The influence of tea growing promotion on household food security of smallholder farmers

A case of Kanungu District

A Research Project submitted to Van Hall Larenstein University of Applied Sciences in partial fulfilment of the requirements for the award of Professional Master Degree in Management of Development, Specialization: Rural Development and Food Security

Byamukama Mathias Thadius

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Dedication

Dedicated to **mum** and **dad**, for their words of encouragement.

Acknowledgement

God Almighty for my healthy life, granting me the wisdom and strength to complete the program.

I take this honor to appreciate NUFFIC and the host institution, Van Hall Larenstein University of Applied Sciences for financing and facilitating my Masters studies respectively.

I am deeply grateful and indebted to my supervisor Bernard Gildermarcher for his inspirational advice and encouragement throughout the course of this study.

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Last but not the least, special thanks to Kanungu District staff, Tea factory staff and farmers for their wonderful cooperation that made this research study a success.

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Acronyms and Abbreviations

AT Uganda Ltd: Appropriate Technology Uganda Limited

CC: Community Connector

EIT: Ethical Trading Initiative

FAO: Food and Agriculture Organisation

IFAD: International Fund for Agricultural Development

KAZARDI: Kachwekano Zonal Agricultural Research and Development Institute

KDDP: Kanungu District Development Plan

KDTDP: Kanungu District Tourism Development Plan

KGTF: Kayonza Growers Tea Factory

NAADS: National Agricultural Advisory Services

NARO: National Agricultural Research Organisation

SSA: Sub Saharan Africa

UBOS: Uganda Bureau of Statistics

UgSh: Uganda Shillings

Abstract

This research is about the influence of promoting a cash crop on household food security among the smallholder farmers. To be more specific, how tea growing promotion influenced household food security among smallholder farmers. Promoting a cash crops is said to be contrary to household food security and therefore a need for constant surveillance. The study was carried out in Kanungu District where tea has been promoted as a strategic enterprise since 2004. The government of Uganda under the ministry of agriculture initiated a strategy to support priority agricultural enterprises at zone level to increase volumes and quality for both national and export market. It's under this approach that tea enterprise has been promoted over the years in Kanungu district as a strategic enterprise to improve on household incomes in fight to curb down poverty levels in the district. The Kanungu Local government through NAADS program, under public private partnership arrangement has worked closely with the management of private tea factories to promote tea production within the district. The objective of the tea project was and is still to promote planting of quality tea clone, increase tea green leaf production and enhance household income and food security. A survey was the research strategy used to achieve the research objective which was to explore how tea growing promotion influenced household food security among smallholder farmers. The following research questions were formulated to aid in achieving the research: 1) To what extent are the smallholder tea farmers involved in producing staple food crops for home consumption? 2) What changes have been experienced at household level in terms of tea and staple food production over the years that influence household food security? 3) How does the income generated from tea production and other sources contribute to the household food? In this research, forty households were used as a sample size, focus group discussion and interviewing key informants were part of the methodology to obtain data to answer the research questions. The study explored in detail the key findings on land distribution , labour distribution, agro input use that have been negatively affected by tea growing promotion and gender inequalities as result of tea promotion among smallholder farmers. And how these changes in turn influence household food security. To arrest the situation, actions must be taken by; improving on the selection criteria for the nature of the farmers to involve in tea production, increase production per unit area than increased acreage, have trials of labour saving technologies in food crop production, developing value chains for food crops, and consider trainings for both men and women on gender inequalities.

Chapter one: Introduction

1.1 Overview of Kanungu district

Kanungu district is located in south-western Uganda, it borders with Democratic Republic of Congo (DRC) in the west, Rukungiri district in the east, Kabale and Kisoro districts in the south and Lake Edward in the north (See figure 1). At Uganda's Independence in 1962, Kanungu was known as Kinkizi County and was located within the Kigezi district. In 1974 the Runkungiri district was founded with Kinkizi County becoming one of its counties. However, in 2001 Kinkizi County became a new district called Kanungu. (KDDP, 2012-2015). The district is about 478 Kilometers away from Kampala Uganda's capital city (KDDP, 2012-2015).

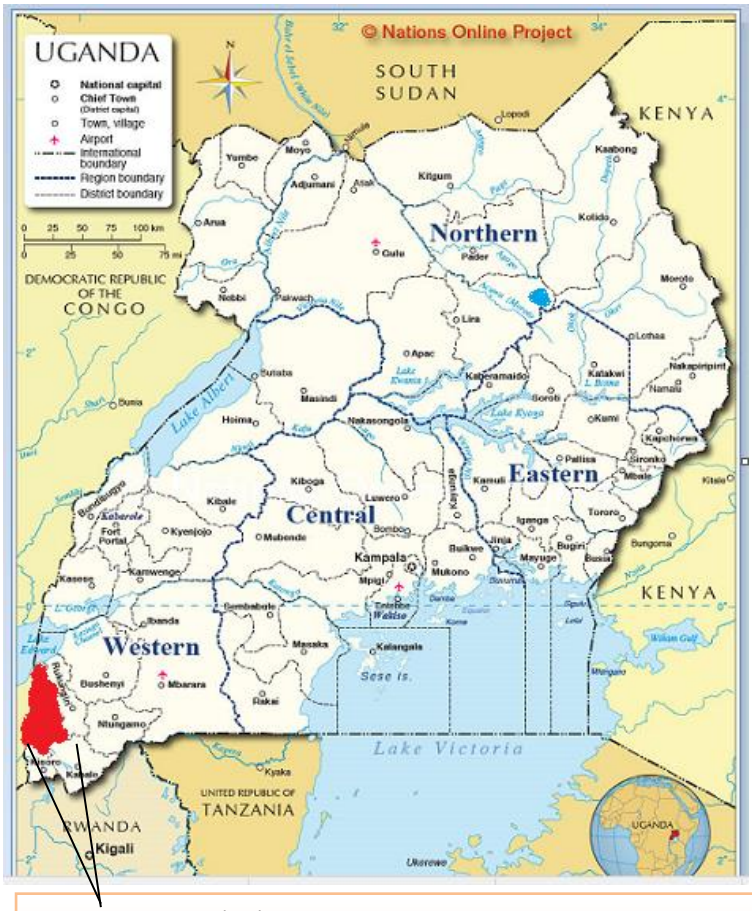


Figure 1: Map of Uganda (Source: World Fact book, 2012)

It has a projected population of 252,100 people, a high population density of 218 per square km compared to national population density of 124 persons per square km (UBOS, 2010). The majority (95%) of this population are rural dwellers who drive their livelihood from the agriculture sector (KDDP, 2012-2013). This closely depicts the over-all Uganda's situation in which 85 percent of Uganda's population live in rural areas and drive their livelihood from agriculture (UBOS, 2010). Also it's worth noting that agriculture is still a dominant sector and regarded as a backbone of Uganda's economy. It employs over 80 percent of the work force, it contributes over 22 percent to the Gross Domestic Product (GDP) and over 90 percent to the country's foreign exchange earnings (UBOS, 2010).

1.2 Land use in Kanungu District

Kanungu district has a total area of 1,228.28 sq km, comprising 60 percent farmland, 15 percent high tropical forest, 11 percent woodland, 9 percent grassland, 2 percent bush land, one percent open water and 2 percent miscellaneous mosaics. The vegetation ranges from the high tropical forests of Bwindi impenetrable national park to the grasslands of Queen national heritage (KDTDP, 2010).

1.3 Agriculture in Kanungu district

The district is bound in the south-western highland ecological zone characterized by the following;

- Its land mass lays between 2500m-1000m above sea level
- A range of soils (deep greyish brown sandy loamy soils and reddish brown sandy soils)
- Binomial rainfall partner with an average rainfall per month ranging between 220mm at the pick and 70mm the minimum. And fairly well distributed with an average of 165 rain days
- It's moderately cool with monthly average temperatures ranging between 15^0c- 22^0c.

All these factors have favored a number of agricultural enterprises in the district (KAZARDI, 2010). Majority of the district's population are engaged in agriculture as earlier mentioned making it the dominant economic activity. Major cash crops in the district are tea, coffee, tobacco and rice with tea currently more pronounced. The primary food crops cultivated are banana (Matooke), potatoes, sweet potatoes, cassava, beans, groundnuts, sorghum, cow peas as well as pineapples, tomatoes, onions and cabbage (Kanungu District, Production and Marketing Department report, 2009).

The land under agricultural production is highly fragmented due to traditional practices of inheritance and high population density. Land is held in customary private ownership although there are few relatively well-off farmers with leasehold titles. Cultivation is done on hill tops, gentle slopes and even many wetlands have been reclaimed for agricultural production due to population pressure. Land shortage, coupled with poor farming practices like, continuous cultivation, bush burning and overgrazing under subsistence agriculture, has led to soil degradation, poor yields and ultimately poverty (KDDP, 2012-2015).

1.3.1 Tea growing in Kanungu district

Tea is one of the oldest cash crops grown in Kanungu district and at a national level it's the second cash crop to coffee for export (UBOS, 2010). The district is sub divided into 17 lower administrative units (sub counties/ town councils) and tea is predominantly grown in areas of Mpungu, Kayonza, Kanyantorogo, Butogota Town Council, Kirima, Kanungu town Council, Rugyeyo, Rutenga, Kinaaba and to a smaller extent Kambuga Sub county (NAADS, 2012) due to prevailing conditions that favor tea growing in these units. The main tea cultivars grown by the farmers in Kanungu district are clones of 6/8 and 31/8 which were expensive to buy for the rural small scale farmers. Since 2008 up-to-date, the unit cost of a tea seedling in district has been on rise from 250 Ugsh to 380 Ugsh making it more expensive to buy. This implies that the farmer has to spend 2,000,000 Ugsh to 3,500,000 (625 -1000 euros) to buy seedlings for planting one hectare. This partly explains why the government had to intervene to procure seedlings and give them out to farmers at free cost to facilitated increased tea production in the area.

The mode of production includes, estates which are owned by the factories in the district (Kayonza growers tea factory and Kinkiizi development company) and out growers who account for 95% of the green leaf supplied for processing in these two factories mentioned above (NAADS, 2012). These out growers operate on different sizes of land and with different sizes of tea gardens (small scale, medium and large scale). About 4072 smallholder farmers existed by

2007 and cultivated over an area covering approximately 2000 ha (Cauter, 2007). This was a situation before tea promotion was emphasised under NAADS programme in 2008. On average it implies that smallholder tea farmers then were growing tea averagely on 0.4 ha, basically on small scale. Many more farmers were brought on board and most of the tea farmers that existed then also expanded on their tea gardens with tea promotion project. Farmers have been interested to be in tea production the fact that it has a reliable market provided by the tea factories, more stable prices and provides a regular and reliable income to farmers. The smallholder tea farmers are paid for the green leaf delivered at the end of each month (the first payment) and the tea bonus (second payment) which is always paid annually. The tea green leaf prices have been on rise over the past years and currently farmers are paid 400 Ug Sh each kilogram equivalent to 13 euro cents.

It is also worth noting that tea productivity is still low among smallholder farmers, estimated to be about 875kg/ha per month compared to estates with productivity of 1,000kg/ha per month (KGTF, 2012). The smallholder farmers tend to increase their tea green leaf sales through expansion of their tea gardens (putting more land under tea production) than intensification due to limited capital to buy agro-inputs like fertilizers to improve on their productivity. On the environmental perspective, tea is one of the suitable crops to grow on the fragile soils with in the hilly terrain that cover most parts of the district. It establishes bush cover which protects the soil from erosion keeping the soils productive for a long time.

1.3.2 The tea growing promotion as a strategic agricultural enterprise

The government of Uganda under the ministry of agriculture 2001/2002 initiated a strategy to support priority agricultural enterprises at zone level to increase volumes and quality for both national and export market. The argument put forward by the ministry is not for large scale agricultural production for the selected enterprise per say, but rather for both agro-industrial development and sustainable trade. To attract investors into agro-processing of a particular commodity requires assurances that the commodity in question will have adequate supply. This can come from small, medium and large-scale producers and, if they are in the same zone or locality, transaction costs incurred in moving commodities from sparsely located production points can be minimized (Kraybil and Kidoido, 2009).

Under this approach, tea enterprise has been promoted over the years in Kanungu district as a strategic enterprise to improve on household incomes in fight to curb down poverty levels in the district. The Kanungu Local government through NAADS program, under public private partnership arrangement has worked closely with the management of private tea factories to promote tea production within the district. The objective of the partnership was and is still to promote planting of quality tea clone, increase tea green leaf production and enhance household income and food security for the different categories of farmers (small, medium and large-scale producers) through sales of tea green leaf.

Currently over 65,000 farmers exist in the tea growing areas of the district (KGTF, 2012). In order to boost tea production, since 2004 the government in partnership with the private sector, have promoted the tea enterprise by supporting all categories of farmers with free quality tea plantlets to enable farmers expand on their gardens and increase quality and quantity of tea green production that can fetch them more money to increase on their household income. On the other hand, the increase in the green leaf production in the area keeps the agro processing companies that provide market and process green leaf in business. This is evidenced with the

expansion of the tea processing production lines within the existing tea factories and a new factory recently established and operating in Butogota Town council to accommodate processing of extra green leaf produced by the farmers as a result of the tea promotion intervention in the district.

Table 1: Major interventions to promote tea production in Kanungu District

Year	**Value of the intervention**	**Estimated number of seedlings procured to support farmers (Out growers)**	**Lead agencies involved in the intervention**
2002- 2004	1.56 B Ug sh	7.8 Million seedlings	MAAIF in partnership with Kanungu Local government
2007- 2008	0.4B Ug sh	800,000 seedlings	Kanungu District in partnership with NAADS Secretariat, Kinkiizi Development Company and Kayonza growers Tea factory
2009	1.14 B Ug sh	3 million seedlings	Kayonza growers Tea factory
2009	0.76 B Ug sh	2 million seedlings	Kanungu District in partnership with NAADS Secretariat and Kinkiizi Development Company
2010	1.67 B Ug Sh	4.4 million Seedlings	Kanungu District in partnership with NAADS Secretariat and Kinkiizi Development Company
2011	2.356 B Ug sh	6.2 million Seedlings	Kanungu District in partnership with NAADS Secretariat and Kinkiizi Development Company

Source: Adapted from Kanungu District local government NAADS annual report (2012).

By the year 2011, about 7.9 billion Uganda shillings (2.6 million euros) had been invested in the tea project. However it should be noted that this project is ongoing.

1.4 Research problem definition

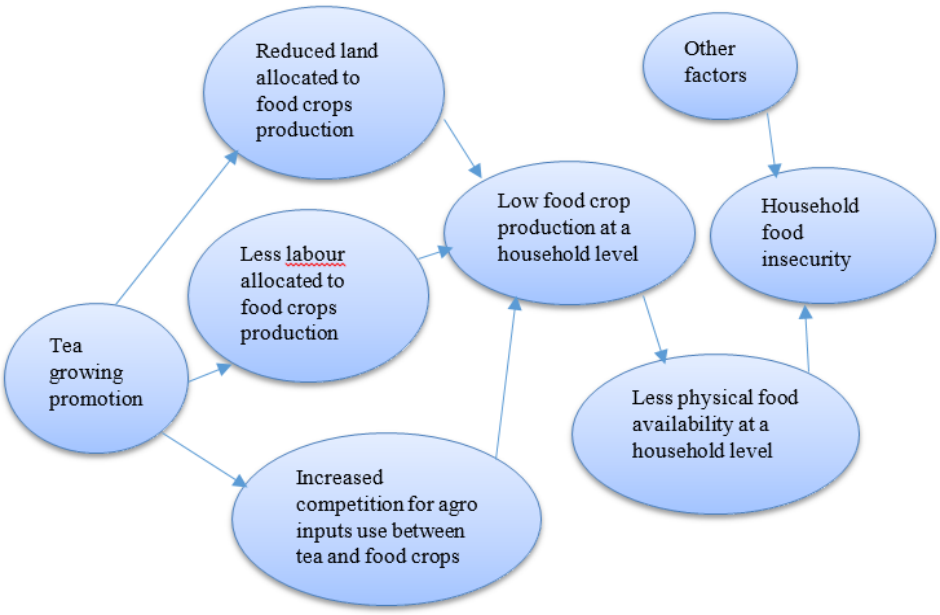
Cash Crop production often is suspected to be contradictory to food security (Weiss, etal., 2012) and this puts some households at a risk of being food insecure. Tea is a leading cash crop in the district grown mainly by smallholder farmers (out growers) who account for about 95 percent of the total tea green leaf production (KGTF, 2012). Tea growing among smallholder farmers is besides food crops which are produced for home consumption and surplus for selling. Among the many constraints faced by the smallholder farmers in the district is limited land for crop production which is even fragmented (KDDP). This impinges agricultural production among smallholder farmers.The average household land holding is estimated at 1.1 hectares although extremes also exist that is to say households with more than 8 hectares (2 percent) and the landless (5 percent) (District survey, 2012). Since 2004, tea has been promoted in the district as strategic enterprise to improve household income for the farming communities. The promotion of tea enterprise was much more emphasised since 2008 where the local government under NAADS program in partnership with private companies, have procured and given out tea seedlings to farmers indiscriminately at a free cost to establish new tea fields or to expand on

their earlier existing tea fields. This promotion has resulted into a stiff competition between food crops and tea for the production land and other factors of production like labour and agro-inputs at household level. This sparks the discussion that tea promotion may affect household food security, worsening the food insecurity status in the district of which 50-65 percent of the households were reported to be food insecure (UBOS, 2010).

The argument that smallholder farmers engaged in tea production can gain extra income to purchase food to meet their household food requirements is the talk of the day though there was no empirical evidence to support the argument in the context of Kanungu district.

According to Weiss, etal., 2012, lack of adequate land and growing of cash crops reduces the amount of food produced for the family, women's control over income and therefore, the food supply (since women do not market commercial crops). Statistics showed that 10 percent of the households engaged in agriculture in Uganda experience food shortage due to inadequate land for production (UBOS, 2010). Land is limited, so cash crops may occupy land which is needed for food crops for household food security. The issue is how the cultivation of cash crops (tea) can be combined with food crops (Hartog, Staveren and Brouwer, 2006). And will the cash income generated from the cash crop be sufficient to compensate for the lesser availability of home produced food. According to Weiss, etal., (2012), commercialisation of agriculture has not resulted into dramatic negative effects on food and nutrition among rural population. However the issue of cash crops versus food crops needs continued surveillance (Hartog, Staveren and Brouwer 2006). In this context, a research was conducted to explore the influence of tea growing promotion on household food availability and access among smallholder farmers with limited land and other resources for agricultural production.

Figure 2: The causal diagram



1.5 Research problem statement

Tea growing promotion among smallholder farmers who are resource constrained most especially with limited land for agricultural production, results into reduced household food

production. And this affects household's food availability and access among smallholder farmers, aggravating food insecurity at household level within the district.

1.6. Research objective

The objective of the research was to explore how tea growing promotion influenced household food security among smallholder farmers.

1.7. Research central question

To what extent has tea growing among smallholder farmers influenced their households' food security?

1.8. Sub questions

- To what extent are the smallholder tea farmers involved in producing staple food crops for home consumption?
- What changes have been experienced at household level in terms of tea and staple food production over the years that influence household food security?
- How does the income generated from tea production and other sources contribute to the household food?

1.9 Justification of the study

The study is intended to justify whether it's viable for every smallholder farmer should get involved in tea production without compromising their household food security. The findings of the research contribute knowledge that can guide policy makers in making informed decisions and guidelines in the struggle to improve household income and food security among smallholder farmers.

Chapter two: Literature Review

2.1 Working definitions

2.1.1 Food security.

According to the World Food Summit organized in Rome 1996, Food security has been defined as access by all people, at all times, to adequate food for an active, healthy life (Coleman, etal.,2011). According to Jose and Rica (2012), Food security is defined as when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life. This widely accepted definition points out the categorical dimensions of food security as food availability, food access, utilization and stability.

According to Gross, etal. (2000), the above mentioned categorical dimensions of food security are relevant to all levels of the social organisations, from individual to household (micro level), to the communities (meso level) and to the national and global level (macro level). And all these categorical food security dimensions differ in nature, causes, and effects at three different social organizational levels mentioned. This research focused on food security at household level (micro level).

According to Hartog, Staveren, and Brouwer (2006), availability and access to food are two essential determinants of food security. And also state that food enters the household in different ways;

a. A household may produce food and has direct access to food. The ability of farmers to produce food in adequate amounts and sufficient variety depends to a larger extent on their access to resources like sufficient and fertile land to grow crops and rare animals to sustain survival of the household on a continuous basis.

b. Food is also purchased. Most households purchase a part of their food which they do not produce or do not in sufficient quantities. This presents the dimension of food access. Access depends on household income and prices, and is therefore prone to risk, especially if income falls, food prices rise and harvests in rural areas fall (Devereux and Maxwell, 2001).

This research focuses on how tea growing promotion influences the two essential determinants of food security (availability and access) at household level among smallholder farmers. It looks at the extent to which these households have access to sufficient resources like land, labour, agro-inputs to grow staple food crops at the same time grow tea to sustain survival of the household with a continuous supply of food. And also how the household income generated from tea contributes to households' access to food.

2.1.2 Food availability

This is achieved if adequate food is ready to have at people's disposal (Gross, etal., 2000) . Food availability is a dimension that addresses supply side of food security (FAO, 2006). As already mentioned that these dimensions differ in nature at different social organisation levels. At micro level (household) which is the area of concern for this research, food availability can be determined by the level of household food production and supply by the markets. According to Devereux and Maxwell (2001), in Sub Saharan Africa rural households are much more

dependent on agricultural production for their household food supplies. In this context therefore, this research focuses on food availability at household level in relation to household food production as a main supply of food at a household level.

2.1.3 Food access

This is ensured when all households and all individuals within those households have sufficient resources to obtain appropriate foods (through production, purchase or donation) for nutritious diet (Gross, etal., 2000). It's also explained that having sufficient food at a national level or at certain territorial level cannot be taken as a proof that all the households or individuals are in that country/ territory have enough food to eat (Devereux and Maxwell, 2001). And as earlier mentioned this dimension has different indicators at different levels of social organisations. These may include food prices, wage rates, per capita food consumption, meal frequency, employment rate, level of income (FAO, 2006). In the interest of this research, we explore how the income generated from tea and other sources contributes to household's access to food in relation to the existing market conditions.

2.1.4 Adequate utilization

Refers to the ability of the human body to ingest and metabolise food. The dimension of utilization of food involves moving away from household food security to individual food security. Determines whether individuals receive enough food to cover their needs. Also biological utilization needs to be considered referring to the ability of the human body to take food and to convert it into nutrients that can be used by the body to maintain health (Gross, etal., 2000).

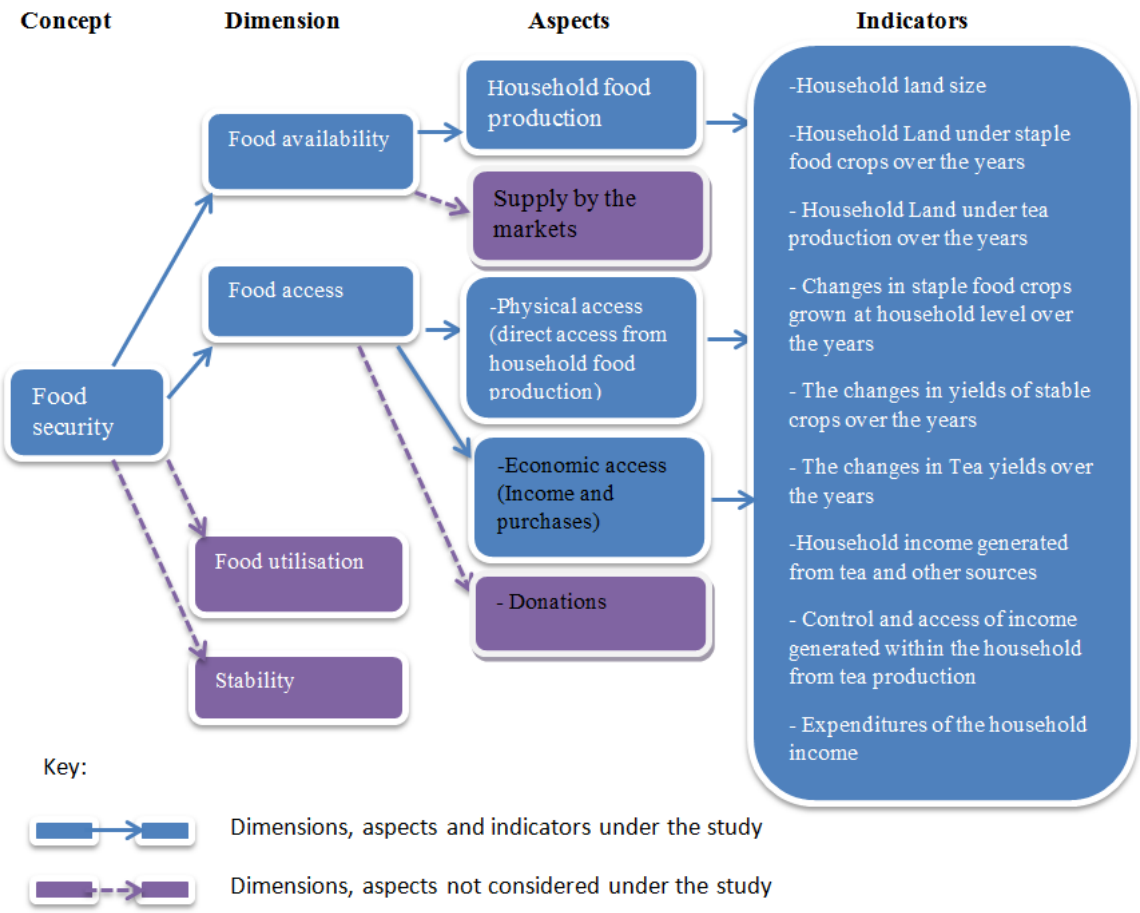
2.1.5 Stability

Refers to the temporal determinant of food and nutrition security and affects all the three dimensions over time. Even if you are food intake is adequate today, you are still considered to be food insecure if you have inadequate access to food on periodic basis, risking a deterioration of your nutritional status (Gross, etal., 2000).

2.1.6 The conceptual framework at micro level (household level)

The main concept underpinning this research is of food security. Therefore, the conceptual framework for this research is based on the theoretical concepts of food security and its dimensions.

Figure 3: Conceptual framework on food security at a household level



Source: Adapted from Gross, etal., 2000.

2.1.7 Definition of smallholder farmer

The definition of smallholder differs significantly according to crop, and to the social, cultural, economic and political context (ETI, 2005). Definitions often go by size of smallholding or dependence on family labour as opposed to non-family. The smallholder farmers in this research are defined in relation to the characteristics which they share in common;

• produce relatively small volumes of produce on relatively small plots of land, primarily depend on family labour with minimum or no hired labour force and are generally less well-resourced than commercial-scale farmers (ETI,2005). On this note therefore, it's worth noting that 95% of the farmers in Kanungu District operate as smallholder farmers (KDDP, 2010/2011). Even households with relatively large household landholdings more than eight hectares of land, the minority (2%) also in most case operate on small scale. They are involved in more than three agricultural enterprises each on a small scale. Therefore even those with substantial pieces of land does not necessary translate into large scale production or commercialisation.

This research therefore, explores food availability and access among the smallholder tea farmers' households' in terms of physical food production and economic access through purchases with income generated from tea. Having it in mind that smallholder farmers are resource constrained, Devereux and Maxwell (2009), echoes it that having sufficient resources as a household or individual contributes to both physical production and economic access to

food. In this regard land which is one of the most crucial factors of agricultural production and one of the major limiting factors in Kanungu district which was the existing knowledge was at the center of this research. Farmers with different land sizes engaged in both tea and food crop production over the years were consulted in the study.

2.1.8 A household

Despite best practices to standardise the definition of a household, it is unclear which type of definition or which intersections of key words should be used to have a universally accepted definition (Beaman and Dillon, 2012). Therefore definitions defer although household definitions are used to address different economic units of interest. In relation to this research, a household has been defined as;

A composition of a group of persons related or not, living in the same dwelling space who have at least one common plot together or one income-generating activity together and under the responsibility of a head whose authority is acknowledged by all the members (Beaman and Dillon, 2012).

2.2 Factors of production in farming among smallholder farmers

Agricultural production and growth are strongly associated with equitable asset and resource distribution (Jayne, Mather and Mghenyi, 2010). The smallholder farmers who are resource constrained are usually limited in terms of what they can produce. Smallholder farmers are constrained differently in terms of land, labour and agro inputs and this affects their potentials to produce. In turn this affects their food security since most of the smallholder households in Africa depend on mainly on their production for food supply during most time of the year (Kgutha, etal. 2010).

2.2.1 Land

Land is a fundamental factor of production in the agricultural sector. According to Kgutha, etal., (2010), in countries where land is not communally owned, the size of land owned by a family or a household becomes an important asset as it determines the amount of food that can be produced for family in terms of crop and livestock any given time. In Kanungu district there are disparities in distribution of available land for agricultural land. The average household land holding is at 2.5 acres although extremes exist with over 20 acres (2%) and the land less (5%) according to the District survey (2012).

Many farmers fail to produce and realise their full potential because they are constrained with land. The household size landholdings are dwindling year after another mainly due to increased population pressure and traditional inheritance practices that make land to be divided and subdivided into small portions that are less economical to operate on (KDDP, 2012-2015). Jayne, Mather and Mghenyi (2010), show that there is an existing strong relationship between access to land, agricultural commercialization and household income in southern and eastern Africa. Landlessness therefore, means lack of an important resource and a sign of food insecurity and poverty (Kgutha, etal., 2010).

2.2.2 Farm labour

Farm labour is a vitally important component of small farm assets. Shortage of farm power seriously constrains increase in agricultural production (Sims and Kienzle, 2006). It should be noted that mechanisation of agriculture is still low in Sub-Saharan Africa (SSA) and there is too much reliance on human power using simple tools. For example according to IFAD (2013), it was estimated that 65 percent of the land in sub-Saharan Africa is prepared by hand power. Hand tools are the most important implements for smallholder farmers thought SSA. They are used everywhere for land clearing and primary tillage, and thereafter for variety of agricultural jobs, form weeding to harvesting (Sims and Kienzle, 2006).

The agricultural systems in Uganda over the years are characterised by dependency on human power with simple tools for production (UBOS, 2010). High transaction costs for labour saving technologies has forced smallholder farmers to continue relying on labour intensive means than capital intensive (Bagamba, Burger and Kuyvenhoven, 2007). Even the labour saving technologies are not readily available and supplied to farmers in some areas. Reliance on man power with no labour saving technologies reduces labour efficiency and also lowers farm power supply. Shortage of farm power constrains increase in agricultural production, with a resultant stagnation in farm family income and the danger of a further slide towards poverty and hunger (Sims and Kienzle, 2006).

There is minimal use of draught animal and mechanical power in Uganda and therefore smallholder farmers mainly depend on man power with simple tools (UBOS, 2010). According to Action Aid Uganda (2010), women contribute 70 percent of the agricultural labour therefore continued reliance on man power increases drudgery to women who have to balance agricultural work with other domestic work (Bagamba, Burger and Kuyvenhoven, 2007). Evers and Walters (2000), put it forward that even women have taken over some of the roles that were traditionally for men. They perform tasks that were traditionally outside their domain and most men are unwilling or unable to share women's work in most cases. Smallholder farmers would contribute more to the economy especially women if there were solutions to back breaking activities through use of efficient means in agricultural production. With improved technologies we are able to increase production per unit are, expand on the area under cultivation where land is available and reduce on drudgery (Sims and Kienzle, 2006).

2.2.3 Agro input use

According to Jayne, Mather and Mghenyi (2010), over the last 40 years, food crop productivity has risen through the rest of the world, yet has remained stagnant in Africa. And explanations for this are many, although they usually center on low input use. It's explained also that, there is limited use of fertilizers and improved cultivars most especially in Sub Saharan Africa and Uganda is not any different. Uganda is said to have low adoption rate for use of improved inputs (Okoboi, 2012) and programs like NAADS and other agencies that are involved in promoting use of modern agricultural technologies have an uphill task of providing. There is a need to persuade farmers that use of these technologies not only enhance yields but also increases farm profits.

Although use of improved inputs in production is desirable, not all farmers use these inputs due to various reasons like limited knowledge among farmers, limited access to credit, poor distribution systems for agro inputs among others (Okoboi, 2012).

Use of inputs like improved seeds & fertilizer is reported to be low in Kanungu District, only about 15 percent of the farmers use these improved technologies (KDDP, 2012-2015). Recent studies (C.C, 2012), indicate a decrease in production and productivity among smallholder farmers. Farmers are getting much less yields on farm compared to the research station. Soil exhaustion coupled with limited use of improved inputs among others are greatly contributing to low yields among smallholder farmers (C.C, 2012).

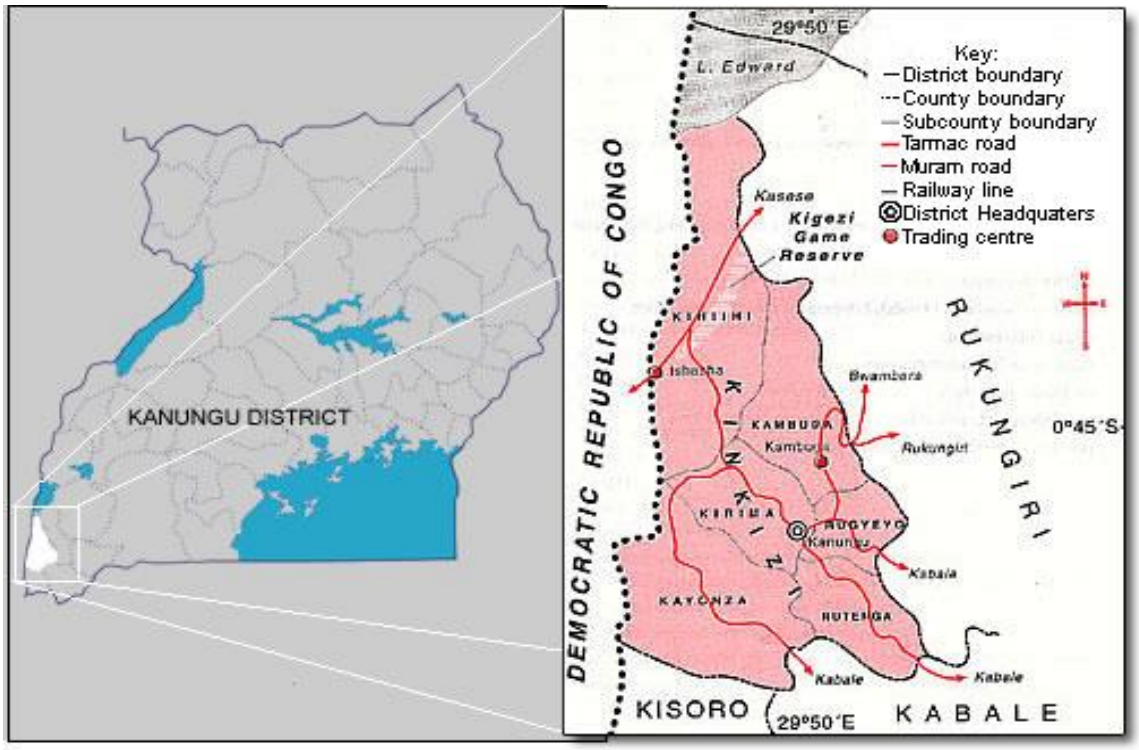
Chapter three: Methodology

This chapter describes the methodology of the research. It presents the research strategy, research design, and the methods of data collection that were used to achieve the research objective.

3.1 Research area

The research was carried out in Kanungu district, as stated before it's located in south western parts of Uganda with seventeen lower administrative units (Sub counties/ Town councils). The district is divided into three agricultural zones that is to say;
Low altitude, mid altitude and high altitude which range between 1000m-1300m above sea level, 1400m-1700m and 1800m- 2100m above sea level respectively (KDDP, 2012). The three agricultural zones have a few distinctive characteristics that differentiate one from another. Tea is grown in the mid and high altitude and therefore it's in here that the sub counties of Rugyeyo and Kirima (see figure 4) were selected for the research.

Figure 4: Map of Kanungu District showing study areas of Rugyeyo and Kirima sub counties



Source: Kanungu District Development Plan, 2012-202015

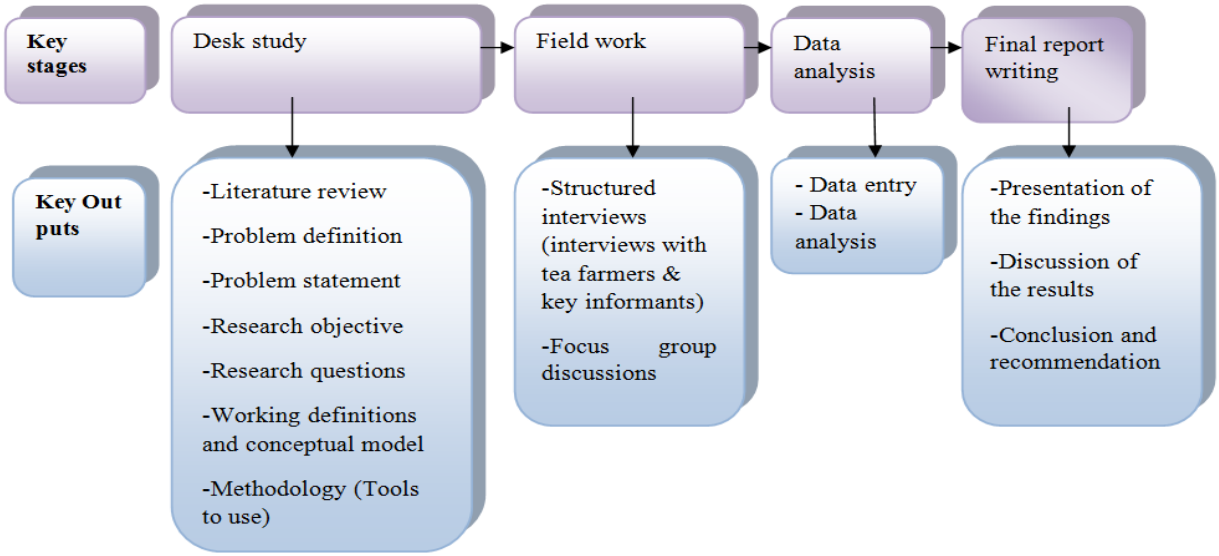
3.2 Research Strategy

For this study, a survey was used as a research strategy. This was conducted to collect comprehensive primary data that would answer the research questions. A survey which employed face–to-face- structured interviews was used. This enable the researcher to interact with the respondents and listen to them as they voiced out their opinions.

3.3 Research design

The study was both qualitative and quantitative in approach and was based on both literature and empirical data through desk study and field work respectively. Questionnaires and a checklist as tools were used in this research. The questionnaires were researcher administered to informants who were from the tea growing households in the district. And interviews guided by a check list were conducted among the key informants who are key stakeholders in tea promotion project. In addition to interviews, focus group discussions were also conducted. These assisted in giving more information relevant to this research.

Figure 5: The research stages



3.4 Desk study

This was the first stage of research and it involved collection and use of secondary information. It basically involved literature study for gaining more insight on the research conducted.

The information collection was through use of electronic search to access the digital library of WUR, as well as other internet sources, books, journals, reports and unpublished documents in relation to the research topic and area of study. This was done to find relevant information on the food security concepts and agricultural production among smallholder farmers.

Furthermore, the desk study was done to get the literature review and background information on the area of study in relation to natural resource endowments, demographic characteristic, tea promotion project its self and other relevant aspects that would influence the research under study. Partly this information helped in the development of the problem statement, research objective and research questions of which in all was an iterative process. The information obtained and gaps then helped in designing tools that were used in the field to get more relevant data. And this was later analysed to answer the research questions.

3.5 Field work

The field work was the second step of the research. It involved gathering primary data through interviews and focus group discussions. A questionnaire and a check list were the tools used to guide interviews and group discussions (see annexes 1, 2 and 3).

3.5.1 Interviews with farmers

The primary data from the households of smallholder farmers involved in tea production was collected by conducting interviews using a questionnaire as a tool. A questionnaire was prepared in advance and later pretested in the field. This was done to check its accuracy and preciseness in relation to the data that was required to answer the research questions. Later the questionnaire was adjusted as per the feedback to suit the information that was required. The questionnaires were researcher-administered to all the respondents, this was done in fervor of self-administered because; some of the farmers selected could not read and write. Also researcher administered questionnaires made it possible to clarify questions to the respondent where necessary. It was also intended to listen to the respondents directly as they voice out their opinions. This provided an opportunity to capture more stories relevant to the research topic during interviews. The questionnaire used comprised of both closed and open ended questions which could allow collection detailed information required to answer the research questions.

A sample of forty (40) households involved in tea growing were selected from the lists of tea project beneficiaries. The household land holding size was considered during selection of the households to involve in the interviews. As mentioned, land being known already as a limiting factor to crop production among the smallholder farmers in the district, it guided the selection of whom to involve in the interviews. A range of households with varying household land sizes were considered so as to get opinions from a range of farmers. Its form the 40 households selected then that 40 respondents were contacted for interviews. Equal numbers in terms of sex (20 male and 20 female farmers) were considered. This was done to obtain balanced information in relation to gender perspective.

3.5.2 Interviews with key informants

A checklist as a tool was used to conduct interviews with key informants (technical officers in the district production department, planning unit and from tea processing companies). These key informants were selected on the basis that they have access to information/ records on tea and food crop production, agro input use, prices and land use in the district. Therefore they were consulted then to provide information relevant to this research.

3.5.3 Focus group discussion

Two focus group discussions were conducted. The participants for these focus group discussions were selected from the existing farmer groups engaged in tea production. It should be noted that these existing farmer groups' are usually of a mixed composition in terms of gender. Two farmer groups were selected form the two sub counties of Rugyeyo and Kirima, one from each sub county. For the farmer group selected in Rugyeyo Sub County, only female members of the group involved in tea production were invited to participate in the Rugyeyo focus group discussion. And in Kirima the farmer group selected, only male members involved in tea production were invited in the group discussion held then. Both male and female farmers

were listened too, to obtain balanced information on gender point of view. And in both meeting, having one gender provided an atmosphere for the two to air out their opinions freely.

Table 2: Break down of the respondents

Method of data collection	**Type of respondent**	**Number of respondents**
Survey using a questionnaire	Tea farmers (both male and female)	40
Two focus group discussions	Tea farmers (both male and female)	22
Interviews with key informants	**District and factory technical staff**	
	a. District production coordinator	01
	b. District commercial officer	01
	c. District planner	01
	d. Factory manager (Kikinzi development tea factory)	01
	e. Factory field staff (Kayonza growers tea factory)	01

Source: Field result, August 2013

3.6 Data processing

Data collected was analysed using both quantitative and descriptive techniques. Data from farmers was coded and entered in Microsoft Excel and SPSS data sheets for analysis. The study used descriptive statistical tools to analyise the data which was presented in form of tables, graphs with percentages and frequencies. The analysis was done in a manner that would answer the research questions.

Chapter four: Research Findings

This chapter presents the research findings presented in tables, graphs, percentages and frequencies used to describe the opinions of the respondents in relation to the research questions. The results presented in this chapter include; level of farmers' involvement in both food crops and tea production, distribution of land, labour and agro-inputs in both food crops and in tea production and the contribution of income generated from tea to household food security.

4.1 Crop production

According to the KDDP (2010-2014), majority of the farmers in Kanungu district are smallholder farmers engaged in both crop production and livestock keeping. Irrespective of household land holdings, farmers on average are engage in growing more than three crops. It was found out that even households owning land in the range of 4-12 acres (1.6 - 4.8 ha) which is quite a big chunk of land under Kanungu situation, were also found to be involved in growing more three crops at the same time each in most cases on small scale. Some of the crops appeared in pure stands while other crops were intercropped. The commonly grown food crops in the sub counties where research was conducted included banana, sweet potatoes, cassava, maize, ground nuts and yams. Tea and coffee were the major cash crops. Famers tend to diversify in crop production as strategy to reduce risks associated with agriculture like droughts, hail storm, floods to avoid being caught off guard. This was done to protect their household income and food security.

Table 3: The predominant crops that are in three zones of Kanungu District

Zone	Sub counties	Predominant crops
Low altitude (1000m-1300m)	Nyamirama, Kihihi, Kihiihi Town Council, Nyanga, Nyakinoni, Katete	rice, maize, millet, cassava, ground nuts, coffee,
Mid altitude (1400m-1700m)	Rugyeyo, Kanungu T.C, Kirima, Kanyantorogo, Kayonza, Butogota T.C, Kambuga T.C, Kambuga S.c	banana, sweet potatoes, cassava, maize, Millet, beans, G.nuts, tea, coffee, pineapples
High altitude (1800m-2500m)	Mpungu, Rutenga, Kinaaba	potatoes, cassava, banana, beans tea, coffee

Source: Kanungu district survey, 2012

The survey findings showed that all the households engaged in tea production grow food crops besides for home consumption and excess for sale in some instances.

Over the years, survey findings showed that since 2007 the majority of the farmers (55%) have expanded on their tea fields compared to food crop fields. The expansion of the tea fields farmers say was well facilitated by the government program (NAADS) which supported them with tea seedlings that were previously expensive for them to buy. Also the will of farmers to

expand tea fields was as a result of farmers' realization that tea has ready market and gives a steady income to their households compared to food crops. A male respondent says:

> *"why invest more in food crops, those are women's crops". They manage them and all we get from them is food to fill our stomachs" (Rugyeyo, interview, 2013).*

Other farmers see tea as a security crop which they can use as collateral to get loans compared to annual food crops. Also some farmers take tea to be a security crop in their old age where the farmer rents out the tea field and shares with the tenant the income generated.

However, 45 percent of the households interviewed showed that over the years they have not been able to continue expanding on their tea fields irrespective of government's support because they have limited land to do so. Also the survey results showed that none of the households has experienced a reduction in the tea field size instead in the attempt to expand tea fields over the years, farmers showed that they have ever replaced a food crop on a given piece of land with tea. The survey results showed that none of the households has ever made an attempt to uproot tea to grow any of the staple food crops. This has resulted into a decline in household land size under food crops and vise-versa for tea. A male respondent says:

> *"may be if you have not yet tasted on tea money, how can you uproot tea to grow cassava? That is total madness" (Kirima, interview, 2013).*

On the same note, the results showed that over the years millet which was and still an important food security crop in the region is being a abandoned. The reasons to this act farmers say millet growing is labour intensive, less profitable according the farmers and above all that soils are exhausted to support millet production. A female respondent says:

> *"we used to grow millet when we had enough land, we would put part of our land under fallow for some time and then get back to it when it is productive enough. But now days you can't put land to rest may be if you want to die of hunger. Way back in my childhood, we used to harvest about 8 bags of millet each of 100kgs in 'omukyika' (0.2ha) but know days if you are lucky you get 1 or 2 bags" (Rugyeyo, interview, 2013).*

Also a female respondent laments,

> *"in fact am about to give up with maize growing. In a season I can harvest 2-3 bags of 100kgs in ómukyika' (0.2ha). It was only once that I harvested 8 bags of 100kg in 'omukyika' when NAADS had supported me with fertilizer and maize seed. But I didn't have money to continue buying inputs" (Kyirima, interview, 2013).*

The majority of the respondents (95%) irrespective of household land holding size and household's tea field size, ranked tea as the most important source of their household income. It's this income that is mainly tagged to finance household major expenses most especially school fees, medical care and other household essentials like clothing and fuel (kerosene). Farmer explained that income from tea is rarely spent on food, it's only happens in times of crisis for example if they experience crop failures and they have food shortages. Again on rare occasions it's spent on foods which they can't produce at household level and even not

produced by their immediate neighbors. In some situations where the immediate neighbor produces what a household is missing, barter trade was a practice instead of buying with cash.

The survey results showed that productivity of different food crops over the years was going down. Majority of the farmers (95%) showed that their yields for food crops per unit area are reducing over the years. And they believe that continuous cultivation of their soils without resting them (land fallowing) and with limited or not at all applying external inputs like fertilizers have made soils to get exhausted. For this reason, their yields are dwindling year after a year.

4.2 Land for production

4.2.1 Household land for crop production

The survey results show that majority of the farmers (90%) solely cultivated family owned land under communal private ownership arrangement which they used for agricultural production. Only a minority (10%) were found in addition to household land to be hiring extra land on short term to grow specifically annual food crops. They were not allowed to grow perennial crops on hired land.

According to the Kinkizi development tea factory production report (2012), the average size of tea fields for the out growers was about 2.5 acres (1ha). Also all farmers were found to be growing tea on family land. It's nowhere, a farmer is allowed to grow a perennial crop on a rented land.

Field findings showed that only 40 percent of the households involved in tea production were convinced to have adequate land reserved for food crops production to produce household food supply and surplus for sale. However 60 percent of the households agreed not to have adequate land reserved for food crop production though they were into tea growing. This was happening due to the benefits of tea growing as explained already before.

Table 4: Household land size and land reserved for food crops production

Responses	Household land holding size estimate (acres)											Total
	2.0	2.5	3.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.00	
a. Households with adequate land reserved for food crops	0	0	0	1	2	1	1	2	3	4	2	16
b. Households without adequate land reserved for food crops	2	8	14	0	0	0	0	0	0	0	0	24
Total	2	8	14	1	2	1	1	2	3	4	2	40

Source: Field result, August 2013

From the table 4 above, survey results showed that its only households which had land less or equal to three acres that did not have adequate land reserved for food crop production. On the other hand, its only households with land more than three acres that agreed to had reserved adequate land for food crop production.

Also the research findings showed that 48 percent of smallholder farmers households' interviewed were not producing enough staple food crops in their homes to meet household staple food required to feed the household members. And the major reason given of not doing so was that they had limited land to produce adequate food. And only 52 percent were able to produce enough of the staple food crops for home use and even surplus for sale to earn money. Some of the households which were not able to produce enough using their own pieces of land employed strategies which included; hiring extra land to grow food crops and be able to feed the household members, some offered casual labour for food ("okushaka"). Others were getting donations from neighbors or relatives working elsewhere to fill the food gap in their households. However farmers who hired land for food crops were always not sure of that same piece of land the following season since the landlords have the capacity to evict them any time. And this keeps them worried of their future household food supplies.

Table 5 Household land size and adequate staple food production at household level

Harvest enough staple food crops to feed the household members all year round	Household land holding size estimate (acres)											Total
	2.0	2.5	3.0	5.0	6.0	7.00	8.00	9.00	10.00	11.0	12.0	
Yes	0	3	2	1	2	1	1	2	3	4	2	21
No	2	5	12	0	0	0	0	0	0	0	0	19
Total	2	8	14	1	2	1	1	2	3	4	2	40

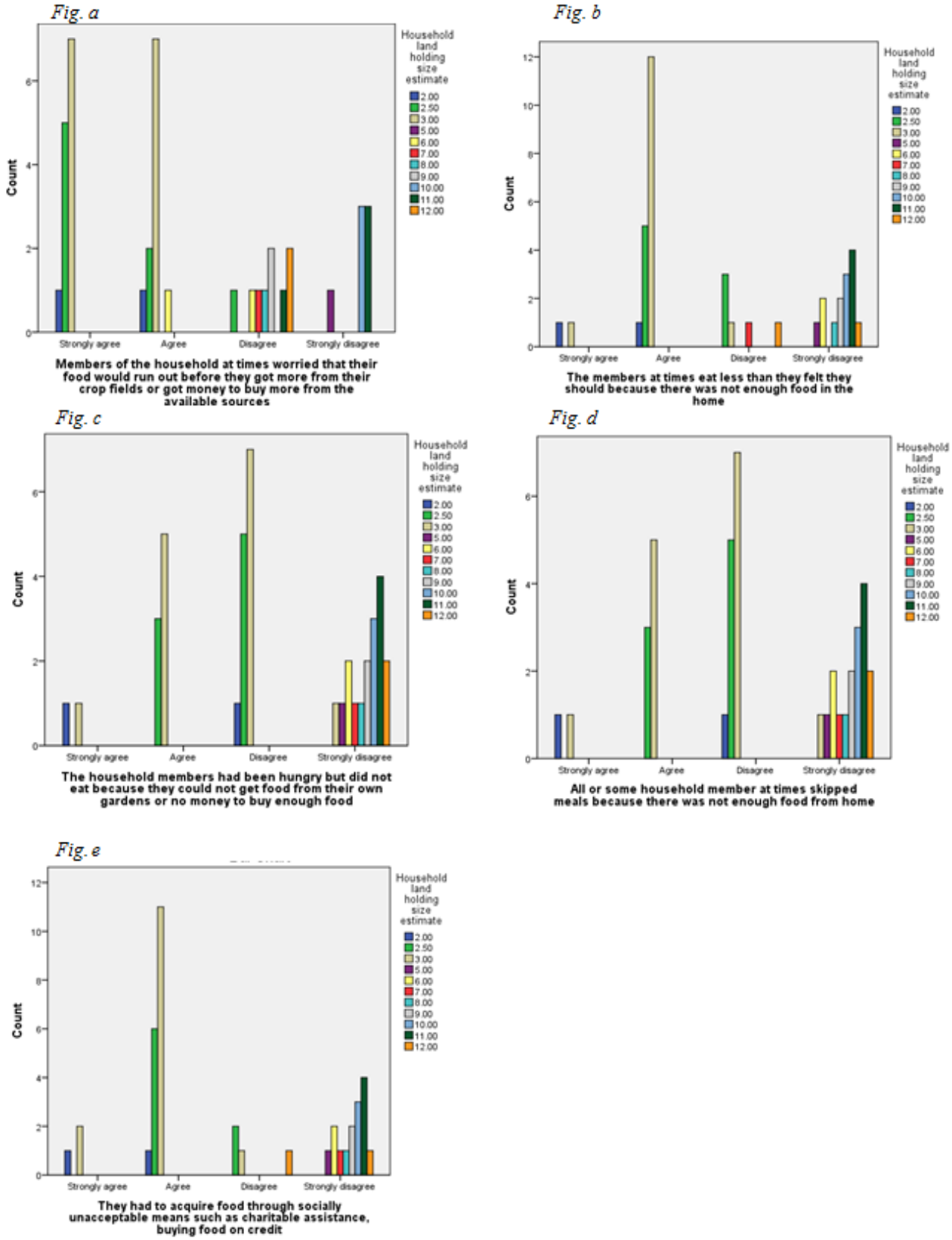
Source: Field result, August 2013

Table 5 above shows that all the households that responded to have not been able to produce enough staple food crops to meet household staple food needs were all with less household land holding which was less or equal to 3 acres of land. Contrary to those who responded to have been able to produce enough staple food crops, 76 percent of them were with relativity big household land holdings 5 acres and above. The 24 percent of the households that produce enough had less or equal to three acres of household land holding but their strategy was to hire extra land which they were using to grow staple annual food crops to sustain their households.

4.2.2 Households land holding verses selected household food insecurity indicators

The survey findings showed that households which were more limited with land for both food and cash crop production (less than 3 acres) were found to be more positive in response to some of the household food insecurity indicators. This phenomenon is illustrated in figure 6a, b, c, d and e.

Figure 6: Household land holdings verses selected household food insecurity indicators



Source: Field result, August 2013

The survey results presented in figure 6, showed how households with varying household land holdings were differently susceptible food insecurity in terms of supplies of stable food crops. Basing on the selected indicators below, according to Coleman, Nord, Margaret and Carlson (2011);

a. "Members of the household at times worried that their food will run out before they got more from their crop fields or got money to buy more from the available sources". This is represented in figure 6.a, it's found out that households which strongly agreed to this indicator were only households with less or equal to three acres of household land size. And its only households with household land holdings more than three acres that strongly dis agreed with this statement.

- "The members at times eat less than they felt they should because there was not enough food in the home". Again from the results illustrated in figure 6.b, it showed that it's only households with less or equal to three acres that were strongly in agreement with the statement.

- "All or some household member at times skipped meals because there was not enough food from home". In relation to this indicator, the results in figure 6.d showed that only households with less or equal to three acres of land agreed or strongly agreed with the statement but none of the households with household land holding above three acres were in agreement with the statement.

- "The household members had been hungry but did not eat because they could not get food from their own gardens or no money to buy enough food". Again in relation to this indicator, the results in figure 6.c showed that only households with less or equal to three acres agreed or strongly agreed with the statement but none of the households with household land more than three acres of land were in agreement with the statement.

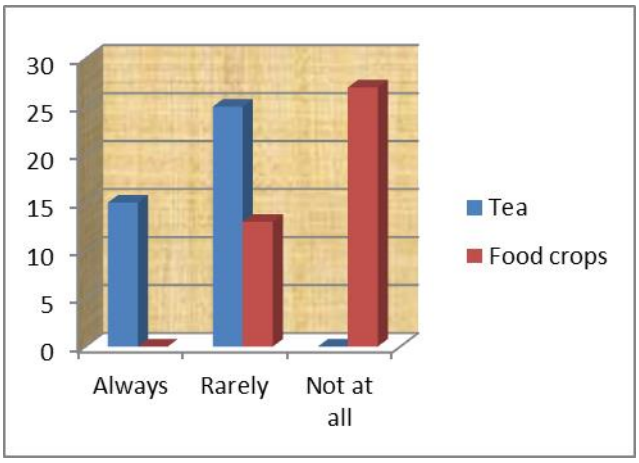
- "They had to acquire food through socially unacceptable means such as charitable assistance, buying food on credit". The results from the survey illustrated in figure 6.e showed that it's only households with less or equal to three acres of land that agreed or strongly agreed to the statement and all households with household land holding more than three acres disagreed or strongly disagreed with the statement.

It was found out that households with land holdings less or equal to three acres for staple food crops production and other land uses were much more positive in reference to food insecurity indicators compared to households with more than three acres of land.

4.3 Agro-input use in crop production

The survey findings showed that farmers find it expensive to buy and use some of the agro-inputs. Inputs like agrochemicals (fertiliser, pesticides, fumigants, plant hormones, herbicides) and improved seeds are hardly bought and used to improve on production and productivity of both food and cash crops. The farmers that have tried to use agro inputs, more effort has been put in tea production than in food crops.

Figure 7: The degree of a gro-input use (Agrochemicals and improved seed) in tea and food crops



Source: Field result, August 2013

The results showed that 38 percent of the farmers always apply inputs like herbicides and fertilisers to their tea fields to improve on the levels of production in tea and only 62% rarely apply the above mentioned inputs. The results also showed that none of the farmers was found not to be making use of the above mentioned inputs in their tea fields. Some farmers were buying inputs directly from agro input dealers and others were supported by the tea factories with inputs on credit. Inputs on credit would then be paid for in instalments. The factories deducted the money on the payments they make monthly for the green leaf supplied by farmers. Such factory arrangements enabled a number of resource constrained farmers to access inputs. Also some farmers were supported by the government under NAADS program with inputs although the support is not a continuous to individual farmers.

In food crop production it's almost the reverse. None of the farmers was consistently using inputs like improved seed, fertilizer and other agro chemicals to enable them improve on their yields. Only 32 percent of the households on rare occasions used these inputs. 68 percent were not using the above mentioned inputs in crop production. The farmers that on rare occasions used the inputs mentioned, most of them said that they were supported by the government under NAADS program. Farmers hardly buy these inputs with their own cash directly from the agro-input dealers. Surprisingly even some of the fertilizer that is given to farmers meant for food crops like NPK, under NAADS programme is diverted into tea fields. A male respondent said:

> *"how can I waste the opportunity, once am given NPK under NAADS programm to apply in maize, then they will have saved me from buying one for tea (Kirima, interview, 2013)."*

4.4 Labour supply in crop production

The field findings showed that the households were mainly dependent on family labour for farm activities with minimal or not at all use of hired labour. The 48 percent strongly agreed to be surviving on family labour and 52 percent agreed to the statement. None of the household disagreed or strongly disagreed not to be dependent on family labour. During a group discussion with farmers, farmers put it forward that casual labour supply has gone down and those available to offer the services are expensive to rely on. The youth prefer not to work on agricultural farms instead migrate to towns for other jobs. This contributes to less supply of casual labour for farming activities. Also during a group discussion, it was put forward that limited labour supply especially in food crop production at household level was greatly contributing to household food insecurity. It was stressed that husbands and school going children were less contributing to food crop production. It was mainly women's work to grow food crops even handle them in post-harvest related activities like sorting before storage. Also during the group discussion participants stressed that poor health of the women in some families put households at a risk of transitory food insecurity. Poor health of women makes the households to miss out some seasons of annual food crops. And this affects household food production and supply in the subsequent month hence making them less food secure. This showed the level of dependency on women to produce food crops for home consumption.

Figure 8: The gender analysis framework in crop and tea production

Crop	**Main activities**	**Who does what?**	
		Male	**Female**
		Man	**Woman**
Tea	Land clearing	✓	✓
	Hoeing (seed bed preparation)	✓	✓
	Digging holes	✓	✓
	Planting	✓	✓
	Weeding	✓	✓
	Herbicide application	✓	
	Fertilizer application	✓	
	Plucking green leaf	✓	✓
	Delivering green leaf to collection centers	✓	✓
Annual food crops (maize, millet and beans)	Land clearing	✓	✓
	Hoeing (seed bed preparation)		✓
	Planting		✓
	Weeding		✓
	Harvesting		✓
	Drying		✓
	Sorting		✓

Source: Field result, August 2013

The frame work was drawn during group discussions with farmers. It was found out that men concentrated their labour in tea production. And women are always called up on by men to participate in tea farming activities as shown in the frame work whenever a need arises. In food crop production, considering the main and common activities related to the three staple food crops, men are less active. Men only participate in land preparation and this is not always the case. Men participate in land preparation mainly when the crop fields are to be established on a land that is so bushy and needs clearing before digging is done. The rest of the work is left to be done by the women as illustrated in figure 8 above. Women complained of too much work they are left alone to do. In addition to farm work, they are expected to do domestic chores work. They are expected to prepare food for the family members, fetch water and fire wood and other chores work. In some instances men have even ignored the roles that were traditionally acknowledged to be men's work. A female respondent says:

> *"traditionally women we were not allowed to climb. But what should we do, our husbands are no longer interested in constructing for us granaries or food stores. So we shall start to climb because how do they expect us to construct without climbing" (Rugyeyo, interview, 2013).*

Some households were found to be experiencing poor post-harvest handling of grains due to men's neglect to construct food stores. And this raises post-harvest losses of food at household level.

Figure 9: Poor post-harvest handling of maize combs and sorghum during drying and storage in Rugyeyo Sub County

Maize combs scattered in the leaving room

Maize combs dried on the ground

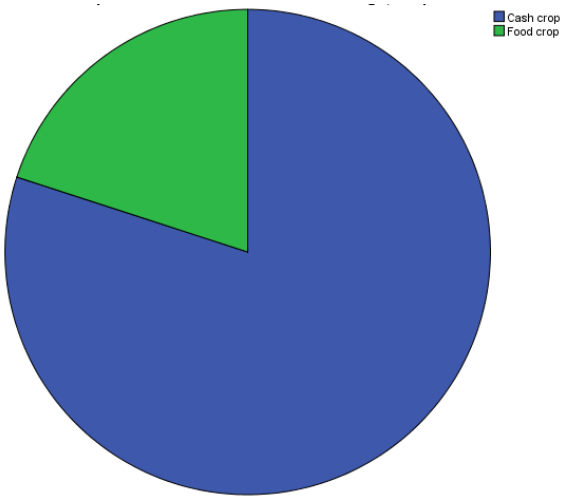
Sorghum dried on the polyethane paper

Source: Field result, August 2013

From group discussions it was stressed that famers experience labour peak times. This happens in the period between months of September- November and February- March which are the two rainy seasons in Kanungu district. During these periods, so many farm activities are going on in both food crops and tea. It's during this period that all annual food crops are planted, weeding in the perennial food crops like in banana plantations is at the peak. Even in tea production, during the rainy season tea is more vegetative and therefore requires more labour to pluck the green leaf.

The field findings showed that at labour peak times, the majority (80%) of the farmers give priority to tea related farm activities with limited family labour force.

Figure 10: Responses in relation to prioritisation of labour in tea and food crops



Source: Field result, August 2013

Even when the household is to hire casual labour, tea related activities are given priority. During group discussion, participants strongly said that women are always called upon to participate in plucking green leaf when a need arises. The survey results also revealed that much of the farm work both in food crops and tea are done manually with simple tools. They hardly use labour saving technologies which makes it more time consuming and less efficient in production.

4.5 Contribution of tea to household income and food security

4.5.1 Household income

The survey results showed that among the tea growing households, 95 percent strongly agreed that tea was the major source of income in their households. The key informants from the tea factories provided information which showed that on average smallholder tea farmers harvest 4200kg - 4800kg per acre (0.4ha) annually. Currently the farm gate price for a kilogram of green leaf is 400Ug (0.13 euro cents). Therefore on average smallholder farmers are able to earn 1,680,000Ug - 1,920,000Ug (560 euros – 640 euros) per acre (0.4ha) annually. The records from the tea factories in Kanungu district showed that over the years they have experienced an increase in the green leaf they receive from out growers and this in return translates into the money that is paid to the tea farmers for their green leaf. Factory records showed that green leaf received from tea farmers has increased from 12,171 tons by 2007 to 18,548 tons by 2012. This means that 7.4 billion Uganda shillings (2.47 Million euros) was the income generated by the tea farmers from their tea sales to the Kanungu tea factories by the year 2012. The tea factories have always provided ready market, offer transport services for the green leaf and pay farmers promptly in two installments. Farmers are paid 93 percent of the total sales for their green leaf supplied monthly (first payment) and 7 percent is accumulated and paid once in a year (second payment). This kind of payment arrangements were found to be favorable among the farmers, the fact that they were always assured of the money at the end of every month and year. The factories encouraged their clients to have accounts with microfinance institutions within their

locality through which their money is always deposited to by the tea factories. During interviews a respondent says:

> *"By the way, civil servants are not better off me, I receive monthly salary from my tea fields and I get my gratuity every year. In fact am better off because I don't receive orders the way civil servants do" (Kirima, interview, 2013).*

Figure 11: The trend of green leaf received by the tea factories in Kanungu District

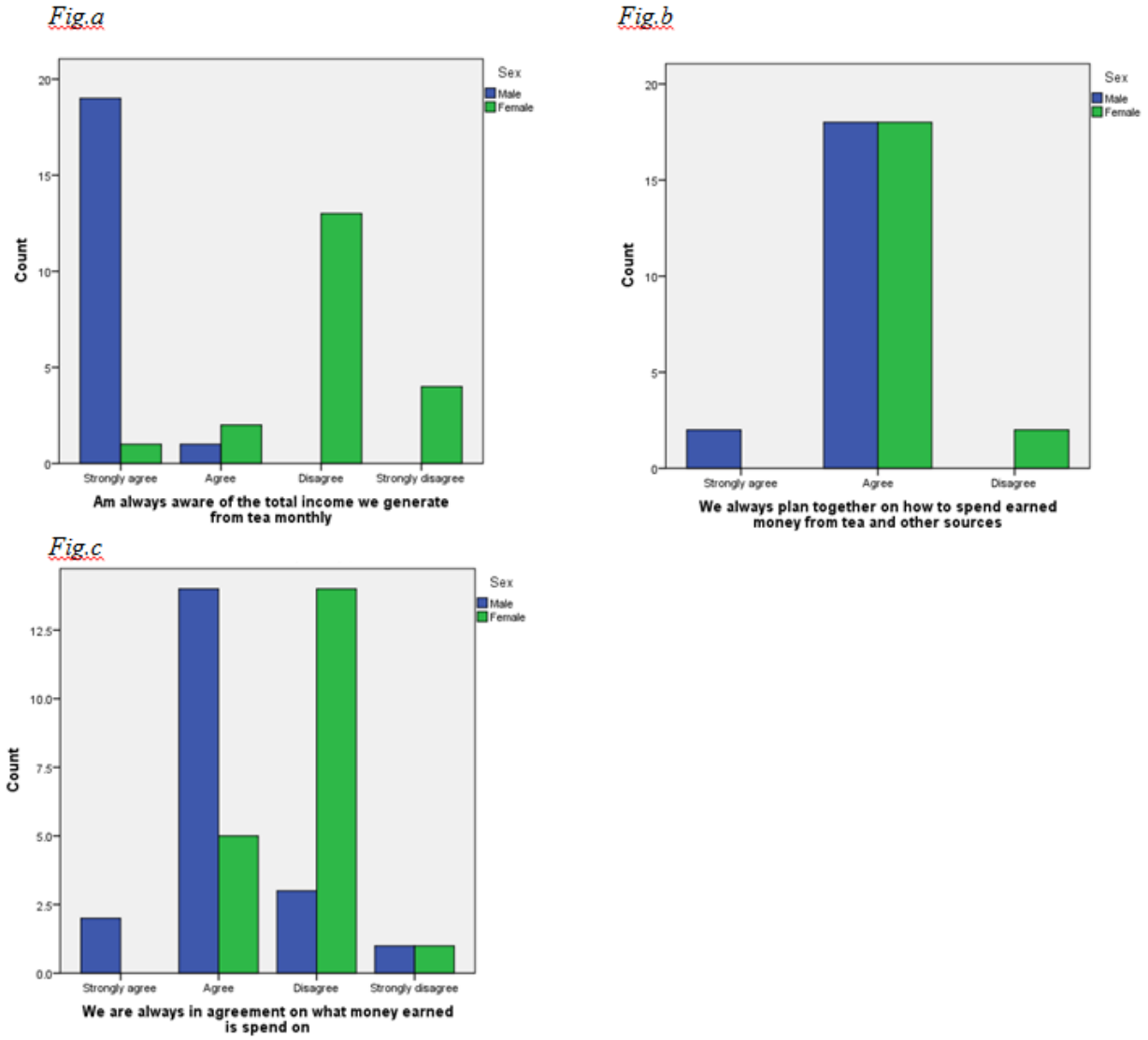
Source: Field result August, 2013

These increments in green leaf received and processed by the tea factories was attributed to the government programms that promoted tea growing among the smallholder farmers in the district since 2004 up-to-date. The shape increment of green leaf supplies form 13.1 tons to 7.2 tons in the years of 2009-2010 is attributed to the quantities of tea seedlings that were supplied to farmers in the previous time that were also then contributing to total tea production in the district.

4.5.2 Household income, access and control

The survey findings showed that a significant income is always generated from tea sales, and is ranked by the majority to be the most important source of household income. However, women's access and control to this income is questionable.

Figure 12: Responses of men and women in relation to household income and expenses



Source: Field result August, 2013

The responses from men and women in figure 12a showed that majority of men are always aware of how much they earn from their tea green leaf compared to the women. Women in most cases are left in the dark and 85 percent of the women interviewed were not aware of how much the household earns from tea.

Also figure 12b shows that the majority of the couples do plan together on how they should spend the money earned with in their household. However this was always a cover for men, women said. Women accused men of not taking up their suggestions and end up spending the

money earned as per their wishes. This is illustrated in figure 12c where the majority of the women (75%), were not in agreement with the statement. Men always make final decisions in most cases on what money should be spent on. A female respondent said:

> *"How dare you ask the husband how much he has withdrawn after the factory has deposited money at the end of the month. The day money is deposited, it's Christmas day to him. He reaches home drank and if you are lucky you find half of the money withdrawn still with him. If you dare ask him and you argue with him, then that night you sleep outside the house. Which you worked with him to construct" (Kirima, interview, 2013).*

Also during a group discussion, women complained of the tea factories putting all the money on men's account which they cannot access. This lets women down and cannot benefit equally on the tea proceeds for their hard labour they invest in tea in most cases. In relation to transparency of how much the household earns from tea, most men are not open to declare exactly what they earn monthly. A male respondent said:

> *"you cannot declare every single coin to your wife. If you declare everything then what if you want to marry a second wife or buy a beer, where do you get the money from?" (Rugyeyo, interview, 2013).*

All this show the level to which women are denied access and control to household income.

4.5.3 Household food sources

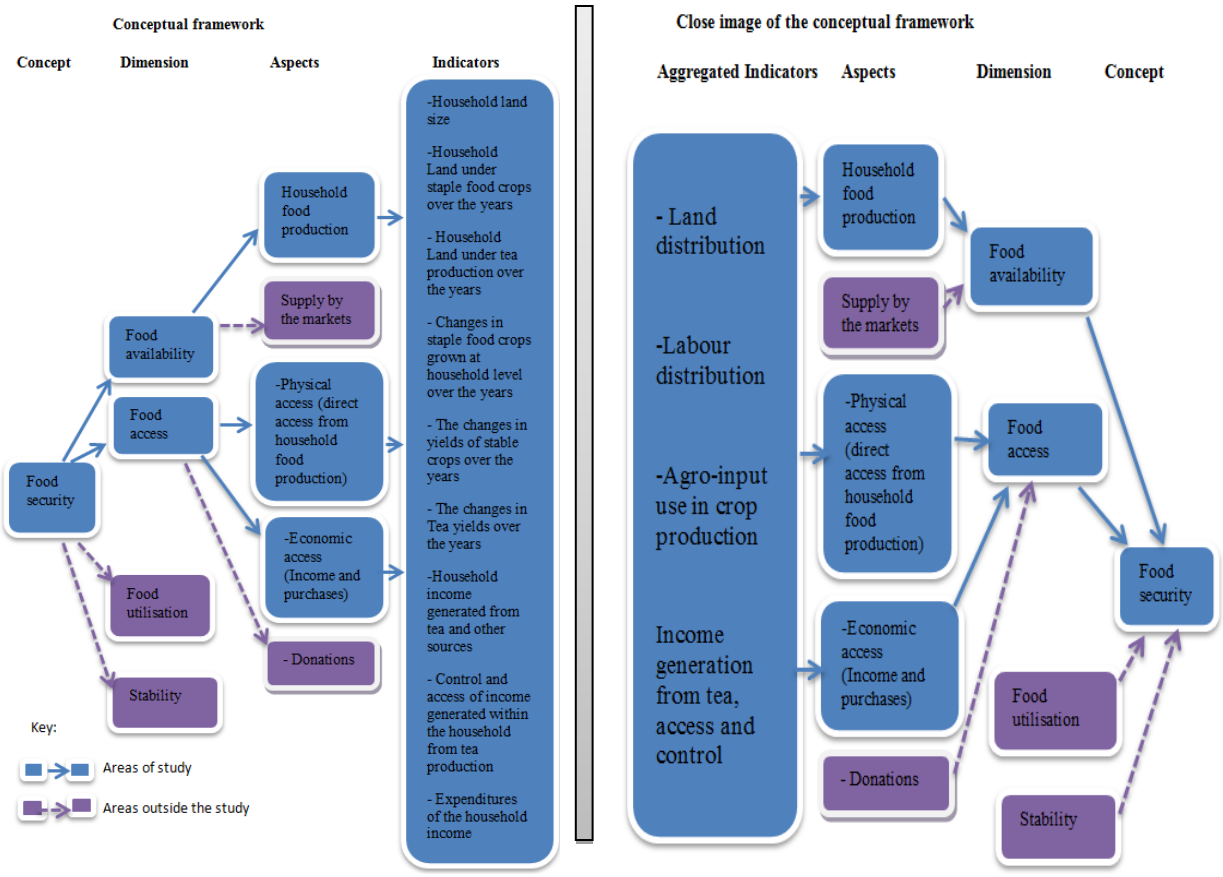
The field results showed that all the households mainly feed their household members with food they produce on their farms. They hardly buy food and that if they were to buy food, it happens in times of crisis or buy food which the household or even neighbors cannot produce. Findings showed that the household income is spared for other household expenses. It is mainly spent on school fees, medical care and household items like fuel (kerosene). And these are so demanding the respondents said. The survey findings showed that on rare occasions when they are to buy food, majority buy from food stores and local markets.

From the field findings, all the respondents unanimously agreed that food is readily available within the food stores and in the local markets. However 95 percent of the respondents strongly agreed that prices of stable food crops are not affordable. Prices for many food crops continue to go up as indicated in annex. 4.

Chapter five: Discussion of the Results

This chapter goes further to discuss the field findings in relation to the research questions. In this chapter, close to a mirror image of the conceptual frame work (figure 13) is employed to analyse the research findings. The finds on the measurable indicators with in the conceptual framework were the ultimate facts that were aggregated into the basics of land, labour, agro-input use in tea and crops production and also on income as described in chapter four. These aggregated basics were later used to discuss the influence of tea promotion on the aspects of food availability and access, which in turn influence household food security.

Figure 13: The research conceptual framework and its close image



5.1 Land distribution

5.1.1 Household land

As already mentioned, smallholder farmers are farmers that are resource constrained (ETI, 2005). And among the resources they are constrained with, land is inclusive. The average household land holding in Kanungu district is at 2.5 acres or 1 ha (District survey, 2012). The results revealed that it was only households with land less or equal to three acres that were much more food insecure compared to the households which had relatively large chunks of land. This was in relation to food insecurity indicators (Figure 6). The households with large

chunks of land were not any different in terms of farming technics they employed on their farms to produce more food per unit area. They instead take advantage of big sizes of land they hold to allocate more land to food crop production. And this enables them to produce what is enough for home use. This makes them food secure in terms of physical staple food supply in their households compared to their counterparts with limited land. The same result brings an impression that households with limited household land holdings getting involved in tea production did not make them any better in terms of accessing physical food. The limited land they allocated to food crops, resulted into low production at household level with the currently poor agricultural practices. This consequently affected food availability aggravating food insecurity.

The reality is that food crop production is competing with tea for production land among the smallholder farmers with limited land. The fact that almost all households increase their crop production through extensive farming other than intensive farming it puts households with limited land at a greater risk (Jayne, Mather and Mghenyi, 2010). Therefore smallholder farmers with limited land need to be aware of this competition and grant enough land to food crops as one way to increase physical food production and food supply to their households under the current poor farming techniques. The level of awareness will help farmers to be much more conscious when taking decisions and choices on which crops to grow on their limited land.

5.1.2 Rented land

From the results, table showed that 21 percent of the households with limited land, less or equal to three acres were found to be hiring extra land to grow staple food crops. And at the same time reserving a portion of their own land to grow tea that is taken to be “a man’s crop” purposely for income generation. In the first place, the strategy of hiring land to increase production and food supply at household level seemed unrealistic and even not sustainable. Farmers were not entering into any long term contracts with the landlords and they were being sent off from using the hired land with a short notice or no notice at all. And this resulted to sudden shocks in terms of food supply to some households causing transitory food insecurity in some households. The strategy is not sustainable to smallholder famers compared to better plans to use their own land. Appropriate choices on which crops to grow with limited resources must get into the minds of smallholder farmers. It’s not that other staple food crops that are always competing with tea for production land are not profitable as alleged by some farmers especially men. According to the District survey (2012), on enterprise profitability analysis food crops like cassava, banana, beans and ground nuts which perform in the same region are ranked and reported to be more profitable than tea in terms of income generated per unit area with a consideration of all other factors of product. Therefore, smallholder farmers need to look at these food crops as enterprises and alternative source of income which can fetch money and at the sometime directly contribute to household physical food supply.

5.2 Farm labour supply

5.2.1 Gender differences in labour supply in crop production

In reference to the survey results, it’s noted that smallholder farmers in Kanungu district are constrained not only with land but also with labour supply. Food crops are seen to be “women’s crops” and women are left alone in most cases to get engaged in almost all the farm activities and even in post-harvest activities of food crops.

"Why invest more in food crops, those are women's crops". "They manage them and all we get from them is food to fill our stomachs" (Rugyeyo, interview, 2013), a male respondent says.

This shows you the level to which women are left alone in food crop production. Women are left helpless only to invest in their labour and produce food crops to their level best to feed the household members.

According to Action Aid Uganda report (2011), women produce 80 percent of the food and provide about 70 percent of the total agriculture labour in Uganda. Most men seem not to be concerned as to why they should invest their labour in food crops production. Men have cut off their labour supply from food crop production, instead supplied their labour into tea production. Even the children on rare occasions that used to participate in food crop production, with introduction of free education programms, they are less available to help their mothers. This worsens the labour supply in food crops production at a household level. As if this is not enough to burden women in terms of labour supply in their household, in addition they do chores work. Women have to prepare meals, collect fire wood and water in the absence of the children. All these activities leave women divided and end up also investing limited time and labour in food crop production. Therefore over dependency on women to produce food crops has resulted to limited food production at household level. A female respondent says:

> "*nowadays things are too hard for me, my children go to school they used to help me a lot, my husband is either in his tea garden or in his own things and then am left alone to prepare the crop fields, plant, weed, do everything. You can imagine two hands to feed eight people in this household. God should have mercy" (Kirima, interview, 2013).*

All this makes life for rural women hard and full of misery in trying to feed the household members.

5.2.2 Prioritisation of labour supply in crop production

The survey results showed that at labour peak times, the majority (80%) of the farmers give priority to tea related farming activities. During labour peak times, women are also called upon to supply their labour in tea production. From group discussions, farmers stressed that they experience labour peak times in the period between months of September- November and February- March which are the two rainy seasons in Kanungu district as already mentioned. It's during these rainy seasons that tea is more vegetative and therefore requires more labour to pluck the green leaf. Due to too much dependency on family labour, scarcity of casual laborers coupled with high wages of casual laborers, men decide to call upon women also to supply their labour in tea plucking. It's during this same period (rainy season) that women are supposed to be planting the annual food crops like maize, beans, ground nut and millet. Also weeding in the gardens of perennial food crops like banana is at the peak since weeds too tend to accumulate during the rainy season. But at times all these activities are postponed in favor of plucking green leaf. A male respondent said:

> *"we have to dedicate our time first in tea because with green leaf, you have to pick it at a right time or else you make a loss. Weeding in cassava, banana plantation can wait,*

even if you weed at a later time nothing happens to them. You will still find the plants standing upright" (Kirima, interview, 2013).

The fact that women are at this time in tea production plucking green leaf, activities in the food crop fields are postponed and not done in time. According to MacDonald, etal. (2009), timely field operations is one of the principles in crop production. Operations like planting, weeding, fertilizer application and harvesting need to be done timely to achieve better yields. But in relation to the field findings where women are delayed to perform some of the activities in crop fields has an impact on the total production. This in the long run influences how much food will be physically produced and available in the households. MacDonald, etal., (2009), timely planting of crops like cereals makes them to benefit on the nitrogen flush that accumulate in the upper layers of soil during the dry season, more likely to receive enough rain and a void coinciding with dry spells and get through the production cycle before pests and disease accumulate in the fields. This makes the crops to flourish and perform better than crops not planted in time. All these benefits are missed out by the famers who delay to plant, consequently affecting their production.

Besides that, prioritising tea in labour peak times and other days supplying minimal labour to food crops has made women to abandon some food crops that are labour intensive like millet. This is reflected in the results as one of the reasons as to why women are abandoning millet production. However good it is as a food security crop in the region, many farmers are in the course of a abandoning it. Women have decided to go for crops that are less labour intensive like sweet potatoes, beans, yams and potatoes which are more perishable and can't last in stores for a long time due to lack of value addition technologies compared to millet. Millet is a very important food security crop in the region, it is one of the cereal crops that has less storage pests and can be stored for a very long time and be used by the households in times of food shortage. All these benefits are being abandoned the fact that they experience labour shortages in their households. The implication is that at times of crisis, households which used stored millet as a fallback position to feed their households is no more, instead they rush to food stores to buy maize flour for those who can afford.

5.2.3 Lack of labour saving technologies

The survey results revealed that all the households of smallholder farmers interacted with do their farming activities manually with simple tools. This worsens the situation of labour supply in crop production. Farming is generally characterised by use of rudimentary tools which is a true picture of subsistence farming in Uganda (UBOS, 2010). During group discussions farmers acknowledged to be using hand hoes, machete, spades and other elementary garden tools in crop production. Sims and Kienzle (2006), puts forward that estimated 65 percent of the land in sub-Saharan Africa is prepared by hand power. Women using rudimentary tools to produce food crops makes it laborious and time consuming.

Use of rudimentary tools affects total crop production in terms of the total acreage that can be put to crop production. Even with households where land to grow food crops is not limited, women cannot go further to realise their full potential the fact that they are using tools which are not efficient at all. For example, according to UBOS report (2010), it takes 15-20 man days to prepare one acre (0.4 ha) size of a maize seed bed with a hand hoe, only 6 hours for animal draught power use and 30 minutes with a tractor. This give us the idea of how much time is

wasted due to use of rudimentary tools. And how much extra land that would be put to use to food crop production in households where land is not a limiting factor if such labour saving technologies are in place. This would in turn translate into more food production and physical food availability at household level even in the district. The main reasons given by farmers why not try labour saving technologies were; because of limited cash to invest in the technologies, technologies are not at all available in the district and to some farmers, they were not aware of technologies to use. This is in line with Okoboi (2012) who adds to say that limited knowledge among farmers, limited access to credit and poor distribution systems for agro inputs contribute to low adoption of labour saving technologies.

5.3 Agro input use

The survey findings showed the use of agro-inputs especially agrochemicals (fertiliser, pesticides, fumigants, plant hormones, herbicides) and improved seeds in crop production is a very rare practice among smallholder farmers. Results showed that only 32 percent of the smallholder farmers were on rare occasions using the mentioned inputs and at the sometime not consistent in using them. And 62 percent of the households do not at all make use of these inputs. The main reason given by farmers why so, was that they have inadequate cash to invest in these inputs. Also from the results, farmers attitude in relation to use of agro inputs in food crops production was identified to be one of the big challenges limiting usage of external inputs. For example a male respondent said:

"how can I waste the opportunity, once am given NPK under NAADS programm to apply in maize, then they will have saved me from buying one for tea (Kirima, interview, 2013)."

This shows you that to some farmers it's not only limited capital to buy these inputs but attitude itself. Male farmers have less interest in investing in food crops. Results showed that none of the households interviewed for example was not applying fertilizers in tea but it's the reverse in food crops. For the majority of the households as indicated in figure 12, men have access and control of major income sources and their for they can afford to buy inputs to invest in tea since its "a man's crop." And this is not true for food crops because they are taken to be "women crops" and yet most of the women have access but no control over the income in their households and therefore cannot afford to invest in inputs. Even women that have been trained in farmer field schools under NAADS programm and are aware of the contribution of external inputs, most of them are helpless because cannot afford to buy them. They only stop at using the packages that are given to them by NAADS and later when finished are not supported by men to buy more inputs. Most women for example were using retained seeds of which they are aware of that their productivity is very low. Such conditions worsens food production and food availability at household level.

Also results showed that due to limited land, farmers continuously cultivate their land without resting it growing annual crops. This practice coupled with limited use of fertilisers accelerates the soil exhaustion in return which reduces crop yields. According to AT Uganda Ltd (2010), soils in Uganda have been exhausted of their natural fertility through continuous cropping without external inputs. In relation to this and the research results, famers stressed to have been experiencing the decline in yields of most food crops. The low yields they are getting from exhausted soils have discouraged some farmers from reinvesting in their labour. Soil exhaustion explains why most farmers have abandoned crops like millet yet its major food security crop in

the region. Cereals (maize and millet) are heavy feeders which can no longer be supported by the exhausted soils (AT Uganda Ltd, 2010). All this that is happening translates into low yields, low food production consequently affecting food availability at household level.

5.4 Household income, its access, control and expenditures

Field finds showed that on average smallholder farmers are able to earn 1,680,000Ug - 1,920,000Ug (560 euros – 640 euros) per acre (0.4ha) annually. It was also reported that about 7.4 billion Uganda shillings (2.47 million euros) were paid to tea farmers in 2012 and factories predict to receive more of the green leaf in the coming years. The prediction is attributed to the fact that a considerable acreage of tea fields planted in recent years have not yet fully established to offer green leaf expected per unit area. But in the coming years, the same tea fields are expected to have fully established and give the maximum yield as possible. This implies that more than 7.4 billion Uganda shillings will be annually be earned by the tea farming households. This will be a great success for the project as it will be in the direction of achieving one of its objectives which was to increase household income among smallholder farmers.

However, what remains unclear is to whether the project will have achieved its second intended objective which was to improve on household food security through economic access. According to Devereux and Maxwell (2001), food security planners have to make choices and sometimes trade-offs considered when promoting a cash crop or a food crop in relation to food security. In relation to tea promotion project, the project was anticipating to improve on smallholder farmers' household income and their purchasing power to access food through market supply. Talking of economic access to food, through enhancing the purchasing power of an individual or a household to accessing food through market supply among the smallholder farmers who are resource constrained is puzzle. The results showed that most of the households produce their own food for home consumption and only buy in times of crisis like if they experience crop failures or when the family cannot real produce what they need to consume at home with the resources available. In line with these findings Kigutha, etal. (2010), expressed that the majority of the households in Sub-Saharan Africa depend on food produced at home than urban people whose food supply is dependent to the market supply. It's a culture deeply rooted among the rural people and they feel much more food secure once they are producing much of the food they need to consume. Therefore the survey results are not a surprise that households rely on food they produced on their farms.

Even though these farmers are to rely on the markets for food, it's realised from the results that tea is the major source of income for 95 percent of the tea growing households and the income from tea is mainly planned for to finance other major household expenses like school fees and medical care. This therefore leaves the household divided on whether money should be spent on food or the other expenses. And this is realised in the results when farmers said that much of their income is rarely spent on food only in times of crisis but much more on other expenses. These conflicting expenses again at household level lower the purchasing power of the most households.

Devereux and Maxwell (2001), also say that dependency on the market supply puts you at risk because of the variations in food supplies and fluctuations in food prices. When prices of food crops go high and tea is still stable it implies that the household dependent on the market food supply has to spend more than it used to on food. Annexes 4 and 5 show the fluctuations of

food and tea prices respectively over the years. Comparing the prices since 2008 up to 2012, it's very clear that prices of most staple food crops fluctuate and not stable. And the trend shows that from 2008 up to date prices of staple food crops continue to increase at a much faster rate than tea prices. This implies that farmers have to sell more kilograms of tea green leaf to buy the some quantity of staple foods over the years (barter terms of trade). This trend is not favorable for a household which decides to depend on market supply for its food. The prices of these staple food crops in the long run are likely to rise even much more faster than it has been the fact that tea growing promotion is too affecting the internal total staple food supply to the local markets in the district as already explained in chapter four. This will make food prices more unaffordable and much more a challenging to those households that will be producing tea on limited acreage earning slightly low income from it. Such households might find themselves in the situation where all the income earned from tea is again spent on household food or even in deficit. All this might aggravate food insecurity in the district more especially among smallholder farmers who do not produce enough food for their households. It would be better for such households with too limited land to concentrate on food crop production in such situation than putting their limited resources to tea production.

The survey results also revealed that women who are awaited to prepare and save food on the table in most households they have no access and control to the income generated from tea and other sources. Form the results it was found out that in most cases money for tea earnings is deposited on the farmers' accounts where men are usually sole signatories. In some households women are not even aware of how much they earn from tea regularly. She says:

> *"how dare you ask the husband how much he has withdrawn after the factory has deposited money at the end of the month. The day money is deposited, it's Christmas day to him. He reaches home drank and if you are lucky you find half of the money withdrawn still with him. If you dare ask him and you argue with him, then that night you sleep outside the house of which you worked with him to construct" (A female respondent in Kirima, interview, 2013).*

Therefore it's a great risk to take it for granted that the income from tea will enable smallholder farmers' households to access food through markets. It's not always the case that all men that receive earnings from tea are mindful to spend on household food. Some men have side expenses which do not develop or sustain other household members. As a saying goes "it's risky to carry all your eggs in one basket." According to Ellis (2000), diversification among rural households is a strategy to their risks. Therefore smallholder farmers having land reserved to produce enough staple foods for home use at worst would be a meaningful strategy for such households than relying on tea income.

Chapter six: Conclusion and Recommendations

6.1 Conclusion

Smallholder farmers engaged in tea production, tea growing is done besides food crops whose production is at a subsistence level. Tea is an established agricultural enterprise in the district with a clear value chain and with a number of stakeholders interacting at different levels. From the results it's clear that tea promotion project is on its course to achieving one of its objectives which was to increase household income. It's a major source of income to the majority of tea growing households and it has tremendously supported the lives of many people in the district. The income generated has supported household in many ways but most especially in educating their children and paying for their medical bills. However, the income generated from tea has not contributed much to household food security. It's is neither invested in food crop production nor always used to buy food for household members.

Tea growing among smallholder farmers who are much more resource constrained results into a competition for production factors between tea and food crops production. Some farmers reserve inadequate land for food crops and with the current poor farming practices cannot harvest what is enough to sustain their households. Household labour is not evenly distribution between food crops and tea. Men tend to prioritise tea and give less attention to food crops. Women are always left alone to produce food crops with rudimentary tools which are inefficient. This results into low food production and food availability at household level.

In terms of agro input use, smallholder farmers have shown less interest to invest in food crops compared to tea in terms of agro input use to improve production. Men who control major sources of household income take food crops to be a female crop and have not invested in them. Women are left helpless to see crop yields dwindle down year after a year due to soil exhaustion as a result of continuous cultivation with minimal use of external inputs. Many farmers are on the course of abandoning traditional staple food crops whose yields have gone down due to soil exhaustion.

The tea growing promotion project has not been gender sensitive. Supporting households in the tea enterprise continues to widen the gap between men and women. This is in relation to income distribution between men and women. Men are accessing and controlling the income from tea which is the most important source of income in the tea growing households. Women have been left in the dark making them weaker in terms of decision making at household level.

Therefore all this said, tea growing among smallholder farmers that are much more resource constrained and poorly guided compromises household food production, food availability and access. This aggravates food insecurity in the households and in the district at large.

6.2 Recommendations

Basing on the fact findings of the study, how the tea growing promotion is affecting household food security of the smallholder farmers the following points are recommended to improve on the current situation.

The key stakeholder in the implementation of the tea project (Kanungu District Local government, NAADS secretariat and tea factories) should improve on the selection criteria for the future tea seedlings beneficiaries. More clear guidelines based on profitability analysis of tea in relation to other food crops and resource base of the smallholder farmers should be considered to determine farmers that should or not benefit from the tea seedlings that are given out.

Studies have shown that crop productivity both in tea and food crops is still much below the research station levels. And the major reason attributed to this has been limited use of agro inputs among the farmers. Efforts should be put by NAADS or any agricultural development programs to give a complete package (planting materials with agro chemicals) to increase production per unit area than increasing production through increased acreage. On the some note, affordable credit for agro inputs attached to food crop production should be extended to women to facilitate increased production for food crops.

NAADS and any other agricultural development programs in the district should have trials of labour saving technologies in food crop production. These technologies should be intended to reduce human drudgery in performing activities related to crop production. Findings showed that almost all the work is manual with use of rudimentary tools.

NAADS and any other agricultural development programs in the district should look at developing the value chains of some profitable food crops which can double deal as food crops and cash crops. Developing value chains for food crops by providing more stable markets for farmers, would economically empower women that are much more involved in food crop production through earnings. And they would be able to plough back part of the proceeds. This will in the long run improve on food crop production at household level. In the same line, developing a value chain of food crops which are double dealing as cash crops would interest men too to invest their labour in food crops. Men always attach their labour to money and therefore how much they are to earn from such food crops would interest them to invest in their labour and even money earned from other sources. And this in the long run would enable farmers to produce more at home for sale and for home consumption.

The tea factories as part of their social cooperate responsibility should consider trainings for both men and women on gender inequalities. Training both men and women to get to the understanding the need for equal access and control of the income generated from tea is a pertinent issue at stake. Failure to do so may result into women not willing to participating in tea production at household level. Women failure to supply their labour in tea production would automatically lower the tea green leaf production at household level. This would endanger tea factories business since in the long run may operate below their capacities affecting their profits too. Considering these trainings would be sustainable to the factories and to the smallholder farms households if the factories care about the well-being of their clients. Also the community and gender based department of Kanungu Local Government should also step up the same

trainings or work hand in hand with the tea factories to make sure that these gender inequalities are resolved.

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Appendices

Annex 1: Questionnaire

The influence of tea growing promotion on household food security among smallholder farmers

A case of Kanungu District

Questionnaire

Informed Consent

You are being asked to participate in a study on investigating the influence of tea growing promotion on household food security among smallholder farmers: A case of Kanungu District. The study is in fulfillment of a master degree in Management of Development, specialization in Rural Development and Food security. Your participation is voluntary and you will encounter no personal risk from participating in this study. The information you provide will be anonymous and kept strictly confidential .If you have any questions about the study, please do not hesitate to contact us, either by email or phone. Email: bmkmathias@yahoo.co.uk; Phone no: +256776476266

Date:…… Signed:…… Respondent

Serial No:…….

Section A: Basic information

1. Location……..... Sex: Male ( ) Female ( )

2. Primary Occupation:..... Household size:……

Section B: Resources and production

3. Ownership of land: Freehold ( ) Leasehold ( ) Mailo ( ) Communal ( )
4. Household landholding estimate :.....(Acres).....(Hectares)

5. Do you grow any food crops? Yes ( ) No ( )

6. If yes which food crops do you grow? .....

7. How often do you use inputs like fertilizers, improved seeds and pesticides to attain high yields in
   the staple food crops?
   Always ( ) Rarely ( ) Not at all ( )

8. Which of the following statements do you agree with on comparing annual production for the staple food crops you grow over the years?

   a. The annual production is on increase ( ) b. The annual production is more less the same ( )

c. The annual production is going down or reducing ( )

9. What could be the reasons for the above answer……..

10. Which of the statements do you agree with?
    a. I have adequate land to grow enough of the food crops for home use and surplus for sale ( )
    b. I don't have adequate land to grow enough of the food crops for home use and surplus for sale ( )
11. Do you harvest enough of the staple food crops you grow to feed the household members all year around? Yes ( ) No ( )

12. If not how do you sustain the household?.....
13. Which of the following statements do you agree with?
    a. Members of the household (mainly adult) at times worried that their food would run out before they got more from their crop fields or got money to buy more from the available sources.

       Strongly agree ( ) Agree ( ) Disagree ( ) Strongly disagree ( )
    b. The household members at times eat less than they felt they should because there was not enough food in the home.

       Strongly agree ( ) Agree ( ) Disagree ( ) Strongly disagree ( )
    c. All or some household member at times skipped meals because there was not enough food in the home.

       Strongly agree ( ) Agree ( ) Disagree ( ) Strongly disagree ( )
    d. The household members had been hungry but did not eat because they could not get food from their own gardens or no money to buy enough food.

       Strongly agree ( ) Agree ( ) Disagree ( ) Strongly disagree ( )
    e. They had to acquire food through socially unacceptable means such as charitable assistance, buying food on credit etc.
       Strongly agree ( ) Agree ( ) Disagree ( ) Strongly disagree ( )

14. Since 2007, which of the following statements do you agree with?
    a. More land has been put under staple food production ( )
    b. Land size is still more less the same under staple food production ( )
    c. Land size under crop production has reduced ( )

15. What could be the reasons for the situation above?.....

16. Are you still growing all the food crops you used to grow (way back 2007)? Yes ( ) No ( )

17. If not, which crops aren't you growing anymore?.....

18. If you stopped growing some of the crops, what were the reasons behind it?
    .....
19. How big is the size of your tea field currently?.....
20. Since you started to grow tea or way back in 2007. Which of the following statements describes your situation. Tea garden size has…..

    a. Been expanded ( ) b. Remained more less the same ( ) Reduced in size ( )

21. What could be the reason(s) for the above given answer?.....
22. Which of the following statements do you agree with?

    a. I have ever replaced food crop field with tea growing ( )

    b. I have ever cleared a tea field to grow food crops ( )

23. How often do you use external inputs like fertilizers and herbicides to ascertain high yields in tea?

    Always ( ) Rarely ( ) Not at all ( )

24. Do you agree with the following statements?

    a. We mainly depend on family labour for farm activities. Strongly agree ( ) Agree ( ) Disagree ( ) Strongly disagree ( )

    b. We do experience labour peak times and labour shortage during farming activities. Strongly agree ( ) Agree ( ) Dis agree ( ) Strongly dis agree ( )

    c. At labour peak times and with labour shortage, we prioritise farm activities for? Cash crop/ tea ( ) Food crop ( )

    d. We hardly use labour saving machinery in farming activities and basically relay on manual labour

    Strongly agree ( ) Agree ( ) Disagree ( ) Strongly disagree ( )

Section C: Income and Expenditures

25. What are the major sources of income in your household?.....
26. How do you rate tea as a source of income in your household?

    Most important ( ) Important ( ) Less important ( )

27. Do you agree with the following statements?

    a. Am always aware of the total income we get from tea leaves sold every monthly.

    Strongly agree ( ) Agree ( ) Disagree ( ) Strongly disagree ( )

b. We always plan together (husband and wife) of how the money we earn from tea and other source

should be spent. Strongly agree ( ) Agree ( ) Disagree ( ) Strongly disagree ( )

c. We (husband and wife) are always in agreement with what we spend on money we earn monthly.

Strongly agree ( ) Agree ( ) Disagree ( ) Strongly disagree ( )

28. In case you disagree/ strongly disagree with any of the above statements, give reason(s)...……

29. What are some the things that you usually spend on much of your income?.....

30. Which of the following is the main source of food you prepare at home?

From a family gardens ( ) From markets through buying ( ) Gifts/donation ( ) Any other specify……

31. How often do you buy staple food for home consumption?

Always ( ) Rarely ( ) Not at all ( )

32. If you are to buy staple foods, do you agree with this statement?

a. Staple food crops are always available in the nearby.

Strongly agree ( ) Agree ( ) Disagree ( ) Strongly disagree ( )

b. Prices of staple foods crops are usual affordable.

Strongly agree ( ) Agree ( ) Disagree ( ) Strongly disagree ( )

33. Where do you have to buy food crops in case you are to do so?

Daily/weekly local markets ( ) Supper markets ( ) Directly from farmers ( ) Any other specify……..

Thank you for your participation

Annex 2: Checklist for interviews with Key informants

A) Tea factory staff for both Kayonza Tea growers factory and Kikinzi Development tea factory (Field manager or Station Manager)

- Tea green leaf supply and processed over the years
- Tea green leaf prices over the years
- Number of out growers
- Farmers average tea field size'
- Acreage of factory tea estates
- Productivity of tea fields (Estates and out growers)
- Payment procedures
- Agro input support

B) District production staff (DNC, DPC and DCO)

- Land use
- Crop production and productivity
- Farmers supported over the years
- Value of support given to farmers
- Selection of farmer beneficiaries to tea project
- Strategies to improve food security in the district
- Food security crops in the district
- How food security crops are promoted
- Prices of different crops over the years
- Profitability analysis of the major crops in the district
- Use of external inputs in crop production

Annex 3: A check list for focus group discussion

Topic: The influence of tea growing promotion on household food security among smallholder farmers

1. Listing food crops grown and ranking them to their relevancy in terms of food security at household level (Pairwise ranking tool to be used).
2. Which of the staple food crops mentioned are getting less grown in the current cropping system compared to past years and why?
3. What do you usually consider when making a choice of what to grow on your land?
4. And who determines what to grow on the family land?
5. How often do you use inputs like fertilizers, improved seeds and pesticides to attain high yields in
   both food crops and tea?
6. Which farming activities are both men and women always involved in for both tea and staple food crops production? (Outcome; Harvard Analytical Framework/Gender Roles Framework).
7. Which of the activities mentioned above are you likely to postpone in labour pick times and shortage?
8. What could be the causes of food insecurity with in your villages?
9. What do you usually spend the money on with the money earned from tea and other sources? (Major expenditures)
10. Who determines when, how to spend the money and on what? (among the man and woman in a household)

Annex 4: Prices of food crops for the years 2008-2013

CROPS	Unit	FOOD STORE AND LOCAL MARKET INFORMATION					
		Average prices in Uganda shillings for years 2008 – 2013					
		2008	2009	2010	2011	2012	2013
Rice	Kg	2,000	2,200	1,500	2,700	2,600	3,000
Maize grains	Kg	300	800	200	1,200	800	800
Maize flour	Kg	800	1,300	800	1,650	1,500	1,600
Matooke	Kg	200	250	150	300	500	800
Sweet potatoes	Kg	200	550	250	400	500	600
Potatoes	Kg	500	800	750	1000	1,100	1,500
Millet grains (kg)	Kg	800	1,200	900	1,500	1,600	2,000
Millet flour (kg)	Kg	1,200	1,600	1,200	1,500	1,800	2,600
Sorghum gains (kg)	Kg	600	800	500	900	750	1000
Sorghum flour (kg)	Kg	1,200	1,200	1,400	1,600	1,600	1,800
Cassava chips (kg)	Kg	500	800	600	500	500	1,300
Cassava fresh	Kg	800	1,000	1,400	1,200	1,200	1,600
Beans	Kg	800	1,000	900	1,500	1,200	1,800
Peas (kg)	Kg	1,400	1,800	2,000	2,100	2,300	3,400
Ground nuts (kg)	Kg	1,500	2,300	2,000	3,500	3,600	3,800

Source: Adapted from district market information reports 2008-2012

Annex: 5 Farm-gate prices of tea green leaf for the years 2004-2012

Year	Farm-gate price for a kilogram of tea green leaf (Ug)
2004	160
2005	160
2006	180
2007	200
2008	210
2009	310
2010	310
2011	400
2012	400

Annex 6: Photo Gallery