilities was still a big problem for smallholder farming households in Uganda. Therefore, a household can be said to be food secure only if it is secure in terms of both the acquisition and the utilization of food.

## Analysis of determinants of food security

IFAD (2014) suggests a fourfold conceptual framework for analyzing food security presented in Figure 4. It looks at the ability to improve and maintain the 'level of acquirement'; the ability to cope with 'shocks to acquirement'; the ability to improve and maintain the 'level of utilization'; and the ability to cope with 'shocks to utilization'.

Figure 4: Flowchart for analyzing the determinants of food security



Adapted from: International Fund for Agriculture Development (2014).

The analysis of these four concepts involves looking at two key areas - that of level of food acquisition and food utilization and the shocks in food acquisition and utilization. The main determinants of the level of food requirement include endowment and entitlement mapping (Sen 1981, Osman 1995). On the other hand the determinants of ability to cope with shocks of acquirement include mainly those related to 1). Reduction in fluctuations in household incomes



like: the degree of diversification of household's livelihood strategy; and 2). Reduction in fluctuation in consumption basing on the fluctuation in income. This will require a household to establish a scope for consumption-smoothing - the ability of a household to maintain the normal level of food consumption in the face of an income shock (Hamound 2010, IFAD 2014).

### **Global and regional food security status**

The Food and Agriculture Organization (2013, p. 8), indicates that a total of 842 million people or around one in eight people in the world, were estimated to be suffering from chronic hunger between 2011–2013, implying, they were regularly not getting enough food to conduct an active life. This figure shows a 3.08 percent reduction in level of hunger reported by FAO in 2011-2012 that indicated that 868 million people were estimated to be undernourished.

It is, however, important to note that the improvement in the level of nutrition or food security has occurred but with sharp regional differences. Sub-Saharan Africa remains the region with the highest prevalence of undernourishment, with modest progress in recent years. Western Asia shows no progress, while Southern Asia and Northern Africa show slow progress. Refer to Figure 5. Many countries still struggle to meet the ambiguous food security goals of: 1). The World Food Summit (WFS) of 1996 whose target is to halve the number of hungry people in the world (FAO 1996); and 2). The 2001 Millennium Development Goal (MDG), targeting to halve the proportion of hungry people in the total population.

Although many countries still struggle to meet these targets, on 12<sup>th</sup> June 2013, the FAO reported that thirty-eight countries had already met internationally established targets in the fight against hunger, chalking up success ahead of the established deadline of 2015<sup>2</sup> (FAO, 2014). An additional 18 countries were congratulated for reaching both MDG 1 and the stricter World Food Summit (WFS) goal, having reduced by half the absolute number of undernourished people between 1990-92 and 2010-2012<sup>3</sup>. This is a positive sign toward achieving the international food

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<sup>2</sup> The countries achieving MDG 1 alone were identified as: Algeria, Angola, Bangladesh, Benin, Brazil, Cambodia, Cameroon, Chile, Dominican Republic, Fiji, Honduras, Indonesia, Jordan, Malawi, Maldives, Niger, Nigeria, Panama, Togo and Uruguay.

<sup>3</sup> The countries achieving both MDG 1 and the WFS are: Armenia, Azerbaijan, Cuba, Djibouti, Georgia, Ghana, Guyana, Kuwait, Kyrgyzstan, Nicaragua, Peru, Saint Vincent and the Grenadines, Samoa, Sao Tome and Principe, Thailand, Turkmenistan, Venezuela (Bolivarian Republic of) and Viet Nam

security targets, and if other countries fulfill their commitments, it was possible that food security in Africa will improve steadily.

Despite the reduction in the world's hungry people and the successes of some countries to meet international targets on food security, the number of undernourished people has been still high as already indicated above. FAO chief was noted to have asserted: "*Globally, hunger has declined over the past decade, but 870 million people are still undernourished, and millions of others suffer the consequences of vitamin and mineral deficiencies, including child stunting,*" the FAO chief said (FAO 2014a, para 4).

Substantial reductions in both the estimated number and prevalence of undernourishment have occurred in most countries of Eastern and South Eastern Asia, as well as in Latin America, however, it is still worse in south Asia and closely followed by Sub-Saharan Africa as shown in table 4 below.

### **Justification for regional differences in undernourishment**

FAO observes that several factors account for the regional differences in the reduction in hunger which include differences in economic conditions, infrastructure, the organization of food production, the presence of social provisions and political and institutional stability. The slow progress of Sub-Saharan Africa where Uganda belongs in reducing hunger can be attributed to often miserably inadequate infrastructure that plagues vast areas of rural Africa (FAO 2013). Much as improved communication and broader access to information technology may, to some extent support the increased in hunger reduction rate in the East Asia and some part of North Africa.

Table 4: Undernourishment around the world, 1990-92 and 2011-13

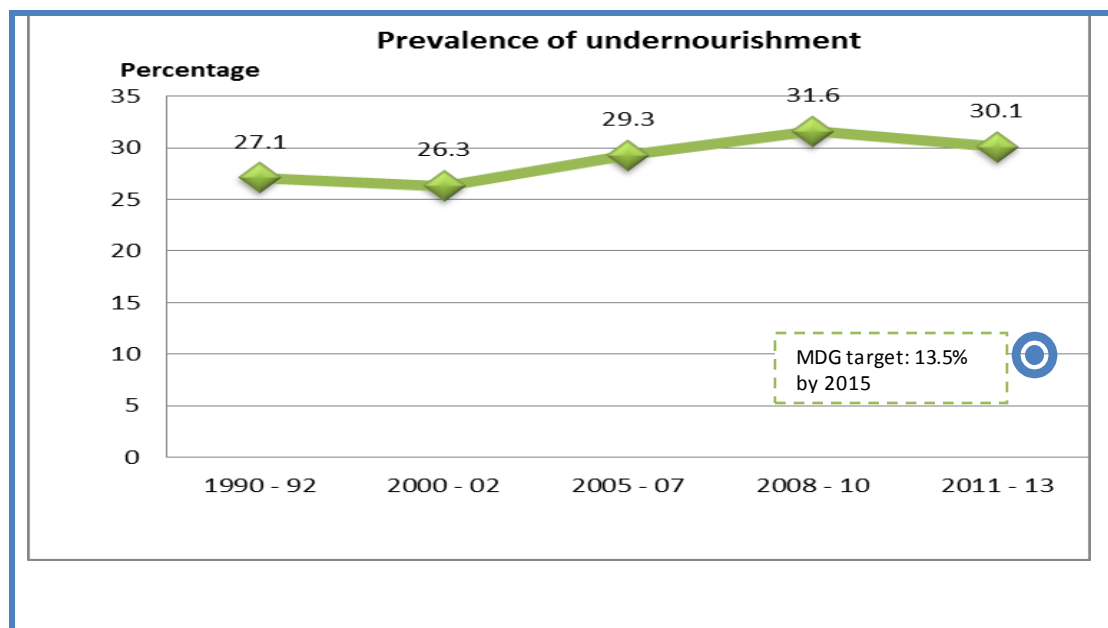
	Numbers of undernourished (millions and prevalence (%) of undernourishment)				
	1990-92	2000-02	2005-07	2008-10	2011-13*
<b>WORLD</b>	1 015.3	1 015.3	1 015.3	1 015.3	1 015.3
	18.9%	18.9%	18.9%	18.9%	18.9%
<b>DEVELOPED REGIONS</b>	19.8	19.8	19.8	19.8	19.8
	<5%	<5%	<5%	<5%	<5%
<b>DEVELOPMENT REGIONS</b>	995.5	995.5	995.5	995.5	995.5
	23.6%	23.6%	23.6%	23.6%	23.6%
<b>Africa</b>	177.6	177.6	177.6	177.6	177.6
	27.3%	27.3%	27.3%	27.3%	27.3%
Northern Africa	4.6	4.6	4.6	4.6	4.6
	<5%	<5%	<5%	<5%	<5%
Sub-Saharan Africa	173.1	173.1	173.1	173.1	173.1
	32.7%	32.7%	32.7%	32.7%	32.7%
<b>Asia</b>	751.3	751.3	751.3	751.3	751.3
	24.1%	24.1%	24.1%	24.1%	24.1%
Caucasus and Central Asia	9.7	9.7	9.7	9.7	9.7
	14.4%	14.4%	14.4%	14.4%	14.4%
Eastern Asia	278.7	278.7	278.7	278.7	278.7
	22.2%	22.2%	22.2%	22.2%	22.2%
South-Eastern Asia	140.3	140.3	140.3	140.3	140.3
	31.1%	31.1%	31.1%	31.1%	31.1%
Southern Asia	314.3	314.3	314.3	314.3	314.3
	25.7%	25.7%	25.7%	25.7%	25.7%
Western Asia	8.4	8.4	8.4	8.4	8.4
	6.6%	6.6%	6.6%	6.6%	6.6%
<b>Latin America and the Caribbean</b>	65.7	65.7	65.7	65.7	65.7
	14.7%	14.7%	14.7%	14.7%	14.7%
Caribbean	8.3	7.2	7.5	6.8	7.2
	27.6%	27.6%	27.6%	27.6%	27.6%
Latin America	57.4	57.4	57.4	57.4	57.4
	13.8%	13.8%	13.8%	13.8%	13.8%
Oceania	0.8	1.2	1.1	1.1	1.2
	13.5%	13.5%	13.5%	13.5%	13.5%

Source: FAO, IFAD and WFP (2013, p. 8). Note: \* Projections

### 3.4 Food security in Uganda: General overview

Uganda's food security situation is still not the best compared to the rest of the world and the Sub-Saharan Africa. Near 1.4 million people, approximately 3.9% of the total population of Uganda are food insecure (FAO, IFAD and WFP 2013), and the number Ugandans suffering from food insecurity measured in terms of caloric intake is alarming with limited rates of income poverty (Ssewanyana and Kasirye 2010). The country has registered increased prevalence of undernourishment since the early 2000s and the hope of achieving the MDG hunger target by 2015 is minimal, see Figure 5.

**Figure 5: Food production and dietary energy supply in Uganda between 1990-2012**

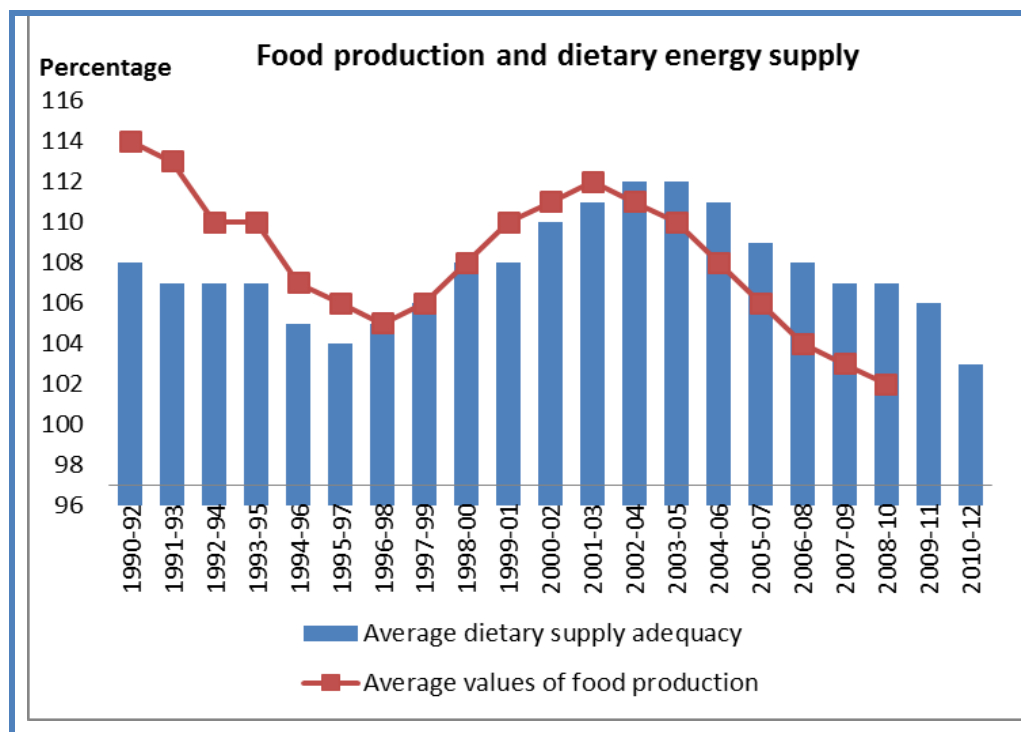


Adapted from: FAO, IFAD & WFP (2013, p. 39).

In the past few years, there have been several attempts to study food insecurity in Uganda by several researchers in terms of its nature, extent and impacts. Some of the studies conducted include those by the World Food Programme (2013 & 2009), Simler (2010), Ssewanyana and Kasirye (2010 & 2003), Pouw (2009), Benson et al (2008), Alderman (2007), Ssewanyana et al (2006), and Banhingwa (1999). They all, however, reveal an unfavorable food security situation, coupled with increasing food prices.

Uganda's growth in food production has not met the increasing population growth at an annual rate of 3.2%. Statistics show that food production per capita has been declining since 2002-04 as shown in Figure 6. Additionally, dietary energy supply, which includes the energy supplied by importing food, has kept declining since 2003-05 although it remains on average-adequate to meet the energy requirement of the population.

**Figure 6: Food production and dietary energy supply per person in Uganda**



Adapted from: FAO, IFAD & WFP (2013, p.39)

### What has the government done about this?

Uganda has had a low adoption and use of modern agricultural technology which has partly contributed to low productivity growth. The government of Uganda is, however, trying to tackle this challenge through the implementation of the National Agricultural Advisory Services – NAADS which was established in 2001 as a public-private approach to extension service delivery. One of the key objectives of NAADS is to promote food security, nutrition and household incomes through increased production and market oriented farming (MoFPED 2012, p. 19). The second phase of NAADS called NAADS II launched in December 2011 is being implemented under the umbrella project ‘Agriculture Technology and Agribusiness Advisory

Services' (ATAAS) that seeks to link technology generation and dissemination under the National Agriculture Research Organization – NARO (MoFPED 2012, p. 18).

Although the NAADS programme has been effective in reducing food insecurity through distribution of a variety of inputs and technology to farmers across the country, it has not been effective in reaching resource poor farmers majority of which are engaged in subsistence agriculture. In the eastern region just like other regions across the country, farmers with land between two to five acres benefited more in receiving NAADS technology compared to those with less than 2 acres (MoFPED 2012, p.57). It is also evident that about 41% of the food security farmers served by the NAADS programme sell off most (70-100%) of the output produced using the NAADS input. This scenario illustrates the level of ineffectiveness of the programme in ensuring food security. (MoFPED 2012, p.63).

The Government of Uganda has also made more commitments to attain food security. For example, Uganda ratified Article 25 (1) of the Universal Declaration of Human Rights and Article 11 (1)<sup>4</sup> of the International Convention on Economic, Social and Cultural Rights in 1987 (MoFPED 2012, p. 10). Both of these provide for the right of everyone to adequate standards of living, including adequate food. The importance of food and nutrition is recognized in *Objectives XIV*, and *XXII* of the 1995 Constitution of the Republic of Uganda, (ROU, 1995).

In this respect, the Uganda Food and Nutrition Policy (UFNP)<sup>5</sup>, which explicitly recognizes the right to food, was developed and adopted in July 2003 by a multi-sectoral Food and Nutrition Council (UFNC), under the leadership of the Ministry of Agriculture, Animal Industry, and Fisheries (MAAIF) and the Ministry of Health (MoH) as the line ministries for its implementation and coordination with other stakeholders (MAAIF and MoH, 2003, MoFPED 2012). The UFNP was framed within the framework of the overall national development policy objective of *poverty eradication*, as described in the Poverty Eradication Action Plan (PEAP),

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<sup>4</sup> **Article 11**

“The States Parties to the present Covenant recognize the right of everyone to an adequate standard of living for himself and his family, including adequate food, clothing and housing, and to the continuous improvement of living conditions. The States Parties will take appropriate steps to ensure the realization of this right, recognizing to this effect the essential importance of international co-operation based on free consent”

<sup>5</sup> The Uganda Food and Nutrition Policy aims to ensure food security and adequate nutrition for all people in Uganda for their health as well as their social and economic well-being.

which provides the framework for all national development policies in Uganda (MAAIF and MoH, 2003; MoFPED, 2005).

However, there has been no remarkable improvement in the nutrition levels of many Ugandans since the adoption of the Uganda food and nutrition policy in 2003. The prevalence rate of malnutrition in Uganda was estimated at 26.3% between 2000-2002, while it stood at 30.1% between 2011-2013 (FAO, IFAD and WFP 2013, p.39). This could imply that the adoption and implementation of the food and nutrition policy in Uganda has not been effective in addressing malnutrition and food insecurity in the country.

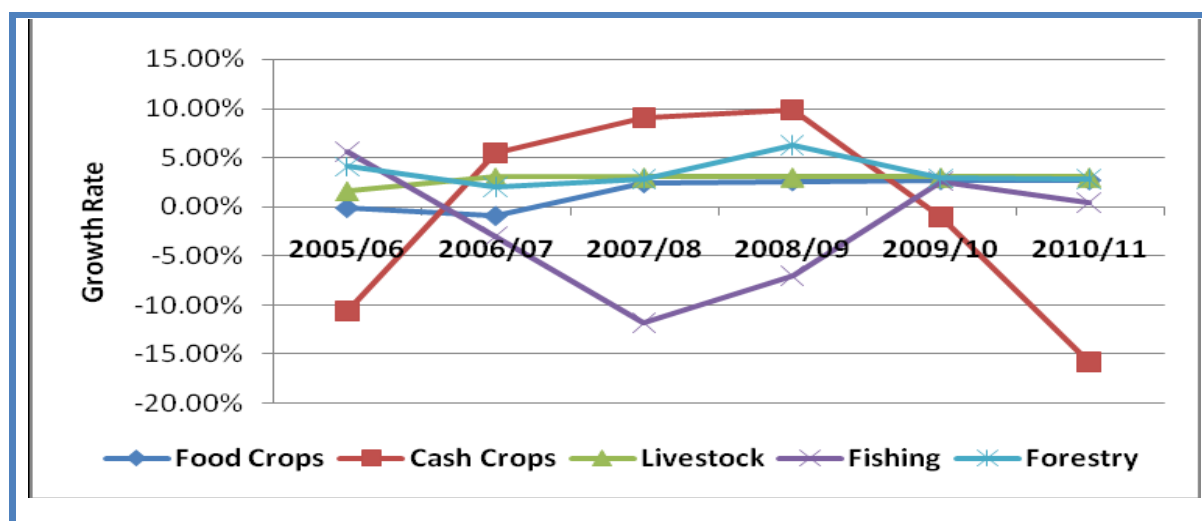
In March 2010, the government of Uganda also signed the comprehensive Africa Agriculture Development Programme (CAADP)<sup>6</sup> compact, committing itself to allocate 10 percent of the National budget to the Agriculture sector and pursue policies to ensure a growth rate of 6 percent per annum for agriculture sector (MoFPED 2012, p.10). However, in the same financial year, government spending on agriculture amounted to only 5 percent of the total budget, less from 7.6 percent in the previous year (FAO, IFAD and WFP 2013, p.39). Budget allocation to agriculture sector has kept declining and has never met the African Union Maputo Declaration of allocating 10 percent of the National Budget for Agriculture. This shows lack of government commitment in fighting food insecurity and poverty among its people.

The continued low investment in agriculture sector and agricultural technology has affected the share of agriculture in the total Gross Domestic Product (GDP) steadily. It has declined over years, for example from 18.3 percent in financial year 2005/2006 to 13.9 percent in financial year 2010/2011 (MoFPED, 2013, p. 11), see also Figure 7.

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<sup>6</sup> In 2003, African countries gathered in Maputo and endorsed the Comprehensive Africa Agriculture Development Programme (CAADP) otherwise called the Maputo Declaration on Agriculture and Food Security.

Figure 7: GDP growth rate of agriculture sub-sector in Uganda



Source: MoFPED (2011)

The growth rate of the agriculture sector in Uganda has been erratic and on a declining trend from 2.9 percent in 2008/09 to 0.9 percent in 2010/11 amidst the high population growth rate of 3.2 percent, see table 5.

Table 5: Sectoral real GDP growth rates

Sector	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11
Agriculture, forestry and fishing	0.5%	0.1%	1.3%	2.9%	2.4%	0.9%
Industry	14.7%	9.6%	8.8%	5.8%	6.5%	7.5%
Services	12.2%	8.0%	9.7%	8.8%	7.4%	8.0%
GDP at Market Price	10.8%	8.4%	8.7%	7.3%	5.5%	6.3%

Source: UBOS data, MoFPED, (2011)

The fluctuating and deteriorating pattern in the growth of the agricultural sector in Uganda shows the low level of sustainability in the sector. People only produce what can sustain them for a short time, but thereafter they go hungry again. The pattern cannot aid achievement of

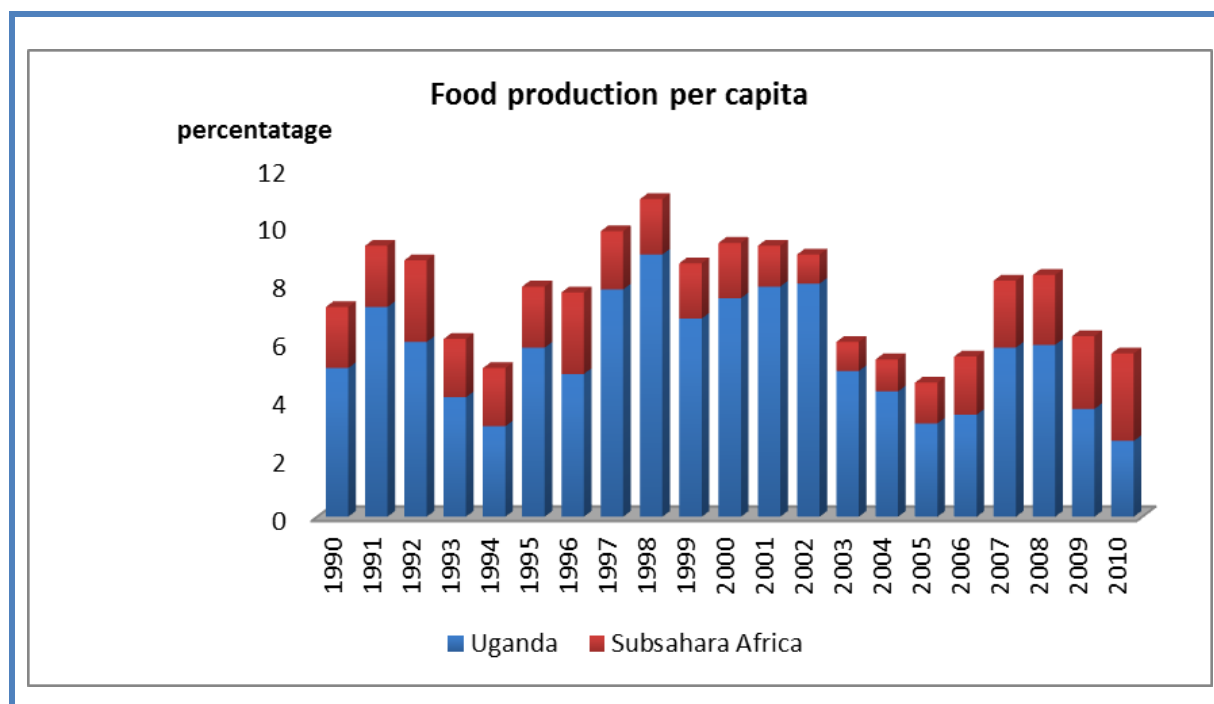


sustainable development. Efforts need to be pursued that enable the growth of the agricultural sector from mere sustainability to result in sustainable development. The per capita food production in Uganda is much more variable than the average for Sub-Saharan Africa, this is partly attributed to lack of irrigation largely, see Figure 8.

Uganda's agriculture depends heavily on rain-fed production with less than one percent of land under irrigated farming. The term Rain-fed agriculture is used to describe farming practices that rely on rainfall for water, (Rosegrant, M. et al, 2002). This has made many farmers to become vulnerable to risks due to climate variability. Following increased variability of rainfall and higher frequency of extreme events in the last decade, some parts of Uganda have suffered severe food shortages. In the north-eastern region, for example, inhabited by the Karamojongs, consecutive years of poor weather conditions and below normal rainfall since 2012 have had severe impacts on food security in the area.

In June 2013, the Integrated Food Security Phase Classification (IPC) analysis carried out by Food Security partners and led by MAAIF and the report released in November 2013 revealed that up to 1,194,423 people in the semi-arid region of Karamoja faced stressed levels of food insecurity.

**Figure 8: Per capita food production variability in Uganda**



Adapted from: FAO, IFAD and WFP (2013)

Although the Karamoja had enough food stocks at community level, they still faced challenges of inadequate food intake. Levels of malnutrition were still high due to poor dietary diversity and poor childcare and feeding practices. It was predicted that these people would in the near future have to access food through purchases from the market using income obtained from the sale of livestock, firewood and charcoal (IPC 2013).

In almost the same period, the report from the Famine Early Warning Systems Network (FEWS NET) indicated that people adopted negative coping strategies that involved consuming stocks sparingly by reducing the number of meals and skipping meals to stretch through the lean season, but the food was, however, exhausted by March 2014. The demand for food from markets increased and some other coping strategies are being used such as receiving food loans, sharing assistance and other food, begging for food, and abnormally high reliance on firewood and charcoal sales at this time (FEWS NET 2014). This has left many people highly indebted, and their heavy reliance on firewood and charcoal sales has a negative implication on environmental conservation and sustainability.

FAO, IFAD and WFP, (2013) recommend that, for Uganda to realize its agricultural potential, the government must provide public goods such as extension services and irrigation, transport and communication infrastructure to permit smallholder farmers who account for over 95 percent of all farms to increase their productivity.

### **Food security status in Uganda and the eastern region in particular**

Uganda is endowed with large-fresh-water resources as well as favorable soil conditions and climate with great agricultural potential. It is estimated that about 81 percent of all households (42 million) are engaged in agriculture<sup>7</sup>. However, the involvement of households in agriculture varies from region to region. Ninety one percent of the households in the eastern region of Uganda where this study was conducted is actively engaged in agriculture (WFP 2013, p. 6).

According to the FAO statistics presented in WFP (2013, p. 6), Uganda produces enough plantain and cassava, the two most important staples to feed its people. Maize and beans are also produced in surplus which enables export to the nearby markets like Kenya and South Sudan (See table 6).

**Table 6: Production of major crops ('000 metric tons) by region**

<b>Crop</b>	<b>Central</b>	<b>Eastern</b>	<b>Northern</b>	<b>Western</b>
Maize	712	948	376	548
Beans	263	180	95	314
Cassava	471	435	415	116
Bananas for food	4,296	239	35	3,430
Sweet potatoes	423	458	278	313

Source: World Food Programme (2013).

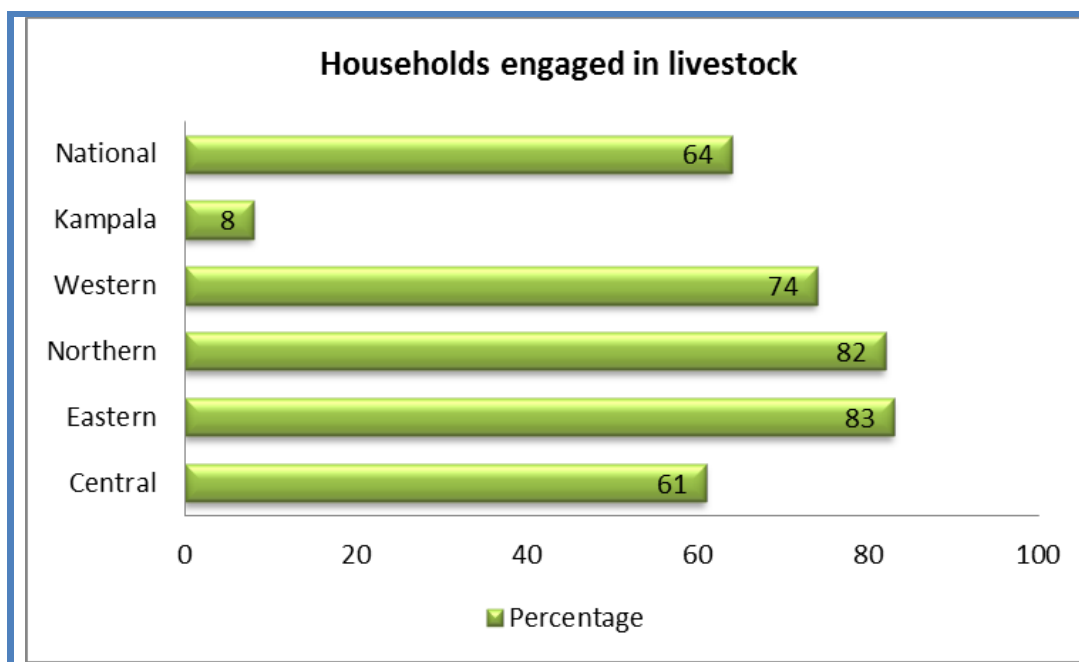
Matooke (Banana) is mainly produced in central and western Uganda while the eastern produces more maize, and the northern produces fewer food crops (maize, bananas, beans and sweet potatoes) compared to other regions given its aridity conditions as shown in table 6 above. Generally, matooke accounts for the largest expenditure shares on food as well as the largest

<sup>7</sup> A household is said to be engaged in agriculture if any member of the household is involved in cultivating crops during the first and/or the second cropping season

median quantity consumed according to the Uganda National Household Survey 2005/06 (UNHS 2006) and Ssewanyana and Kasirye (2010, p. 11). Other main foods consumed include sweet potatoes, cassava, rice, maize grain and maize flour, bread, fresh and dry beans millet and sorghum among others

Mixed agriculture is commonly practiced in Uganda and livestock production<sup>8</sup> is an integral part of the agriculture sector, contributing up to 5.2 percent of the country's GDP (WFP 2013, p. 7). In the Eastern part of Uganda, up to 83 percent of the households are engaged in livestock production alongside crop production, followed by 82 percent in the northern region, see Figure 9 below.

**Figure 9: Percentage of households engaged in livestock farming by region (%).**



Source: World Food Programme (2013)

Climate variability resulting from prolonged dry spells, however, affects livestock and food production in some parts of Uganda and particularly the eastern and the northeast, affecting access to pasture and water, as well as reducing on the number of meals consumed per day (WFP, 2013, FEWSNET, 2010).

<sup>8</sup> Livestock refers to all animals and birds kept or reared specifically for agricultural purposes including cattle, sheep, goats, pigs, horses, poultry, rabbits and donkeys. The definition is regardless of the number owned.

Traditionally, homes in Uganda are supposed to take three meals a day. A meal according to the Uganda National Household Survey (UNHS) was considered to be any substantial amount of food eaten at one time UNHS (2006). The 2009/10 UNHS findings, however, indicate a substantial reduction in the number of meals consumed per day with many families taking one meal a day. This was mainly pronounced in rural areas that suffered food insecurity most, with Northern and North Eastern Uganda being the most affected; see table 7. This implies a significant variation in the state of food security in the country that partly results from the sources of food and the climate conditions.

**Table 7: Distribution of households that took one meal a day (%)**

Residence	2002/03	2005/06	2009/10
<b>Urban/Rural</b>			
Rural	6.0	9.0	10.1
Urban	8.1	6.3	5.9
<b>Region</b>			
Kampala	5.3	6.4	6.9
Central	3.7	9.6	7.3
Eastern	3.0	4.8	7.3
Northern	25.1	18.1	20.1
Western	4.5	3.8	5.8
<b>Uganda</b>	<b>7.7</b>	<b>8.5</b>	<b>9.3</b>

Source: Uganda National Household Survey 2009/2010

### **Sources of food and food security in Uganda**

Although the majority of the households are involved in farming, Ugandans are fairly market dependent with markets being the main sources of food calories for about 50% of households. This makes many households vulnerable to food insecurity when food prices rise sharply (WFP, 2013). The seasonality of the cropping calendar caused by climate variability has been one of the major causes of high food prices in Uganda.

The Mount Elgon ecological zone where this study was conducted experiences a sub-tropical 'bimodal' climate with two rainy seasons (March-May and July-September), with dry seasons following them as already indicated in chapter 2. The implication is that there are two crops

growing season with the first harvesting usually taking place between June and August and second harvest from November to January. Of late, however, the climatic patterns have been unreliable with rains coming later than expected which affects food production.

Because of lack of proper storage facilities, limited access to credit and sources of income, smallholder farmers in Uganda are often compelled to sell their food surpluses to the market immediately after harvest (WFP 2013). Sometimes they sell directly to the established markets while at times; they sell through intermediaries (middlemen) who pay small prices. As a result, the food market chain in Uganda is a long one, refer to Figure 10 below:

**Figure 10: The food market structure in Uganda**



The World Food Programme plays a major role in the grain market of Uganda as a whole seller and buyer. Although the grain market looks to be vibrant, men are the key players and women who provide a crucial contribution as farmers, workers and entrepreneurs are disadvantaged due to gender gaps involve in Uganda's food security. The gender-related issues in Uganda's food security are discussed later in this section.

The sources of food consumed in Uganda are usually categorized based on the type of food. For example, the majority of the consumers of cereals and roots and tubers acquires it through own

production, while meat, dairy and related foods as vegetables are mainly purchased from the market (Ssewanyana and Kasirye, 2010, p. 14). Access to food, source and category of food also varies from region to region. Most of the unprocessed staples are acquired from purchases mainly. For example in the eastern region, majority of the households produce their own root and tuber crops like potatoes and cassava, and cereals like maize, sorghum and millet that are widely consumed. While other foods like fruits, vegetables and meat and dairy products except chicken are mainly purchased from the market (Ssewanyana and Kasirye 2010).

### **Gender and food security in Uganda**

In 2010, it was established that Uganda had a total of 6.2 million households, 30.1 percent of these were female headed households (UBOS, 2010). Although there is such a big percentage of female headed households in Uganda, women still face gender-specific constraints that hinder their productivity as well as reduce their contribution to agriculture production, economic growth and the well-being of their families and communities.

For example, women face gender gaps in access to productive resources. They control less than men and the land they occupy is often of poor quality, yet they have limited credit to use modern inputs like fertilizers, pesticides and improved seeds as their male counterparts do. The land tenure is also insecure due to customs and economic conditions. Women also use less credit in farming and usually the control of credit they obtain from the produce is in the hands of men especially for those women that are married. Yet, it is believed that if women had equal access to good quality resources, their farm output would equal that of men, and this means that the level of undernourishment in Uganda as well as other developing countries would go down (FAO, 2011b).

### **Summary of the food security situation in Uganda**

World Food Programme (2013) during the Comprehensive Food Security and Vulnerability Analysis (CFSVA) in Uganda came up with 10 key findings which give a clear picture of Uganda's food security status. These findings are presented in Box 2.

## Box 2: Summary of food security situation in Uganda

- Nationally, almost half (48%) of Ugandans was food energy deficient between September 2009 and August 2010.
- Nearly 5% of Ugandans had poor food consumption, which reflects an extremely unbalanced diet, that is devoid of protein and chiefly comprised of starchy maize or matooke (plantain) flavored with some vegetables. Seventeen percent had borderline food consumption, which means they consume a slightly more varied diet with more pulses, vegetables and sugars, but still barely any animal proteins, milk or fruit.
- A third of Ugandan children were stunted, 14% severely so, and the rate was “serious” in western (42%) and eastern (36%) Uganda. Rural Ugandans were also more likely to be stunted than urban (37% vs 14%).
- Food insecurity and malnutrition were strongly associated with monetary poverty (here measured by the expenditure quintile). Despite Uganda’s progress in reducing the incidence of poverty, the absolute number of poor people has increased due to population growth and poverty remains firmly entrenched in rural areas. About 30% of all rural people still live below the national rural poverty line.
- The poorest households in rural Uganda were the most dependent on purchasing their food, making them highly vulnerable to food price rises for the foods they need to buy.

Source: Adapted from World Food Programme (2013, p.1)

### 3.5 Climate change and food security

The term climate change is used to denote any significant, but extended change in the measurement of climate. The changes could be a result of natural variability or anthropogenic (man-made) influences such as the burning of fossil fuels to produce energy, deforestation, industrial processes and some agricultural practices like the intensive use of fertilizers and other chemicals (IPCC TAR 2001, Levina and Tirpak 2006). The aforementioned activities emit carbon dioxide in the atmosphere in large amounts resulting in global warming.

According to the 4<sup>th</sup> Intergovernmental Panel on Climate Change assessment report (IPCC, 2007), the global mean surface temperature has increased by about 0.07<sup>o</sup>C for every decade in the past 100 years, with the increase becoming more rapid at about 0.18<sup>o</sup>C per decade in the last 25 years. The African Ministerial Conference on the Environment (AMCEN, 2011) revealed that the last decade (2001-2010) was the warmest on record, with average temperatures reaching



0.46° C above the 1961-1990 mean, and 0.21° C warmer than the 1991-2000 periods. Africa is reported to be warming up faster than any other continent all-year round, and the trend is likely to continue (IPCC, 2007).

There is already much written about climate change in the literature and thus this study will not dwell much on discussing the concept of climate change and food security. However, interest will be on looking briefly at the impact climate change can have on food and livelihood security and how smallholder farmers are trying to adapt to climate variability. The case of how the groups of women in Medak district in India adapted amidst the 2001-2002 drought in India was also found interesting for this study and it is presented later in this section.

### **Impact of climate change on food and livelihood security**

The increased incidences of flooding, extreme droughts and rising sea levels are proven to have “immediate impacts on food production, food distribution infrastructure, the incidence of food emergencies, livelihoods, assets and opportunities and human health in both rural and urban areas” (FAO, 2007, p. 7). These impacts have a direct influence on the social economic development in the society. The impact of climate change on food security does not only manifest in the form of drought or floods, but also on the growth and spread of pests and diseases of humans, plants and animals, together with water security (Lesley 2008, p. 3).

Evidence from the IPCC (2000, 2007) indicates that countries in the temperate regions are likely to enjoy some economic advantage from climate change because additional warming will benefit their agriculture sector. However, countries lying in the tropical and sub-tropical regions are predicted to be more vulnerable to warming as a result of additional warming that will affect water balance and harm their agriculture sector. The IPCC predicts that the worst affected region will be Africa because currently, there is already evidence of the severe effects of climate change. Many countries in Africa including Uganda, for example, lack updated information systems; they have poor technology as well as many of the economies largely depend on agriculture.

Farmers in Africa have already faced the problem of a dwindling water supply and water variability due to unstable rainfalls. This has already led to millions of people to be affected by

droughts. The impact is predicted to be more in advance of climate change (Dinar et al, 2008). Agriculture just like fisheries and forestry is very sensitive to climate and increasing the warming caused by climate change will likely affect its production. FAO (2008, p. 11) identifies two main food security implications of changes in agriculture production patterns and performance:

1. Impacts on the production of food that will affect food supply on the global and local levels; with low income countries that have limited financial capacity to trade and depend highly on production of their own food suffering more compared to developed regions that can easily offset declines in local supply through imports.
2. Impacts on all forms of agricultural production will affect livelihoods and access to food.

This implies that producer groups like rural and smallholder farmers in developing countries that are less able to deal with climate change risk having their safety and welfare compromised.

### **Adaptation by smallholder farmers to climate change in Uganda**

Smallholder farmers in Uganda are adapting to climate change using several strategies among which include:

#### *Encroachment of swamps*

Farmers are encroaching on swamp areas to grow crops that are suitable for swamp conditions like potatoes and rice in case of increased incidence of drought conditions and moisture stress (Bagamba et al, 2012). This implied shifting labour from other crops to swamp crops. However, Bagamba and others found out that encroachment on swamps for cultivation did not have economic gains because, first, the acreage under swamp cultivation was too small to cause any significant impact, and secondly, resources (labour) shifting from a higher value crop (bananas) to sweet potatoes was not economical. Instead, swamp encroachment was negatively impacting on the wetland resource and its ecosystem.

#### *Crop livestock integration*

Farmers are minimizing the risks of crop lose by diversifying their resource base through growing many different crops as well involving in non-farming activities like fishing, hunting

and gathering wild food plants (Bagamba et al 2012). This has also included changes in the cropping time basing on the availability of rains, changes in the production techniques, as well as growing of drought resistant varieties. These findings relate to what Diner et al (2008) found out among adaptation strategies by smallholder farmers elsewhere.

Considering the above adaptation strategies employed by farmers, they could suggest that some adaptation by farmers take place autonomously and may not need government or policy intervention. However, the government could have an important role to play in promoting certain aspects such as infrastructure improvement, availability of weather information and stabilization of local market conditions among others.

Other non-governmental organizations and projects like food banks could however also have roles to play, especially since many poor people run to them for services and inputs. It is good to identify what role agencies like banks play or could play in helping smallholder farmers to achieve food security, build sustainable livelihoods but also adapt to the changes in the climate. Section 3.5 presents information about the food bank, a subject that has scarcely been researched by scholars.

### **Limitations to effective adaptation**

Smallholder farmers face numerous limitations to effective adaptation to climate change. They for example suffer from poverty and lack of credit; lack of knowledge; market access and problems with transport; difficulty in obtaining drugs for their cattle and seeds for appropriate hybrids of plants such as drought resistant kinds; reluctance to grow crops that they cannot themselves consume due to poor market access; lack of information to about the appropriate and efficient adaptation as well as weather information, particularly with regards to the timing of the rains; and others perceived many adaptation strategies as expensive (Dinar et al, 2008).

### **3.6 The food banks and food Security**

Tarasuk (2005, p. 303) argues that food insecurity can force people to adopt food consumption patterns and employ a variety of strategies to acquire food or money that fall outside social norms. For the food insecure households make daily decisions about how much of the household

expenditure can be spent on food, and what types of foods should be purchased, how many meals to have a day and so on.

While food insecure households in developing countries will opt to skip meals in order to save food for the next day, receiving food loans, sharing assistance and other food, begging for food, among other strategies (FEWS NET 2014), food insecure households in developed countries have resorted to seeking food aid from food banks, and other emergence food providers – EFPs (Moldofsky, 2008, Berner and O’Brien 2004). Many of these coping strategies used by people experiencing poverty and food insecurity in order to obtain and conserve food may be more conscious than others, while others may be more ad hoc in response to changing circumstances (Barnett, 2001). This study, however, is interested in the strategy of the food bank, which has spread through from the developed countries to the developing countries.

### **What are food banks?**

Whereas some food banks are engaged in direct provision of food to the hungry people, others in the Food Bank Movement see this differently. Some would see a food bank as: “... a centralized warehouse or clearing house registered as a non-profit organization for collecting, storing and distributing food (donated/shared), free of charge, to front line agencies which provide supplemental food and meals to the hungry” (Riches 1986, p. 16). In this definition, emphasis can be found in the notion of surplus food in the food production and retail system. It also says much about the relationship between surplus food and the hungry. This signifies that food banks intend to make food which would otherwise be dumped/wasted available to the organizations which can put it to good use. Therefore the term “food bank” is used collectively to include food depots, food pantries and other community-based food distribution sites (Starkey, et al 1998, p. 1144).

The Food Bank of Singapore (2013), on the other hand looks at itself as a place where companies or people can come to deposit their unused or unwanted foods which will then be collected and allocated to the needy via various channels through Voluntary Welfare Organizations (VWOs), charities, soup kitchens etc. This definition also stresses the notion of surplus and unwanted (waste) food and the needy.

However, while some people argue that it is difficult to distinguish between surplus food and waste and the needs of the hungry people; others look at 'calling donated food' as 'waste' as having a harsher connotation (Riches 1986, p. 16). In any case, the surplus would suggest to the public that this is a food which cannot be used by the food industry, whereas, waste leaves the impression that the private sector is inefficient.

Generally, food banks can be understood as community-centered warehouses that solicit, store and distribute food from local producers, retail food sources, the federal community distribution programs and the food industry (Nicholas-Casebort and Morris, 2001).

### **Who are food bank users in developed countries?**

Most studies on food banks reveal that food bank users are of a diverse range of people with diverse characteristics, and problems. However, the uniting factor among them is that they are usually food insecure people who also often have financial insecurity. Studies in New Zealand for example, reveal that frequent bank users were recipients of state benefits (NZCCSS, 2005, Thériault and Yadlowski, 2000 and Mackay, 1995). These findings are in line with Starkey *et al.* (1998) that found out that 83.5% of food bank users in Montreal, Canada, were also in receipt of social assistance.

Another main category of food bank users is the low income earners and the unemployed. Low income earners often had challenges meeting their food requirements and as well as livelihood security because of lack of job security as well as increasing poverty among their households and thus opted to resort to food banks for food assistance (Stephen *et al.* 2000).

Riches (2002) and Uttley (1997) found out that single mothers were also among the frequent food bank users. Their frequency could partly be due to lack of stable incomes, although other factors could have contributed to it. Other studies have, however revealed the aspect of immigration as the contributing factor to the increased number of food bank users.

Studies by Starkey *et al.*, (1999); and Daily Bread Food Bank, (2005) in Montreal and Toronto for example, indicate that nearly half of all food bank clients are immigrants, mainly coming from Eastern Europe, South America and the Caribbean. The author of this study from his experience confirms that frequent users of the Salvation Army food pantry in Kristiansand,

Norway are mainly immigrants from Nigeria, Liberia, Somalia, Poland, Eritrea and other. He therefore, in one way or another agrees with the above findings by Starkey et al, and the Daily Bread Food Bank.

### **Who are food bank providers?**

Food banks are mainly run by NGOs and or voluntary welfare organizations which are many times religious founded or affiliated with religious organizations (Fitzgerald and Cameron, 1989, p. 23, Crack, et al 2007, Daly, 1996). Other food banks like the Hunger Project food bank are founded by nonprofit charitable organizations (The Global Hunger Project 2012). Traditionally, food banks serve two main goals: to assist low-income consumers and to distribute surplus food. Although many of these organizations offer food assistance, they have diverse objectives and food banks are often just part of their program.

McPherson, (2006) observed that many food banks are used by owners to encourage their users to access other services they offer for example advocacy and budgeting service or general life-skills courses. She notes that after a certain number of visits to the food bank it may be a requirement that the client seeks budgeting advice. In some cases, the food bank services are used as a means to generate demand for other services which are supported by the state contractual agreement.

The author of this study visited the Salvation Army food pantry in Kristiansand on many occasions since the commencement of this study in 2013. He also observed that the providers used the food pantry to encourage people to listen to the word of God. Usually while people are eating food and taking coffee in the service hall, a team of church members will minister to them through godly songs and there will be a brief preaching. Users are also encouraged to attend church service with them if they had no church they attended. It can therefore be argued that whereas many food banks offered food aid to the hungry, many did not have the objective to end hunger and promote food security, but rather provide relief and emergency food supplies to the hungry.

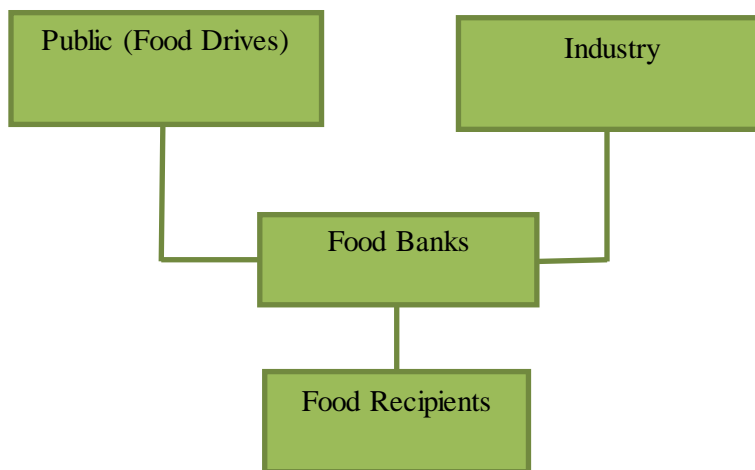
### **Can conventional food banks reduce food insecurity?**

Riches (1986, p. 4), argues that the rise of food banks provides concrete evidence of the collapse of social assistance and unemployment insurance. This implies the breakdown of the safety net at the very point in an economy where it should be providing its strongest support to the most vulnerable.

According to Husbands (1999), food banks and other community assistance programs should only be relied on as emergency measures rather than being institutionalized as permanent mechanisms for food access. Husbands argue that traditional food banks are geared toward providing emergency assistance (hunger alleviation) but not addressing hunger as a structural phenomenon. They solicit food from the public and corporations in addition to purchasing food from producers. Because of the different understandings of the operations of food banks, different models of food banks exist. However, the simple model employed by traditional food banks is the 'hunger-alleviation model' (Husbands 1999, p. 107), illustrated in Figure 11.

Food companies, restaurants and individuals donate food to the Food Banks. However, charities and churches are the major funders of food banks in the U.S. (Hayes and Laundan, 2009, p. 428). Due to their dependency on public and corporate goodwill, many of the food banks are unwilling to pursue social change in any determined way (Husbands 1999). They often employ voluntary labor and very-low key fundraising. They usually have insufficient human and financial resource to undertake the research, advocacy and community mobilization needed to systematically address hunger.

**Figure 11: Hunger – alleviation model**



Source: Husbands, W., (1999, p. 107)

While anxieties about the adequacy and appropriateness of this response to income-related food problems proliferate, food banks are now regarded as a ‘necessary community resource’ especially in the U.S (Starkey et al 1998, p. 1148).

The study by Starkey and others (1998) found out that the majority of the food bank users in Canada were not those thought to be the most vulnerable in terms of nutritional status (the very young, elderly and those with chronic health conditions); they were rather healthy, single individuals, though also mainly non-working poor. It is observed that the assistance provided by food banks largely depends upon the quality and quantity of donations from the public and from producers, processors and retailers (Teron and Tarasuk 1999, p. 382). This affects the amount of food donated and its nutritional value. The amount of food supplied is usually not sufficient to meet the caloric requirements of food bank users.

### **The paradigm shift in the role of food banks in food security**

Due to the rise in obesity and diet-related diseases among food insecure people of late, some food bank personnel have been persuaded to actively promote more nutritious products (Handforth, Hennink, Marlene and Schwartz, 2013). Some food banks are offering nutritional education to their users (Food bank of Delaware 2011, Cotugna 2002). Other food banks have



gone ahead to engage researchers to develop nutrition-profiling system to measure the food distributed in terms of MyPyramid day (Anderson, 1990, ed.).

Other measures have been developed to establish the exact cause of food insecurity, for example the Core Food Security Measure (CFSM) that is used nationally to assess the extent and severity of household food insecurity in the previous 12 months due to inadequate money for food (Derrickson, Fisher and Anderson, 2000). This paradigm does not only possess the potential to address both food insecurity and malnutrition in vulnerable populations, but also presents a new opportunity for anti-hunger advocates and nutrition advocates to work together toward a common goal (Handforth et al, 2013).

Earlier on in 1999, Husbands had suggested that for food banks to effectively provide the desired local solutions to food insecurity, and build livelihood security, they need to transform into anti-hunger organizations. This means that the expanded role of anti-hunger organizations would include – severely reducing the incidence of hunger and eliminate the need for food banks as welfare or emergency agencies. The new role would require anti-hunger organizations to play combined roles of research, public-education, public-policy advocacy, one-on-one advocacy, and community mobilization. This does not, however, rule out the inimitable role of food banks in providing emergency assistance programs and services to meet people's basic needs (Husbands 1999, p. 108). This would however be faced with limitations due to the food banks reliance on good will of individuals and corporations for their success.

### **Alternative approaches to the food bank concept**

Elsewhere in the world, the concept of food bank has been adopted and implemented differently with the aim of addressing food insecurity and reducing the number of hungry people on the globe. In South-East Asia for example, in Cambodia, Laos, Thailand and Bangladesh, the concept is adopted in the form of 'Community-managed Rice Banks' (Datta 2007, UNBconnect 2014), while in India, Cameroon and Bukina Faso, food banks have been adopted in the form of 'Community Grain Banks' (Inter Pares, 2004, Edakkadi 2013, RELUFA 2008, Eugene 2013, Yamengo 2013). These institutions are reported to have had a great impact on the food security of these countries.

### **What are community-managed rice banks?**

Generally, a rice bank is a simple wooden structure housing a supply of rice. In many cases, the initial supply of rice in these banks usually comes either from the community's surplus (from a collective rice field maintained for that purpose), or from external agencies, including local government (Datta, 2007). Villagers borrow rice from the rice bank and repay the same amount when their next crop is harvested.

CARITAS (2004) and UNBconnect (2014) reported that rice banks significantly contributed to food security for the poor in rural areas. In Bangladesh, for example, UNBconnect reported that the hilly areas commonly referred to as Chittagong Hill Tracts (CHT) had always been the most food insecure regions. However, by May 2014, a total of 1,708 community rice banks had been established in the hilly districts of Rangamati, Bandarban and Khagrachari, under the Community Empowerment and Economic Development Project financed by Chittagong Hill Tracts Development Facility (CHTDF) program of UNDP. It was reported that these areas have become food secure following the distribution of rice banks which allowed them to easily address the 'lean' period (period of scarcity) (UNBconnect 2014).

### **Management of community rice bank**

Community rice banks are established and managed by community members themselves. They supply materials for construction and renovation of the rice warehouses and are only facilitated by external assistance with technical input and other material support (Datta, 2007). Community members are helped to establish a three-person management committee that consists of the chief (usually the village chief), clerk (accounting officer) and rice bank keeper.

The committee oversees loan disbursement, leads the village in fixing the annual interest rate on rice returned to the bank, and reports on activities including transaction details. They are trained in basic principles, objectives and management of the rice banks, as well as provided with supplementary managerial documents like stock account, application for loan and contract, stock records, application for a membership, and formats of monthly, quarterly, and annual reports. Villagers were also sensitized on the benefits of managing the rice banks in a sustainable manner and their role in achieving this sustainability (Datta, 2007).

Inter Pares (2004) reported that rice banks were judged to be working well and ensuring that the villagers' families in the areas they were established did not go hungry. It was also reported that rice bank users were well motivated and the rice banks were sustainable. Generally, establishment and management of community rice banks remain the

### **What are community grain banks?**

The community grain bank is a community managed food security system, where the community is trained to set up a bank of food grains from which they can borrow during times of need and repay in kind with a minimal interest fixed by the community (Swaminathan, n.d). Unlike community rice banks that are specialized in rice, grain banks are designed to store different types of grain at the same time, grain crops stored include: Ragi, paddy/rice, maize, and millet (Reddy and Adolph, 2002 and Carter, 2001).

In grain producing countries, it is observed that grain prices are usually very low after harvest period, when most farmers have plenty of grain. Later in the year, prices shoot sharply. When people's own grain supplies start to run out and the need to buy grain rises, grain prices are often high. To prevent food insecurity, grain banks buy grain when prices are low around harvest time and sell it at fair prices when it is in short supply. Grain banks have been proven to save farmers/poor people during times of drought from the exploitation by traders who take advantage of difficult situations to sell grain to people at very high prices (Carter 2001).

This community-based managed food security strategy has been considered very effective and has been replicated in many other districts of India. For example, the village-level grain banks in Raigad District of Maharashtra state, supported by the Academy of Development Science (ADS). By 2002, ADS had established 132 grain banks in 120 villages of Raigad and Thare districts (D'silva, 2014). Community grain funds/banks have not only supported women to retrieve a strong biodiversity on their farms, but also reestablished women's control and leadership over their community plasma knowledge (D'silva 2014).

## **Learning from selected samples of conventional food banks**

Although many of the conventional food banks in developed countries discussed above may not be able to adopt the alternative food bank approaches like ‘community-managed rice banks’ and ‘community grain banks’ due to contextual and other differences; some food banks have tried to shift from the traditional roles of food collection and emergency food supplies to initiating community gardens, income generating projects, skills trainings, linking farmers to markets as well as providing farmers with improved seeds. These roles are important in ensuring sustainable access, availability and utilization of food as well as improving livelihood security. A sample of some of the food banks and their operations is presented in this subsection to show how they can be used as practical examples for food banks in Uganda.

### **a) The food bank of Delaware**

On top of providing children’s nutrition program and the mobile pantry, the school pantry and culinary school, typical of traditional food banks, the food bank of Delaware run a supplemental nutrition assistance program (SNAP) outreach in collaboration with the government (Food bank of Delaware, 2011). It also conducts the community supported Agriculture program (CSA). CSA is a generic term coined in the USA in 1985 to promote fresh, locally grown food and foster social and ecological responsibility. It can be defined as a partnership between farmers and consumers where the responsibilities and rewards of farming are shared (Soil Association 1997, p. 5)

CSA has become a popular way to buy local, seasonal food. This not only allows money to remain in circulation within the local community leading to local development, it also checks on buying imported foods or those transported from far areas that have an effect on global warming and the environment (NRDC 2010).

Furthermore, by encouraging CSA, the Delaware food bank helps farmers to avoid exploitation from moneylenders. In this case, CSA members become the shareholders of a local produce farm and the money they pay to the farmers helps them to buy seeds, pesticides, fertilizers and land preparation, which saves them from taking loans (Food Bank of Delaware 2011, and Soil Association 1997, p. 5).

Community food banks in Uganda can emulate this to support smallholder crop farmers to achieve food security and sustainable livelihood through initiating and promoting CSAs of various models. For examples the subscription or farmer-driven model, the shareholder or consumer-driver model; farmer cooperatives and farmer-consumer-cooperatives model (Soil Association 1997, p. 6).

This has a direct effect on the accessibility and availability of food supplies to the community for consumption and the consumption of locally nutritious and fresh foods. One of the challenges facing Uganda's smallholder crop farmers is limited access to financial resources and market. Implementing the CSA strategy would provide local solutions to this challenge.

#### **b) The community food bank of Southern Arizona**

This food bank offers several programs and services. However, two of them were found interesting for the purpose of this study, these are: The farm-to-child program; and the community food consignment program (Community food bank, 2009). Through the farm-to-child program, the community food bank of Southern Arizona uses experts to help children, parents and teachers learn to garden through technical assistance and workshops. It is indicated that children involved in gardening show an increased preference for fruits and vegetables (Heim, S., et al 2009, p. 1220), this improves their nutrition intake.

The community food consignment program on the other hand, promotes farmers' productivity by offering gardeners and small farmers an opportunity to sell produce and other goods at the farmers' market. This helps to reduce one of the common problems facing small farmers – access to markets. It is an attractive program that encourages backyard gardening and chicken raising not only for income, but also improving family nutrition (Community food bank, 2009).

Both farm-to-child program and community food consignment program would offer practical solutions to the food challenges in Uganda. Universal primary and secondary education in Uganda, for example, is facing a challenge of feeding pupils and students respectively. Food banks in Uganda may need to team up with schools to develop school gardens into productive and sustainable sources of nutritious fresh foods to provide meals to students. Also community gardening would be a useful way by which food banks in Uganda could help smallholder farmers

who rely on family labor to expand their production. This can be achieved through joint farming and utilizing the services of volunteers from agriculture universities/institutions in Uganda and from among food bank volunteers.

### **c) In South Africa**

The agencies that work as links between the food bank and the local people are encouraged by the food bank to establish income generation and agriculture projects as well as skills training. These projects are monitored by the food bank of South Africa's team of community field workers. In 2013, it was indicated that out of all the agencies that worked with adult development, 60% had an income-generation program for beneficiaries, 22% had an agriculture project (food or community garden), and 15% had helped their beneficiaries to gain access to formal employment (Food bank of South Africa, 2013). This is crucial in improving the livelihood of local people and building their capacity to afford access to food.

Although the Hunger Project food bank in Uganda does not reach beneficiaries through link-organizations like the food bank of South Africa does, it would emulate the South Africa food bank by encouraging smallholder farmers to diversify their sources of livelihood. The food bank in Uganda is already providing practical skills trainings to both farmers directly and trainers of trainees, who in turn are expected to train other farmers in appropriate farming methods. Details of these are provided below.

### **d) In Uganda**

The Hunger Project food banks have played a significant role in improving farming and agribusiness skills among local farmers. In 2012, it was recorded that a total of over 2,538 partner farmers (1,356 women and 1,182 men) was trained in better farming methods and agribusiness (THP-Uganda 2012, p. 10). This report, however, takes a national statistic of the Hunger Project training and does not break down the number of partner farmers who were trained per region or food bank. It is thus difficult to indicate how many were trained from Mbale district where this research was conducted to provide a basis for assessment of the impact of the training. Nonetheless, it was generally reported that the training boosted the adoption of best farming methods in the epicenter communities, including planting early maturing and high yield seed varieties, post-harvest handling and storage as well as collective marketing.

To increase local farmers' capacities through use of the knowledge and skills acquired through the food security trainings; the report indicates that a total of 596 agriculture trainers of trainers were created (THP-Uganda 2012, p. 10). The report further indicated that the food banks distributed 6,970 kg of improved seeds and 1,050 kg of fertilizers to farmers. The type/species of seeds distributed, their sources, and the number of people, who benefited, as well as the number of food banks that distributed the farm technologies, however, could not be traced in the report and thus it cannot be concluded on how the seeds were suitable for the local environments. The report, nevertheless, indicated increased yields and rise in local farmers' income as a result of the inputs.

To this end, therefore, it can be argued that food banks that pursue the traditional role of providing emergency food that is donated by the public and industries cannot in any way help people achieve sustainable livelihoods and food security. However, those that have diversified their operations like the Hunger Project food banks, food banks of South Africa and the food bank of Delaware to some extent can offer effective mechanisms for achieving sustainable livelihoods and food security.

It can also be concluded that from the experience of community managed rice banks and grain banks discussed in this chapter that establishing a community-managed food bank system was the best way to empower poor communities to fight food insecurity. However, food banks on their own are not effective instruments for eradicating food insecurity, they need to be implemented alongside other programs like appropriate education and training, health programs, water and sanitation programs, savings and credit, among others.

### **3.7. Theoretical framework**

The sustainable livelihoods framework of the Institute of Development Studies (IDS) was adopted for this study. Since the study intended to explore an understanding of the concept of food security and sustainable livelihoods, in the context food banking, the sustainable livelihoods approach was considered more appropriate. Sustainable livelihood offers an approach to development that is people-centered and cuts across different disciplines. It targets at eliminating poverty, strengthening local capacities in achieving sustainability; as well as facilitating the understanding of the diverse and dynamic livelihood systems.

While using the Institute of Development Studies' (IDS) sustainable livelihoods framework in this study (refer to Figure 12), it was not considered as a blueprint that should not be changed. Rather, it was adopted and adapted to suit the needs of the study context. It offered useful insights to the researcher, as it worked as a useful checklist while developing data collection tools and actual data collection, as well as data analysis.

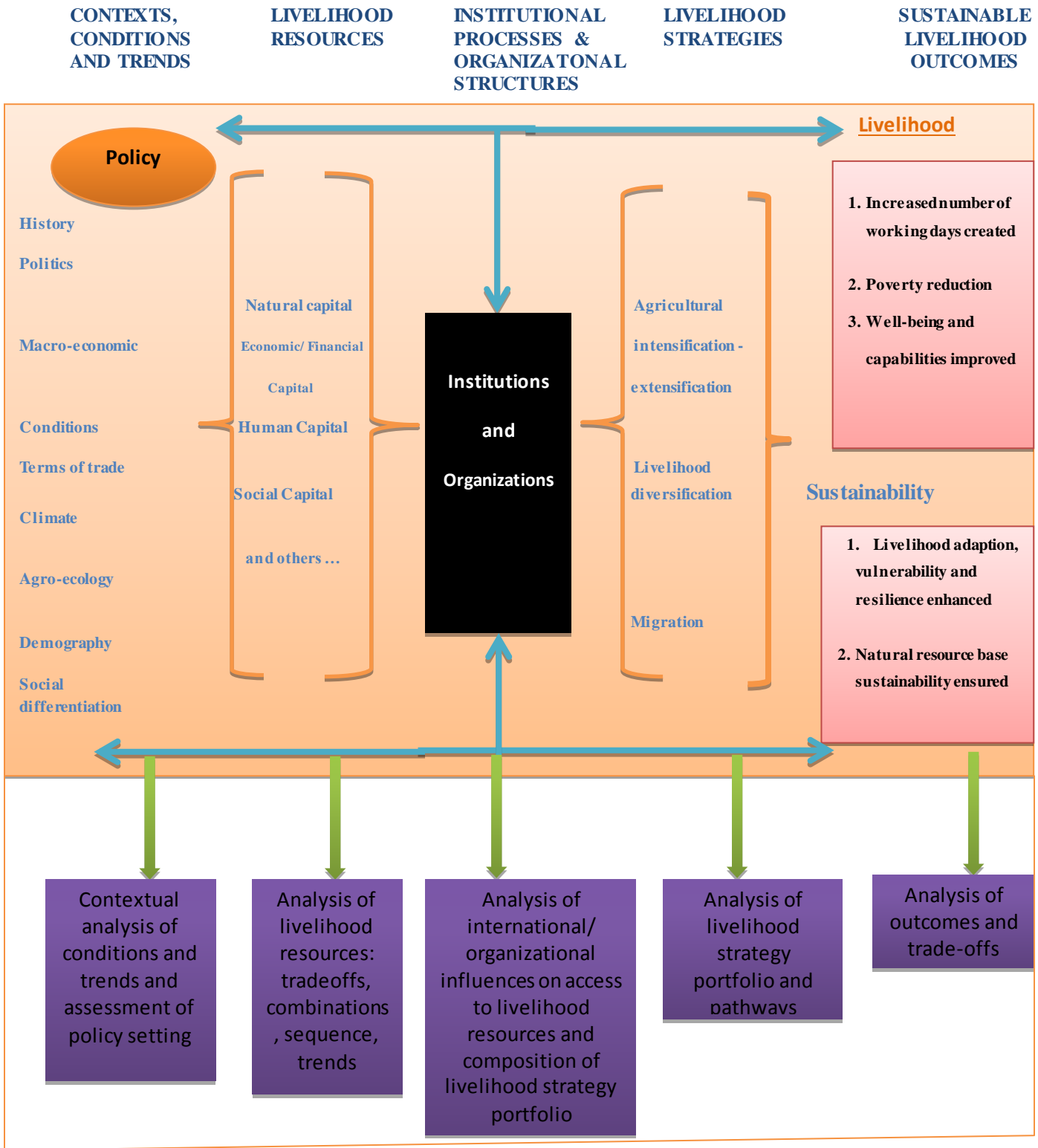
Using the livelihood framework, the author in this study paid attention on how the food bank was helping smallholder farmers to tap into and utilize a range of livelihood resources/capital assets in pursuing sustainable livelihoods. For example, under natural capital, questions that related to access to and use of land, water, and trees were asked. In human capital, focus was paid on both indigenous and modern knowledge, education levels of both the farmers and service providers, and good health of the farmers.

Social capital, the study investigated the existing networks and relationships and how the farmers were tapping them or being helped to tap them for building their security and adaptation abilities. The financial capital element looked at farmers' cash base, access to credit, as well as access to market. Finally, in physical capital, interest was put on food and seed storage facilities, agro-chemical inputs, and the mixing of enterprise to include livestock

Since this study was examining at the role of the food bank in these aspects of food security and livelihood sustainability, attention was also paid on what the livelihood perspective would offer when it came to seed security. It was discovered that availability and access to quality and sufficient seed presented a major challenge to food security among the farmers in the area of study. Therefore the livelihood perspective was helpful in understanding and identifying the sources of seed insecurity as well as linking these sources to livelihood vulnerability and resilience.



Figure 12: Sustainable Livelihoods Framework



Adapted from: Scoones, I., (1998). IDS Working Paper 7

Smallholder farmers become more secure with sustainable food production when they have seed security. The availability, access and quality of seed are very important factors for smallholder farmers in Uganda. Sperling et al, (2006) presents a good framework to analyze seed security for farmers as presented in table 8. This study adapted Sperling and others' model and integrated it into the livelihood analysis of smallholder farmers.

**Table 8: Seed security framework: Basic parameters**

Parameter	Seed Security
Availability	Sufficient quantity of seed of adapting crops within reasonable proximity (spatial availability), and in time for critical sowing periods (temporal availability).
Access	People have adequate income or other resources to purchase or barter for appropriate seeds.
Quality	Seed is of acceptable quality and of desired varieties (seed health, physiological quality, and variety integrity).

Source: Sperling, Remington, and Haugen (2006, p. 3).

According to Sperling, Remington, and Haugen (2006, p. 3), *availability* refers to whether the sufficient quantity of seed of target crops is present within reasonable proximity (spatial availability) and in time for critical sowing periods (temporal availability). It is essentially a geographically-based parameter, and so is independent of the socioeconomic status of farmers.

*Seed access* is a parameter specific to farmers or communities. It largely depends upon the assets of the farmer or household in question: whether they have the cash (financial capital) or social networks (social capital) to purchase or barter seed.

*Seed quality* includes two broad aspects: Seed quality per se, and varying quality. Seed quality consists of physical, physiological and sanitary attributes (such as the germination rate, and the absence or presence of disease, stones, sand, broken seed or weeds). Variety quality consists of genetic attributes, such as plant type, duration of the growth cycle, seed color and shape, palatability and so on. These parameters offered useful checklist to the researcher while investigating the food bank's role in food security, assessing the validity of the responses from different respondent categories and appropriate analysis of findings.

## 4. RESEARCH METHODOLOGY

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### 4.1 Introduction

*This chapter presents the overall research design, data sampling as well as data collection techniques. Furthermore the descriptive, interpretive and statistical methods used for the analysis of the findings of the study are also discussed.*

### 4.2 Empirical context and data collection

#### 4.2.1 Research design

The research design serves as a master plan for the researcher to define the research question, identify the appropriate variables of the study, determine what methods to use to collect data as well as deciding how to accurately analyze and present the findings. It is the phase at which the researcher decides and implements an appropriate data collection and data analysis for the research (Ghuri & Gronhaug 2010).

The current research is a case study research and follows a descriptive research design. A single case of the food banks in Uganda was explored to provide a thorough understanding of the food bank operations in real-life context in relation to the social dynamics of smallholder farmers. A qualitative research strategy was employed to enable exploring the experiences of the smallholder farmers and their perception of the role the food bank for their food security and livelihood sustainability as well as building resilience to climate change. After carefully selecting the appropriate design and research strategy, the next step is to select the type of data needed to answer the research question. Two types of data were selected and used: 1) secondary data and; 2) the primary data. For the purpose of this study, the analysis is based on primary data that was collected precisely for this study.

#### 4.2.2 Sampling

According to Webster (1985), sampling is the process or technique of selecting a suitable sample or a representative part of the population for the purpose of determining the parameters of the entire population. When the research problem is specified and an appropriate research

approach & data source is developed, the next step of research is to choose the elements that form the information needed (Ghauri & Gronhaug, 2010). Therefore a population of the study must first be identified, and thereafter, a sample from the population of study selected for that purpose. The population of this study was thus identified as indicated below.

### **Population**

Population simply refers to a larger group of study units that are targeted for a specific study. For purposes of this research, the identified target population is around 370,000 rural farmers engaged in smallholder farming in Mbale district. Given that this is quite a huge population, a sampling framework is chosen to identify the best sample.

### **Sampling frame**

The sampling frame is the listing of the elements from which the concrete sample will be drawn. For the current research, the list of sub-counties that the food bank served was identified and these included the four sub-counties of Busoba, Nyondo, Lukhonge, and Bukiende. The researcher assessed the level of involvement of farmers from the food bank activities by different farmers and out of the four, he selected three sub-counties which had many farmers actively involved and these included: Busoba, Nyondo and Lukhonge.

### **Sampling procedure**

The convenience sampling procedure was used for data collection. Active community change agents (animators) were identified from each of the selected sub-counties and used as gate keepers to mobilize and identify farmers to participate in the study.

### **Sample size**

The question of sample size is determined by a number of factors, some of which are statistical, while others are not. The current research decided on a sample of 80 respondents in total basing on the qualitative nature of the study. This included 60 smallholder farmers, nine community agents, 6 key informants selected from Busoba sub-county staff and other technical people in Busoba, and 5 Hunger Project staff. From the above mentioned, each category responded to the study in different ways. Key informants and project staff answered semi structured interviews,

while farmers and community change agents participated in focus group discussions (FGDs). Five key farmers were purposefully selected for individual interviews to crosscheck information from the FGDs. Data collection continued until the researcher realized there was no new information coming in.

#### **4.2.3 Data collection methods & tools**

##### **Semi-structured interviews**

Semi-structured interview method was used to collect data from the Hunger Project staff and key informants. A list of interview questions was developed to offer a starting point for the study, however, many others questions were generated along as the interviews progressed to offer a detailed understanding of the variables under investigation. This method was chosen because of its intrusive nature, as well as its ability to confirm what is already known and providing the researcher opportunity to learn new things.

##### **Focus group discussions**

Six focus group discussions (FGDs) were conducted with smallholder farmers. In each Sub-county, two FGDs were conducted, one for women and one for men. The size of the focus groups ranged between 8 – 10 participants in all. Respondents in all groups were vibrant participants and openly offered their opinions about the topics under discussion. One other FGD was organized for community change agents/animators. This was held in the Lukhonge sub-county. Animators were working as food bank volunteers and trainers in their respective areas of jurisdiction and were thus expected to offer useful information to the study.

##### **Participant observation**

Participatory observation was used during field visits to the farmers' homes, farms and farmer field schools. The researcher observed farmers' adaptation strategies to climate change as well as the adoption level of improved farming methods acquired from food bank trainings. A comparison was made between those who adapted to the methods and those who did not. Focused observation was preferred and observation was supported by interviews. Participants' insights from farmers guided the researcher's decisions about what to observe. The findings are discussed in chapter five of this report.

### 4.3 Data analysis

Data analysis is the stage when the researcher makes sense of the data collected (Merriam, 2009, pp. 175-179). When the data collection is completed, data analysis can start to consolidate, reduce and interpret what has been said by respondents and what the researcher has observed and read to make meaning out of it. Due to the iterative and the embryonic nature of qualitative research, however, it is sometimes difficult to draw a hard line between data collection and data analysis. The researcher therefore has to choose from the methods of data analysis one that suits the purpose of the study. In this research, a descriptive method was used.

To extract meaning from raw data collected from both semi structured interviews and focus group discussions, the researcher developed a coding system with a matrix of codes that helped to classify data into thematic tags. Similar themes were grouped in the same category on the matrix and a code book was developed to define each of the categories. From these themes, the researcher engaged in a critical reflection and description of the findings. Some information was analyzed through use of tables to offer a statistical representation, for example, of the age, gender, and education levels of respondents as well as to disaggregate and cross-tabulate findings by category of respondents.

The observation notes were written in the form of a research diary and were used to crosscheck and supplement information collected using interviews and FGDs. Pictures from the field were also used to support interview findings.

### 4.4 Ethical consideration

In respect of ethical considerations in research, the author agrees with Neuman (2007) that ‘a major ethical dilemma in research is that which requires researchers to strike a balance between the demand placed on them as professional scientists in pursuit of truth/knowledge, and their subjects’ [and others in society] rights and values potentially threatened by the research. Permission was therefore sought from the relevant authorities before commencement of the study.

Prior to conducting an interview, the researcher explained clearly to the respondents the purpose of the study and their consent for participating in the interviews was sought. The researcher

clearly emphasized to the participants that the information collected from them would be treated with due confidentiality. This was expected to allow the respondents to feel at peace to answer or not to answer to the study questions. Of the respondents who felt uneasy to sign the consent form and/or perhaps were semi-illiterate, the form was read to them and the aim of the study clearly explained.

The study made all efforts possible to avoid any sort of psychological and physical harm to the respondents. The researcher also as much as possible avoided making any careless reference to offensive stereotypes, assumptions and other statements considered cruel to the respondents. In the same vein, the author paid due respect to the culture of the respondents and avoided approaching them judgmentally (Piper & Simons, 2005).

## 5. RESULTS

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### 5.1 Introduction

*This chapter focuses on the descriptive analysis and discussion of the data in line with literature review. Subsections are created where necessary to aid in the organization of information presented herein. Simple descriptive statistics were also used where appropriate.*

### 5.2 Descriptive statistics

Descriptive statistics were used to describe the basic characteristics of the data in this study. They provide simple summaries about the samples and variables. Simple frequencies are used to present and check variables. The demographics of the selected respondents of the study are presented in table 9. A sample size of 80 respondents was selected for this study. All respondents were present and participated in the study, the response rate was therefore 100 percent.

The sample consisted of 32 female and 48 male respondents. The dominant gender being male as they are often more represented in community decision making and control almost all productive livelihood resources of their households. The frequency of education levels among respondents indicate that 11 had a university level education that was either a degree or diploma (13.8%), representing the lowest percentage. Those with university education were mainly among the project staff and the key informants. The number of respondents with high school level education was 24 (30%) and those with primary school education were 45 (56.3%), representing the majority of the respondents. This indicates that there was still a high level of illiteracy in the community. High illiteracy levels among smallholder farmers have implications on the level of adapting to modern farming methods and technology.

The frequency of experience of project staff and volunteers indicates that three out of five members of staff selected for this study had less than two years of experience working with the project. While the two that were also members of the management committee had experience of above five years with the project. They were around as volunteer workers even before the food warehouse was constructed.



Among the key informants, only one out of the six respondents had less than two years of working experience in the area, the rest had worked in the area for more than five years. Those with higher working experience in the area offered very useful insights to the study. The distributions of the age ranges indicate that the majority of the respondents, 48 (60%) were between the ages of 31-40 years old. The next highest frequency, 21 (26.3%) were about 30 years of age and below. The smallest representation 11 (13.8%) were above 40 years of age.

In relation to distribution of smallholder farmers who were selected for the study per sub-county, 25 (36.2%) were selected from Lukhonge, 23 (33.3%) from Busoba, and 21 (30.4%) were selected from Nyondo sub-county. All community change agents – nine of them, were selected from the Lukhonge sub - county. The statistics about the demographics in a tabular form are given as follows:

**Table 9: The demographic profile of respondents**

Variables	Total size	Description	Frequency	Percentage
Gender	80	Male	<b>42</b>	<b>52.5</b>
		Female	<b>38</b>	<b>47.5</b>
Education	80	University Education	<b>11</b>	<b>13.8</b>
		High school	<b>24</b>	<b>30</b>
		Primary school	<b>45</b>	<b>56.3</b>
Experience	11	Less than 2 years	<b>4</b>	<b>36.4</b>
		More than 5 years	<b>7</b>	<b>63.6</b>
Age of respondents	80	30 years and below	<b>21</b>	<b>26.3</b>
		31 -40 years old	<b>48</b>	<b>60</b>
		41 years and above	<b>11</b>	<b>13.8</b>
Distribution of farmers by sub-county including change agents	69	Busoba	<b>23</b>	<b>33.3</b>
		Nyondo	<b>21</b>	<b>30.4</b>
		Lukhonge	<b>25</b>	<b>36.2</b>

Source: Author's field work (2014)

### 5.3 Sources of food and seed for smallholder farmers

The study started by establishing the main sources of households' food and seeds for planting. From all the six focus group discussions, two common sources of food were established. These included farming from their gardens, and buying from shops when their stock ran out. In one group, however, some farmers mentioned a third source of food which was tilling gardens for other farmers and in return they were given food as a pay (commonly referred to as '*Leja Leja*').

When it came to the sources of seeds they used on their farms, a variety of sources were mentioned across all the Focus Group Discussions and individual interviews with farmers. The main sources of seeds were: 1) buying from farmers' shops like Sukura and El – Shadai; seed 2) saving from farm harvests; and 3) seed loans from the food bank. There was a general agreement from respondents that although most times the food bank supplied quality seeds, they usually came late and were in insufficient quantities. As a result, the output has been usually low, consequently affecting the rate of seed loan repayment by farmers. Thus the factors of accessibility and availability as presented by Sterling et al (2006) affect the farm output of farmers.

The two main sources of food and seeds mentioned by respondents that included farming and buying were lined with the findings of the World Food Programme (2013). World Food Programme indicates that much as the majority of Ugandans were involved in farming, they were also fairly market oriented with the market, contributing up to 50% of food calories of households. It also brings in the aspects of physical capital and financial capital as presented in the livelihood framework (Scoones, 1998). Farmers are utilizing their physical capital (land) to generate food they need for their households. Many farmers also reported to sell most of their harvest to local markets to get financial capital to meet other needs. The sale of their farm output was thus one source of their livelihoods.

The other sources of seed mentioned included Government programs like National Agriculture Advisory Services (NAADS) and National Agriculture Research Organization (NARO) which worked as partners of the food bank to offer services and seeds to farmers. Some rice farmers got seeds from international NGOs like the Japan International Cooperation Agency (JICA), while others who were members of farmer groups, sourced seeds from farmers' associations like

Busoba Tubana Mixed Farmers Association (BUTUMFA); and others got from friends and relatives. Like indicated in the literature, NAADS is the main instrument through which the government of Uganda is implementing food security programs (MFEPD, 2012), while NARO distributes seeds for purposes of multiplication and dissemination of new technologies. This finding however, also indicates that farmers have utilizing their social capital efficiently in locating and acquiring seeds from different sources.

It was evident in this study that there was a high level of relief dependency among farmers on outside sources. Farmers felt much disappointed if they did not get the amount of seeds they expected from a particular service provider like the food bank or the NAADS program. It is therefore important that these farmers are trained and encouraged to save their own seeds from their harvests, which is an affordable and reliable means of achieving food security. Since the food bank is offering storage services for farmers' foods, they could also take advantage of it to store their seeds for the next harvest.

The challenge however is that, many farmers have resorted to use of hybrid species which cannot be recycled for more than once. Berge (1996) observed that the effect of increasing agriculture modernization has resulted in farmers increasingly purchasing more of their seed requirements and consequently reducing the importance of indigenous knowledge in food security.

Encouraging seed saving will enable farmers to have different varieties of each crop to allow for varied physical environments as well as to act as coping strategy for complex and diverse risky environments associated with climate variability.

### **Challenges to accessing sufficient food**

It is believed that today, smallholder farmers are experiencing a number of interlocking stressors other than climate change and climate variability (HLPE 2012, p. 281) that limits their access to sufficient food. This was evident among the farmers who participated in this study.

#### *Access to sufficient and quality seeds*

Although they indicated having a variety of sources of seeds, access to sufficient and quality seeds was found to be one of the major factors affecting food security among smallholder farmers in Mbale. Farmers stressed that there was a lot of duplication of seeds that were sold in farm shops and even at times those supplied from other sources earlier mentioned. As a result,

they posed a threat to their abilities to improve food production. What can therefore help smallholder farmers to know the quality of seeds before they buy and sow it?

Ravinder et al (2007, p. 4), suggest that farmers need to be equipped with knowledge of which supplies of seeds are healthy to allow farmers choose seeds that could increase their crop yields significantly. Many smallholder farmers often inspect seed before purchasing from the farm shops or local markets, but it should be noted that the quality of seed is not always obvious to the naked eye. The seed security framework used in this study indicates that seed quality consists of physical, physiological and sanitary attributes such as the germination rate, and the absence or presence of disease, stones, sand, broken seed or weeds (Sperling et al, 2006).

Whereas farmers may be able to observe the physical quality, they may not be in position to measure the physiological quality of the seeds. They may also need to be helped to measure the variety quality which according to Sperling et al includes genetic attributes such as plant type, duration of the growth cycle, seed color and shape, and palatability (Sperling et al 2006). Due to poverty, however, many farmers were not in the position to acquire adequate and good quality seeds to plant, which compromised their output.

The food bank as well as other service providers like NAADS and NARO provided limited quantities of seeds to meet farmers' seed demands. Consequently, when farmers plant less, their harvests are also low, and thus less or nothing was stored in the food bank. Whatever farmers produced was consumed or sold to meet other pressing household needs hence perpetuating food insecurity.

#### *Small and infertile land*

The other challenge discovered from the study included limited land which was also becoming less fertile. It hindered farmers from expanding their production through use of tractors or ox-plows. This challenge is attributed to limited financial capital of the smallholder farmers to enable them enlarge their land size either through purchase or hiring. Also, because the available land is small, it is over cultivated season after season without allowing it to fallow. High poverty levels also made it difficult for them to apply fertilizers and other agro-chemical inputs to add value to the soils. These coupled with high population growth rate that is increasing pressure on the available land, have made it quite difficult for farmers to achieve sustainable food security.

### *Others included*

Big family sizes with a large number of members in unproductive ages; climatic changes like drought and prolonged rains also leading to increased rates of pests and disease outbreak. Lack of appropriate food storage services at the household level; limited skills in appropriate farming methods; thieves and stray animals that affected their crops; family sickness which affected family labor and resources; selling of crops by husbands stealthily; over reliance on single farm enterprise as well as laziness and negligence were also mentioned among challenges limiting households' abilities to acquire food security.

Many of the above challenges are in line with the findings from Curtis (2013, p. 7) & IFAD (2013, p. 9). They argue that smallholder farmers experience challenges of poor quality seed and land, inadequate water supplies, rely on basic farming equipment and poor storage facilities. Once these challenges are compounded by the increasing impact of climate change and poor access to local markets, extension services and rural financial services, farmers become vulnerable to shocks of poverty, hunger and food insecurity.

## **5.4 The role of the food bank for food security**

The Food bank in Busoba is used regularly by farmers, primarily by those living in close proximity to the food bank. It is thought to be a necessary community resource, especially for purposes of food storage after harvest; improved seeds for planting; and technical knowledge and skills. Farmers appreciated the role the food bank had played in encouraging them to grow indigenous crops that were drought and pest resistant. Others appreciated the intermediary role the food bank played in linking them to the Hunger Project village bank to acquire the loans they used to finance their farming. This information is presented statistically across all focus groups in table 10.

It was, however, found out that low harvests resulting from droughts and other factors like use of poor farming methods strongly affected food storage in the food bank and consequently affected food security. Many farmers in the distant sub-counties like Nyondo and Lukhonge did not store their food with the food bank because of distance. They cannot afford transporting their produce to the food bank despite their lack of appropriate storage facilities at household level. It was partly due to distance that many farmers indicated that they lacked access to information about

the food bank and its services. Others argued that the food bank had done little in fighting food insecurity. They therefore suggested that the food banks should be decentralized to different sub-counties for easy access to food storage services, information, as well as to reduce the costs of transport involved.

Alternatively, the author considers that the food bank could solve this problem by having decentralized food collection centers where the villagers would collect their food. The food bank agents and volunteers would then pick it up and deliver to the food bank on their behalf. This alternative, however, only offers a short term remedy and will only be possible if the food bank and its volunteers have transport means, which was lacking at the time of this study. In the long term, permanent solutions may need to be established. Useful recommendations are made in this report later in chapter 6.

On the other hand, food bank officials indicated that although they tried their best to train and sensitize farmers on better farming methods and the value of storing their food in the food bank, their adoption rate was still low. Besides farmers relying heavily on traditional farming methods and having poor post-harvest handling, they were also reluctant to preserve and save their seeds. They instead preferred to sell off their produce earlier than store and sell when prices were high. This also posed a challenge to the food bank's efforts to help farmers save and have enough food throughout the year.

One other main challenge the food bank has to battle with is the negative mindset among the farmers. Besides having a dependence syndrome on external support for their seed requirements, the study established that the smallholder farmers in the area of study did not take responsibility and proper care for the seeds they received from the food bank or the NAADS program. Interviews with the Hunger Project Mbale epicenter chairman and the NAADS coordinator from Busoba sub-county revealed an interesting fact about the farmers in this area. They noted that when farmers got seeds from the food bank or the NAADS program, many planted the seeds separate from those acquired from other sources like the market or their own saved seed. When it came to caring for the crops grown, they paid more attention to the crops grown from their own seeds and little attention was given to the crops grown from the food bank or the NAADS program seeds.

They also noted that the farmers often tagged the crops for example “*this is the Hunger Project beans or maize*” and “*this is NAADS maize or beans*” accordingly depending on the source. In other words, they considered them NGO crops or government crops respectively, and took no responsibility for them. When the yields from such crops became poor, the blame was shifted to the service providers for providing poor quality seeds yet the care provided to the crop was not proper. They even called the NAADS coordinator or the food bank officer to see their crops while still in the field to justify their non-repayment of the seed loan.

The researcher observes that if this attitude among many farmers is not changed, it will continue to frustrate the food bank and government’s effort to build food security among poor farming households where over eighty percent of Uganda’s population belonged.

The food bank officials also acknowledge the fact that farmers complained of accessibility to the food bank due to transport problems. The food bank officer and the epicenter Chairman, however noted that this was never a problem at the time they used to have a double cabin pickup on station. They could pick farmer’s produce from their respective villages and deliver to the food bank. The pickup was later, however, taken by THP-U because it was becoming costly to maintain and instead, a motorcycle was offered. They requested the Hunger Project-Uganda office to return the double cabin pickup to facilitate transport. For a mini time, the food bank was planning to establish seed selection centers near farmers where they would help farmers to select quality seeds for storage and increase the value after the sale.

The food bank, however, also faced financial constraints while helping smallholder farmers to achieve food security. Although farmers complained of getting insufficient quantities of seeds as earlier indicated, the food bank staff indicated that they also often had insufficient seed supplies compared to farmers’ demand due to their limited financial capacity (see section 5.5 on food bank funding and sustainability). The food bank, however, tried to supply seed to the farmers through its retooling program where profits generated from the sale of its previous season produce would be plowed back into the purchase of new seeds. It also acquired improved seeds from partners like NARO to supply to farmers. At the time of this study, the food bank had already acquired NABE 15, NABE 16 and NABE 17 beans and other breeds like K132 from NARO and stocked ready for supply to farmers as the planting season was approaching

NABE 15, NABE 16 and NABE 17 are quick maturing; disease-resistant and high-yielding bean varieties that were recently released by the National Agriculture Research Organization for growing by farmers. These varieties, and others that were yet to be released, were selected by smallholders because of their higher productivity in the field compared to existing varieties and landraces, coupled with their good taste and ease of cooking (East Africa Agribusiness Magazine, March 2014).

Although the food bank supplied seed to farmers to plant on loan, it was established that the food bank in Mbale and all other food banks operated by the Hunger Project in Uganda did not offer relief or emergency food to the hungry during times of food scarcity. It trained and encouraged farmers to produce more food instead and to save in order to prepare themselves for times of scarcity. This was intended to ensure sustainability in the food supply. However, it cannot be ruled out that some of the seeds farmers collected from the food bank on loan ended up being eaten given that there was limited follow-up and monitoring. It was one reason accounting for low rates of seed repayment by farmers to the food bank.

This finding is contrary to the operations of other food banks like the food bank of Delaware (2011), the community food bank of Southern Arizona (Community food bank, 2009), food bank of South Jersey (2014), and the Chalmers Community Service Center in Guelph, Ontario (Chalmers Community Service Center, 2014) just to mention a few. The food banks mentioned are established to offer emergency food and not to achieve food security. Although some food banks have established relationships with community gardens where produce that is grown in community gardens and church grounds is donated to the food banks.

Besides supplying food to the hungry, the above food banks give out free clothes and household items like beddings and small appliances. They offer mending services for clothing and backpacks as well as offering social time for guests to have coffee and conversations (Board Chairman Chalmers Community Service Center, 2014). Such activities are typical of traditional food banks and are quite different from the way the Hunger Project food banks operate in Uganda.





Mr. Wamalo Joel, the food bank officer inspecting the improved bean seeds in the food bank that were to be distributed to farmers. The seeds were supplied by NARO for distributed to farmers in the September–November 2013 planting season for multiplication. However, because they reached late at the food bank and the rains were poor, the food bank stored them to wait for the next planting season. **Photo: Author (2014)**

The food bank in Uganda however, has some likeness to the community-managed rice banks that are becoming increasingly used in South-East Asia as a means of addressing seasonal food crisis facing the poor communities (Datta, 2007).

Rice bank in the physical sense is a simple wooden structure housing a supply of rice. Rice banks usually get their initial rice supply either from the community's surplus (from a collective rice field maintained for the purpose), or from external agencies, including local government.

Villagers borrow rice from the bank and repay the same amount when their next crop is harvested. This is almost similar to what is practiced in the food bank in Uganda.

The difference is that, with rice banks, villagers were free to use the rice borrowed from rice banks as food during times of food scarcity or for planting. However, with the food bank in Uganda, seeds are typically given out for planting and not for food. Nonetheless, both rice banks in South-East Asia and the food banks in Uganda are not only considered far cheaper than borrowing from moneylenders, but also helps to reduce exploitative practices, meet specific basic needs, and promote collective decision making (Datta, 2007).

**Table 10: Food bank role in food security and name of FGD cross-tabulation**

Role of food bank	FGD Group						Total out of 6
	Busoba Women's FGD	Busoba Men's FGD	Lukhonge Women's FGD	Lukhonge Men's FGD	Nyondo Women's FGD	Nyondo Men's FGD	
Food storage services	1	1	1	1	1	0	5
Quality seeds	1	0	1	1	1	0	4
Skills training	0	0	1	1	1	0	3
Link to village bank for farm credit	1	0	1	0	1	0	3
Encouraging Farmers' group formation	0	0	1	1	0	0	2
Encouraging growing of indigenous crops	1	1	1	1	1	0	5
Contributing nothing	0	0	0	0	0	1	1
Limited information about the food bank services	0	0	0	0	1	1	2
Exchange visits	0	0	0	1	0	0	1
Total	4	2	6	6	6	2	26

Source: Author's fieldwork (2014)

From the table 10 above, it can be observed that women played an active role in the food bank activities compared to men. They were more aware of the benefits they derived from the food bank as well as the services the food bank offered as opposed to men. It can also be concluded that men in Busoba and Nyondo sub-counties were less involved in the food bank activities and thus did not have much to say about the role of the food bank in food security compared to their colleagues from the Lukhonge sub - county.

Generally, it can be observed that farmers from the Lukhonge sub - county were more actively involved in the food bank programs than the other two sub-counties as witnessed from the number of responses from both men and women. In terms of distance, Lukhonge is located far away from the Hunger Project epicenter, compared to Busoba and Nyondo, yet Lukhonge was more active than Busoba and Nyondo. This study did not establish reasons to this scenario; however, it is a fact that needs to be established to ensure that the services of the food bank benefit all potential target groups equally.

## **5.5 Funding and sustainability for the food bank**

The food bank in Mbale - Busoba relies heavily on the Hunger Project Uganda (THP-U) for its major funding. The Hunger Project Uganda (THPU) is an affiliate of the Global Hunger Project, a 501 (c) (3) non-profit charitable organization incorporated in the United States, (The Global Hunger Project 2012). The Hunger Project raises funds, via contributions, in Australia, Canada, Germany, Japan, New Zealand, Sweden, Switzerland, the Netherlands, the United Kingdom, and the United States.

The annual operating budget of the Hunger Project globally is approximately \$18 million. Approximately 30% of the revenue raised for THP originates in the United States, the bulk of which comes as unrestricted funds from individuals (THP 2013b). Operations of the Hunger Projects in developing countries also raise considerable amounts of funding from governmental and multilateral sources. The Hunger Project does not consider its investors as donors, but rather involved partners and stakeholders in the fulfillment of the THP mission (THP 2013b).

## **Sustainability of the food bank in Mbale**

The sustainability strategies for the food bank at the moment are based on its operational strategies for example;

### ***Revolving seed-loan***

In the initial stages, for example, the food bank received funding for its operations from the Hunger Project-Uganda (THPU) as a revolving Loan Fund. The funds were used to procure seeds and other technologies to supply to farmers in form of loans. Later, after THP-U stopped providing funds for the procurement of seeds, the food bank used the funds raised from the revolving scheme to procure seeds and supply to farmers. At the time of this study, the food bank had about two million Uganda shillings on its account from its revolving scheme and it was in preparations to procure seeds (Interview with the chairman Mbale Epicenter, and food bank Officer, 2014).

### ***Establishing partnerships***

The other strategy that the food bank uses is establishment of external partnership with other agencies for services and technology. It has, for example established partnerships with NARO, NAADS, and Mbale District Local Government. At the time this research was conducted, a memorandum of understanding was being established between the food bank through the Hunger Project – Mbale epicenter and the East African Seed Company for supply of quality seed at subsidized costs to the food bank and its farmers (Interview with the chairman Mbale Epicenter, 2014).

### ***Local community empowerment***

The food bank was also empowering farmers to become self-reliant through linking them to acquisition of credit from the village bank and other savings and credit cooperatives. This was intended to help farmers develop capacities to meet their own seed requirement in the near future and reduce their dependence on the food bank for seed. There is also a good sign of sustainability in the very fact that the food banks are managed by the local people who are appointed by the community. The Hunger Project has a food security committee that manages the affairs of the food bank, and this committee is elected by the community during the community meeting. In

one way or another therefore, community members feel a sense of ownership, which is an important aspect of sustainability.

### ***Local seed production***

Furthermore, the food bank was growing its own food to produce food and seed supply locally. At the time of this research, the food bank was in negotiations with some sub-counties for land to expand its food production. Currently, the project has the smallest land on which it grows its food, but plans are underway to expand its production through the acquisition of more land.



The currently available plot of land on which the food bank grew its food. **Photo: Author (2014)**

### ***Women involvement***

The food bank encourages women active involvement in the operation and management of the food bank because of their proven commitment and efficiency. However, the challenge they face is the higher illiteracy levels among women that reduce the level of their involvement. This challenge is, however, being addressed through introduction of adult literacy program through the Hunger Project's education program. This is also aimed at encouraging women's participation in the management of the food bank program because many women in the community were illiterate which reduced their level of self-confidence.

The adult literacy levels of the women in the area are likely to rise faster because other NGOs like Foundation for Integrated Community Development Programme (FICODEP) also recently launched a Functional Adult Literacy program which has seen many women enroll to take up the free literacy course. The participation of women in the food bank is expected to enhance their social mobility and participation in the community decision-making process which strengthens the operation of the food bank.

### **Challenges to sustainability**

#### ***Crop failure***

Despite the efforts by the food bank to achieve sustainability, discussions revealed that consecutive crop failure due to prolonged drought posed the greatest challenge for the sustainability of the food bank. Crop failure not only made seed loan recovery by the food bank difficult, but also left households with insufficient food to meet their daily food requirement.

#### ***Dependency syndrome***

The high relief dependency tendency was another potential challenge because it made some farmers to believe that the seeds they received from the food bank were a relief from the NGO and therefore there was no need to repay. When the Hunger Project Changed the Assistant Project Officer of the Mbale epicenter, it was reported that many farmers defaulted repaying their seed loan, claiming they had paid to the old project officer who had been replaced. And since there was no evidence to prove otherwise, the food bank incurred losses. The same problem existed in another project department like the Micro-credit department, which by the time of this study was still battling to recover all the loans disbursed under the leadership of the outgoing assistant project officer, because the borrowers claimed they had paid to the former project officer.

The food bank was, however, trying to address this problem by creating awareness among the people through explaining the role of the project and the obligation of the borrowers to repay the seeds in order for the food bank to be sustainable. Some farmers had repaid while others still had not. In the author's opinion, the food bank could also try to address this problem through exchange visits and using well-performing food banks as model learning centers for experience sharing on how good the food bank should be managed.

### ***Community ownership of the food bank***

The concept of community ownership of the food bank is still not well established in the sub-counties where the food bank works. Many villagers are still not proud of their right to make decisions about the way seeds are procured, stocks in terms of their proper use and maintenance, as well as access to information and their influence on the kind of information circulated. There is a need to improve on the information flow and awareness creation about the food bank and its services among the villagers to increase their involvement for sustainability.

Generally, it is still too early to tell whether food bank is self-sustaining or not because it is still implementing its first strategic plan and expanding its operation. It's about two years now since the official launch of the Mbale food bank, although its operation started earlier before its official launch.

### **How the food bank could improve food security**

#### **a) Suggestions from farmers**

To improve the food bank's role in food security, farmers urged the food bank to secure and supply enough seeds on time to allow timely planting. Relating to what Curtis (2013) says, smallholder farmers often lack influence and power over decisions that affect them. The farmers argued that they were not often involved in deciding on which type of seeds to be procured. They thus wished to be involved in making decisions on such matters because they had clear knowledge of what they wanted based on the nature of their soils.

Farmers also suggested receiving a variety of seeds from the food bank for purposes of spreading risks. For example, on top of receiving cereals and legumes like maize and beans, they also wanted to receive vegetable seed. They urged the food bank to supply fertilizers and pesticides alongside the seed supply on loan. They were willing to take fertilizer and pesticide loans and to pay back in line with the terms and conditions for borrowing from the food bank. Many farmers said that their crops failed to yield well because they did not know the appropriate type of fertilizers and pesticides to apply. They thus wished to have these supplies availed to them by the food bank as well as giving them technical advice on their use.

Four out of the six focus groups suggested that the food bank should be brought closer to the people. They agreed with the idea of having a main centralized food bank at the Hunger Project epicenter, but also suggested having sub-branches in different sub-counties. In relation to this, they also wished to have information offices decentralized to different sub-counties. Farmers in Lukhonge and Nyondo sub-counties were even willing to offer land to have information offices and food bank sub-branches established in their areas. The demand for having food bank services brought closer partly explains the important role the food bank would play in fighting food insecurity if it became more effective in its operation.

Whereas female farmers in Busoba and Lukhonge sub-counties wanted the food bank to procure ox-plows for hire, their counterpart men in the two sub-counties suggested having a tractor at the food bank that they would hire in order to increase the land under production. This form of suggestion could imply that the farmers' mindset was getting broadened and they were moving toward a shift from the use of traditional household labor to mechanized farming which would improve output. Nonetheless, many farmers among themselves still believed the farmer's mindset still needed to be changed for good through trainings. This was mentioned in three focus group discussions and from almost all the eight individual farmers interviewed. They also encouraged more awareness creation about the services offered by the food bank.

Although farmers from Lukhonge suggested that the food bank should conduct village level skills trainings to farmers, this will be unrealistic given the huge numbers of villages per sub-county and the limited capacity of the food bank. On average, a sub-county in Uganda has about 30 villages (Author's calculation based on UBOS (2002) statistics).

The possible alternative in the author's view would be, to increase the number of farmer field schools and locating them at strategic areas in terms of access by farmers and the availability of enough land for demonstration. Currently the food bank has only two farmers' field schools, one in the Lukhonge sub - county and the second in Busoba sub-county and a demonstration garden near the food bank premises (Author's fieldwork 2014). This information is summarized in the table 11.



**Table 11: Farmers' suggestions for improvement in food security by the food bank and name of FGD cross-tabulation**

Suggestion	FGD Group						Total out of 6
	Busoba Women's FGD	Busoba Men's FGD	Lukhonge Women's FGD	Lukhonge Men's FGD	Nyondo Women's FGD	Nyondo Men's FGD	
Bring food bank near to the people.	0	0	1	1	1	1	4
Supply enough seeds and on time.	1	1	1	1	1	0	5
Provide pesticides and fertilizers on loan.	1	0	1	1	1	0	4
Provide oxen plough for hire.	1	0	1	0	0	0	2
Train farmers in improved farming methods.	0	0	0	1	1	1	3
Conduct village level farmer trainings.	0	0	0	1	0	0	1
Acquire tractor for hire	0	1	0	1	0	0	2
Train to change farmers' mindset.	0	0	1	1	0	1	3
Provide transport to the food bank.	0	0	0	0	1	0	1
Involvement of farmers in deciding seeds to procure.	0	0	1	0	0	1	2
Sensitization and awareness creation about the food bank.	1	0	1	0	0	1	3
<b>Total</b>	<b>4</b>	<b>2</b>	<b>7</b>	<b>7</b>	<b>5</b>	<b>5</b>	<b>30</b>

Source: Author' fieldwork (2014)

## **b) Suggestions from key informants**

Though most information from key informants was similar to the suggestions made by farmers like securing enough seeds; increasing sensitization; supplying farmers with fertilizers and pesticides at a subsidized cost and change of farmers' mindset; they also offered other useful suggestions. Five out of the six key respondents suggested having close monitoring and follow-up on the farmers who received seeds and training from the food bank to ensure that they were doing things right. This was observed by both farmers and key informants to be lacking in the food bank operations.

One possible reason for lack of close follow-up would be because the food bank was mainly run by volunteers who besides being few in number, they also had a lot of other commitments outside the food bank. It is the Hunger Project's principle to empower the local people to manage their own development through beneficiary participation. Nonetheless, the use of volunteers could also be a result of limited funding for the food bank, but also as a strategy to build local capacity as well as ownership among community members to ensure sustainability. It can also however be observed that almost all food banks across the world use volunteers to run their activities (Agostinho and Arminda, 2012).

Therefore, given that food bank volunteers are usually not paid and that they have highly valued opportunities competing for their time, attention and money; it is important that the food bank personnel understand what motivates these individuals toward giving their time to food bank service and activities for better performance (Brand et al, 2008).

There was also a suggestion by key informants that the food bank should build the capacities of its staff and volunteers in dealing with food security issues among smallholder farmers. This could be achieved through training and research on seed preservation and value addition. Key informants encouraged the food bank to conduct more research on how best they could preserve farmers' food as well as to add value in it. This was expected to improve the prices of produce as well as improving farmers' livelihoods. However, given that the food bank in Uganda, just like other food banks around the world often employ voluntary labor and often have very-low key fundraising (Husbands 1999, Agostinho and Arminda 2012), it has insufficient human and

financial resources to undertake research and innovations to systematically address food insecurity and hunger.

One way, however, the food bank could do this is by cooperating with agricultural colleges and universities (for example the Arapai agricultural college, Bukalasa agricultural college, Makerere University college of Agriculture and Environment Science) to help in conducting research and documenting the collections; controlling the quality of seeds as well as multiplying the most interesting seed varieties to farmers (Development Fund, Norway 2011). Other food banks like the community Food Bank of Southern Arizona (2009) and the Food Bank of Delaware (2011) cooperate with Universities and make use of Agriculture university students for skilled manpower in form of internship programs. Table 12 displays the recommendations by key informants statistically.

**Table 12: How key informants suggest food banks should improve food security**

<b>Suggestion</b>	<b>Frequency</b>	<b>Percentage</b>
Secure enough seeds	4	12.5
Research on seed preservation and value addition	6	18.8
Capacity building of food bank staff and volunteers	4	12.5
Increase sensitization and knowledge creation about the food bank	3	9.4
Change farmer's mind set	5	15.6
Offer seeds, fertilizers, and pesticides at subsidized costs	5	15.6
<b>Total</b>	<b>32</b>	<b>100</b>

Source: Author's fieldwork (2014)

## **Conclusion**

Despite the attempts made to fight food insecurity, the food bank still faces challenges like the negative mindset of farmers toward adapting to new farming methods and post-harvest handling problems. Nonetheless, there was clear evidence that the food bank had great potential to help farmers improve their food security. The farmers, project staff as well as key informants all indicated that the food bank trained and encouraged farmers to: getting back to the growing of

indigenous crops that were drought and pest resistant; planting improved species and apply fertilizers and manure; enterprise mix like growing both cash and food crops alongside rearing some animals and poultry. Generally, farmers who had adopted these practices were doing far much better in food security compared to those who did not.

## **5.6. The food bank as a mechanism for achieving sustainable livelihoods**

Sustainable food security in developing countries like Uganda where the majority of families derives their livelihood from agriculture cannot be pursued in isolation of sustainable livelihoods. This study established whether the food bank could be a mechanism for achieving sustainable livelihoods among smallholder farmers.

Aware that the issues of poverty reduction and environmental management have been central in the debate on sustainable livelihoods (Scoones 1998, p. 3), questions on sustainable livelihoods in this study paid emphasis on capital and income sources as well as environmental protection and building resilience to climate change. The study investigated the institution (food bank) influence on access to livelihood resources by farmers; contextual barriers to attaining sustainable livelihood by farmers; and livelihood strategies that could be instituted to help farmers attain sustainable livelihoods.

This section is divided into two main sub-sections: 5.6.1. Livelihood resources and strategies; and 5.6.2 building resilience to climate change.

### **5.6.1 Livelihood resources and strategies**

#### **a) Exploring the institutional (food bank) influences**

It was established from both farmers and food bank officials that the food bank helped farmers to get access to credit that they used in their farming. For example, before a farmer qualified to get a seed loan from the food bank, he / she had to be a member of a registered farmer group. Farmer groups were able to access group loans from the Hunger Project village bank with recommendation from the food bank officials at times, although many times they were accepted based on assessment by the loan committee. This not only supported their farming activities, but also enabled them to invest in other business activities to diversify their sources of income. Some women in Lukhonge sub-county focus group joyfully asserted:

*We got a loan from the hunger project village bank, invested it in a business and made much profit. Now we have been able to open up our own food store and other farmers keep their food with us (Women FGD Lukhonge, 2014).*

This is a sign of sustainability for the food bank program and such initiatives should be encouraged to reduce the costs involved in managing food banks at centralized locations as well as encouraging farmers to save food for food security.

Farmers indicated that their employable time had increased as they were occupied in many farming enterprises including non-farm enterprises like petty trade because their farm incomes had improved. When asked whether the food bank helped them to improve their incomes, all farmers unanimously said yes, except for the Nyondo sub-county men's Focus Group Discussion that indicated that they had not got any help in that area.

Farmers contended that, the food bank offered them storage facilities that enabled them to store up their food until the prices were high on the market before they could sell, while keeping the rest for household consumption in the future and for planting. They said that this was difficult in the past because of poor storage facilities at their homes that compelled them to sell their harvests early to middlemen who would pay them paltry prices.

Others said, with food at their easy reach in their houses, it was susceptible to waste as husbands would sell it for alcohol, and also rodents and other pests affected it thus affecting household incomes. They, however, appreciated that, with their food in the food bank, they were sure of its security from man, as well as pests and rodents.

Through observation, however, it was noted that, although the food bank was rodent free and offered security for the farmers' food, it lacked proper stalls for keeping farmers' produce. The food bags were laid on the ground and others on low tables. It was easy for grain beetles and other pantry pests to invade them. The researcher recommends that better stalls that are high enough should be put in place to reduce any risks of pests that may result due to poor storage and cause loss to farmers.



Mr. Wamolo Joel, the food bank officer checking the stored grain on the floor inside the food bank. **Photo: Author (2014)**

Also, besides teaching farmers better farming methods, which in their own were a strategy to help farmers boost their incomes, the food bank encouraged farmers to form savings and credit co-operatives (SACCOs). SACCOs are a network of cooperatives, ranging from community-based initiatives, recruiting members who work in the informal economy to workplace-based groups (The cooperative societies Act, 2003). They come together to save money, take loans from their group as well as get funding from government and other commercial financial institutions to support their activities. SACCOs in Uganda are regulated by the Uganda Savings and Credit Cooperation Union Ltd (UCSCU) which sets regulations to govern their operations (UCSCU, 2014).

Encouraging the formation of SACCOs by the food bank was intended to encourage farmers to develop a savings culture and reduce overspending of their hard earned incomes. Many farmers interviewed did not have accounts with commercial banks where they saved their money. They indicated that they kept all their money at home, which put them at risk of unnecessary spending and thieves. Forming and joining saving groups would offer an affordable means for them to save their money and get loans whenever they needed to. Some farmers had already joined the Hunger Project village bank where they saved their money and were proud of their increased savings. One female respondent exclaimed:

*“...I was shocked when I took a financial statement of my account with the Hunger Project village bank; my account had almost a million shillings from savings. It is the first time I’ve saved money” (Female respondent from Lukhonge Women’s FGD, 2014)*

The food bank officials also realized that many farming households spent most of their incomes on treating common illnesses. Through their change agents the food bank started sensitizes farmers on household sanitation and hygiene to reduce the rate of common illnesses. They also encouraged proper nutrition for children and other household members. This in one way or another reduces household expenditures and allows more time for labor to be active which boosts household incomes.

Besides referring community members to the Hunger Project health center established at the epicenter building, the community change agents (animators) are actively involved in sensitizing communities on how to prevent the spread of malaria, HIV/AIDS, maternal mortality as well as sanitary related illnesses (interview with the Hunger Project chairman Mbale, and the animators, 2014). This activity falls under the Hunger Project’s nutrition and health care program (THP-U, 2013). Community change agents are trained in various community health skills in partnership with government health department before they are sent out to help communities.

This form of community health service delivery is necessary, especially in health system like that of Uganda, where despite the recent progress in service availability like: improved access to maternal and child care as well as response to HIV/AIDS; the quality of service delivery to address infant and maternal mortality is still poor (Ministry of Health 2012). Primary health care remains difficult for some to access, and quality of care is inconsistent. The referral system is not functional, and patients often ignore secondary or tertiary care due to the high costs involved (Ministry of Health, 2012). The role of community animators as health workers is therefore significant in cases where formal health services are inadequate.

#### **b) The mixed enterprise strategy**

One important other strategy the farmers appreciated from the food bank for boosting their livelihoods was the skill of mixed enterprise. The food bank trained farmers in adopting a mixed enterprise method to boost their household livelihoods as well as food security. They encouraged farmers to grow cash crops like coffee and raise animals and poultry alongside food crop

growing. Some of the animals they encouraged farmers to raise were dairy cows for milk, piggery and improved goats. The food bank also has a demonstration project for local poultry as well as piggery from which the farmers came and learned how to raise a mixed farm enterprise on a small plot of land (see picture 2).

The food bank, however, was hindered by lack of constant water supply to run an effective demonstration farm. The project's irrigation system for example used the water system supplied by the National water and sewerage corporation that was pumped in through a small tank at the demonstration garden (see picture a). Because of the high costs involved in paying the water bills compared to the output from the demonstration gardens, especially the vegetable gardens which required constant watering, the plots were often abandoned during dry season (see picture b).

That notwithstanding, the maize demonstration farm had the best maize plantation in the area despite the scorching sun at the time of this study. Despite the dry weather that affected most farmers' maize production, the food bank still maintained good production because of the good farming methods exhibited (see picture c). The banana demonstration garden also had good bunches despite the extreme weather conditions at the time of this study (refer to picture, d).





(a) Food bank officer at the water tank for irrigation. Photo: Author (2014)



(b) Drying vegetable garden and the piggery project house. Photo: Author (2014)



(b) Demonstration plot for maize during dry season. Photo: Author (2014)



(c) The chairman and another board member in banana garden. Photo: Author (2014)

It was observed that farmers who had adopted the mixed enterprise strategy in their farming had better results and they showed higher chances of achieving sustainable livelihoods and food security compared to those who did not. The farmer in the picture below is a model farmer in the Busoba sub - county practicing mixed farming. His farm has dairy cows, and waste from the cows was used for manure in the coffee and banana plantations. He has also inter-planted coffee with trees that not only contribute to the conservation of the environment, but was also a source of income to his household. He gave his story as recorded below.



A subsistence farmer who grows both food crops and cash crops with some dairy cows for mixed enterprise, **Photo: Author (2014)**



*“I have planted large acres of trees from which I cut timber once in a while. I have inter-planted trees with coffee from which I have been able to educate my children and many of my siblings. I have dairy cows which served me milk throughout the year for family consumption as well as selling to meet petty family needs. The animals also supply me with manure and urea that I use in my food crops and cash crop plantations. I am now a model in championing the growing of indigenous crops. I rarely buy food in my home, except for a few things like sugar, salt and cooking oil I cannot produce locally”*  
**(Individual interview, 2014).**

Similar farmers that had adopted this strategy celebrated its benefits in driving them towards sustainable livelihoods and food security. The food bank operated a coffee nursery project from which mixed enterprise, farmers acquired quality coffee seedlings for planting at an affordable price of 100 Ug. Shs. per seedling compared to prevailing market price of 200.

### **c) Marketing**

Although some members of the project staff and few farmers indicated that the food bank linked farmers to better sources of market for their produce, many farmers and key informants indicated that efforts were still lacking in this area. Much as it is in the plans of the food bank to find better markets for farmers’ produce, it had still not done much. Farmers marketed their produce as individuals and efforts for collective marketing were lacking.

Some of the reasons the food bank officials gave for not being able to find an appropriate market were: first, many farmers had low output from their farms which did not necessitate collective marketing; second, some farmers sold their produce while still in the garden; and third, other farmers did not select their seeds well which made marketing difficult. Nonetheless, some farmers appreciated the food bank for linking them with schools to buy their produce and at one time, the food bank had connected farmers to the World Food Programme in marketing their produce.



The chairman of the Hunger Project epicenter in Mbale inspecting the coffee and other tree seedling that the project caretaker had relocated and not watered, they were withering rapidly. **Photo: Author (2014)**

#### **d) How to improve the food bank's role for sustainable livelihoods**

Farmers had a number of suggestions to make on how the food bank could help them improve their livelihoods. Table 13 summarizes the suggestions from the six focus groups.

When asked whether the food bank could be an effective mechanism to help smallholder farmers achieve sustainable livelihood, all key informants answered to the greatest extent it was. They argued that Mbale is a farming community and food storage facilities still remained the major challenge for many farmers. If the food bank increased sensitization about its services, taught farmers better farming methods to improve their yields, and increased farmers' skills on seed saving to reduce reliance on buying and handouts, without doubt the food bank would be an effective mechanism to drive farmers toward sustainable livelihoods.

**Table 13: How farmers suggest food bank could help achieving sustainable livelihoods**

<b>Suggestion</b>	<b>Count</b>
Search for good markets	2
Emphasize enterprise mix	4
Introduce vocational skills training for youth and women	1
Educate farmers in food and money saving skills	2
Supply farmers with variety of seeds	4
Supplying fertilizers, pesticides and pumps	4
Lobbying village bank to reduce interest on loans	3
Hire or employ Agriculture extension workers	3
Value addition of stored food	1
<b>Total</b>	<b>24</b>

Source: Author's field work (2014)

## **Conclusion**

Unlike the many conventional food banks studied by Teron and Tarasuk (1999) and Husbands (1999) and others, whose operation largely depended upon the quality and quantity of donations from the public and from food producers, processors and retailers, the Hunger Project food bank used for this study had effective measures in place to transform smallholder farmers to sustainable livelihoods. Farmers could store their food at the food bank and be able to sell it when the prices are high. They were also linked to financial services through the village bank. The mixed enterprise strategy improved farmers' sources of livelihoods as they could earn from cash crops, milk from dairy cows, poultry as well as other products.

This study therefore recommends that agricultural production activities with forward and backward linkages should be promoted as they have the potential for providing arrays of possible agribusiness activities for sustainable rural livelihoods. The food bank, however, needs to help the farmers to develop and standardize the management tools for these enterprises that suit the requirements for smallholder farming units.

### 5.6.2 Building resilience to climate change

The effects of climate change are already occurring globally, although many people are still ill-prepared for the risks from climate change (Yokohama, 2014). In 2007, the International Climate Change Risk Report labeled Uganda as one of the most unprepared and most vulnerable countries in the world (CIGI 2007). Vulnerability, the susceptibility or predisposition to be adversely affected is a concept commonly used in relation to appraising effective response to climate change. It covers a variety of concepts and elements, including sensitivity or susceptibility to harm and lack of capacity to cope and adapt (IPCC 2014b, p. 4).

Uganda's high vulnerability to climate change is a result of its heavy dependence on primary production and natural resource use that are facing additional stress from rapid population growth rate, weak institutional capacity, limited financial resources and low income per capita, limited infrastructure in both health and economic sector, limited capacity and equipment for disaster management, and heavy reliance on subsistent and rain-fed agriculture (MWLE 2002, PEAP 2004).

Climate change in Uganda is manifested in different ways. Global Climate Change models project that Uganda will experience an increase in average temperatures up by up to 1.5° C in the next 20 years (GOU, 2009) and that Uganda's temperatures will be 4.3° C by 2080 (IPCC, 2007). This is expected to increase the levels of poverty and food insecurity in Uganda (World Bank, 2013). Today, the intensity and frequency of droughts in almost all regions of the country are a clear evidence of climate change.

The long April – August 2013 droughts left a number of people hungry in eastern Uganda (The Republic of Uganda, 2013). Floods have also become common of late in Uganda. For example, in 2007, the Teso region of Uganda received the heaviest rainfall (amount per annum) in 35 years that left an estimate of 50,000 households affected and crop fields destroyed leading to food insecurity (WFP, 2008). The heavy rains that lasted for six hours on 1<sup>st</sup> May 2013 in Kasese, Western Uganda led to the bursting of River Nyamwamba leading to flooding of nine sub-counties. The Uganda Red Cross Society (2013) reported that eight people were confirmed dead due to the floods and at least five people were missing. A population of 25, 455 people was

severely affected after the destruction of houses, crops and facilities such as bridges, roads, hospitals and power lines.

Heavy rains have also been associated with landslides mainly accelerated by human activity and torrential rains which have cost life, property and financial resources (Ministry of State for Relief, Disaster Preparedness and Refugees, 2010). The prolonged droughts and frequency of floods in Uganda have resulted in an increased incidence of pests, vectors and diseases in plants, livestock and humans. For example the outbreak of moths in Eastern and central Uganda in March 2012 (The Republic of Uganda 2013), followed by the invasion of dangerous Looper caterpillars in the districts of Masaka, Buikwe, Mukono, Buvuma, Rakai, Wakiso and Bulambuli in April 2012 (The Daily Monitor, April 2012). These and many other pests have caused much destruction on farm lands, making the need to find ways of addressing the effect of climate change in Uganda inevitable.

Farmers in Uganda need to be assisted to adapt to reduce the risks from a changing climate. This study investigated how farmers were adapting to the aforementioned changes in climate variability manifesting itself in the form of prolonged droughts, pests and diseases as well as floods. It also sought to establish how the food bank was helping smallholder farmers to build their adaptive capacities and as well as exploring other forms of support farmers would need to build resilience to the climate variability.

### **Adaptation by smallholder farmers to climate change in Uganda**

This study established that much as the farmers were already being affected by the effect of climate change, they were not familiar with the concept of 'climate change.' Like their colleagues in other African countries as indicated by Ariel Diner and others (2008), smallholder farmers in Uganda adapted to climate change in various ways.

Although smallholder farmers had less control over nature and while some indicated that in the face of prolonged drought they had nothing to do than to pray to God for the rains, many farmers applied other locally affordable means. Farmers with plots of marshlands and plots of land along springs grew crops during dry seasons as they could easily water the crops. Many swamps and springs were, however, seasonal and they dried up when the dry spell got prolonged.



A farmer in the Lukhonge sub - county mulching his banana plantation intercropped with coffee.  
**Photo: Author (2014)**

Some farmers mulched their gardens using plant residues to protect it from direct sun. They also applied fertilizers and organic manure from animals and other biodegradable substances to improve soil fertility and maintain soil structure.

Spraying crops with pests was also practiced by some farmers who could afford to buy the pesticides, while others uprooted the affected plants and burned them up. It was also discovered that some farmers made their own local pesticides through a mixture of several herbs, red pepper, ash, and animal urine. The mixture is placed in a container for a period of 3-4 days to ferment and there after it is diluted with water and sprayed on crops. It was reported that the local chemical was effective in preventing a variety of field pests and diseases as well as adding urea to the soil which improved yields when properly applied.

Farmers also changed their planting season basing on the availability of rainfall as well as timely and proper weeding. They often received information about the expected arrival time for rains supplied by the National Agriculture Research Organization through the food bank and they planned accordingly. To prevent the effect of stored pests, farmers that afforded to buy pesticides together with those that could not afford, all reported that they dried their cereals thoroughly before storing.



Those who did not afford to spray stored the cereals and legumes in the mixture of chaff before sieving. This method was also reported to be an effective way of controlling pests of stored crops. No farmers applied irrigation methods, although they learned about irrigation from the food bank trainings. Even at the farmer field school in Lukhonge for example, crops of farmers who did not irrigate were drying up at the time of this study, while those of other farmers who irrigated on the same demonstration farm were doing very well as seen in the pictures below.

These findings are in line with the UNEP, (2011) indicating that many farmers in Uganda depended much on rainfall to grow their crops and use fewer inputs like fertilizers. This leaves many farmers vulnerable to the changing rainfall patterns and climatic variability that could be brought about by global warming. One major challenge is that Uganda as a country is not climate-resilient because it lacks precise rainfall data and has poor crop husbandry that relied heavily on rain-fed agriculture.

### **The food bank strategy for building resilience to climate change**

#### ***Soil preservation and weather information***

It was found out that the food bank helped farmers in proper soil preservation and rainfall predictions through the use of other service providers like the National Agricultural Advisory Services (NAADS) coordinators and National Agriculture Research Organization (NARO). The National Agriculture Research Organization received help from UNEP to develop efficient systems for collecting, recording and analyzing agro-meteorological information such as rainfall amounts and patterns (UNEP 2011, p. 23). This enabled NARO to strengthen its knowledge about uncertainties faced by farmers and provides farmers with information on expected rainfall and amounts.

However, a senior meteorologist at the Ministry of Water and Environment, Mr. Khalid Muwembe said the projections could not be relied on heavily due to increased variability in climate. He indicated that, previously the weather pattern showed two good planting seasons, that is, March to May and September to November which were timely and would enable farmers to follow the traditional trends of planting (East African Agribusiness Magazine March, 2014). However, this trend has since changed because occasionally, there is continuous rainfall during times of dry season and pronged dry spell occurrences during rainy seasons making it difficult

for farmers to plan well. He thus advised farmers to seek expert advice before planting to avoid erratic weather conditions that could destroy their crops



Farmers showing the researcher a maize field at the farmer field school in Lukhonge. The yields in the garden were poor and farmers explained that it was because they lacked irrigation facilities and fertilizers to apply although they planted good quality seeds.

**Photo: Author 2014**

### *Indigenous crops*

The food bank also encouraged farmers to grow drought resistant crops such as indigenous crops, as well as encouraging the early preparation of gardens during dry season and planting at first rains. As earlier mentioned, the prolonged droughts and floods in Uganda have been associated with an increase in the spread of pests like the outbreak of moths the invasion of dangerous Looper caterpillars between March and April 2012 that affected crops in many farms. In preparation for such occurrences, the food bank uses the service providers like the Agriculture extension Assistants to recommend to farmers the appropriate pesticides. The food bank also at times supplied pesticides and spray pumps to farmers on credit.

### *Dry-farming*

The attempt by the food bank to help farmers in proper soil preservation and emphasis on indigenous crops could imply that the food bank is trying to build resilience to climate change through dry-farming. This practice requires farmers to properly prepare their soils well by deep

ploughing, cultivation, and allowing for the planting of crops. This should however be accompanied by the choice of the crop, its proper seedling, and its proper care and harvesting.

Several crops have been considered appropriate for dry-farming and the food bank has been encouraging some of them. It is hoped that if farmers adopted this kind of farming, they will likely build some resilience to climate variations. Some of the crops the food bank is emphasizing for this purpose include:

*Climbing yams (Also known as air potatoes)*

This is an herbaceous, high climbing crop with vines up to 65 feet long. It grows climbing on shrubs and trees. It produces aerial tubers (bulbils) with 1 to 4 occurring at leaf axils that drop and sprout to form new plants. The fruits usually start yielding between June and September and year-round. Climbing yams are resistant to drought and can survive all year-round under any weather conditions.



Two different farmers showing plants of climbing yams that withstood long dry spell.  
**Photo: Author (2014)**

*Sweet Potatoes*

Potatoes are another crop that is suitable for dry-farming. Potatoes can still give good yields even when tried on lands under a rainfall of twelve inches. They are also well adapted for use in rotation and can thus be used for land fallowing. Given their nature of being cover crops,

potatoes are good in controlling moisture under the ground and can be an appropriate crop farmer should be encouraged to grow especially when rains are predicted to be low in amounts.



A sweet, potato garden in Busoba Sub-county that looked healthy amidst the dry spell.

**Photo: Author (2014)**

Other dry-farming crops that the food bank encouraged farmers to grow included sorghum, which promises to be a good yielder, under arid conditions although many farmers in Mbale have not grown it of late.

From the author's experience of the area, he observes that practicing dry-farming in Uganda and Mbale in particular where the land is becoming less fertile each year will not yield better results without inter-planting crops with leguminous crops. Growing of leguminous or pod-bearing crops will be of great importance to farmers because of their multipurpose roles. First, they are rich in nitrogenous substances which are valuable animal feeds, and secondly, legumes have the ability to gather nitrogen from the air, which can be used for maintaining the fertility of the soil. Research has, however proved that the selection of the type of legume and crop to be inter-cropped with as well as the spatial requirement play an important role in determining the yields.





Farmers and community change agent explaining to the researcher (*in black shirt*) the usefulness of leguminous crops in a garden at a farmer field school in the Lukhonge sub - county. **Photo: Author (2014)**

According to Ghosh (2004), spacing arrangements of plants, planting rates and maturity dates must be put under consideration when planning intercropping. Legumes have been proven to play an important role in suppressing weeds in particular crops. For example, intercropping of soybean in sesame and sorghum in cotton significantly decreases the biomass and density of the weeds and increases net return (Iqbal *et al.* (2007). Malik *et al.* (2008) also reported that wild radish and rye cover crops reduced total weed density by 35 and 50%, respectively without herbicides.

It can therefore be argued that intercropping of other crops will not only increase the nutrient levels in the soils, but also control weeds and save the costs of herbicides in some cases.

Legumes improve soil fertility through nitrogen fixation. It is argued that while recycled plant residues and animal manures help to maintain the overall nutrient balance on the farm, the single, accurate import of nitrogen is from the fixation of atmospheric nitrogen by legumes (Briggs *et al.* 2005).

Nitrogen is supplied in legumes from root nodules in which *Rhizobium* spp. bacteria convert soil, atmospheric nitrogen into a form usable by the plant. The amount of nitrogen fixed in the roots of grain legumes has been estimated at 150-200 kg/ha, the majority of which is removed in the grain of the crop (Fisher, 1996).

One mistake many smallholder farmers usually do is to remove the crop residues from the field during harvest. Farmers uproot the legumes like beans, soya beans, groundnuts and take everything home; residues are often burned after removing the pods. Jensen (2002) argues that this practice removes much of the fixed nitrogen from the soil and reduces the benefit to the following crops. It may also result into nitrate ( $\text{NO}_3$ ) leaching especially in environments which receive surplus precipitation. Jensen (2002) suggests that this situation can be tamed by early sowing of the subsequent cereals or Nitrogen catch cropping

### ***Afforestation***

For purposes of air purification and influencing rainfall formation, the Hunger Project food bank also encourages tree planting. They sensitize farmers even those with limited land to plant some trees at the edges of their gardens. They have also managed a tree nursery project with a variety of assorted seedlings from which farmers can get tree seedlings at a low cost. This is promoted as a youth project to actively involve the youth in environmental protection programs as well as earning them a living.

Many farmers have adopted this strategy, although its adaptation is still low. Some farmers complain of having small lands that cannot support both crops and tree-growing while others argue that some trees suck the water from the soils making it unsuitable for crop growing. Many who have, however inter-planted trees like Calliandra (*Calliandra calothyrsus*) with crops say that they have no such effects on the crops. Instead, they enrich the soil, making it more fertile. Some youths have been inspired to set up their own tree nursery projects and they indicate that they have been able to harvest good sums of money from the projects each year.

### ***Irrigation facilities***

The food bank also has a drip irrigation system on its demonstration farm at the project premises. On this farm, the farmers are trained in vegetable growing and management during dry season. The system however was expensive because of its reliance on water from the national water and sewerage corporation grid as already indicated in section 5.6. It was difficult for farmers to adapt because the area had limited water sources. Its adoption and use by the food bank itself was also not cost effective. The vegetables that were grown on the demonstration farm had dried up

because the food bank could not afford the water bill for irrigation as the output did not meet the costs of production.

The researcher recommends that rainwater harvesting should be considered as an alternative. Underground tanks should be established to collect rain water from the Hunger Project epicenter's 'L' building, including the food bank structure to supply cheap and sufficient water for irrigation during dry season.



The epicenter chairman, at the tree nursery project. This project is meant to be for the youth; however, the youths were reluctant to care for it. The project administration has hired someone to look after it. **Photo: Author (2014)**



A youth who enjoyed growing and selling tree seedlings. He said he has planted over 2 acres of coffee intercropped with trees and all were doing very well. **Photo: Author (2014)**

## Conclusion

In a nutshell, the study established that helping farmers to adapt and meet the climate challenge calls for individuals and institutions to be able to assess and understand climate change, design and implement sufficient policies and most importantly, to take action on climate resilient growth (UNEP 2011, p. 5). The food bank may therefore need to partner with other service providers to help farmers adapt to agro-environment zoning strategy. This enables production of land suitability assessment; indicating which type of crops are appropriate for specific areas, for example land availability assessment, which identifies exclusion zones to protect areas with high biodiversity and carbon storage values (UNEP 2011, p. 11).

## 6. CONCLUSION

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### 6.1 Concluding remarks

The aim of conducting this research was to identify the important roles food banks play in ensuring food security, livelihood sustainability as well as building smallholder farmers' resilience to climate change. The necessity for this was the fact that similar studies have been conducted in different settings i.e. developed countries in the United States and Canada majorly looking at food security, and the health of food bank users, but no similar study has been conducted in Uganda or looked at the role of food banks. Furthermore, it was widely noted that hunger and food insecurity was increasing the need for food banks and emergency food providers (EFP) and that climate change in Uganda is very likely to exacerbate food insecurity. Yet, no study has been conducted to establish how food banks would be useful in building food security and sustainable livelihoods as well building climate resilience among Uganda's smallholder farmers constituting over 80 percent of Uganda's population.

This research looked at the previous literature and established a starting point for analyzing the role food banks in food security, sustainable livelihoods and climate change resilience. Three main research questions were formulated to find out the extent to which food banks helped in addressing the challenge of food insecurity among smallholder farmers in Uganda; whether food banks could be used as a means for transforming smallholder farmers from a state of vulnerability to a state of sustainable livelihoods; and how the food banks could help smallholder farmers to build resilience to the shocks of climate change.

Findings revealed that currently, it is hard to measure the socioeconomic impact of the food bank in Mbale on smallholder farmers, food security and livelihood, because it is difficult to isolate its contribution from that of interrelated programs like; the National Agriculture Advisory Services, farmer associations like Busoba Tubaana Mixed Farmers' Association; the role of other government programs like free Primary and Secondary school education, and other activities farmers were engaged in to generate income. However, judging from the discussions with farmers and key informants, it can confidently be concluded that the food bank was playing a significant role in improving smallholder farmers' food production and income levels in the sub-



counties it was operating. Since the poor farmers are now able to apply better farming methods and use improved seeds they acquire from the food bank, as well as keeping their food in the food bank, their daily wage rate has significantly increased.

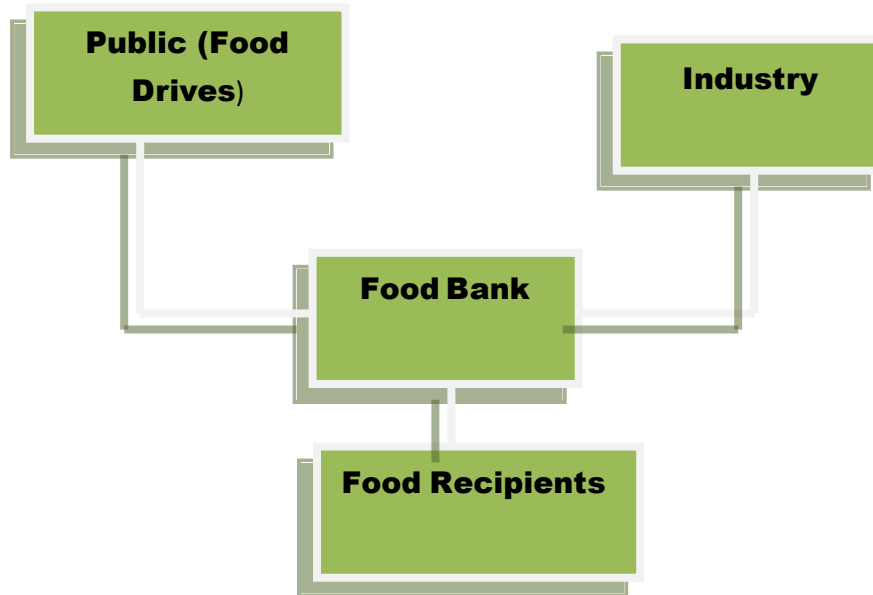
It was also found out that much of the literature on food banks indicates that food banks exist to provide emergency food to the hungry and not ensuring food security and sustainable livelihoods for farmers. It is indicated that food banks collect the 'would-be wasted food' from industries, supermarkets and other sources and either distribute directly to the hungry people or through front line agencies which provide supplemental food and meals to the hungry. In this line of operation, 'conventional food banks' are seen to serve two main goals; assisting low-income consumers have access to food, and distributing surplus food. The objectives show nothing about working to end hunger or promote food security.

This study, however, established that the operation of the food bank in Uganda was far different from those represented in much of the literature mainly from Canada and the US. The overall goal of the food bank in Uganda is to end hunger and starvation which, when achieved tantamount to food security. The food bank in Uganda does not offer emergency or relief food to the hungry. Instead, it encourages the growing of more food and saving for the future, which provides security for the farmers in times of famine and food scarcity by providing quality seeds for farmers, provides safe storage facilities for farmers to store their food after harvest, offers skilled trainings to farmers in different aspects to improve their farming knowledge and yields as well as establishing farmer field schools and demonstration plots to provide hands on training for farmers.

Not only that, the food bank was also found to be actively involved in helping farmers to diversify their sources of household income through mixed enterprise, linking them to credit services to enable them engage in other profitable businesses, as well as helping them to engage in savings and credit cooperatives. There is evidence that farmers who have followed the training programs of the food bank have improved their income levels, others are already food secure while others are on their way to food security. Nonetheless, the food bank found it difficult to have all farmers adapt to the new farming methods and technology either due to poverty, or negative attitude towards adapting to change and the attitude of dependence on external help, or all the above.

With this knowledge, the author finds the food bank hunger-alleviation model suggested by Husbands (1999) less applicable to food banks in Uganda. The model would be applicable if the food bank was dealing with urban dwellers who are not directly involved in food production through farming. But since the food bank in Uganda aims to work with rural smallholder farmers, the model below is less applicable and the author suggests modification to this model as reflected in figure 13.

#### **Food bank hunger – alleviation model according to Husbands**



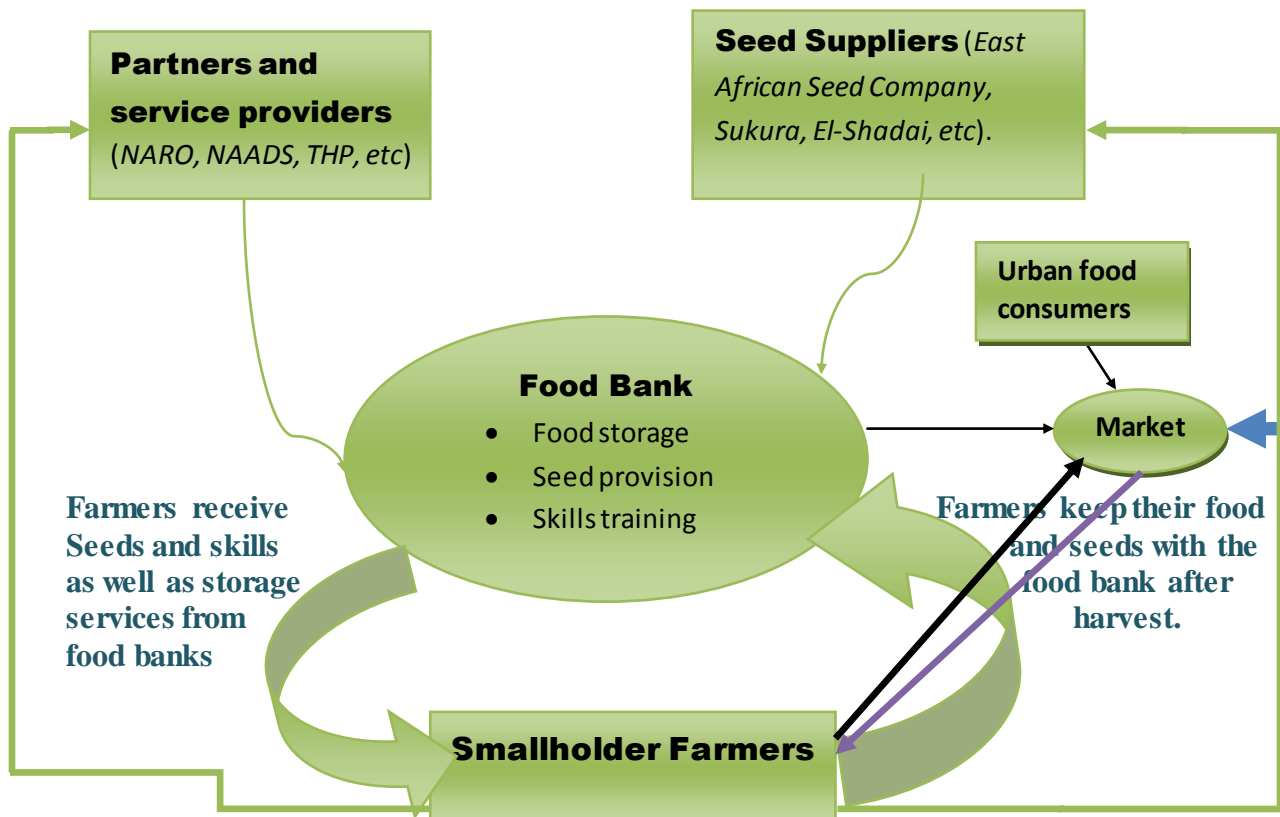
Source: Husbands, W. (1999, p. 107)

The above model looks at the food bank users (food recipients) as only recipients not contributors. They are only at the receiving end, making them more vulnerable and food insecure, especially where the food bank was not in a position to supply them with food. It is suitable for urban food bank users who do not farm but rather depend on the market for their sources of food.

Using the experience from Uganda (the Hunger Project) food bank that works in rural areas directly with farmers, the author would propose a new hunger-alleviation model adapted for smallholder farmers where food bank users are the key providers of food to the food bank and are the center of focus. They refer to the food bank for knowledge, skills and other inputs and

then produce food that they store in the food bank other than referring to the food bank as the provider of emergency food donated by industries and the public. However, food banks that intend to serve urban food consumers will find Husband's model useful.

**Figure 13: Food bank hunger-alleviation model for smallholder farmers in Uganda**



Source: Author, (2014)

From figure 13 above, we can observe the dynamic nature of the food security and food bank system in Uganda as well as the dynamic character known to smallholder farmers. Much as smallholder farmers refer to the food bank for seeds and skills/technical advice, they also have direct access to seed suppliers and service providers where the food bank gets its seeds and services. Those who have money can get their seed requirement direct from the seed suppliers and others get seed supply directly from the National Agriculture Advisory Services (NAADS) as indicated in section 5.3. Smallholder farmers can also meet their seed requirements by buying from the market, while at the same time supplying their produce direct to the market after. They

can also keep their food in the food bank after harvest, where the food bank can also help to find markets from both urban dwellers and larger markets like the World Food Programme.

It is also clear that the seed suppliers that supply the food bank's seed requirements are the same suppliers of seeds to the general market. It can thus generally be observed from the above model that the market is the convergence point for almost all stakeholders involved in food security that is the food bank, the urban dwellers, the farmers and seed suppliers, hence justifying the fact that Ugandans are market oriented. Although the food bank partners/service providers have no arrow connecting direct to the market on the above model, in one way or another they have a connection to the food market.

## **6.2 Contribution of the study**

This research is first to study the role of food banks in food security, sustainable livelihoods and climate change resilience among smallholder farmers in the context of Uganda. There was no particular research found studying food banks in Uganda especially in connection to food security and climate change apart from reports from the Hunger Project that supports the food banks in Uganda. This study on food banks and food security, sustainable livelihoods and climate change resilience in the context of developing countries was conducted at the time when food security and livelihood sustainability is at the forefront of Uganda's development agenda. It was also timely at the time when the concept of food banks is still new in Uganda and often confused with food barns or granaries.

This research contributes to the literature analyzing the strategies to build food security and sustainable livelihoods among smallholder farmers as well as stallholder farmer's adaptability to the changing climate. More specifically the empirical findings of this study contribute to the understanding of the need to establish community-based food security systems where smallholder farmers' capacity to steer food security in a sustainable manner is rejuvenated.

## **6.3 Implications of the study**

The current research puts forth some useful insights in the field of food security and smallholder agriculture, especially in reference to the Ugandan context. If well studied, it provides a clear understanding for service providers of smallholder farmers to help them adapt to the changing

system of agricultural production under the changing environment influenced by climate change. Improving smallholder farmers' productivity depends on gathering useful information about the changing trends in the farming system and making calculated decisions regarding smallholder farmers preferences and choices to avoid imposing on them the technology and methods that would not be applicable in their context.

Additionally, from the results discussed in the previous chapter it is clear that, much as some smallholder farmers were still rigid, many were flexible and already adapting to new technology and farming methods as well as adapting to climate variability in different ways. This promises great potential for smallholder farmers to achieve food security and sustainable livelihoods, especially if the food bank and other service providers improve their service provision decisions through proper feasibility studies and involving the smallholder farmers themselves in decision making.

Furthermore, the findings reveal that proper and safe food storage has the advantage of not only ensuring that poor households had access to food for a longer period of the year, including times of scarcity, but also in improving household incomes which contributes to their livelihood security. The food bank service providers therefore need to review their strategies to ensure that the problem of distance that barred many farmers from accessing the food bank and information about its services is removed to enable farmers to access better food storage services offered by the food bank.

Finally, managerial and administrative implications of this study will help food bank service providers and other food security service providers like the government NAADS program to revisit their strategies and improve the capacity of the smallholder farmers in making decisions that relate to the management of the food bank and food security as well as encouraging community ownership of the food bank project

#### **6.4 Limitations of the study**

The current study has some limitations that can be addressed in future research. Firstly, it only focuses on one food bank, the Hunger Project Mbale epicenter food bank in the Mt. Elgon ecological zone. Future research should expand coverage and study more than one food banks in

different locations and climate zones. Furthermore, this research focused mainly on smallholder crop farmers. It might be useful for future research to consider studying both smallholder crop farmers and smallholder livestock farmers since it was established that many farmers were growing crops alongside livestock rearing.

Additionally, this research employed qualitative methods. It might be of interest for future research to use quantitative methods to conduct wider surveys that provide a greater understanding of the practices of food banks and their role in food security, livelihood sustainability and climate change in Uganda.

Finally, this study paid attention on the role food banks played in food security, but did not consider identifying what the food bank considered to be the causes of hunger to make a correct assessment of the extent to which they were addressing the root cause not the symptoms. It will be of great interest for future researchers to study the causes of hunger among smallholder farmers and how the food bank could help farmers to not only achieve food security, and at the same time attaining food sovereignty.

In a nutshell, smallholder farmers in general are still food insecure and efforts of both the government and nongovernmental agencies are still needed to support the food security program in Uganda. Farmers still have a major challenge of accessing quality and sufficient seed to improve their production, although the food bank, the National Agriculture Research Organization and the National Agriculture Advisory Services were playing a significant role of providing quality seed and capacity building to farmers. Some farmers that have adapted to the new farming system and put in practice the skills they have acquired from the food bank and other service providers have registered better yields and incomes, much as the fraction is still small and the food bank and other service providers need to widen their operation scope.

## 6.5 Recommendations

### *a) Establish community-managed food banks*

It was established from this study that farmers wanted the food banks decentralized to lower levels. It is an indication that farmers are interested more in having a community-managed food bank in their own communities where they can easily access, but also influence the decision

making process in the day-to-day management of the food banks. This study recommends that the Hunger Project should consider initiating community-managed food banks at village levels where the community members are helped to form committees amongst themselves to manage them. This practice will not only reduce the costs of managing food banks by the Hunger Project, but also has the potential to increase the sense of ownership, community participation in decision making and sustainability of the food bank movement.

The main food bank at the Hunger Project epicenter would play a supervisory and capacity building role as well as helping farmers to establish simple tools and procedures related to the management of the food banks. This is intended to build the development capacity of the rural people to initiate and manage their own development. LaFond and Brown (2003, p. 7) say that development capacity represents the potential for using resources effectively and maintaining gains in performance with gradually reduced levels of external support. The four principles suggested by the Catholic Relief Services (CSR 1997) and Kaplan (1999) would be helpful in guiding the establishment of the community-managed food banks:

- They should be compatible with the level of community capacity, such as educational level, skills, knowledge, perceptions, and understanding;
- They should be simple and easy, so that people feel confident to practice and use them;
- They should employ the local language to ensure ease of understanding; and
- They should be developed with the community's active involvement, to build their sense of ownership.

The best approach to build the community capacity for development, especially among smallholder farmers in Mbale and Uganda as a whole will be to make suitable efforts and investments in training, adult education, and cross-visits, so that those with responsibility for managing food banks could learn from each other as ably as possible (Oya 2001).

*b) Equitable distribution of benefits*

From the discussions with farmers that the food bank served, the argument was that there was a need to ensure the equitable distribution of the benefits of the food bank among all community members that it served. While Lukhonge sub-county farmers praised the food bank for the great improvement it had brought in their agricultural production and household incomes, farmers in

Nyondo sub-county and some others from Busoba sub-county indicated that they had not benefited much. Others did not know exactly what happens inside the food bank. Villagers were more aware of the micro-credit services of the Hunger Project than the food bank because the microfinance department seemed more vibrant in the way it operated. This study recommends that there is a need to establish a service delivery system that benefits every target beneficiary equally. Equity depends on getting community members to agree that the arrangement is fair (Mansuri and Rao 2004).

One of the main challenges that both the farmers and the food bank faced was lack of adequate seeds for planting. Farmers usually relied on relief seed sources like from the food bank, the National Agriculture Advisory Services (NAADS) and other sources for their seed requirement. Because of poverty, many smallholder farmers did not afford to meet their seed requirement. This study makes two recommendations in this regard:

*c) Encourage seed saving*

First, the food bank should encourage seed saving among farmers and preferably preservation of the indigenous species. It is obvious on the Ugandan market that there is a high market demand for indigenous seeds and cereals due to their taste and preferences, although, due to their rapid disappearance from the market as a result of the invasion of modern seeds, farmer preference is shifting towards genetically modified species (GMOs). Helping farmers to save seeds for the next planting season as well as helping them to grow traditional high value crops will enhance the capacity of smallholder farmers to become food secure.

*d) Initiate a community supported agriculture program*

Alternatively, the food bank could initiate and pilot the concept of community supported agriculture (CSA). Community supported agriculture program ensures a partnership between farmers and consumers where the responsibility and rewards of farming are shared. The farmers could receive funds from the potential consumers in advance and use it to buy seeds, pesticides, fertilizers and land preparation. During harvest, the proportion of the harvest is then paid to the consumers who provided the funds according to the established terms and conditions.



Encouraging community supported agriculture will provide multiple benefits for smallholder farmers, the agricultural sector as well as the economy of Uganda. First, the system ensures that money from the community remains in circulation within the local community leading to local development because the consumers are usually members from within the local community. Second, it checks on buying imported foods or foods transported from far areas that have an effect on global warming and the environment. Third, it provides a ready market and security for farmers' produce; and fourth, it would save farmers from exploitation by private money lenders and other financial institutions that charge high interests on loans.

*e) Rainwater harvesting facilities*

This study also established that smallholder farmers learn better farming methods best through demonstration and hands on training. However the food bank was constrained by lack of sufficient water for irrigation at the demonstration sites during the dry season that made the demonstration farms less efficient. Reliance on National Water and Sewerage Corporation for water supply was not the best way to support the irrigation program. This study, therefore recommends that the food bank should invest in rainwater harvesting to collect water during rainy season and use it for irrigation during dry season. Underground tanks that have higher capacities would be the most appropriate strategy to adopt.

The Mbale district lies in the Mount Elgon climatic zone and experiences the main rains between March and September with an average rainfall ranging between 1500 – 1250 mm. This would supply cheap and sufficient water for irrigation at the demonstration sites. Funding proposals could also be developed and funding sought from different sources to support rain water harvesting project for smallholder farmers too, for example from the African Water Facility of the African Development Bank (ADB), Water and Sanitation Program-Africa Region (WSP-AF), among others.

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## APPENDICES

### Appendix 1: Data collection tools used

#### a) Focus Group Discussion for Farmers

This interview seeks your critical assessment of the role; the food bank plays in ensuring food security and sustainable livelihood among smallholder farmers in Uganda. Please note that this study is not an investigation into some activities of the Hunger Project food bank as an entity. The study is purely academic and any responses obtained will be treated with uttermost confidentiality. Kindly respond truthfully. Thank you.

#### Questions

1. What are your major sources of food in your households?
2. What major challenges do you face in getting enough food?
3. How have you benefited from the Hunger Project food bank as regards food security?
4. How do you deal with the problem of hash climatic conditions like:
  - a) Prolonged drought
  - b) Flooding
  - c) Pests and diseases
5. How has the food bank helped you in addressing the above climate challenges?
6. How does the food bank help you with the marketing of your surplus produce?
7. In your opinions, do you think your income levels have improved ever since you joined the food bank? Explain your answer.
8. How best do you think the food bank can help you to improve food security in your homes?
9. How best do you think the food bank can help you to improve your household incomes?
10. How best do you think the food bank can help you to build resilience to climate change?

**Thank you for your time**

**b) Focus Group Discussion for Community Change Agents**

1. What are your major roles regarding the food bank operation and food security among community members?
2. What role does the food bank play in ensuring food security among smallholder farmers?
3. What major strategies does the food bank use to ensure food security among smallholder crop farmers?
4. What are some of the challenges the food bank faces in ensuring that the above strategies are effectively implemented?
5. How do you overcome the above challenges?
6. How does the food bank help farmers in addressing the challenges of climate change?
7. How does the food bank help farmers to improve their household incomes?
8. What would you recommend that the food bank should do to help farmers achieve sustainable food security and livelihoods?
9. Do you have any other information regarding the work of the food bank that you would like to share with me?

**Thank you for your time**

**c) Semi-structured interview guide for project staff**

**Section A: Background information**

Sex	
Age	
Education level	
Position held	
Years of service	

**Section B: Addressing food insecurity among smallholder crop farmers**

1. How many Sub-counties in Mbale district do you serve?
2. How many smallholder farmers have subscribed to the food bank project?
3. What is the original project target in terms of numbers of farmers to be reached?
4. What criteria do you use in selecting farmers who subscribe to the food bank?
5. What are your major sources of seeds/food in the food bank?
6. Do you usually offer relief food to farmers during times of famine?
7. How do you help smallholder farmers achieve sustainable food security?
8. How responsive have the smallholder farmers been in the food bank program?
9. What challenges did you face in helping smallholder farmers to fight food insecurity?
- 10.** What coping strategies have you put in place to address or reduce the magnitude of the above challenges?

**Section C: Transforming smallholder crop farmers to a sustainable livelihood**

11. How do you help smallholder farmers to improve their levels of incomes?
12. How do you help farmers to address the challenge of low output from the agricultural produce?
13. How do you help smallholder farmers gain access to reliable market for their output?
14. What other services do you offer to the farmers?

**Section D: Building resilience to negative shocks of climate change**

15. How do you help smallholder farmers to best prepare for the negative events of climate change like:

- a) Prolonged drought
- b) Floods
- c) Pests and diseases

16. How responsive have the smallholder farmers been in adopting strategies to build resilience to climate change?

17. Do you have any additional information about the food bank that you would like to share?

\*\*\*\*\*END - Thank you for your time \*\*\*\*\*

#### d) Key informant interview guide

##### Section A: Background information

<b>Sex</b>	Male ( )	<b>Educational background</b>		
	Female ( )			
<b>Age</b>	30 years and below ( )	Secondary ( )		
	31-40 years ( )	Certificate ( )		
	41 years and above ( )	Diploma ( )		
		Degree ( )		
		Postgraduate ( )		
<b>Position held</b>		<b>Organization</b>		<b>Years of service</b>

##### Section B: Addressing food insecurity among smallholder crop farmers

1. Do you think food banks can be an effective means for achieving food security in Mbale District? Please explain.
2. What would be your assessment of the role of the Hunger Project food bank in fighting food insecurity among smallholder farmers in the sub-counties it has worked?
3. How best do you think the food bank can help smallholder crop farmers to achieve food security?

##### Section C: Transforming smallholder crop farmers to a sustainable livelihood

4. What is the perception of smallholder crop farmers in Busoba as regards storing their seeds/food in the food bank?
5. What role has the food bank played to help smallholder farmers to market their surplus produce?
6. What do you think are the major obstacles towards achieving sustainable livelihoods for smallholder farmers?
7. Do you think the food bank can be an effective institution to help smallholder farmers achieve sustainable livelihoods? Please justify your answer.

##### Section D: Building resilience to negative shocks of climate change

8. What methods do smallholder farmers use to protect their fields from the effects of climate change?
9. How is the food bank helping smallholder crop farmers to build resilience to climate change?
10. In your opinion, what do you recommend the food bank to do to help smallholder farmers build resilience to the negative effects of climate change?

**END: Thank You for Your Time**



## Appendix 2: Research ethics: Consent form



### Full title of Project:

From sustainability to sustainable development: the role of food banks in food security, a case study of the Hunger Project food bank, Mbale epicenter, Uganda

### Name, position and contact address of Researcher:

Joseph watuleke, Master's student, Department of Development Studies,  
University of Agder, Kristiansand, Norway

### Please Initial Box

- |    |  |                          |
|----|--|--------------------------|
| 1. | I confirm that I have read and understand the information sheet for the above study and have had the opportunity to ask questions. | <input type="checkbox"/> |
| 2. | I understand that my participation is voluntary and that I am free to withdraw at any time, without giving reason.                 | <input type="checkbox"/> |
| 3. | I agree to take part in the above study.   | <input type="checkbox"/> |
| 4. | I agree to the interview / focus group / consultation being audio recorded   | <input type="checkbox"/> |
| 6. | I agree to the use of anonymised quotes in publications  | <input type="checkbox"/> |

Name of Participant	Date	Signature

Name of Researcher	Date	Signature