

**FARMERS' PARTICIPATION IN FOOD SUPPLY AND FOOD SECURITY AMONG
THE HOUSE HOLDS OF MBARARA AND ISINGIRO DISTRICTS,
WESTERN UGANDA**

**A RESEARCH REPORT SUBMITTED TO THE COLLEGE OF HIGHER DEGREES
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DECLARATION A

"This thesis is my original work and has not been presented for a Degree or any other academic award in any University or Institution of Learning".

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Name and Signature of Candidate

5th / 10 / 2014

Date

DECLARATION B

I confirm that the work reported in this thesis was carried out by the candidate under my supervision".



Dr. Kibuuka Muhammad

Supervisor

Date 05th / 11 / 2014

DEDICATION

I dedicate this research to my beloved immediate family most in particular my beloved wife, late-parents and my supervisor for all the love, understanding, encouragement, material and moral support, without them my studies would not have been a success. To my dear brothers and sisters together with my colleagues and friends, I love you all.

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ABSTRACT

The study investigated the relationship between farmers' participation in food aid supply and food security among the households of Mbarara and Isingiro Districts, Western Uganda. The study was guided by three objectives namely, to determine; 1) the extent to which farmers in Mbarara participate in food aid supply; 2) the extent of food security among the households; and 3) whether participation in food supply affects food security among farmers in Mbarara and Isingiro districts. A descriptive correlational and cross sectional survey design was used to collect data from 120 farmers, using a self-administered questionnaire and interview guide. Analysis was done using frequency counts, means and Pearson's Linear Correlation Coefficient. The findings indicated a generally high extent of farmers' participate in food aid supply (overall mean=2.91) and a generally satisfactory extent of food security (overall mean=2.90). There was a positive and significant correlation between farmers' participation in food aid supply and the extent of food security ($r=0.473$, Sig.0.000). The study concurred with the Oxfam food security theory by Dilley (1992) stating that Food security is a dynamic idea that has undergone significant transformations in its conceptual lifetime and the most significant being the shift from an initial view of food security as a product of reliable supplies to the growing contemporary emphasis on food and as a single input in diffuse of local lively-hood strategies. The researcher recommends that; farmers in Mbarara and Isingiro districts should improve on their farming methods, use high quality agricultural breeds, apply irrigation methods during their farming activities and the Government of Uganda should provide free and high quality agricultural breeds to them. Further research can be carried out on quantity of food supplied and the extent of food security among farmers in Mbarara and Isingiro districts.

LITERATURE REVIEW	10
2.0 Introduction	10
2.1 Farmers' participation in food supply	10
2.1.2 Food security among famers participating in food aid supply	11
2.1.4 Challenges experienced by farmers in their participation in food supply	13
Related studies	20
 CHAPTER THREE	 23
METHODOLOGY.....	23
3.1 Research Design.....	23
3.2 Research population	23
3.3 Sample size.....	24
3.4 Sampling Techniques	24
3.5 Measurement of study variables	24
3.6 Research instruments	25
3.7 Validity and reliability of the instruments	26
3.8 Data Gathering Procedures	26
3.9 Data analysis	26
3.10 Ethical Considerations	27
3.11 Limitations of the Study	27
 CHAPTER FOUR	 29
PRESENTATION, ANALYSIS AND INTERPRETATION OF RESULTS	29
4.0 Introduction	29
4.2 Extent of farmers' participation in food supply	30
4.3 Extent of Food security	33
 CHAPTER FIVE.....	 41

DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS	41
5.0 Introduction	41
5.1 Discussions	41
5.2 Conclusions	44
5.3 Recommendation.....	45
Areas for further research.....	45
REFERENCES	46
APPENDICES	50
APPENDIX I: RESEARCH INSTRUMENT	50
APPENDIX II: R.V. Krejcie and D.W Morgan(1970), Determine sample size	54

LIST OF TABLES

Table 3:1 Population Distribution	23
Table 1: Profile of Respondents	29
Table 2: Extent of farmers' participation in food supply.....	31
Table 3: Other facts on farmer participation in food aid supply	32
Table 4: Extent of Food security.....	35
Table 5: More facts on Food production among farmers in Mbarara and Isingiro districts	37
Table 6: Significant relationship between participation in food supply and Food security in Mbarara and Isingiro districts	39
Table 7: Regression Analysis between the Dependent and Independent Variables	40

CHAPTER ONE

INTRODUCTION

1.0 Introduction

This chapter covers the background of the study, problem statement, purpose of the study, objectives of the study, research questions, hypothesis, scope of the study, significance of the study and operational definitions of key terms.

1.1 Background

1.1.1 Historical Perspective

Historically, accessing food has been a consistent problem on the African continent (Maxwell, 2006). For example, Ethiopia's ongoing experiences with recurrent food insecurity clearly demonstrate the persistent nature of this dilemma. The world's principle international food aid agency, the United Nations World Food Programme (WFP), has been consistently active within Ethiopia since 1965 (WFP, 2008).

In the 1970s food security was mostly considered in terms of national and global food supplies. The food crisis in Africa in the early 1970s stimulated major concern on the part of the international donor community regarding supply shortfalls created by production failures caused by drought and desert encroachment. This primary focus on lack of food supplies as the major cause of food insecurity was given credence at the 1974 World Food Conference (Davies, Buchanan-Smith and Lambert, 1991).

The limitations of the food supply focus came to light during the food crisis that again plagued Africa in the mid-1980s. It became clear that adequate food availability at the national level did not automatically translate into food security at the individual and household levels. Researchers and development practitioners realized that food insecurity occurred in situations where food was available but not accessible because of erosion to people's entitlement to food. "Entitlement" refers to the set of income and resource bundles (e.g. assets, commodities) over which households can establish control and secure their livelihoods. Sen's (1981) theory on food entitlement had a considerable influence on this change in thinking, representing a paradigm shift in the way that famines were

conceptualized. Households derive food entitlements from their own production, income, gathering of wild foods, community support (claims), assets, migration, etc. Thus a number of socio-economic variables have an influence on a household's access to food (Borton and Shoham, 1991).

Worsening food insecurity came to be viewed as an evolving process in which the victims were not passive to its effects. Social anthropologists observed that vulnerable populations exhibited a sequence of responses to economic stress, giving recognition to the importance of behavioral responses and coping mechanisms in food crises. By the late 1980s, donor organizations, local governments and non-governmental organizations (NGOs) had begun to incorporate more extensive socio-economic information in their diagnoses of food insecurity (Frankenberger, 1992).

Since the 1980s, economic liberalization and privatization have been a major focus in Uganda, as marketing boards were dismantled or turned into private enterprises. Traders and agribusiness firms now face relatively few regulatory barriers to participate in agricultural marketing and prices are largely determined by supply and demand forces. Yet, high transaction costs and a still incipient private sector remain key obstacles to the development of input and output markets, resulting in poor market access and adverse terms of trade for farmers (Hodges, 2005).

1.1.2 Theoretical Perspective

The Oxfam food security theory by Dilley (1992) which states that Food security is a dynamic idea that has undergone a significant transformations in its conceptual lifetime and the most significant of these transformations is the shift from an initial view of food security as a product of reliable supplies of food to the growing contemporary emphasis on food and as a single input in house local lively-hood strategies. The principal international food aid agency, the United Nations World Food Programme (WFP), has been working in Ethiopia since 1965 (WFP, 2008). In 2008, the organization estimated that over 12 million Ethiopians were affected by malnutrition, and food aid was provided for 8.7 million beneficiaries (WFP, 2008).

1.1.3 Conceptual Perspective

Food security is understood as having continuous access to an adequate supply of food, which allows the maintenance of proper nourishment and health. Other definitions understand food security in terms of limited food availability and restricted access to food, often seen as the simultaneous outcomes of low agricultural productivity, insufficient incomes and the failures of policies and institutions (Reutlinger *et al.*, 1985). Small holder farmer participation in local and regional food aid procurement means the ability of individuals and households to exert command over their access to food, facilitating a better understanding of the underlying causes of food shortages (Maxwell, 2001).

1.1.4 Contextual Perspective

Currently, among many operations across the continent, the WFP lists high profile relief work within Chad, Democratic Republic of Congo, Djibouti, Ethiopia, Kenya, Somalia, Uganda, Zimbabwe and Sudan (WFP, 2008). They have also highlighted their mounting concern to Southern African regions. WFP officials have consistently remained highly active in the countries that provide one of many examples illustrating the persistent nature of food insecurity in sub-Saharan Africa. In January 2008, the WFP procured 210,000 metric tons of food from Uganda to provide food aid for approximately 3.4 million people both locally and regionally (WFP, 2008). Internally, this food is used for local consumption in northern Internally Displaced People (IDP) camps, in other food insecure pockets of the western region, and in refugee camps, mainly those located in the southwestern areas bordering Tanzania, Rwanda and DR Congo. Approximately 2.15 million Ugandans are food insecure (USAID, 2008). The populations most at risk are those that are concentrated in the western areas where Mbarara and Isigiro districts are located. Moreover, Uganda provides food aid externally for consumption within neighboring countries. Regionally, Democratic Republic of Congo, Burundi, and Rwanda have utilized food aid assistance procured from Uganda during times of famine and food insecurity (WFP, 2008).

Farmers in the country have begun to contribute to food aid sales as cooperative organizations link them to WFP initiatives. This contribution was projected to become larger as of 2009. This primarily is due to the fact that the WFP recently launched its Purchase for

Progress (P4P) program within Uganda and various other food insecure developing countries in April 2009. The P4P program aims to improve small-scale farmers' agricultural productivity. It supports farmers by making food aid purchases for cash, improving access to competitive markets and increasing income levels (WFP, 2008).

1.2 Problem Statement

Studies related to food security in sub-Saharan Africa illustrate that, in the majority of the countries examined, over 50% of households are considered food insecure, an adverse trend that has been intensifying in recent years (Smith, Alderman & Aduayom, 2006). Between 1992 and 2004, the number of individuals suffering from food insecurity in this region increased by over 26% (von Braun, 2007). Furthermore, recent statistics demonstrate that, as a result of this high level of food insecurity, undernourishment is prevalent in 33% of the region's total population (FAO, 2006), accessing food has been a consistent problem on the African continent. The WFP states that Food supply holds true to the main objective of the organization, which aims to ensure that appropriate food commodities are available in a timely and cost-efficient manner" (WFP, 1996). Nonetheless, past experiences have provided evidence that it is often effective in reducing hunger when extreme food insecurity and famine arise (Walker, 2005). Although a myriad of publications on food aid and food security exist, there is a limited amount of work relating to local and regional food aid procurement. This indicates that the requirements of both beneficiaries and donors are accounted for. However farmers' participation in food supply has been minimal and most food has been obtained from large agricultural firms. In Uganda, 95% of local food aid is purchased from well established processing companies (Coulter, Walker & Hodges, 2007). As farmers become more involved, their experiences with food supply must be examined in order to determine the development effectiveness of food security. Selected works must be acknowledged for having explored how food supply impacts farmers on a national scale including how it affects domestic processing plants and regional export markets (Castillo, 2007). It is against this background that the researcher wanted to establish how the existing food supply is being practiced by farmers and how it has affected their food security.

1.3 Purpose of the Study

The purpose of this study was to establish how the existing method of food supply is being practiced by farmers and how it has affected their uplifting food security.

1.4 Objectives of the Study

The objectives of this research are to:-

- 1 To assess the extent to which farmers in Mbarara and Isingiro districts participate in food supply.
- 2 To assess the extent of food security among farmers in Mbarara and Isingiro districts.
- 3 To determine whether participation in food supply affects food security of farmers in Mbarara and Isingiro districts.

1.5 Research Questions

1. To what extent do farmers in Mbarara and Isingiro districts participate in food supply?
2. What is the extent of food security among farmers in Mbarara and Isingiro districts?
3. How does participation in food supply affects food security of farmers in Mbarara and Isingiro districts?

1.6 Hypotheses

Participation in food supply significantly affect food security among farmers in Mbarara and Isingiro Districts.

1.7 Scope of the Study

1.7.1 Geographical scope

This study covered Mbarara and Isingiro districts with in the cooperatives .The area for this research was Manyakabi cooperative society an umbrella organization that hosts a number of famers that participate in food supply. The Mbarara and Isingiro districts are neighbouring districts located in the southwestern region of Uganda. Originally, Mbarara was one singular district; however, due to its large size, its lack of administrative capacity and the need to equalize funding distribution throughout the area, in 2005, the district was separated into four independent districts. These districts are; Mbarara, Isingiro, Ibanda and

Kiruhura. The Manyakabi Area Cooperative Enterprise covers specific sub-counties of the Mbarara and Isingiro districts, which were once part of the larger Mbarara district. It works with farming groups from the Masha, Nyakatunda, Kabingo and Birere sub-counties in Isingiro district and the Nyamuyanja, Nyakayoyo and Mwizi sub-counties in Mbarara district. The Manyakabi Area Cooperative Enterprise was chosen as an accessible case study option through email discussions and a visit to the cooperative's manager and other local contacts. This cooperative is physically located in Isingiro, and works mainly with existing farming groups in Isingiro and the neighbouring Mbarara district. These farming groups are composed mainly of female farmers, many of whom are involved in the production and sale of beans and maize as food supply commodities. Food purchases have been made in the cooperative's catchment area since 2005.

1.7.2 Content scope

This covered the relationship between farmer's participation in food supply and food security in Mbarara and Isingiro Districts. Farmers' participation in food supply was conceptualized in terms of quantity of food supplied and quality of food supplied, where as food security was perceived as food production and food storage.

1.7.3 Theoretical scope

The study used the Oxfam food security theory by Dilley (1992) which states that Food security is a dynamic idea that has undergone a significant transformations in its conceptual lifetime and the most significant of these transformations is the shift from an initial view of food security as a product of reliable supplies of food to the growing contemporary emphasis on food and as a single input in douse local lively-hood strategies.

1.8 Significance of the Study

The study findings will contribute to the following areas; Researchers; will get references for scholarly benefits and get the opportunity to know the areas for further research and the information contributed to the gaps of knowledge as the main aim for this study in relation to technological or social economic value of the community living around this case study.

A review of secondary materials, an analysis of literary sources and correspondence with various experts will be completed. In relation to food security and food aid strategies, an extensive explanation of local and regional procurement will be established. A chapter based on literature and policy reviews will explore the following topics: (1) defining and measuring food security, (2) an historical analysis of food aid policy, (3) reviewing the newly emerging strategy of local and regional procurement, (4) the involvement of the WFP and the international community, and (5) regional/geographical conditions related to the case study. This will address some of the questions raised by the objectives of the research. It will also generate a relevant background that will be used to inform the case study, which will take place during the period of fieldwork in southwestern Uganda's Mbarara and Isingiro districts. Lastly, the data collected will be analyzed and the case study will be linked to the literature and policy review in order to engage in a discussion of the findings that proposes solutions to negative findings and acknowledges positive findings of these more visible actors, while equally significant actors involved at a smaller scale often go unnoticed. The practice of local and regional food aid procurement includes farmers, cooperatives and rural agricultural communities which must be examined in relation to wider global processes. Therefore, this project directly assesses the impacts that food supply has on the livelihood of farmers working with cooperatives in an agricultural community. Since such relief processes take place within and between nations, various levels of society must be considered.

(i) The primary stakeholders of the study are the farmers who experience the repercussions of international decision-making. The farmers, and the cooperatives and communities that support them, will be the main beneficiaries of this study. The benefits and challenges experienced by small-scale agriculturalists will be examined, and the results will be of practical significance to the development of future strategies of food supply within the case study region. The findings will have the potential to be applied to make changes at the policy level. All actors linked to the processes at work within the community are significant, and should therefore be held accountable for resolving any challenges and amplifying any benefits. It is necessary to recognize that the results of the study will not be universally applicable, since the objectives of the study are very specific to the needs of a certain group

of farmers and there are limitations associated with the research process. Nonetheless, the results will have specific importance to the community being studied and may also act to inform future research on food supply.

(ii) Through several means, the outcomes of this study will be disseminated to the stakeholders involved. There are plans to publish this work in an academic journal, such as Food Policy. Such publications will distribute the outcomes of the research to policy-makers and encourage experts to take the study's results into consideration when reviewing the policy frameworks surrounding food supply strategies. Furthermore, it is extremely important to present the results of the research directly to the specific organizations and rural communities that were consulted with, including the Manyakabi Area Cooperative Society, the individual farmers who were interviewed, and the WFP officials who were contacted. They are entitled to view the findings and ascertain their own conclusions from the results. Finally, this research aspires to promote further examinations into whether or not local and regional procurement is a justifiable method of supplying food aid, with a particular focus on the participation of farmers.

1.9 Operational definition of terms

Farmers: Defining the agricultural household is problematic. Farming can be practiced formally, informally, as employment, for a source of income as a commercial activity, for subsistence needs, or as a combination of these various practices: "The notion of an agricultural household is complex as it may include farm worker households, small-scale subsistence farmers and large-scale commercial farmers, while agricultural activities may be practiced on a part-time, seasonal or full-time basis" (Pauw, 2007, 196). Further complicating this definition, according to Bryceson (2002), rural farmers in Africa have begun to turn away from producing their traditional crops and staple foods, in order to diversify their livelihoods and gain cash income through nonagricultural employment, thereby reducing agricultural productivity in farming regions.

Participation: The action of taking part in something:

Food security: The World Food Summit of 1996 defined food security as existing "when all people at all times have access to sufficient, safe, nutritious food to maintain a healthy and

active life”. Commonly, the concept of food security is defined as including both physical and economic access to food that meets people's dietary needs as well as their food preferences.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter deals with literature related to the subject of the study and will be arranged according to objectives of the study in form of sub-themes.

2.1 Farmers' participation in food aid supply

Participation was examined in terms of food quality and safety, food quantity, food distribution and emergency food assistance.

Food quality and safety

This refers to the quality characteristics of food that is acceptable to the World Food Program. This includes external factors as appearance (size, shape, colour, gloss, and consistency), texture, and flavour; factors such as federal grade standards (e.g. of eggs) and internal (chemical, physical, microbial). A common concern surrounds farmers' capacity to satisfy food quality and safety standards. PVO contracts with the USDA included commodity-specific standards, and Ugandan commodities have to meet additional standards specified by the local government and by the PVO headquarters. The millet and cowpeas in Uganda are sampled at each supplier's warehouse prior to delivery to schools. A few of the samples are found non-compliant with the government standards. In the case of millet, the single violation is a sample containing a live insect. The FBO supplier then treats and cleans the stock prior to delivery. Non-compliance in the cowpea procurements is related mainly to the presence of dirt and broken beans, criteria not required by the USDA and/or not involving health risks. The laboratory always recommends that the product is safe and could be sorted by recipients. US-sourced commodities are subjected in testing by the national laboratory as well, and none of these delivered fail to meet product quality and safety standards. However, 3% of the bulgur wheat and 5% of the lentils intended for Mbarara district do not arrive or rejected on arrival at the port. The FOOD SUPPLY commodities clearly match or surpass the US-sourced commodities in terms of food quality and safety (Asiimwe and Mpuga, 2007).

Quantity of food supplied

Canada singularly contributed a relatively significant amount of funds for the combined purchase and delivery of 104,937 metric tons (WFP, 2009). This level of contribution was possible because in April 2008, the Canadian government untied its food aid budget with the aim of enhancing local markets in developing countries and to meet the needs of the food security more effectively: “Untying food helps promote the development of food markets and helps to ensure the food assistance needs of vulnerable populations are met in a more timely manner” (Government of Canada, 2009). Indeed, throughout the world most smallholder producers are actually net food buyers, not net food sellers. Therefore, pricing policies that aim to increase prices in an attempt to induce greater production can harm the majority of smallholder households that on net buy the same product (Mpuga, 2007).

Food distribution

This refers to a method of distributing or transporting food or drink from one place to another, it is a very important factor in food aid procurement. Where it breaks down, famine, malnutrition or illness can occur. During some periods of Ancient Rome, food distribution occurred with the policy of giving free bread to its citizens under the provision of a common good. Small holder farmers use direct distribution in local and regional food aid procurement, this is done through the provision of locally or regionally purchased commodities directly to targeted beneficiaries, in contrast to the distribution of cash- or quantity-denominated vouchers where beneficiaries must purchase the food themselves, and this is one of the methods by which participants in the food supply Project choose to distribute locally or regionally procured food commodities to beneficiary households and the participants use only vouchers and direct (food) distribution under USDA-funded food supply projects (Hodges, 2007).

2.2 Food security among famers participating in food aid supply

Food security in Uganda remains problematic in certain areas where population continues to rise or where an influx of refugees has been witnessed but where food production rates do not match this growth rate (Government of Uganda, 2004). Subsequent to this discovery, the

UNDP's 2007 development report on Uganda advocates 'rediscovering agriculture for human development'.

Food Processing

Food processing is the transformation of raw ingredients into food, or of food into other forms. Food processing typically takes clean, harvested crops or butchered animal products and uses these to produce attractive, marketable and often long shelf-life food products. One "derived from a covered commodity that has undergone specific processing resulting in a change in the character of the covered commodity, or that has been combined with at least one other covered commodity or other substantive food component. Specific processing that results in a change in the character of the covered commodity includes cooking, curing, smoking, and restructuring. For purposes of this report, processed foods include all processed and milled cereals like rice, maize meal, and bulgur wheat blends; vegetable oils; fortified blended foods; and several commodities in the "other" category, including noodles, cereal bars, canned fish, dairy products and condiments such as iron-fortified fish sauce (Leathers, 2004).

Food Storage and Handling (FSH)

A term developed to refer to any and all ocean, inland, and internal transport, storage, and handling applicable to a given procurement. FSH facilitates cost comparisons between in-kind food aid, which requires ocean freight transport, and local and regional procurement, which may or may not require ocean freight transport. Participants had the option to use ocean freight transport where available or necessary, but none chose to do so under any of the food supply projects. TSH is not a term used by the U.S. government or industry groups (Eele, 1994).

Food production

Uganda's economy is dominated by agriculture and more than 80 percent of Uganda's workforce is engaged in agriculture and approximately 30 percent of Uganda's total land area is dedicated to agriculture. Food crops accounted for approximately half of agricultural GDP in 2003, followed by cash crops (17%), livestock (16%) and fisheries (12%) (RoU, 2004), other important agricultural products include tea, cotton, tobacco, cassava, maize,

millet and pulses. Uganda's agricultural sector is based primarily on smallholder farms, 80% of who own an average of only 2 hectares of land but contribute 70% of agricultural production (RoU, 2004; Bahiigwa, 1999), half of all agricultural production is consumed domestically. This structure has a number of implications for food security both at household and national levels. As small farms are largely dependent on weather and underlying soil fertility, food insecurity emanates from inadequate rainfall, excessive rainfall, pests and diseases, and low crop yield (Bahiigwa, 1999). Weak purchasing power, high transportation costs, and poor distribution infrastructure exacerbate food insecurity. The 2008-2009 Uganda Census of Agriculture found that 57% of 3.6 million surveyed agricultural households reported periods in the previous 12 months when they were unable to maintain consumption at a normal level (UCA, 2010). According to FAO (2010), 27% of the rural population falls below the poverty line, and 63% of total household expenditure in rural areas goes toward food, due to poor storage capacity, gaps in the cropping calendar frequently translate into hungry seasons, especially in the northern region (FAO, 2010).

2.3 Challenges experienced by farmers in their participation in food supply

An import parity price is defined as the cost of a domestic good as set equal to the cost of an import of the same good (WFP, 2007b). This is essentially the price of the good on the world market, plus any additional taxes and transport costs. This initiative, while still in its pilot stages, will likely influence the future development outcomes of procurement projects in many African countries.

Most of these policies are relatively new and existing research and policy reviews have not yet comprehensively examined the results of many of these programmes. Nonetheless, while farmers' participation in food supply may not be a fool proof strategy and although new initiatives will require further investigation and adjustments, it is widely believed to possess a comparative advantage over other food procedures (WFP, 2007). Food supply's strengths provide benefits to beneficiaries and donors, to the development of local economies and markets and to food aid producers and their communities.

Broadly, these benefits arise because farmers' use flexible untied donor funds to make cash purchases of food rather than tying aid to specific conditions. This has several advantages for food aid recipients as well as for donor effectiveness and for the international organizations involved. Primarily, locally food aid is delivered with less delay (Shaw, 2006). In contrast to the expedient food supply response time, overseas shipments merely require transportation from one central location to a nearby recipient region or nation. Food provisions that are procured locally or regionally are more likely to match the local taste preferences of the beneficiaries (Shaw, 2006; WFP, 2006a; WFP, 2008a) and can often be delivered more equally because the beneficiaries are closer to the food source.

However, it is important to recognize that food supply and food shipments are not always as timely as they could be. The bureaucratic structure of aid organizations such as the WFP can prevent the benefit of time efficiency from being carried out to its full potential (Coulter, Walker & Hodges, 2007). Congruently, while the administrative costs associated with food supply are lower, donor funds are also siphoned into bureaucratic arrangements and operational requirements (WFP, 2006a). Nonetheless, overall, costs are lower, a fact that is particularly relevant at a time when fuel and commodity prices are increasing (WFP, 2007b). Additionally, concerning the environment, reduced shipping distances not only moderate costs; they also reduce the large carbon footprint associated with overseas food shipments (WFP, 2007).

By promoting competitive behaviour, food security offers a potential mechanism for agricultural development and the enhancement of production, processing and marketing systems in Africa (Shaw, 2006; WFP, 2006a; Coulter, Walker & Hodges, 2007). Developing country economies stand to benefit from this type of market growth but the process is not always smooth and linear, and therefore often requires strong policy attention. For example, although within food supply market chains the quality of grain has improved for the food aid markets of participating countries, analyses show that quality has not always consistently improved within the regular grain market of these countries (Coulter, Walker & Hodges, 2007). This is particularly true for nations like Uganda, where there are bimodal rainfall patterns. Two rainy seasons allow for higher levels of productivity with the practice of

strong seasonal planning and planting techniques; however, the wet climate makes it difficult to keep grain dry and effectively stored. Therefore, food supply policies are presently attempting to find ways to develop technologies and market infrastructures to reduce grain moisture content and increase overall quality (Wandschneider & Hodges, 2005; Coulter, Walker & Hodges, 2007). While infrastructures (e.g. for transportation and storage) and trade networks are lacking in sub-Saharan Africa (WFP, 2006a), it is reasonable to suggest that if food supply is properly implemented it may have spillover effects that help to overcome some of these weaknesses. As will be explored in more detail, food supply's focus on promoting economic opportunities for smallholder farmers also supports local economies (CARE, 2006 and WFP, 2008).

Moreover, food security is believed to reduce the market distortions caused by injecting tied food aid into food insecure regions (CARE, 2006). While many argue that the risk of market distortion is still a problem (CARE, 2006; Shaw, 2006), it is believed to be more manageable and preventable than the distortions that arise from direct injections of tied food aid procured in the donor nation (OECD, 2006). The WFP's tender process and market analysis attempt to avert these potential detriments. Evidently, FOOD SUPPLY is a very complex undertaking that requires an examination of various factors that may also pose risks and these must be considered during policy-making to prevent harmful outcomes for producers, beneficiaries and all scales of actors and communities who are involved as stakeholders (OECD, 2006).

Despite the many benefits associated with security, there are some risks, including the fact that "there is a lack of systematic and critical review on the contribution that locally procured food aid is making, directly and indirectly, as a development tool in the source countries" (Coulter, Walker & Hodges, 2007, 3). In particular, the experience of small-scale farmers requires much more consistent monitoring. Moreover, the WFP also notes that much of the evidence supporting food supply is anecdotal (WFP, 2006a). Management of this procurement practice remains vague and is largely not standardized (CARE, 2006). As a result, there is a legitimate fear that unsustainable markets will be developed (Tschirley & del Castillo, 2007). This is because farmers' participation in food supply is largely

unplanned; therefore, regions where food supply has become a common practice are vulnerable to reductions or cessations of local purchases (Shaw, 2006). In some circumstances, even the WFP identifies itself as an unreliable buyer (WFP, 2006a). Although the WFP claims to have a major developmental focus, some food supply analysts have criticized the organization for failing to uphold this objective and that in fact; development has become “secondary to its stated objectives” (Tschirley & del Castillo, 2007, 19). These risks may potentially affect beneficiaries and donors, as well as local economies, producers and non-food aid consumers (Shaw, 2006).

For beneficiaries, donors and aid organizations there are some potential setbacks. A failure for the local or regional provider to uphold the quantity or quality of a delivery means that the WFP will not be able to adequately distribute food (Coulter, Walker & Hodges, 2007). Prospective beneficiaries will suffer as a result. Additionally, food safety concerns related to the processing and storage of grain exist (Tschirley & del Castillo, 2007). For example, in the past, maize contaminated with aflatoxin has caused poisoning in Kenya via commercial trade exports in the East African region. If this grain had been procured as food aid, the agency responsible for distributing the grain and the donors and agencies that funded and organized this operation would have been held responsible for resulting loss of life (Tschirley & del Castillo, 2007). The WFP must therefore remain stringent with its quality standards even when relaxing tender requirements for smallholder farmers (Walker & Hodges, 2007).

In counties where food commodities are simultaneously exported and purchased as food aid, producer locations may come at risk as products are transferred out of the area, potentially creating national trade imbalances and disrupting national food security levels (Shaw, 2006). For example, market destabilization may occur in the form of price spikes that promote hoarding and make it more difficult for the poor to afford basic food requirements (CARE, 2006; Shaw, 2006). This is a problem amplified by inter-seasonal price instability, which may affect consumers who do not rely on food aid but who may be forced to purchase more expensive food as prices rise. In order to reduce the probability of such market distortions, researchers believe that procurement should be at the highest after the main harvest season;

yet, critics note that in many cases it is highest during the lean season” (Coulter, Walker & Hodges, 2007,7). In addition to these potential problems, the possibility of price manipulation exists because the market is dominated by a few large farmers, which may exacerbate risks (Coulter, Walker & Hodges, 2007). This reinforces the fact that food supply often results in the exclusion of farmers; more established producers clearly have the upper hand in the food market and exploiting farmers.

In short, in developing countries food supply may have the potential to present smallholder farmers with stronger marketing opportunities for their produce (WFP, 2006a; Coulter, Walker & Hodges, 2007; WFP, 2007b). However, food supply may also present a potential challenge to the success of local agricultural livelihoods since the strength of the highly subsidized and artificial food supply market relies on continued levels of high food insecurity in the region (Wandschneider & Hodges, 2005; Coulter, Walker & Hodges, 2007).

This calls for cooperative arrangements and other support systems that focus beyond the narrow scope of food security towards the development of broader livelihood strategies and marketing opportunities. This research is based on questions surrounding these risks and benefits and the case study revolves around addressing such concerns in a more in-depth manner through an analysis of the findings.

This policy discussion pertains broadly to food supply in Africa and although this case study is focused on the Ugandan experience, it identifies that many African countries engaged in food supply. The comprehensive list of African countries from which the WFP made purchase from in 2007 includes Algeria, Benin, Burkina Faso, Burundi, Cameroon, Democratic Republic of Congo, Cote d’Ivoire, Egypt, Ethiopia, Gambia, Ghana, Kenya, Lesotho, Malawi, Mali, Mozambique, Namibia, Niger, Rwanda, Senegal, Somalia, South Africa, Sudan, Tanzania, Togo, Uganda, Zambia and Zimbabwe (WFP, 2009). The fact that the WFP procures from almost thirty African nations is a testament to the importance of farmer’s role in supporting the redistribution of food to enhance food security on the continent. It also sheds light on important development initiatives surrounding these projects. The Ugandan case is pertinent to this study and therefore requires a more thorough

investigation. Firstly, however, it is crucial to consider the vulnerability of the African smallholder in these efforts to advance this newly emerging policy

Food supply in Uganda in connection with world food programme

These components of the Country Programme (CP) initiative are related to food supply projects in Uganda. Overall, working through the CP, the WFP has made a strong effort to increase the quantity of food aid purchases made in Uganda. As a result, a “strong secular rise in procurement” has been noted in the country (Tschirley & del Castillo, 2007, 17, producing employment and income generating activities in the agricultural sector (Wandschneider & Hodges, 2005). In terms of commodity types, maize, beans, corn-soya blends and vegetable oil are most commonly procured in Uganda by the WFP (WFP 2009a). Maize and maize-based products are the focus of country in food purchases and in 2007 over 85% of purchases, by weight, were put towards maize (WFP 2009 Map; Coulter, Walker & Hodges, 2007). The development of the maize subsector in Uganda has been affected by this focus (WFP, 2006a). Subsequently, improvements have been seen in terms of warehouse storage and the quality management of these grains (Wandschneider & Hodges, 2005).

Capacity of Uganda’s Food supply and Market Infrastructures

Despite Uganda’s strengths as a food aid procurement hub, in order to build an export market for these grains and to thereby enhance the sustainability of food supply processes, grain-processing infrastructure must be improved (Coulter, Walker & Hodges, 2007). For example, despite some improvements in storage facilities, grain quality remains problematic in Uganda, due to bimodal rainfall patterns that make it difficult to properly dry the harvested products and because drying and storage facilities are sparsely located throughout the country (Wandschneider & Hodges, 2005; Coulter, Walker & Hodges, 2007; WFP, 2007b). This “insufficient attention to post-harvest handling” process and technologies has been a “missed....opportunity to help[ing] Uganda develop a formal export market for high quality maize to Kenya, one which can fall back when WFP reduces its procurement” (Coulter, Walker & Hodges, 2007, 9), resulting in reduced trade prospects and price slumps (WFP, 2007b). In fact, with respect to regional trade, food supply in Uganda has produced both positive and negative outcomes. Discouragingly, the WFP’s purchases of beans and

maize have minimized trade flows from Uganda into Kenya and other neighbouring countries (Wandschneider & Hodges, 2005). Nonetheless, “by improving the emergence of a formal grain trading sector, local food aid procurement could provide a platform for successful export development” (Wandschneider & Hodges, 2005).

Although smallholder farmers are the backbone of the agricultural sector, they make modest use of external inputs (e.g. purchased seeds, hired labour, fertilizer), are semi-subsistent, market very little of their produce and typically cultivate 1-5 hectares (approximately 2.5-12 acres) of land per household (Wandschneider & Hodges, 2005). Women are responsible for most farm labour; however, they lack ownership of resources (UNDP, 2007). Overall, productivity and income are low, with most food grown for household and local consumption. Uganda’s primary crops are bananas (matooke), cassava and sweet potatoes and secondary crops are maize and bean which are the commodities most frequently purchased by the WFP in the country. Additionally, main cash crops include coffee, tea, cotton, sugar, tobacco and increasingly livestock (Opio, 1997).

Without question, Uganda’s past and present day problems have shaped the country’s development path. Perhaps most significantly, after over twenty years of conflict in the northern regions, a great deal of money has been spent on military activities rather than on economic development. The current conflict has had a negative impact on localized agricultural productivity, economic processes and social service provision in the north, particularly for IDP populations who receive much of their food from the WFP (WFP, 2005). Partially, as a result of this ongoing internal strife, the United Nations Development Programme’s (UNDP) Human Development Index (HDI) ranks Uganda as low on the development scale, placing the country at 156 out of the 179 countries included in the index, signifying that many improvements are required in the realm of household livelihood development (Tushemereirwe, 2007).

There are both advantageous and disadvantageous potential implications for the farmers in terms of their participation in food supply in Uganda. The literature suggests that farmers engaged in food supply can earn good incomes, which they can reinvest into various

livelihood strategies, including agriculture (Wandschneider & Hodges, 2005; WFP, 2006). Nonetheless, food supply creates a situation that encourages farmers to rely on an ‘artificial markets’ that is based on the local/regional need for food aid (Coulter, Walker & Hodges, 2007). Without producing ‘exit strategies’ and alternative markets for the commodities sold as food aid, farming livelihoods may suffer in the long run. Furthermore, food production contributing to niche food supply markets may compete with food production required for household consumption. Farmers may feel pressured to produce cash crops while neglecting to produce a diverse supply of food crops that can more effectively enhance local food security and fulfill nutritional requirements. Lastly, a lack of access to the resources, skill-sets and technologies required to enter complex markets may prevent farmers’ participation in food supply (Ssewanyana, 2007).

Moreover, food supply is believed to reduce the market distortions caused by injecting tied food into food insecure regions (CARE, 2006). While many argue that the risk of market distortion is still a problem (CARE, 2006; Shaw, 2006), it is believed to be more manageable and preventable than the distortions that arise from direct injections of tied food aid procured in the donor nation (OECD, 2006). The WFP’s tender process and market analysis attempt to avert these potential detriments. Evidently, food supply is a very complex undertaking that requires an examination of various factors that may also pose risks and these must be considered during policy-making to prevent harmful outcomes for producers, beneficiaries and all scales of actors and communities who are involved as stakeholders (Rose, 1997).

2.4 Related studies

Hodges (2005) in his study on food security he noted that in terms of managing potential risks and enhancing benefits, cooperatives can play a positive role in facilitating farmers’ entry into the agricultural market, as well as into other agricultural markets. Under the organization of cooperatives, farmers are often better positioned to gain ownership of the resources that are required to become more successfully integrated within these markets. Therefore, the WFP identifies communities with strong leadership, often possessed by such

farming groups and cooperative associations¹⁴, using them as a tool to facilitate them in training farmers to effectively enter the food aid markets (Hodges, 2005).

Borguignon (2008) noted that because policy fails to consider the farmers, over the last four decades, Africa has been the only continent on the globe where food grain output per capita has been on the decline (UNECA, 2005). Although the agricultural sector employs 60% of the population in Africa, poverty and malnourishment remain significant development issues (Ngomane, 2005). The World Bank's position states that underinvestment in agricultural in the 1980s and 1990s has been extremely detrimental and as a result, donors, national governments and international organizations must now push strongly for agricultural support (Borguignon, 2008). Since reforms based on pricing and trade policies have not been effective and many top-down macro policy approaches have continued to be unproductive in their aim to kick-start development, alternative solutions are required, micro-scale (Borguignon, 2008).

Ngomane (2005) in his study on farmers' participation in food supply, he noticed that the extension programs that involve community input to promote technological development aimed at increasing farmers' productivity are of a key importance to increasing the smallholder's access to more extensive agricultural markets. Typically, the objectives of research and extension services are to increase agricultural output and improve the livelihood of farmers by providing additional inputs and training (Ngomane, 2005). Investments in these areas are likely to produce surplus crops, yet, it is often difficult for farmers to mobilize their existing assets and inputs to produce or profit from this surplus, particularly when physical and institutional infrastructures are weak (Barrett, 2008). Overall, African research and development (R & D) systems have been functioning poorly (Ochieng, 2007) and as a result many extension initiatives resulting from these systems have been inappropriately administered, failing to transfer suitable technologies to rural communities (Ngomane, 2005).

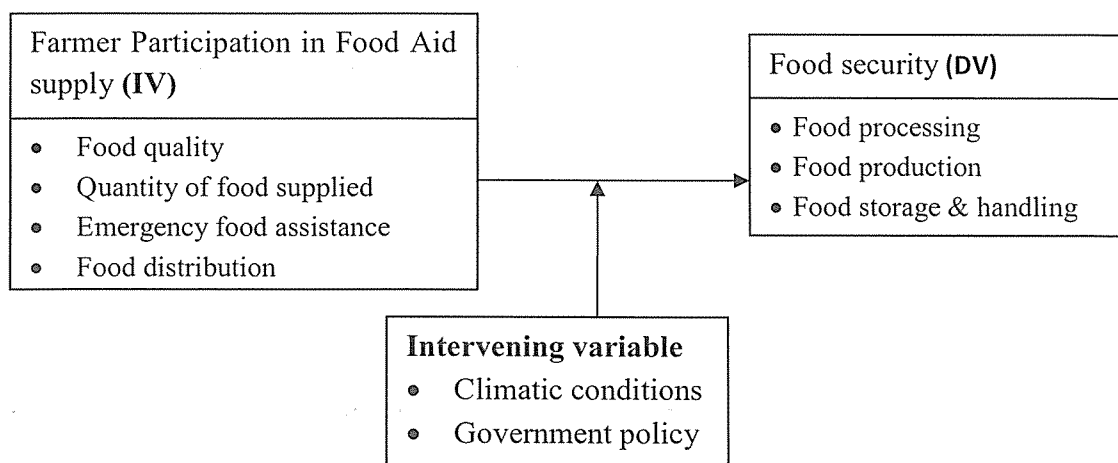
Thomas (2004) noted that in terms of the post-colonial era, technology transfer methods have retained their emphasis on western science, not giving recognition or weight to the valuable indigenous knowledge of smallholder farmers. Furthermore, agricultural extension

activities are highly influenced by donor agendas and do not necessarily take into account the needs of specific communities (Ngomane, 2005). Currently, many extension initiatives fail to reach the most vulnerable populations. There are problems targeting impoverished, remotely located regions and even when they are accessed, low-functioning market and institutional structures cannot always adequately support development initiatives in these regions (Ngomane, 2005).

2.5 Theoretical Perspective

The study was based on the Oxfam food security theory by Dilley (1992) which states that Food security is a dynamic idea that has undergone significant transformations in its conceptual lifetime. The most significant of these transformations is the shift from an initial view of food security as a product of reliable supplies of food to the growing contemporary emphasis on food and as a single input in douse local lively-hood strategies. In this contemporary incarnation, food outcomes are best under-stood through a focus not only on biophysical and economic conditions, but also on socially-conditioned local knowledge and perceptions of those conditions. The con-temporary focus on local knowledge and perceptions, however, has not yet resulted in a systematic discussion of the role played by society in food outcomes (Smith, 2001).

2.6 Conceptual Frame Work on farmer participation in Food Aid Supply and Food security



CHAPTER THREE

METHODOLOGY

3.0 Introduction

This chapter consists of the research design, the research population, sample size, sampling procedures, research instruments, validity and reliability of instruments, data gathering procedures, data analysis, ethical considerations and limitations of the study.

3.1 Research Design

The study adopted a descriptive correlational, ex-post facto and a cross-sectional survey research design. The descriptive correlational design was used to establish whether participation in local and regional food aid procurement affects food security of small holder farmers in Mbarara and Isingiro Districts-Uganda. The ex-post facto design was used because respondents were asked things that had already happened. The cross-sectional design was employed because a cross-section of farmers was selected to participate in the study all at once. Still was a survey since many respondents were included in answering of questionnaires and only used a cross section (a few) of the said sample.

3.2 Research population

A population is the complete collection of all the elements that are of interest in a particular investigation (Amin, 2005 pp: 235). This study targeted a population of 171 farmers and management members from the Manyakabi area cooperative enterprise belonging to different farming groups which were chosen using convenience and judgment sampling. The research centered on the small holder farmers of Mbarara and Isingiro districts in reference to Manyakabi cooperative Enterprise. Specifically the farmers that work with World Food Program (WFP) due to the need to find whether their participation in local and regional food aid procurement threatens their food security.

Table 3.1: Population distribution

Category (Farmers)	Population	Sample size
Mbarara district	76	53
Isingiro district	95	67
Total population	171	120

3.3 Sample size

A sample is a collection of some (subset) elements of a population (Amin, 2005 pp: 242). The researcher selected a sample of 120 farmers and management members belonging to nine different farming groups. This was chosen using Krejcie & Morgan's table for sample size determination (cited in Amin, 2005).

3.4 Sampling Techniques

In terms of sampling, several techniques were applied. During the review of secondary materials, contact with experts in the field provided information about potential participants by establishing links with cooperative managers, who were in turn link the project to specific farmers. WFP affiliates were also predominantly contacted this way. This snowball sampling (networking) enabled a variety of potential individuals with relevant characteristics to be contacted and included in the study sample (Overton & van Diermen, 2006). However, convenience sampling, which makes use of pre-existing, naturally formed groups (Overton & van Diermen, 2006; Creswell, 2003), were the main approach for soliciting research subjects. The cooperative society forms a previously organized group and the farmers managed under its structures were the subjects upon which this study is based.

While both snowballing and convenience sampling are very selective, by incorporating judgment sampling to include outsiders and underrepresented individuals this exclusion were partly countered (Overton & van Diermen, 2006).

3.5 Measurement of study variables

Farmers' participation in food supply

This was measured using food quality, quantity of food supplied, emergency food assistance and food distribution. The respondents were the items on a four –point likert scale ranging from strongly agree (1) to strongly disagree (4).The questions were developed with the guidance of the supervisors.

Food security

This was measured using food processing, food production and food storage & handling on a four-point Likert scale ranging from strongly agree (1) to strongly disagree (4). The researcher developed the questionnaire with the guidance of the supervisor.

3.6 Research instruments

The researcher used questionnaires and interview guide; these were meant to translate attributes or traits into quantities (Amin, 2005). There were four sections of researcher made questionnaire (RMQ) directed to farmers in Mbarara and Isingiro Districts. The first section had the profile of the respondents in terms of age, marital status, education qualification and years of experience.

The second section involved questions on farmers' participation in food supply as the independent variable, the third section involved questions on the dependent variable (food security). An interview guide also was used in order to confirm the information on farmers' participation in food supply as the independent variable and food security as the dependent variable.

Semi-Structured Interviews

A group of 10-15 farmers from one specific cooperative was chosen by convenience and judgment sampling in order to conduct semi-structured interviews and short surveys, which were conducted individually with each farmer. This small sample size allowed for much more in depth, qualitative and focused research within the limited timeframe (Denscombe, 2007). A small number of cooperative managers and WFP affiliates were also be similarly interviewed on the basis of their availability. One-on-one semi-structured interviews with these stakeholders provided the researcher with the ability to ask specific questions in a flexible environment. Interviews were approximately 30 minutes in length; however, timing was flexible due to the conversational manner of communication. The interviewees were provided with instructions and a brief background on the research topic before conversation begins. Bias of the interviewee could cloud information; however, these biases were taken into consideration by making the position of the researcher evident.

Additionally, oral surveys with the farmers were included as a structured component of the interview, using close-ended questions to develop statistic data, based on categorical (ex; yes/no, highest to lowest) and continuous (ex; ranked) scales. Such surveys are more reliable than individually completed written questionnaires because the researcher could often tell if the research subject was providing false information or seems uncomfortable with the subject matter, for example, by being attentive to body language (Denscombe, 2007).

3.7 Validity and reliability of the instruments

In consideration of purpose for each farmer group and since this was designed for variety of purposes, and the fact that it could be evaluated in terms of purpose, several types of validity were used that is, face, and content, construct, concurrent and predictive. A classification based on either logical or criterion was used. With this, the validity of this research was then determined primarily through judgment (logical). With Criterion, the questionnaires and interview guide the researcher participated in delivering and collecting them from small holder farmers together with research assistants, to be sure that the information received was from genuine respondents and relevant to the set objectives. For observation method, the researcher obtained firsthand information about objects, events, object-event interactions of interest, using native type of observation (Amin, 2005). For the purpose of this study, the CVI once calculated was 0.8, and this also helped the researcher to improve on the questions after getting a reliability value of 0.85.

3.8 Data Gathering Procedures

After authorization from the university the researcher took and sent questionnaires and interview guide to the farmers for answering the set questions. This took two to three weeks and then the researcher sat down for tabulation of data to get out the useful information to answer the set questions.

3.9 Data analysis

The researcher used thematic analysis for qualitative data and other statistical methods for quantitative data such as correlation using SPSS soft ware to analyse the data collected. The researcher used frequency counts to analyse data mainly on profile of respondents and some other factual questions. Means and standard deviations were used to analyse data on extent

of participation in local food procurement and the extent of food security among small holder famers in Mbarara and Isingiro Districts. The Pearson's Linear Correlation Coefficient was used to establish the relationship between participation in local food procurement and food security. In order to establish the extent to which participation in local food procurement can affect food security, multiple linear regression analysis was employed.

3.10 Ethical Considerations

The researcher first got clearance from ethics committee of the university for the protection of the community to be involved in this study. The researcher also prepared the informed consent form which respondents used to participate in the study and filled by indicating official acceptance. All authors whose ideas were used in this study were fully recognised through proper citation and referencing.

3.11 Limitations of the Study

Although a strong methodology for this study has been developed, it is important to note that there are potential limitations caused by several constraints. While a case study provided a detailed analysis of a particular process within a specific timeframe and had the ability to uncover complex and nuanced details, it does not necessarily expose universal truths that could be generalized to produce an understanding of seemingly similar circumstances (Denscombe, 2007). This is further complicated by the fact that there was a time and resource constraint associated with this Master's research project. Within this short timeframe, it was difficult to establish full trust of the research subjects and became fully integrated within the community.

Since the case study was limited to a small sample size, data collection aimed at developing statistical evidence very difficult. Given the small number of individuals who were to be interviewed and surveyed, attempting an in-depth statistical analysis was likely produce skewed results that gave more weight to the numbers that was valid (Denscombe, 2007). Moreover, given the research schedule, more extensive measurements taking into account time sensitive changes, such as farmers' livelihood profiles were not possible. Certain areas of interest that incorporated the objectives of a broader analysis, including measurements of

household food security, could not be examined at length, nor was scientific quantitative analysis surrounding such topics be plausible research options. This type of analysis was therefore not undertaken, and existing data sources were the predominant means of accessing statistical information. Since the quality of statistical information that collected on developing countries like our country Uganda, was typically questionable in terms of the accuracy and reliability of the measurements, this must have been considered.

CHAPTER FOUR

PRESENTATION, ANALYSIS AND INTERPRETATION OF RESULTS

4.0 Introduction

This chapter shows the background information of respondents, the extent of farmers' participation in food supply, extent of food security and the significant relationship between the extent of farmers' participation in food supply and extent of food security among farmers in Mbarara and Isingiro districts.

Profile of respondents

Respondents were asked to provide information regarding their age, gender and education level. Their responses were analyzed using frequencies and percentage distributions, as indicated in table 1;

Table 1: Profile of Respondents

Category	Frequency	Percent
Age		
20-30 years	21	17.5
31-40 years	51	42.5
41-50 years	26	21.7
51 years and above	22	18.3
Total	120	100
Gender		
Male	80	66.7
Female	40	33.3
Total	120	100
Education level		
Primary	38	31.7
Secondary	34	28.3
Certificate	43	35.8
Bachelors degree	4	3.3
Masters	1	.8
Total	120	100

Source: Primary Data, 2014

The results in Table 1 revealed that majority (42.5%) of the respondents in this study's sample were aged between 31- 40 years. This implied that majority of the farmers in the sample were in their early adulthood age. These were followed by those between 41-50 years of age constituting 21.7%, indicating the group in their middle adulthood age.

Concerning the respondents' gender, the results in table 1 indicated that most of the respondents in the sample were male (66.7%) as compared to 33.3% who were female, implying that farming and other related agricultural activities in Mbarara and Isingiro districts are done mostly by men.

With respect to education qualification, the study findings showed that certificate holders (35.8%) dominated the study, followed by primary holders (31.7%), then secondary level graduates (28.3%) while Bachelors (3.3%) and Masters (0.8%) Degree holders were very few among this class of famers. These results implied that farmers in Mbarara and Isingiro districts are less educated academically.

4.2 Extent of farmers' participation in food supply

The independent variable in this study (farmers' participation in food supply) was broken into two constructs and these were; food quality (measured with six questions or items) and quantity of food supplied (with seven questions or items). Most of these questions were based on a four point Likert scale, in which farmers in Mbarara and Isingiro districts were required to rate the extent to which they participated in food supply by indicating the extent to which they agree or disagree with each question or item. The SPSS software was used to analyse their responses using means and ranks as indicated in table 2. To interpret the means in Table 2, the following mean ranges and their descriptions were used;

Key to interpretation of means

Mean range	Response range	Interpretation
3.26 - 4.00	Strongly agree	Very high
2.51 - 3.25	Agree	High
1.76 - 2.50	Disagree	Low
1.00 - 1.75	Strongly disagree	Very low



Table 2: Extent of farmers' participation in food supply

Items on farmers' participation in food supply	Mean	Interpretation	Rank
Food quality			
You always supply food products which are clean (with no dust, broken parts)	3.44	Very high	1
You always supply food which meet standards specified government and WFP	3.35	Very high	2
You always supply foods which meet production standards less or no chemicals	3.03	High	3
You always supply food products recommended by the WFP	2.97	High	4
You always provide food which is of good and acceptable quality	2.88	High	5
All your food supplied and sampled has always been accepted with no rejection	2.22	Low	6
Average mean	2.98	High	
Quantity of food supplied			
You have plans to increase amount of food sold to Manyakabi Area Cooperative Society in coming years	3.38	Very high	1
You always supply food consistently to the WFP office in your area	3.18	High	2
You always direct famers to Manyakabi Area Cooperative Society to sell food	3.13	High	3
Majority of small holder farmers in your area are actuary net food buyers	2.97	High	4
You transport food products to Manyakabi Area Cooperative Society for sell	2.73	High	5
You sell food products to Manyakabi area Cooperative Society every year season	2.43	Low	6
You sell food products to Manyakabi Area Cooperative Society in large quantities	2.02	Low	7
Average mean	2.84	High	
Overall mean	2.91	High	

Source: Primary Data, 2014

Results in table 2 indicated that the extent of farmers' participation in food supply is generally high and this was indicated by the overall mean of 2.91, implying that farmers highly supply food with the purpose of assisting or saving the lives of people in camps. Results further indicate that the extent of farmers' participation in food supply differs on different items and in different perspectives; for example, regarding the quality of food supplied, farmers rated themselves generally high (average mean=2.98), implying that the food supplied by farmers in Mbarara and Isingiro districts has the required quality characteristics of food that are acceptable to the World Food Program. However, food quality was rated low on one item indicator and this was on the fact that some food supplied and sampled has sometimes received rejections.

With respect to quantity of food supplied, results in Table 2 indicated that of the seven items used to measure the quantity of food supplied, five were rated high while two were rated low. However, the average mean of 2.84, falls under high on the interpretation scale, implying that these farmers have always supplied food in big quantities to the WFP offices in Mbarara and Isingiro districts. The results on the last two items revealed that consistency in supply is still a problem affecting the quantity of food supplied. This means that farmers can supply food in one season in big quantities and then in another season they may fail to supply. This may be caused by several factors, such as dry seasons, land problems where if one has one piece of land, he/she cannot grow food consistently all season, and so on. Farmers' participation was also examined by exploring other facts about their farming practices regarding certain crops. Their responses are shown in table 3.

Table 3: Other facts on farmer participation in food aid supply

Type of food crop	Quantity per year	Frequency	Percent
Beans	Less than 200kgs	40	51.9
	Between 200-500kgs	37	48.1
Cassava	Less than 200kgs	25	32.5
	Between 200-500kgs	40	51.9
	More than 500kgs	12	15.6
Maize	Less than 200kgs	42	54.5
	Between 200-500kgs	35	45.5
Rice	Less than 200kgs	20	26.0
	Between 200-500kgs	26	33.8
	More than 500kgs	31	40.3
Live stock (meat)	Less than 200kgs	10	13.0
	Between 200-500kgs	67	87.0
Pease	Less than 200kgs	73	94.8
	Between 200-500kgs	4	5.2
Soya beans	Less than 200kgs	77	100
Wheat	Less than 200kgs	77	100
Ground nuts	Less than 200kgs	30	39.0
	Between 200-500kgs	29	37.7
	More than 500kgs	18	23.4
Millet	Less than 200kgs	17	22.1
	Between 200-500kgs	48	62.3
	More than 500kgs	12	15.6

Source: Primary Data, 2014

Results in Table 3 indicated that in this sample, the quantity of beans supplied by majority of farmers in Food Aid supply were less than 200kgs per year (51.9%), and only (48.1%) supplied between 200-500kgs.

The amount of Cassava supplied by farmers in Food Aid supply, results indicate that majority of these farmers supplied between 200-500kgs (51.9%) and these were followed by those who supply less than 200kgs (32.5%).

Concerning maize, results indicate that small holder farmers in Mbarara and Isingiro districts who are participating in Food Aid supply, majority supply less than 200kgs (54.5%).

The amount of Rice supplied by farmers in Food Aid supply, results indicate that majority of these farmers supply more than 500kgs (40.3%) and these were followed by those who supply between 200-500kgs (33.8%).

Majority of farmers in Mbarara and Isingiro districts supply between 200-500kgs of live stock (87%) and only 13% supply less than 200kgs. Still results in table 4 indicated that majority of farmers participating in Food Aid supply supply less than 200kgs of Pease (94.8%).

In this sample, the amount of Soya beans and Wheat supplied is less than 200kgs, with Ground nuts majority supply less than 200kgs (39%) and 37.7% supply between 200-500kgs. The amount of Millet supplied in this sample of 77 respondents, majority of small holder farmers in Mbarara and Isingiro districts is between 200-500kgs (62.3%).

4.3 Extent of Food security

In this study, food security is the dependent variable and was broken into two parts and these are; food storage and handling (with 10 questions in the questionnaire) and food production and processing (with eight questions in the questionnaire). Most of these questions were based on a four point Likert scale and respondents were asked to rate the extent to which food security among members in Manyakabi Area Cooperative Society is satisfactory by indicating the extent to which they agree or disagree with each question or item. Their

responses were analyzed using SPSS and summarized using means and ranks as indicated in table 4. To interpret the means in Table 4, the following mean ranges and descriptions were used;

Key to interpretation of means

Mean range	Response mode	Interpretation
3.26 - 4.00	Strongly agree	Very satisfactory
2.51 - 3.25	Agree	Satisfactory
1.76 - 2.50	Disagree	Unsatisfactory
1.00 - 1.75	Strongly disagree	Very unsatisfactory

Table 4: Extent of Food security

Items on Food security	Mean	Interpretation	Rank
Food storage and handling			
You have some dry cassava in your food store	3.38	Very satisfactory	1
You have adequate knowledge on food processing	3.12	Satisfactory	2
You have some rice in your food store	2.98	Satisfactory	3
You have some millet in your food store	2.89	Satisfactory	4
You have some dry maize in your food store	2.81	Satisfactory	5
You have got enough food to keep in your store	2.71	Satisfactory	6
You have got a well established store where you keep your food	2.70	Satisfactory	7
You have adequate knowledge on food storage	2.69	Satisfactory	8
You have some dry beans in your food store	2.60	Satisfactory	9
You have a permanent food store at home	2.38	Unsatisfactory	10
Average mean	2.83	Satisfactory	
Food production and processing			
You usually do not have food shortages at home for a long time	3.34	Very satisfactory	1
You usually have enough food for domestic consumption all years	3.33	Very satisfactory	2
You expect to increase your land size to produce more food for home use	3.03	Satisfactory	3
You usually have short term food shortages at home	2.97	Satisfactory	4
You always apply fertilizers to increase food production	2.89	Satisfactory	5
You have a big piece of land for growing enough food for home consumption	2.68	Satisfactory	6
Many citizens in your area are engaged in agricultural for food production	2.67	Satisfactory	7
You have less seasonal food shortages (every year there is a season of food shortage)	2.48	Unsatisfactory	8
Average mean	2.94	Satisfactory	
Overall mean	2.90	Satisfactory	

Source: Primary Data, 2014

Results in table 4 indicated that the extent of food security is generally satisfactory and this was indicated by the overall mean of 2.90, which implies that majority of farmers in Mbarara and Isingiro districts are food secure. The results further indicate that the extent of food security is slightly more satisfactory in terms of food production and processing (average mean=2.94) as compared to food storage and handling (average mean=2.83). The findings indicate that out of the 10 question items used to measure food storage and

handling, one was rated very satisfactory, eight were rated satisfactory and one rated unsatisfactory. The unsatisfactory item was on having a permanent food store at home (mean =2.38), which indicated that most respondents do not have food they store at home, since they do not have home stores. This explains partly why consistency in food supply was also rated low (in Table 2). However, since most of the items rated high, the results imply that the level of food storage and handling is generally satisfactory.

With respect to food production and processing, out of the eight items used to measure this construct, only one was rated to be unsatisfactory and this was on having no or less seasonal food shortages (mean=2.48). This suggests that there are seasonal food shortages, which affect consistency in supply of food, as already noted. But since most items were rated satisfactory and the average mean falls under satisfactory, the results imply that there is a satisfactory level of food production and processing among small holder farmers in Mbarara and Isingiro districts, where farmers grow and produce products such as tea, cotton, tobacco, cassava, maize, millet and pulses. This was also observed by Bahigwa (2004) who noted that Uganda's agricultural sector is based primarily on smallholder farms, he also added that 80% of who own an average of only 2 hectares of land but contribute 70% of agricultural production (FAO, 2010).

Food security was also examined using other factual indicators such as the land size used to produce certain crops. Such facts like the size of cultivated land are rough indicators of food security. For example, a big banana plantation implies that a farmer has consistent supply of food at home and even possibly for sale, since "Matookes" are perennial crops that grow throughout the year. Also other crops like beans, rice, Pease, groundnuts and so on, if grown on a large piece of land can provide steady food supply, as they are durable, so they can be stored from one season to another. Due to these facts the researcher asked respondent to provide some data on the sizes of land they use to grow certain crops and this data is summarised in table 5.

Table 5: More facts on Food production among farmers in Mbarara and Isingiro districts

Type of food crop	Land size	Frequency	Percent
Beans	Less than an acre	48	62.3
	One acre	25	32.5
	More than three acres	4	5.2
	Total	77	100
Cassava	Less than an acre	20	26.0
	One acre	40	51.9
	Two acres	13	16.9
	More than three acres	4	5.2
	Total	77	100
Maize	Less than an acre	11	14.3
	One acre	27	35.1
	Two acres	35	45.5
	More than three acres	4	5.2
	Total	77	100
Rice	Less than an acre	11	14.3
	One acre	21	27.3
	Two acres	20	26.0
	More than three acres	25	32.5
	Total	77	100
Millet	Less than an acre	9	11.7
	One acre	24	31.2
	Two acres	44	57.1
	Total	77	100
Banana	Less than an acre	24	31.2
	One acre	29	37.7
	More than three acres	24	31.2
	Total	77	100
Live stock	Animals		
	Goats	30	39.0
	Cow	41	53.2
	Sheep	6	7.8
	Total	77	100

Source: Primary Data, 2014

Results in Table 5 above indicated that in this sample, the quantity of beans produced by majority of farmers are grown on a less than an acre (62.3%), 32.5% produce beans using one acre and only 5.2% use more than three acres while growing beans. When growing Cassava, majority of small holder farmers grow Cassava on one acre (51.9%) and 26% use less than an acre to grow cassava.

Majority of small holder farmers grow maize using two acres of land (45.5%) and these were followed by those who grow maize using only one acre of land (35.1%). Large amount of rice is being produced by small holder farmers in Mbarara and Isingiro districts using more than three acres (32.5%) and these were followed by those who use one acre (27.3%). Majority of millet growers among farmers in Mbarara and Isingiro districts use two acres (57.1%) and these were followed by those using one acre (31.2%). Majority of Banana growers among farmers in Mbarara and Isingiro districts use one acre (37.7%), and majority live stock keepers rear cows (53.2%) and 39% rear Goats.

Relationship between farmers' participation in food supply and Food security

The last objective in this study was to establish whether participation in food supply affects food security of farmers in Mbarara and Isingiro districts. The researcher stated a null hypothesis that participation in food supply is significantly correlated with and affect food security among farmers in Mbarara and Isingiro Districts. To achieve this objective and to test this null hypothesis, the researcher correlated the means on participation towards food supply and that on food security, using the Pearson's Linear Correlation Coefficient (PLCC) as indicated in Table 6;

Table 6: Significant relationship between participation in food supply and Food security in Mbarara and Isingiro districts

Variables correlated	r-value	Sig	Interpretation	Decision on Ho
Farmers' participation in food supply Vs Food storage & handling	.498	.000	Significant correlation	Rejected
Farmers' participation in food supply Vs Food production & processing	.412	.000	Significant correlation	Rejected
Farmers' participation in food supply Vs Overall Food security	.473	.000	Significant correlation	Rejected

Source: Primary Data, 2014

Table 6 revealed a positive significant correlation between the extent of farmer participation in food supply and food security in Mbarara and Isingiro districts ($r = .473$; $Sig = 0.000$). The null hypothesis was rejected meaning that the extent of farmers' participation in food supply and food security are significantly related.

Table 6 further revealed a significant relationship between farmers' participation in food supply and food storage and handling, this was indicated by the r-value and significant value ($r = 0.498$ and $sig = 0.000$) respectively, hence indicating that increase in farmers' participation in food supply increases the extent of food storage and handling and a decrease reduces it.

Still Table 6 connoted that farmers' participation in food supply significantly affects the extent of food production & processing in Mbarara and Isingiro districts, this was denoted by the r-value and sig value ($r = 0.412$ and $sig = 0.000$) respectively, this also leads to a conclusion that high participation of farmers in food supply increases the extent of food production & processing in Mbarara and Isingiro districts. To further confirm the above correlational results, the researcher used regression analysis, results of which are shown in table 6;

Table 7: Regression Analysis between the Dependent and Independent Variables

Variables regressed	Adjusted r²	F-value	Sig.	Interpretation	Decision on H₀
Food security VS Farmers' participation in food supply	.694	23.712	.000	Significant effect	Rejected
Coefficients	Beta	t-value	Sig		
(Constant)		4.034	.000	Significant effect	Rejected
Food quality	.522	6.289	.000	Significant effect	Rejected
Quantity of food supplied	.538	6.484	.000	Significant effect	Rejected

Source: Primary Data, 2014

Regression analysis results in table 7 revealed that farmers' participation in food supply accounted for 69.4% on food security and this is indicated by adjusted r squared of 0.694 leading to a conclusion that farmers' participation in food supply significantly affect the extent food security in Mbarara and Isingiro districts.

The coefficients section of this table denoted that of all the aspects of farmers' participation in food supply, that is quantity of food supplied accounted for the biggest influence on food security ($\beta=0.538$, Sig=0. 000).

CHAPTER FIVE

DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS

5.0 Introduction

This chapter presents the findings, conclusions, recommendations and suggested areas that need further research following the study objectives and study hypothesis.

5.1 Discussions

This study was set to find out the relationship between extent of farmers' participation in food supply and food security among the households of Mbarara and Isingiro districts, three specific objectives guided study and these were i) determining the extent of farmers' participation in food supply; ii) the extent of food security and (iii) the relationship between the extent of farmers' participation in food supply and food security among the households of Mbarara and Isingiro districts. The findings of the study indicated that majority of respondents in this sample ranged between 31-40 years and these were male (66.7%) and had only attained certificate as their highest academic qualification (35.8%).

Data analysis using means denoted that the extent of farmers' participation in food supply was rated high on average (mean= 2.91), implying that farmers highly supply food with the purpose of assisting or save the lives of people in camps, this finding is also in line with CARE (2006) and WFP (2008) where it was found out that only by promoting competitive behaviour, participation in food supply offers a potential mechanism for agricultural development and the enhancement of production, processing and marketing systems in Africa (Shaw, 2006; WFP, 2006a; Coulter, Walker & Hodges, 2007). WFP also added that developing country economies stand to benefit from this type of market growth but the process is not always smooth and linear, and therefore often requires strong policy attention. For example, although within food supply market chains the quality of grain has improved for the food aid markets of participating countries, analyses show that quality has not always consistently improved within the regular grain market of these countries (Coulter, Walker & Hodges, 2007). This is particularly true for nations like Uganda, where there are bimodal rainfall patterns, two rainy seasons allow for higher levels of productivity with the practice

of strong seasonal planning and planting techniques; however, the wet climate makes it difficult to keep grain dry and effectively stored (CARE, 2006 and WFP, 2008).

The extent of food quality was rated high on average (mean=2.98), this also implies that the amount of food supplied by farmers in Mbarara and Isingiro districts has quality characteristics of food that are acceptable to the World Food Program, this also agrees with Asiimwe and Mpuga (2007) who noted that a common concern surrounds smallholder farmers' capacity to satisfy food quality and safety standards. PVO contracts with the USDA included commodity-specific standards, and Ugandan commodities have to meet additional standards specified by the local government and by the PVO headquarters. Asiimwe and Mpuga also added that the millet and cowpeas in Uganda are sampled at each supplier's warehouse prior to delivery to schools. A few of the samples are found non-compliant with the government standards. In the case of millet, the single violation is a sample containing a live insect. The FBO supplier then treats and cleans the stock prior to delivery. Non-compliance in the cowpea procurements is related mainly to the presence of dirt and broken beans, criteria not required by the USDA and/or not involving health risks. The laboratory always recommends that the product is safe and could be sorted by recipients. US-sourced commodities are subjected in testing by the national laboratory as well, and none of these delivered fail to meet product quality and safety standards. However, 3% of the bulgur wheat and 5% of the lentils intended for Mbarara district do not arrive or rejected on arrival at the port. The commodities supplied clearly match or surpass the US-sourced commodities in terms of food quality and safety (Asiimwe & Mpuga, 2007).

Quantity of food supplied was also rated as high and this was indicated by the average mean of 2.84, implying that these farmers have always supplied food consistently to the WFP offices in Mbarara and Isingiro districts, this is also in line with Wandschneider & Hodges (2005) who noted that on overall, working through the CP, the WFP has made a strong effort to increase the quantity of food aid purchases made in Uganda. As a result, a "strong secular rise in procurement" has been noted in the country (Tschirley & del Castillo, 2007, 17, producing employment and income generating activities in the agricultural sector (Wandschneider & Hodges, 2005).

The extent of food security in Mbarara and Isingiro districts was found to be satisfactory and this was indicated by the overall mean (mean=2.90), which implies that majority of farmers in this sample have some dry cassava in their food store and usually do not have food shortages at their homes for a long time, this is also in line with UNDP's (2007) which noted that food security in Uganda remains problematic in certain areas where population continues to rise or where an influx of refugees has been witnessed but where food production rates do not match this growth rate (Government of Uganda, 2004). Subsequent to this discovery, the UNDP's 2007 development report on Uganda advocates 'rediscovering agriculture for human development.

Food storage and handling was rated satisfactory (mean=2.83), implying that that majority of farmers have food stores where they keep their dry foods, and therefore this is in line with Eele (1994) who noted that food storage and handling involves any and all ocean, inland, and internal transport, storage, and handling applicable to a given procurement. FSH facilitates cost comparisons between in-kind food aid, which requires ocean freight transport, and local and regional procurement, which may or may not require ocean freight transport. Participants had the option to use ocean freight transport where available or necessary, but none chose to do so under any of the food supply projects.

Food production and processing was rated as satisfactory on average and this was indicated by the average mean of 2.94, implying that the farmers in Mbarara and Isingiro districts usually have enough food for domestic consumption all years and this is in line with Wandschneider & Hodges (2005) who noted that in terms of commodity types, maize, beans, corn-soya blends and vegetable oil are most commonly procured in Uganda by the WFP (WFP 2009a). Maize and maize-based products are the focus of in-country food supply purchases and in 2007 over 85% of purchases, by weight, were put towards maize (WFP 2009 Map; Coulter, Walker & Hodges, 2007). The development of the maize subsector in Uganda has been affected by this focus (WFP, 2006a). Subsequently, improvements have been seen in terms of warehouse storage and the quality management of these grains (Wandschneider & Hodges, 2005).

The findings also indicated a positive and significant relationship between the extent of farmers' participation towards food supply and food security in Mbarara and Isingiro districts ($r = .473$ & $\text{Sig} = 0.000$ respectively), this is because the significant value was less than 0.05, which is the maximum level of significance required to declare a relationship significant. Therefore implying that hence indicating that increase in farmer participation towards food supply increases the extent of food storage & handling and a decrease in farmer participation reduces it, the findings still indicated that the extent of food security is affected by the participation of farmers in food supply and this was evidenced by the adjusted r-squared where it contributed 69% with its corresponding r and sig values ($r\text{-value} = 23.712$ and $\text{sig} = .000$) respectively.

5.2 Conclusions

From the findings of the study, the researcher concluded that majority of respondents in this sample ranged between 31-40 years, these were male (66.7%) and had only attained certificate as their highest academic qualification (35.8%).

The extent of extent of farmer participation towards food supply was rated as high and this was indicated by the average (mean = 2.91), hence concluding that farmers highly supply food with the purpose of assisting and save the lives of people in camps.

The extent of food security in Mbarara and Isingiro districts was generally rated was found to be satisfactory and this was indicated by the overall mean (mean = 2.90), hence concluding that majority of farmers in this sample have some dry cassava in their food store and usually do not have food shortages at their homes for a long time.

There is a positive and significant relationship between the extent of farmer participation in food supply and food security in Mbarara and Isingiro districts ($r = .473$ & $\text{Sig} = 0.000$ respectively), hence concluding that the more and more of farmers participate in food supply, this increases the extent of food security in Mbarara and Isingiro districts.

5.3 Recommendation

1. The researcher recommends to farmers in Mbarara and Isingiro districts to improve on their farming methods which will help them sell food products to Manyakabi Area Cooperative Society every year/season.
2. The researcher recommends to farmers in Mbarara and Isingiro districts to use high quality agricultural breeds which can help them sell food products to Manyakabi Area Cooperative Society in large quantities.
3. The researcher recommends to farmers in Mbarara and Isingiro districts to apply irrigation methods during their farming activities, this will help them to overcome the problem of seasonal food shortages.
4. Still the researcher recommends to the Government of Uganda to provide free and high quality agricultural breeds to farmers, this will encourage many citizens in Mbarara and Isingiro districts to get engaged in Agricultural for food production.

Areas for further research

Prospective researchers and even students are encouraged to research on the following areas;

1. Quantity of food supplied and the extent of food security among farmers in Mbarara and Isingiro districts.
2. Food quality and the extent of food security among farmers in Mbarara and Isingiro districts.
3. Farmers' participation towards Food Aid supply and the extent of food production in Mbarara and Isingiro districts.

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APPENDICES

APPENDIX I: RESEARCH INSTRUMENT

SECTION A: Profile of respondents

Age: (a) 20-30 years, (b) 31-40 years, (c) 41-50 years, (d) 51 and above

2. Gender: _____ (1) Male _____ (2) Female

4. Educational level (please tick)

- | | |
|----------------|---------------------|
| 1) Primary | 5) Bachelors degree |
| 2) Secondary | 6) Master's degree |
| 3) Certificate | 7) PhD |
| 4) Diploma | 8) None |

SECTION B: Extent of farmer participation towards food aid supply

Direction: Below are some items that provide information on participation towards food aid supply. Tick the box with the number that best reflects how you rate your home food security. Please use the answer key below;

Rating	Response Mode	Description
4	Strongly Agree	You agree with no doubt at all
3	Agree	You agree with some doubt
2	Disagree	You disagree with some doubt
1	Strongly disagree	You disagree with no doubt at all

o. Items on participation towards food supply	Scale			
Food Quality	1	2	3	4
You always provide food which is of good and acceptable quality	1	2	3	4
You always supply food products recommended by the World food program (WFP)	1	2	3	4
You always supply food which meet the standards specified government and WFP	1	2	3	4
All your food supplied and sampled has always been accepted with no rejections	1	2	3	4
You always supply foods which meet production standards (less or no chemicals)	1	2	3	4
You always supply food products which are clean (with no dust, broken parts)	1	2	3	4
Quantity of Food Supplied				
You sell food products to Manyakabi Area Cooperative Society every year/season	1	2	3	4
You sell food products to Manyakabi Area Cooperative Society in large quantities				
You always supply food consistently to the WFP office in your area	1	2	3	4
Majority of small holder farmers in your area are actuary net food buyers	1	2	3	4
You have plans to increase amount of food sold to Manyakabi Area Cooperative Society in coming years	1	2	3	4
You always direct other famers to Manyakabi Area Cooperative Society to sell food				
You always transport food products to Manyakabi Area Cooperative Society for sell	1	2	3	4

Other facts on Participation in food aid supply

Which of the following types of food crops do you usually or have ever supplied to Manyakabi Area Cooperative Society? (Please tick the crop and write the estimated quantity per year e.g. less than 200kgs, 200-500kgs, more than 500kgs...).

Beans	Quantity
Cassava	Quantity
Maize	Quantity
Rice	Quantity
Millet	Quantity
Pease	Quantity
Soya beans	Quantity
Wheat	Quantity
Ground nuts	Quantity
Live stock (meat)	Quantity
Others please specify	

SECTION C: Extent Food security

Direction: Below are some items that provide information on domestic food security. Tick the box with the number that best reflects how you rate your home food security. Please use the answer key below;

Rating	Response Mode	Description
4	Strongly Agree	You agree with no doubt at all
3	Agree	You agree with some doubt
2	Disagree	You disagree with some doubt
1	Strongly disagree	You disagree with no doubt at all

No.	Items on Food security	Scale			
	Food storage & handling				
	You have a permanent food store at home	1	2	3	4
	You have got enough food to keep in your store	1	2	3	4
	You have some dry beans in your food store	1	2	3	4
	You have got a well established store where you keep your food	1	2	3	4
	You have some dry cassava in your food store	1	2	3	4
	You have some dry maize in your food store	1	2	3	4
	You have some rice in your food store	1	2	3	4
	You have some millet in your food store	1	2	3	4

9	You have adequate knowledge on food storage	1	2	3	4
10	You have adequate knowledge on food processing	1	2	3	4

Mention any other foods you have in your home (food) store _____

	Food production and processing				
1	Many citizens in your area are engaged in Agricultural for food production	1	2	3	4
2	You usually have food shortages at home for a long time	1	2	3	4
3	You always apply fertilizers to increase food production	1	2	3	4
4	You have a big piece of land for growing enough food for home consumption	1	2	3	4
5	You usually have enough food for domestic consumption all years	1	2	3	4
6	You expect to increase your land size to produce more food for home use	1	2	3	4
7	You usually have short term food shortages at home	1	2	3	4
8	You have seasonal food shortages (every year there is a season of food shortage)	1	2	3	4

Food production facts

Which of the following crops do you grow at a big size of land? show the approximate land size (Please tick the crop and write the land size estimate e.g. less than an acre, one acre, two acres...).

Beans _____ land size _____

Cassava _____ land size _____

Maize _____ land size _____

Rice _____ land size _____

Millet _____ land size _____

Banana _____ land size _____

Live stock _____ number of animals (goats, cow, sheep)

Others please specify _____

Do you have an income generating activity related to agriculture other than the above?

Yes No

If your answer above is yes, mention the income generating activity

Do you have any other income generating activity not related to agriculture?

Yes No

If your answer above is yes, mention your none agricultural income generating activities

Thanks

Appendix A

Sample size (s) required for the given population sizes (N)

N	S	N	S	N	S	N	S	N	S
10	10	100	80	280	162	800	260	2800	338
15	14	110	86	290	165	850	256	3000	341
20	19	120	92	300	169	900	269	3500	346
25	24	130	97	320	175	950	274	4000	351
30	28	140	103	340	181	1000	278	4500	354
35	32	150	108	360	186	1100	285	5000	357
40	36	160	113	380	191	1200	291	6000	361
45	40	170	118	400	196	1300	297	7000	364
50	44	180	123	420	201	1400	302	8000	367
55	48	190	127	440	205	1500	306	9000	368
60	52	200	132	460	210	1600	310	10000	370
65	56	210	136	480	214	1700	313	15000	375
70	59	220	140	500	217	1800	317	20000	377
75	63	230	144	550	226	1900	320	30000	379
80	66	240	148	600	234	2000	322	40000	380
85	70	250	152	650	242	2200	327	50000	381
90	73	260	155	700	248	2400	331	75000	382
95	76	270	159	750	254	2600	335	100000	384

Note : From R. V. Krejcie and D. W. Morgan(1970), Determining sample size for research activities, Educational and psychological measurement, 30, 608, Sage Publications.

