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DETERMINANTS OF FARMER PARTICIPATION IN AGRO PASTORAL FIELD SCHOOLS: A Case Study of Moroto District in Uganda

Submitted by

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DECLARATION

I, **Meltreen Sikele Wanyonyi**, declare that the thesis, *"Determinants of Farmer Participation in Agro Pastoral Field Schools: A case study of Moroto District, Uganda",* is the outcome of my original effort, completed under the supervision of Professor Jaromír Harmáček. The analysis presented here has not been published anywhere else before. All the literature and secondary sources used in the study have been duly cited and referenced.

Meltreen Sikele Wanyonyi

Date: 31.05.2021

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Zásady pro vypracování

The term Agro Pastoral Field School (APFS) or Farmer Field School (FFS) can be used interchangeably as a participatory and innovative learning approach with an aim of building the capacity of farmers to analyze their production system, identify problems, experiment with potential solutions and adopt farming techniques that are appropriate to their farming systems. Evidence shows that participation in the APFS contribute to community development in a variety of ways such as improving the livelihood of vulnerable groups and promoting gender equality. Addressing the gender inequality issue through participation in the APFS will enable equal access to productive resources and economic opportunities which is essential towards promoting food security and poverty reduction among the rural households of Karamoja sub-region. Due to the voluntary nature of membership in the APFS, it is important to understand the socio-economic factors that determine farmer participation in the APFS. This will facilitate development of better strategies to improve gender inclusivity in farming practices.

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1. Bello, A. (2020). Factors Affecting Respondents’ Participation in Farmers Field Schools in Khartoum State, Sudan. Advances in Social Sciences Research Journal –Vol.7, No.4
2. Bello, J. Agunbiade, T. (2011). Gender and Farmer Field Schools in Agricultural Production Systems in West Africa. The International Journal of Science and Society.
3. Chocholata, L. (2020). Farmer field schools, gender equality, social inclusion and community empowerment –Experiences from Uganda - Karamoja sub-region, case study. Rome, FAO. https://doi.org/10.4060/cb0709en
4. FAO (2016). Farmer Field Schools and Empowerment.
5. UNFPA (2018). Leaving no one Behind in Karamoja. Issue Brief 07

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ABSTRACT

This study investigated the determinants of farmer participation in Agro Pastoral Field Schools (APFS) in Moroto District, Uganda. Structured paper aided questionnaires were used to collect data from 220 respondents and a multistage sampling technique was applied. Descriptive statistics as well as quantitative analyses were performed using the Pearson chi-square test and the binary probit regression model.

Majority of the respondents were female, married, unemployed and lacked formal education. The major reasons for not participating in APFS programs were lack of knowledge about the existence of APFS groups and too much responsibilities which prevented one from joining.

Training attended by the farmer was found to be statistically significant using the Pearson chi-square test while the results of the binary probit regression model revealed that a farmer's age was positively associated with the decision to participate in APFS groups. The level of education and marital status of the farmer were found to be statistically insignificant due to the fact that majority of the farmers in Karamoja have no formal education and are either married or in a domestic partnership. The gender of the farmer was also insignificant which implies that the APFS programs are equally accessible to both men and women in Moroto District.

Table of Contents

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

AMN – Acute Malnutrition

APFS – Agro-Pastoral Field Schools

BMI – Body Mass Index

C&D – Institute for International Cooperation and Development

CAHW – Community Animal Health Worker

CAPS – Community Based Integrated Watershed Management

CARE – Cooperative for Assistance and Relief Everywhere

CSA – Climate Smart Agriculture

DRM – Disaster Risk Management

F-SURE – Fostering Sustainability and Resilience for Food Security in the Karamoja Sub-Region

FAO – Food and Agriculture Organization of the United Nations

FCS – Food Consumption Score

FFS – Farmer Field Schools

GAP – Group Action Plan

GEF – Global Environment Fund

GoU – Government of Uganda

INRM – Integrated Natural Resources Management

IPC – Integrated Phase Classification

IPM – Integrated Pest Management

IPPM – Integrated Production and Pest Management

IPTT – Indicator Performance Tracking Table

KAP – Knowledge, Attitudes and Practice

M&E – Monitoring and Evaluation

MAAIF – Ministry of Agriculture, Animal Industries and Fisheries

MOA – Ministry of Agriculture

PFS – Pastoral Field School

SLM – Sustainable Land Management

UBOS – Uganda Bureau of Statistics

USAID – United States Agency for International Development

UNICEF – United Nations Children's Fund

VSLA – Village Savings and Loans Association

WASH – Water, Sanitation and Hygiene

WFP – World Food Programme

THE INSTITUTE FOR INTERNATIONAL COOPERATION AND DEVELOPMENT (C&D)

The Institute for International Cooperation and Development, also known as C&D, is a non-profit organization which serves as the operational branch of the Italian based association, Africa Mission. Founded in 1972, C&D is recognized as an NGO which is eligible for international development and volunteering, as per Law No 49/87, which regulates the Italian public aid for developing countries. The organization has its main offices in Kampala and Moroto (Uganda), with more than 150 employees. Aside from emergency interventions, C&D has ongoing projects in the sectors of: Water, Sanitation and Hygiene (WASH), Healthcare, Socio-education, Agriculture/ Livestock, Child protection and Support sector for local realities. This serves to assist the local communities face their state of need and see them through their journey to development, providing them with the necessary means and capacity to learn and grow independently, (Africa Mission, 2021).

Beginning February 2021 to end of May 2021, I was based in the Monitoring and Evaluation (M&E) department of the C&D office in Moroto. During this period, I was assigned to the F-SURE project under the direct supervision of the M&E officer. My main duties and responsibilities included: Designing M&E plans and tools for the F-SURE project (these included the Indicator Performance Tracking Table (IPTT), Logical framework, Periodic reporting templates, APFS/ FFS group registration and attendance forms, Item distribution forms, VSLA tracking tools, Survey tools among others); Participating in the data management collection, data entry, data cleaning and data analysis exercises as required by the department (A key example is the Knowledge, Attitudes and Practice (KAP) endline survey, for the Feeding with Food and Knowledge project); Report writing; Offering administrative support alongside other members of the department; and Assisting in organizing for corporate M&E meetings and workshops. A detailed chronogram of the internship duties has been included in Appendix 6.

CHAPTER I: INTRODUCTION

The main goal of this study is to investigate the determinants of farmer participation in agro-pastoral/ farmer field schools (APFS/ FFS) in Nadunget and Tapac Sub counties of Moroto District in Uganda. The APFS approach has been identified by the Food and Agriculture Organization (FAO) as a solution to the chronic food insecurity situation, which has rendered many households vulnerable in the Karamoja Sub-region of North-Eastern Uganda. Through active and constant participation in the APFS groups, the technical capacity of farmers will be enhanced in relation to improved crop farming and livestock rearing. Moreover, the APFS groups will benefit members through creation of new income opportunities and diversification of income sources.

The effectiveness of APFS groups in addressing challenges related to food insecurity depends upon membership to such groups. Taking into consideration the numerous benefits associated with participating in farmer groups such as APFS/ FFS, it is expected that majority of the community members will sign up for membership into the APFS groups. However, due to the voluntary nature of membership into the APFS groups, some people prefer not to join, citing various reasons for their reluctance. Others tend to discontinue their membership status at some point after joining the APFS groups. It is therefore important for policy makers, development practitioners and researchers to understand the determinants of farmer participation in APFS programs, as well as obstacles to participation in order to formulate policies and strategies that address such hindrances.

1.1 Food Insecurity in Karamoja Sub-Region, Uganda

According to the overall food insecurity classification,[1] almost half (46%) of the population in Karamoja is considered to be food insecure, out of which 9% are classified as severely food insecure (WFP and UNICEF, 2017). This shows a marked improvement from the overall situation in 2016 whereby 50% and 12% of the population were considered to be food insecure and severely food insecure respectively (WFP and UNICEF, 2017). According to the IPC Acute Food Insecurity report (2020), 27% of the population in Karamoja is facing high acute food insecurity (IPC Phase 3 or above) as compared to 17% in Kampala City (IPC, 2020). However, this is projected to decrease by 11% in 2021.

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[1] The overall food insecurity classification was obtained using the food security index, which incorporates the food expenditure, food consumption score and livelihood coping mechanisms, (UNICEF and WFP, 2017).

The 2017 Food Security and Nutrition Assessment report by WFP and UNICEF reveals that the 4% increase in food security can be attributed to an increase in humanitarian assistance in the sub region, covering 31% of the households. Moreover, the 6-year trend in food consumption score (FCS) remained stable with a 6% improvement in the poor FCS in 2017 as compared to 2012 (WFP and UNICEF, 2017). The prevalence of severe, moderate and acute malnutrition was also investigated and the study findings differed across all the seven districts of Karamoja (i.e. Abim, Amudat, Kaabong, Kotido, Moroto, Nakapiripirit and Napak Districts). Out of the seven districts, Moroto District displayed the highest score in Global Acute Malnutrition (GAM) and Severe Acute Malnutrition (SAM), with 18.5% and 4.5% respectively. Kotido District had a Moderate Acute Malnutrition (MAM) score of 15.0%, followed by Moroto District with a score of 14.0%. This was way higher than the overall score for Karamoja Sub region whose scores for the severe, moderate and global acute malnutrition were 2.9%, 10.9% and 13.8% respectively. From the findings, women and children, as well as female headed households are more susceptible to severe cases of food insecurity (WFP and UNICEF, 2017). These findings are in line with the IPC Acute Malnutrition scale where Moroto District is classified as being in the Critical level of acute malnutrition (Phase 4) with a GAM of 16.9% (IPC, 2020), while Napak District is classified in Serious state (IPC AMN Phase 3). The remaining districts are classified in Alert (IPC AMN Phase 2) (IPC, 2020).

The severe food insecurity situation in Karamoja Sub region has continuously been aggravated by combined forces which include: i) Increased weather variations,[2] especially poor, spatial and temporal rainfall distribution, leading to poor harvests which in turn leads to reduced food availability at household level; ii) The overall lack of sufficient food stocks leads to the communities relying on market food which has been sourced from other regions. Consequently, the unprecedented increase in staple food prices affects almost 75% of the households who rely on market food for more than half of their food consumption (UNICEF and WFP, 2017); iii) Endemic hazards that affect livestock and agricultural productivity such as high incidence of pests and livestock diseases. The situation is further aggravated by the high variability in climatic conditions, inability to sustain the high living standards and lack of support structures (both technical and

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[2] Between 2040 – 2069, minimum, maximum and average temperatures are projected to increase region wide by 1.8 – 2.1^{0}C, 0.3 – 1.7^{0}C and 1.2 – 1.5^{0}C respectively. Although less certain, rainfall is projected to reduce (50 – 150mm), with distinct annual variabilities, (USAID, 2017).

social) (Browne and Glaeser, 2010). Moreover, the constant migration of livestock in search for water and pasture makes it difficult to contain the threat and spread of animal diseases, (Browne and Glaeser, 2010); and iv) Civil insecurity which includes remarkable variations in the occurrence of cattle raiding and other forms of burglary and violence. The raiding has become more commercial in nature, with a shift in raiding patterns from acquiring large herds of cattle to keep and build one's wealth size to a small-scale raiding pattern, whereby the seized livestock are taken to the market for sale. The insecurity has been exacerbated by the illegal ownership of firearms, despite the government efforts at disarmament,[3] (Browne and Glaeser, 2010). In addition, poor dietary practices in terms of the quality and quantity of food consumption among children, poor feeding and caring practices as well as the unavailability of proper water and sanitation facilities worsen the already deteriorating food insecurity situation in the sub region (IPC, 2020).

One of the major consequences of food insecurity is acute malnutrition (IPC, 2020). As mentioned before, the effects of food insecurity are mostly experienced by women and children. Approximately 203,000 children less than five years of age were acutely malnourished in Karamoja during the course of 2020 (IPC, 2020). Notable differences are observed in terms of the underweight status of both women and children as well as stunted growth in children. According to the 2017 report by WFP and UNICEF, results for the body mass index (BMI) indicate that the rates of underweight women increased by 9%, from 30% to 39%, between 2016 and 2017. Taking into consideration the nutrition status of children, the prevalence of GAM and SAM for the children in the sub region was recorded at 13.8% and 2.9% respectively. For children 6 to 59 months old, boys were more severely affected than girls in terms of acute malnutrition (16.8% and 10.8% respectively). Weight was measured using the Weight-for-Age index and the prevalence for underweight among children aged 6 to 59 months was recorded at 27.7%, with Moroto and Kotido Districts recording the highest prevalence (35.9% and 33.1% respectively). Overall, the prevalence of underweight in children increased by 5.3% between 2016 and 2017. The prevalence of chronic malnutrition (stunting) among children was measured using the Height-for-Age index and was recorded at 32.6%, with the highest prevalence in Moroto District (40.9%), (UNICEF and WFP, 2017).

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[3] The voluntary disarmament program in Karamoja Sub region was initiated by the GoU in 2002 as a response mechanism to the escalation of firearms and high incidences of civil insecurity in the sub region, (Browne and Glaeser, 2010).

Several households have been able to develop response strategies which enable them to deal with the prevailing food insecurity situation in the sub region. These include: finding supplements to their dietary requirements through collection of wild foods and consumption of local brew; consumption of less preferred food; and a reduction in the quantity and portion of meals, (Browne and Glaeser, 2010; IPC, 2020; UNICEF and WFP, 2017). Other response strategies are violent and illicit in nature such as cattle rustling, ambushes by the roadside and other forms of banditry. However, consecutive shocks experienced in Karamoja have rendered some of these coping mechanisms unreliable. This is particularly true for coping strategies that rely on natural resource exploitation such as dependency on bush and wood products, (Browne and Glaeser, 2010). This renders the communities more vulnerable and susceptible to subsequent shocks.

There are various recommendations to address the food insecurity situation in Karamoja which include short-term, medium-term and long-term interventions. The short-term interventions that have been proposed to fill the current deficits include but are not limited to: i) Introduction of social protection programmes such as public cash for work programmes which will enable the marginalized households to access cash income; ii) Support both the agricultural and agro-pastoral households with seeds and other planting material; and iii) Improve animal health through vaccination programs, improved access to veterinary care and drugs and improve the access to and availability of Community Animal Health Workers (CAHW) (FAO, 2016). A number of development organizations, in collaboration with the district local governments, have put in place medium and long-term solutions within a Disaster Risk Management (DRM) framework to target crop and livestock production, land and water management and alternative sources of income. One of the main projects that is currently being implemented by FAO in Karamoja Sub region to build the capacity of farmers to address the persistent food insecurity situation is the F-SURE project.

1.2 The F-Sure Project

The project, "*Fostering Sustainability and Resilience for Food Security in Karamoja Sub region*" (F-SURE),[4] seeks to address chronic food insecurity in the Karamoja Sub-region of North Eastern Uganda, which is caused by a multitude of forces including land degradation and climate change

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[4] Resilience refers to the capacity of all or part of a system to deal with stresses and shocks, which occur as a result of variability in climate change, as well as the capacity of local communities to survive and recover from shocks related to food, caused by factors such as conflict and prices, and thrive in various climatic conditions, (FAO,2017).

dynamics. The project's overall goal is *"to improve food security by addressing the environmental drivers of food insecurity and their root causes in Karamoja sub-region",* (FAO, 2017). The key stakeholders involved in the project include: i) the funding partner i.e. the Global Environment Fund (GEF); ii) the implementing partners i.e. the Government of Uganda through the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF), FAO and UNDP, in collaboration with the local governments from four districts in Karamoja and various NGOs; and iii) the project beneficiaries i.e. the local communities of four selected districts in Karamoja Sub-region (Nakapiripirit, Moroto, Kaabong and Kotido Districts).

In order to achieve its objective, the project aims to realize the following three outcomes: i) Strengthen the enabling policy and institutional frameworks, through various multi-stakeholder platforms which will enable better planning; ii) Invest in food production systems and value chains using the APFS/ FFS approach which has been formulated to adapt to the local realities of the agro-pastoral communities of Karamoja; and iii) Facilitate the development and implementation of a monitoring and evaluation (M&E) framework for both socio-economic and global environmental benefits. The project directly contributes to FAO's strategic objective SO2 and indirectly to strategic objectives SO1, SO4 and SO5 (FAO, 2017).[5]

One of the implementing partners for the F-SURE project is the Institute for International Cooperation and Development (C&D), which supports and facilitates the APFS/ FFS approach in Nadunget and Tapac Sub-counties of Moroto District. The project utilizes APFS/ FFS and watershed management approaches to apply the concepts of Integrated Natural Resources Management (INRM) and Sustainable Land Management (SLM) to build community capacity to sustainably manage land and water resources, and to promote a more productive landscape (FAO, 2017). The most vulnerable groups, especially the women and youth, have been given special focus in order to guarantee equality and eliminate underlying vulnerabilities (FAO, 2017).

C&D is engaged with a total of sixteen (16) trained field facilitators, two (2) project assistants, the local government and other partners to oversee and support the establishment and formalization of APFS/ FFS groups in two main sub counties (Nadunget and Tapac) of Moroto District. The APFS

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[5] The following are FAO's strategic objectives: SO1 *"Contribute to the eradication of hunger, food insecurity and malnutrition"*, SO2 *"Increase and improve provision of goods and services from agriculture, forestry and fisheries in a sustainable manner"*, SO4 *"Enable Inclusive and efficient agricultural and food systems"* and SO5 *"increase the resilience of livelihoods to threats and crises"*, (FAO, 2017).

approach serves as an entry point for reinforcing the watershed management approach, which promotes natural resources protection and conservation in the region (FAO, 2017). As a result, 40 new and 23 existing APFS groups have been established/ reinforced in Lotirir, Naitakwae and Nadunget Parishes in Nadunget Sub county as well as Kodonyo, Katikekile and Tapac Parishes in Tapac Sub county. In relation to the watershed management approach, C&D has been tasked with the responsibility of implementing the following key activities; i) Build the community's technical capacity in INRM and SLM practices; ii) Support APFS/ FFS groups in learning through a participatory approach and scaling up of INRM and SLM practices; iii) Support farmer assisted land regeneration and rehabilitation initiatives by establishing temporary enclosures; and iv) Carry out reforestation and rehabilitation of identified hotspots.

Each APFS/ FFS group consists of 25-30 members who are Ugandan citizens aged 18 years and above and not attending school. Membership to the groups is on a voluntary basis and one is considered an official member of an APFS group upon payment of a membership fee, the amount of which has been agreed upon by the other members of the APFS group. Once the APFS group has certified the minimum membership requirements, it proceeds to be registered at the respective sub county office upon payment of a group registration fee of 50,000 Ugandan Shillings. For the group formalization process to be complete, the group members have to draft and agree to a governing constitution, elect group executive officials (i.e. the Chairperson, Vice Chairperson, Secretary, Treasurer and two Mobilizers), formulate a Group Action Plan (GAP) and prepare a season-long calendar to guide them in their group activities.

Aside from engaging with the APFS group members to build their capacity on INRM practices, catchment management and climate smart agricultural techniques, the project also aims to ensure that the members benefit from sustainable alternative livelihoods such as Village Savings and Loans Associations (VSLA) as well as income generating activities introduced by the project (FAO, 2017). At the moment, there are 63 APFS groups that have been formalized and are fully functional, consisting of 30 members each, which makes a total of 1,890 direct project beneficiaries (Table 1) in Moroto District. Apart from the direct beneficiaries, the project aims to build the capacity of 1,110 additional community members. Other key outputs which will be realized by the project in the six selected parishes include: a) Establishment of six parish-level micro-watershed management associations; b) Development of two community based integrated watershed management (CAPs); and c) Rehabilitation of a total of 1050 hectares of degraded crop

16

lands and forest watershed areas (FAO, 2017). Table 1. below gives a summary of the APFS group profile for each of the six parishes in Moroto District:

Table 1. APFS Groups and Membership Profile in Nadunget and Tapac Sub Counties

Parish	Total APFS Groups	Male members	Female members	Total
Lotirir	11	195	135	330
Nadunget	13	134	256	390
Naitakwae	8	90	150	240
Katikekile	12	141	219	360
Kodonyo	8	91	149	240
Tapac	11	137	193	330
Total	63	726	1164	1890

Source: F-SURE project database developed by C&D (2021)

With special focus on the 63 APFS groups, this study aims to investigate the determinants of farmer participation in the APFS/ FFS groups through a survey conducted with both the APFS and non-APFS members.

1.3 Statement of the Problem

There are numerous benefits attributed to an individual's participation in agro-pastoral/ farmer field schools. These include but are not limited to an improvement in crop production and an increase in livestock and agricultural income (Davis et al, 2010). Ultimately, this leads to an increase in the resilience of households towards negative shocks which are associated with food insecurity. It is therefore expected that majority of the beneficiary communities will tend to participate in the APFS programs. However, this is not the case. Research has shown that failure to participate in APFS groups is attributed to various factors such as: lack of awareness about the APFS programs, too many responsibilities that prevent one from joining, insufficient resources required to adopt the new technology needed by the APFS programs, incompatibility of the farmers with the APFS programs among others (Davis et al, 2010; Silva and Broekel, 2016). Notably, some of the agro-pastoral communities choose to participate in the APFS programs but discontinue their participation at some point (Silva and Broekel, 2016). There has been a growing concern as to what factors determine participation and non-participation in APFS groups, which is the main focus of this study.

1.4 Research objectives

The general objective of the study is: "to investigate the determinants of farmer participation in the agro-pastoral/ farmer field schools in Moroto District, Uganda". In relation to this, the study has three specific objectives:

  i. To determine the socio-economic characteristics of farmers in Moroto District, Uganda.
 ii. To determine the factors that hinder farmer participation in APFS/ FFS groups.
iii. To investigate the factors influencing farmer participation in the APFS/ FFS groups in Moroto District, Uganda.

1.5 Outline of the Study

The following chapters are outlined as follows; Chapter two presents the literature review, Chapter three presents the materials and methods used in the study, Chapter four presents the study results and discussions and finally Chapter five presents the study conclusion and recommendations.

CHAPTER II: LITERATURE REVIEW

This chapter provides an overview of the APFS/ FFS approach, reasons why farmers do not participate in APFS/ FFS programs and the determinants of farmer participation in APFS/ FFS groups as well as other farmer groups.

2.1 The APFS/ FFS Approach

Since their inception, agricultural extension programmes have become one of the most important means of tackling rural poverty (Christoplos and Kidd, 2000); through spreading information concerning agricultural technology, spearheading rural adult education and supporting farmers in developing hands on technical, problem solving and managerial skills (Danso et al. 2018). It is therefore important to find the most effective ways of supporting and facilitating extension programmes to ensure optimum outcomes which are sustainable to the target communities.

One of the most popular agricultural extension programmes is the Agro-Pastoral Field School (APFS) or Farmer Field School (FFS) approach, which utilizes a participatory and innovative learning approach with the aim of promoting climate smart agricultural (CSA) practices (Rhiney and Tomlinson, 2017). Based on the adult education approach, groups of farmers, usually 25-30, meet on a weekly basis under the guidance and supervision of a trained facilitator where they learn by taking part in the farming activities they decide upon (FAO, 2016). The method of interaction is non-formal and comprises of field observations, group discussions and simple experiments. This aims at building the technical capacity of farmers to analyze their production system, identify problems, experiment with potential solutions and adopt farming techniques that are appropriate to their farming systems (FAO, 2016).

The FFS approach was first introduced in Indonesia by FAO in 1989 to promote Integrated Pest Management (IPM) (Pemsl et al., 2006). Over the years, FFS programs have evolved to adapt to various local priorities and contexts (Chocholata et al., 2016). In East Africa, the FFS approach kicked off in 1995 with FAO's Special Programme for Food Security. The programme came to an end in 1998 and in 1999, the East African Sub-Regional Project for Farmer Field Schools in Kenya, Uganda and Tanzania was pioneered by FAO's Global Integrated Pest Management Facility (Kimati, 2015).

Uganda has a widespread and long-standing experience with the development of FFS/ APFS programs since their inception in 1996 by the FAO-IPPM cotton project in Soroti, Eastern Uganda (Isubikalu, 2007). The approach has since evolved countrywide to incorporate a long term strategy and is currently at per with national frameworks, under the mandate and implementation of the Ministry of Agriculture (MOA), together with Non-Governmental Organizations (NGOs) who are actively engaged in the sectors of food security and agricultural practices (Chocholata, 2020). The FFS approach has continuously been implemented in Uganda to facilitate community empowerment through: i) enhancing food security and rural poverty reduction; ii) enabling the restoration of agricultural productivity among internally displaced persons and refugees; and iii) building the resilience and capacity of agro pastoral communities to tackle recurrent climate change hazards such as droughts and floods. Additionally, the approach has been used all over the country to address topics related to diseases, pest control, post-harvest handling and soil fertility (Isubikalu, 2007).

The FFS approach was initially introduced by FAO to adapt to the specific context of Karamoja Sub-region. In relation to this, FAO has designed the APFS approach, which acts as a platform used to integrate multiple interventions ranging from development of farmers' skills, provision of essential inputs required for both agricultural and livestock production, rural savings and income diversification initiatives. One of the key projects that has been implemented so far in relation to the APFS approach is the Karamoja Livelihoods Programme (KALIP), which was undertaken between 2010 and 2015 to protect and enhance income and food security in the sub region. The project was aimed at supporting 13,200 vulnerable households to increase their production, income and resilience at both household and community level, through the agro-pastoral field schools (FAO, 2013). Between 2007 to 2012, FAO has collaborated with approximately 15 NGOs and the respective District Local Governments to establish more than 850 FFS, APFS and Pastoral Field Schools (PFS) in the sub region, which have benefited more than 25,500 households as a consequence. Among the items provided to the farmer groups were: assorted seeds, tools for farming, investment grants and various trainings on crop and animal husbandry, soil and water management practices (FAO, 2013).

Agro pastoral/ farmer field schools are usually established with an aim of improving farmers' knowledge and skills. This enables farmers to make more informed decisions which leads to an improvement in agricultural production and income, an improvement in the livelihoods of rural

communities and a reduction in livelihood vulnerability and poverty especially among small scale farmers (David, 2007; Chocholata, 2020). Quality FFS programs are a useful tool in empowering rural communities through: making information more accessible, developing critical analysis and decision making, increasing food productivity, improving access to food and thereby increasing nutritional security, enabling sustainable management and control over natural resources among others (Chocholata, 2020). In East Africa, FFS programs have been shown to improve per capita agricultural and livestock income across households (Davis et al. 2012). In addition, FFS programs facilitate gender equality, social inclusion and community empowerment through providing opportunities of active engagement of both men and women in FFS activities (Chocholata, 2020; Friis-Hansen, 2012). However, the effectiveness of APFS programs is dependent on the participation of beneficiaries (Oladele and Kgosiemang, 2012).

2.2 Reasons for not Participating in FFS Programs

Almost all farmers are aware of farming programmes such as FFS as introduced by the relevant extension workers. However, only 50 percent of the farmers go ahead to adopt the programmes and out of those who adopt, 16 percent discontinue (Silva and Broekel, 2016). Among the factors hindering the adoption of such programmes are socio-economic and cultural constraints. These include insufficient resources for adoption of new technology as required by the program, incompatibility of the farmers with the programs, environmental constraints and the complexity of the new technology associated with such programs. Other additional constraints to adoption are lack of sufficient intervention by the extension officers, poor technical training and inadequate information about the new technologies associated with FFS programs (Silva and Broekel, 2016).

While investigating why some farmers fail to take part in farmer groups in East Africa, Davis et al. (2010) discovered that the leading cause for non-participation in Uganda was due to lack of information as reported by 53.2 percent of the respondents. This was followed by lack of time as reported by 21.3 percent of the respondents. However, in Kenya, Uganda and Tanzania combined, the main reason for not joining FFS groups was lack of time as reported by 32.6 percent of the respondents, followed by the expectation to join soon as reported by 21.1 percent of the respondents. Other reasons cited were the venue of the FFS groups was far from the house, the leadership of the FFS groups was not good enough, lack of capital, plan to join after observing the results, no FFS around and some of the respondents were too old to join the FFS groups (Davis et

al, 2010). The study recommended initiatives should be introduced to raise more awareness of such programs, for example, through emphasizing on the importance of participating in the programs. According to Agidew and Singh (2018), the main reason why respondents did not participate in farming programs was due to lack of incentives (59%). This was followed by the lack of good governance (20.5%), the time consuming nature of the programs (12.8%) and lastly due to lack of awareness about the programs (7.7%).

While reviewing the effectiveness of farmer field schools in improving farming practices and farmer outcomes, Waddington et al, (2014) established several barriers that exist to adoption of FFS programs by farmers. These include: the top down approach used for training (using transfer of technology approach) is not appealing to most farmers, the curriculum of the FFS programs may not be applicable to the local context, the benefits of the FFS programs are not directly/ indirectly observed by the farmers, the inability to obtain sufficient inputs required such as capital and markets and lack of sufficient social capital.

2.3 Determinants of Farmer Participation in Farmer Groups and FFS

There exist several factors that determine farmers' participation in APFS/ FFS programs. Understanding such factors is important for the design and implementation of successful APFS programs. Moreover, since participation in FFS programs is voluntary in nature, it is important for policy makers, researchers and development practitioners to understand what drives individuals to participate in the programs as well as obstacles to participation (Goff et al., 2008). This will not only help in formulating strategies that address and eliminate the factors that hinder participation, rendering the FFS programmes more accessible, but it will also lead to an understanding of how membership to FFS groups can be enhanced and relied upon for improving agricultural productivity. Some of the existing literature has been able to explore several factors that affect farmer participation in FFS programs for example, on their analysis of the impact of FFS programs on agricultural productivity and poverty in East Africa (Kenya, Uganda and Tanzania), Davis et al. (2010) examined some of the factors that contribute to a household's decision to take part in FFS programs.

According to the literature reviewed, factors such as the level of education of the household head, participation in off farm activities, age of the farmer, gender of the farmer, the size of the household, distance to a tarmac road, the size of the farm, membership in other groups, agricultural

experience, among others affect the decision of the farmer or the household to take part in FFS programs (Davis et al., 2010; Bello, 2020; Goff et al., 2008; Agidew and Singh, 2018).

With respect to gender, findings from research done in the Karamoja Sub-region shows that FFS programs promote gender equality, leading to notable differences at household level in connection with: joint decision making, enhanced communication, decreased cases of gender based violence, increased division of labor and enhanced relations and collaborations between partners (Chocholata, 2020). However, a significant difference continues to exist in terms of male and female participation in FFS groups. While analyzing factors that determine participation and non-participation in FFS programs in Trinidad and Tobago, Goff et al. (2008), found that 73.3% of the participants were male. The study recommends that measures should be taken to increase the participation of women in FFS programs. In other findings, there exists equal representation of both gender in FFS groups whereby female make up 50 percent of FFS membership (Davis et al. 2010). Moreover, Adong et al. (2013) found out that after controlling for other variables, female farmers are more likely to participate in farmer groups than their male counterparts. Factors that undermine women participation in farmer groups include: insufficient sensitization regarding gender issues, too much domestic work that hinder women from participating in farmer groups, focus on export crops by farmer groups which has less women involvement and lack of gender policies to enable gender inclusivity in farmer groups (Towo, 2004). While investigating the determinants of one's decision to participate in FFS programs in East Africa, Davis et al. (2010) found that the gender of the head of the household had no significant impact in Kenya and Tanzania. This shows that there was an equal opportunity for both males and females to participate in FFS groups. However, in Uganda, households headed by women were less likely to participate in FFS programs than those headed by men. Ultimately, households headed by females tend to benefit significantly from FFS programs as compared to households headed by males (Davis et al. 2010). Using data collected from 215 households in the North Eastern highlands of Ethiopia, the gender of the household head was significant and negatively associated with one's decision to participate in agricultural programs (Agidew and Singh, 2018).

Regarding the level of education in Kenya, households whose head had formal education were more likely to take part in FFS programs than households whose head had no formal education at all (Davis et al. 2010). The results were different in Uganda, where the level of education was positively associated with participation in FFS programs. However, in Tanzania, the level of

education had no significant effect on the decision to participate in FFS programs mostly because only a small percentage of farmers have post primary education (Davis et al. 2010). While investigating the socio economic factors that influence farmer participation in FFS programs in Khartoum State, Sudan, Bello (2020) measured participation in terms of the extent of participation i.e. whether one is a participant or not and the level of participation i.e. whether one participates rarely, sometimes or continuously in the FFS programs. He concluded that participation in FFS programs was positively and significantly correlated with the level of education. Benin et al. (2008) concluded that the higher the level of education, the higher the probability of becoming a member of a farmer group in Uganda. This was found to be true for all the regions in the country.

There exist variations in terms of the effect of age on one's decision to participate in FFS programs. Young farmers tend to participate in FFS programs more than older farmers which shows the potential of FFS technologies to penetrate to younger farmers (Davis et al. 2010; Goff et al. 2008). According to Bello (2020), age is significantly and negatively related to the decision to participate in FFS programs. This is because young farmers are expected to be in search of information and apply new innovations related to agriculture as compared to older farmers. In other findings, older farmers are more likely by a 0.9 percent probability to join farmer groups in Uganda than younger farmers. However, regional variations exist with the Northern and Eastern region displaying varying results (1.1 percent and 0.8 percent respectively) (Adong et al., 2013).

Other factors such as the marital status, period of residency in one's community, agricultural experience, ownership of a farm, the size of the farm and the farmer's income were found to be positively and significantly related to farmer participation in FFS programs in Khartoum State, Sudan (Bello, 2020). Goff et al. (2008) also investigated additional factors such as life situation factors, institution factors and disposition factors that influence participation in FFS programs in Trinidad and Tobago. From the study, more participants than non-participants had family members and friends who have participated in FFS programs. A majority of the FFS participants had stayed in the community for a longer duration than the non-participants and had agricultural practices as their main source of income. However, there was no significant relationship between marital status and prior participation in agricultural extension programs with the participation status.

Davis et al. (2010) discovered that majority of the FFS participants belonged to other groups such as savings and credit groups. The size of the household was negatively associated with one's

decision to participate in FFS programs in Kenya but it had no significant impact in Uganda and Tanzania. The dependency ratio, that is the number of dependants over the number of economically active adults, had a positive association with the decision to participate in FFS groups in Kenya but negative association with the decision to participate in FFS groups in Uganda. The result was insignificant for Tanzania and all the three countries in East Africa combined (Davis et al., 2010). The distance and access to tarmac roads was found to be negatively associated with the tendency to participate in FFS programs in Kenya and all the three countries in East Africa, which was the opposite case for Uganda (Davis et al., 2010). On the other hand, the distance and access to markets or urban areas increased the tendency to participate in FFS programs in all the three countries combined as well as for Kenya and Tanzania. (Davis et al., 2010). The study also found out that in Uganda, the size of the farm was positively related with the probability to participate in FFS programs, which was the opposite for Kenya and Tanzania.

In their study, Agidew and Singh (2018) investigated the factors that affect participation in Watershed Management Programs in Ethiopia. From the findings, the higher the farmers' perception, the higher was the decision to participate in the watershed management programs. This was followed by support from the government whereas other variables such as the slope of the farmland exhibited negative correlations. In summary, variables that were key determinants of farmers' decision to participate in watershed management programs were land redistribution, gender of the household head, agricultural work force, the extension service, farm size and farm slope (Agidew and Singh, 2018).

The literature reviewed above gives an insight of some of the probable drivers and obstacles to farmer participation in farmer groups, especially FFS/ APFS. This study further explores the determinants of farmer participation in APFS groups with a special focus on Tapac and Nadunget Sub-counties of Moroto District in Uganda.

CHAPTER III: RESEARCH METHODOLOGY

3.1 Study area: Karamoja

Karamoja Sub-region, situated in North-Eastern Uganda is semi-arid with an area of approximately 27,200 KM^2. The sub-region consists of nine districts (Karenga, Kaabong, Kotido, Abim, Napak, Moroto, Nabilatuk, Nakapiripirit and Amudat), which are mainly characterized by low and unreliable rainfall and an average annual temperature of 21.5^0C. Poverty levels are highest in Karamoja with 82% of the total population living below the poverty line in comparison with 31% of the population at national level (UNFPA, 2018). Food insecurity continues to be a major concern in the sub-region and over-reliance on natural resources exposes livelihoods to climate change dynamics. Climate variability leads to flash floods and recurring and prolonged droughts and famine which undermine the already scarce resources in the sub-region. Other impediments to growth and development include but are not limited to historical aspects such as: cattle raiding, limited access to basic education and health services, poor infrastructure and extreme environmental degradation (UNFPA, 2018).

The livelihood activities vary among districts and across seasons with majority of the population practicing pastoralism and agro-pastoralism. The sub-region is further separated into zones i.e. the Central Livestock and Sorghum zone, the Western Mixed Crop Farming zone, the Mountain and Foothills Maize and Cattle zone and the North Eastern highland agriculture, (IPC, 2015). Livestock rearing (cattle, goats, camels, sheep and pigs) is the most important economic activity which enables the Karamojong to cope up with the harsh semi-arid environments. The main crops cultivated include: sorghum, maize, sunflower, beans, groundnuts, cowpeas and green grams. A majority of households own private land while communal land is mostly set aside for off-farm activities such as charcoal burning, collecting firewood and hunting. As compared to the male headed households, female headed households have less access to land. Other income generating activities in the sub-region include: salaried employment, selling of firewood and charcoal, local brewing, agricultural laboring and quarrying/ mining (UNFPA, 2018).

Traditionally, while men were in charge of livestock, especially the large herds, women were mostly responsible for food security in the households and therefore production of food. Other tasks delegated to women included: construction of houses, fetching water and firewood and

looking after the elderly, the sick and the children. However, following the recent disarmament and the effects of climate change, changing gender roles have enabled women to be involved in income generating activities such as charcoal burning and preparing and selling of local brew while men have become more involved in crop production. This in turn has led to the rise of joint decision making of both men and women at household level, women taking up leadership positions at community level and an overall improvement of women empowerment in the sub-region (UNFPA, 2018).

Figure 1. Map of Karamoja Sub-Region
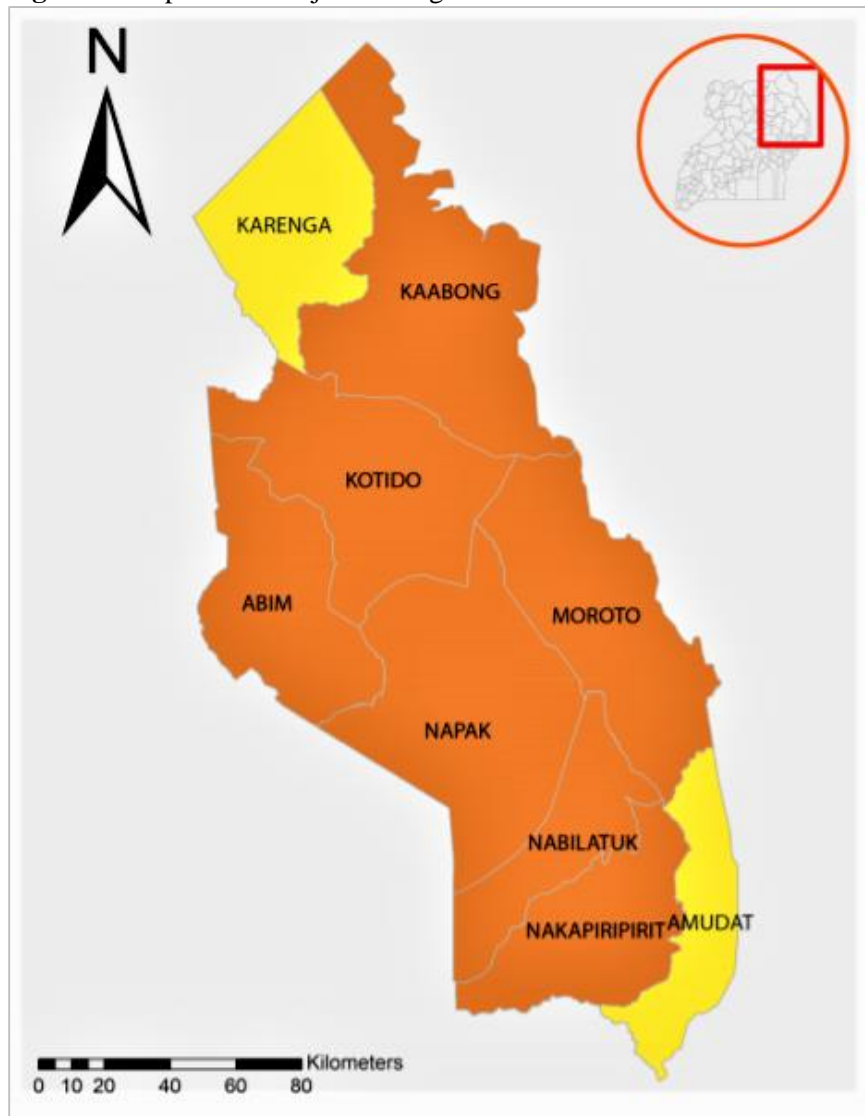
Source: IPC Report, 2020

Note: * The following map represents the acute food insecurity situation in Karamoja Sub-region during the year 2020. Karenga and Amudat Districts were in IPC Phase 2 while the remaining seven districts were in IPC Phase 3. As of 2018, Karenga and Nabilatuk Districts were added to make a total of nine districts.

3.2 Tapac and Nadunget Sub counties in Moroto District

Tapac and Nadunget sub counties, where the F-SURE project is being implemented by C&D, are located in Moroto District, which is situated in the East of central Karamoja and is generally suitable for agro-pastoral production.

The projected 2020 population of Nadunget sub county is 44,500 people while that of Tapac sub county is 17,700 people (UBOS, 2019). While Tapac sub county is inhabited by the Tepeth who are mostly mountain dwelling, Nadunget sub county is inhabited by the Matheniko, both of who are Karamojong ethnic groups.

Located on the slopes of Mt. Moroto, Tapac sub county stands at an elevation of 2000-2500 m above sea level and receives an annual rainfall of approximately 800-1000 mm. Crop farming and livestock rearing are the main livelihood activities practiced by the local communities in the sub county. The common crops grown are sorghum, maize, sunflower, beans, vegetables and fruits. This is mainly attributed to the increased amounts of rainfall in the sub county.

Nadunget sub county is situated at an elevation of 1000-1200 m above sea level and experiences an average annual rainfall of approximately 300-500 mm. It is thus predominantly pastoral in nature as compared to Tapac. The main livestock reared are cattle, goats and sheep while drought tolerant crops such as sorghum, cow peas, sun flower among others are cultivated.

Over the years, climate change variability has rendered the above mentioned rainfall dynamics inconsistent leading to challenges in both crop and livestock production. The main challenges experienced in the two sub counties include: insufficient and unreliable rainfall resulting to poor harvest, pests and livestock diseases, lack of clean and safe water for both human beings and livestock, soil erosion and degradation, over grazing, bush fires, deforestation and over-exploitation of minerals.

3.3 Methods of data collection and sampling procedure

The target population consisted of farmers from the six parishes where the F-SURE project is currently being implemented by C&D i.e. Lotirir, Naitakwae and Nadunget Parishes in Nadunget sub county and Katikekile, Kodonyo and Tapac Parishes in Tapac sub county. The respondents consisted of male and female farmers who are of working age and who are both members and non-members of the APFS groups. Both primary and secondary sources of data were used to conduct

the study. Questionnaires consisting of open ended and close ended questions were used to collect the primary data. Secondary data was collected from studies done in the past, various reports, books, journals and sources from the internet. The initial target was a sample size of 222 farmers, consisting 126 APFS members and 96 non-APFS members. Out of this, 220 (99.1%) farmers, that is 133 APFS members and 87 non-APFS members, actually participated in the study. This sample size was selected taking into account the limited time available to conduct the study and in such a way that it would be sufficient to perform the required statistical analyses.

A mixture of probability and non-probability sampling was used in order to select the participants who took part in the study. A two stage sampling technique was used to identify non-APFS members in the respective parishes. The first stage involved identifying the villages with the APFS groups and the second stage involved selecting a random sample of non-APFS members to take part in the study. Each of the 16 APFS facilitators was tasked with interviewing 6 non-APFS members from the various villages, to make a total of 96 non-APFS study participants. On the other hand, convenience sampling was first used to select members of the APFS groups and later simple random sampling was used to select two members from each APFS group (one male and one female), who took part in the study. Microsoft Excel was used to randomly sample from the existing list of APFS members in the database. This resulted in a sample of 126 APFS members out of the total 1890 APFS members who are part of the F-SURE project in Tapac and Nadunget Sub counties of Moroto District.

3.4 Data collection procedures and research Design

The data collection process took place during the last week of March and the first two weeks of April 2021 for a maximum period of three weeks. Information relating to the personal demographic and socio economic characteristics of the respondents as well as their households was captured. This included information such as the respondent's age, marital status, level of education, asset ownership, employment status, education level of the household members, main livelihood activity among others. Due to the lack of knowledge of English language by majority of the respondents, the questionnaires, which were designed in English, were administered using the Karamojong language. Face to face interviews were conducted by 16 APFS facilitators who are part of the C&D team currently working on the F-SURE project in Moroto District.

3.5 Data Analysis

The data collected was analyzed both quantitatively and qualitatively. Microsoft Excel 2016 and Stata version 13 were used to perform the required statistical analyses. Summary descriptive statistics were used to obtain a clear understanding of the socio economic and personal demographic characteristics of the study participants. Frequency tables were also used, which enabled us to compare and contrast different categories of the sample units.

The Pearson Chi-Square test was used to determine whether there exists a statistically significant relationship between the categorical variables. Finally, since the dependent variable (participation in APFS programs) was represented by a dummy variable, the binary probit model was used to determine the relationship between the dependent and independent variables of the study. This is in line with various studies which used either the binary probit or logistic models to conduct their analyses. For example, Davis et al. (2010) employed the binary probit regression model to investigate the determinants of farmer participation in FFS programs in Kenya, Uganda and Tanzania. In addition to the binary logistic regression model used to investigate the factors affecting farmer participation in watershed management programs, Agidew and Singh (2018) also used the Pearson chi-square test to investigate the relationship between the dependent and independent variables of the study.

CHAPTER IV: RESULTS AND DISCUSSION

The following chapter presents the results and discussion of the study. Section one presents a description of the socio-economic characteristics of the respondents in the two sub counties of Moroto District, Section two gives an overview of the reasons for not participating in APFS programs and Section three presents the determinants of farmer participation in APFS programs.

4.1 Description of the socio-economic characteristics of farmers

This section presents a description of the socio-economic characteristics of the study participants using the individual and household level characteristics. An individual is said to be a member of an APFS group if he/ she is a registered member of any active APFS group that has been formalized and registered at the sub county level.

Gender of the Respondents

Out of 220 respondents who were interviewed, 116 were female representing 52.7% of the total respondents and 104 were male representing 47.3% of the total.

This is consistent with the fact that, in as much as agriculture is not restricted to any particular sex in Karamoja, it is observed that women take the leading role in agricultural practices while men are mostly concerned with taking care of livestock.

Figure 2. Respondent Sex (M = Male, F = Female)

RESPONDENT SEX

M, 47.27%

F, 52.73%
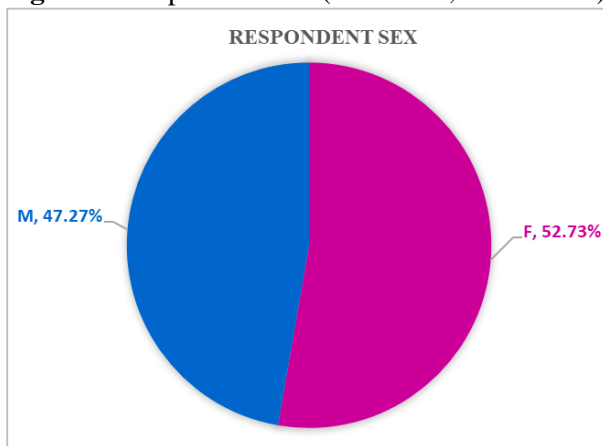
Source: Author

Age Distribution of the Respondents

Out of 216 respondents whose ages were recorded, 43.5% were between the age of 25-34 constituting the majority age group. This was followed by 22.7% of the respondents who were between the age of 18-24, 16.2% between the age of 35-44, 9.7% between the age of 45-54, 4.6% above the age of 55 and lastly 3.2% below the age of 18. The average age of the respondents was approximately 32 years, which corresponds to the average age of APFS members under the F-SURE project in Moroto District.

Figure 3. Age Distribution of the Respondents
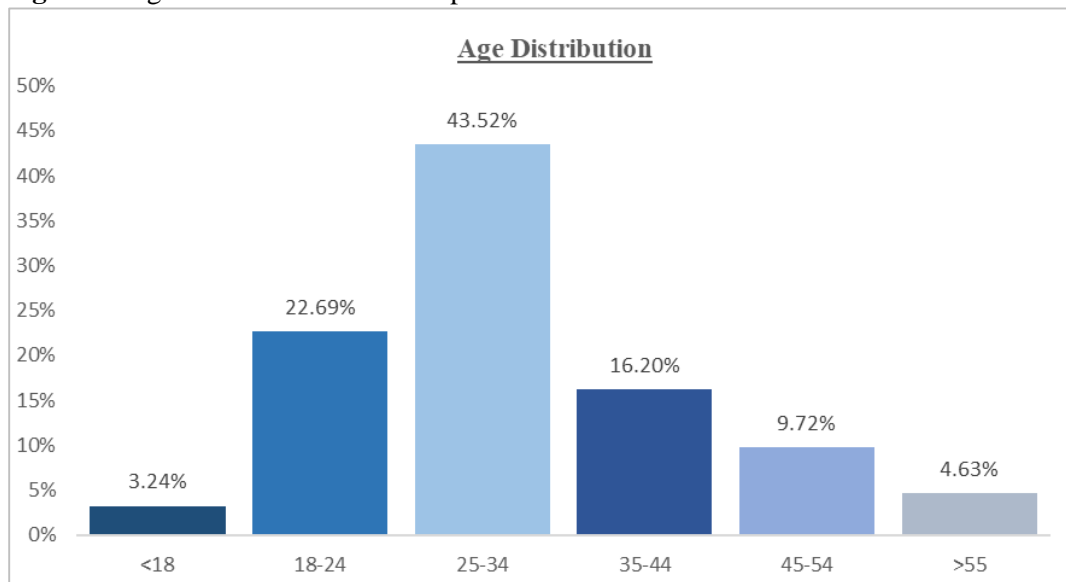
Source: Author

Marital Status of the Respondents

Majority of the respondents were either married or in a domestic partnership. This is represented by 81.8% of the total 220 respondents. 13.6% of the respondents reported to be single and never married while the remaining 4.6% were either divorced, separated or widowed. The high proportion of individuals who are either married or in a domestic partnership can be linked to the high incidence of adolescence marriage in Karamoja Sub region as compared to the rest of the country. The patterns in marital status are associated with the wealth and education status in such a way that economic deprivation is positively associated with higher levels of adolescence marriage. Furthermore, the lower the level of education attainment, the higher the chances of getting married during adolescence (Amin et al., 2013).

Figure 4. Marital Status of the Respondents
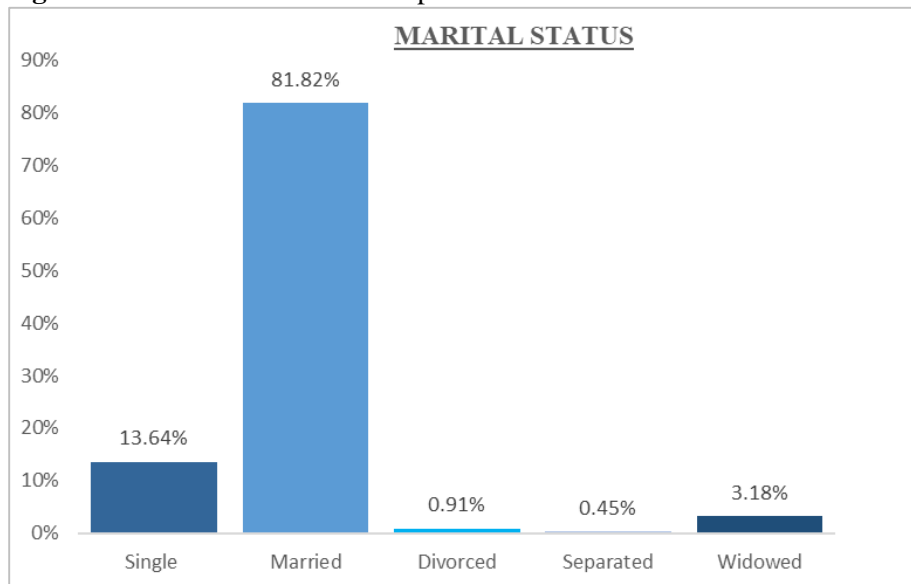
Source: Author

Level of Education of the Respondents

Out of 219 respondents who reported their level of education, it was noted that majority of the respondents (72.6%) have no formal education. The remaining 20.6% of the respondents have primary education, 5.5% have secondary education while less than 1% have tertiary education. This is in line with the overall situation in Karamoja where the literacy rate stands at 25% as compared to that of Kampala which is 94% (UNFPA, 2018). Out of the total respondents, 1 respondent has pursued the Alternative Basic Education for Karamoja (ABEK), which is an informal education program that targets 6 to 18 year olds living in the pastoral communities of Karamoja.

Taking into consideration the education statistics of the respondent's households, majority of the households had adults with no formal education at all. For the households with children of school going age, most of them were reported to be staying at home due to: lack of school fees, lack of nearby schools or due to the children being busy with domestic work such as herding and gardening.

Figure 5. Education Status of the Respondents
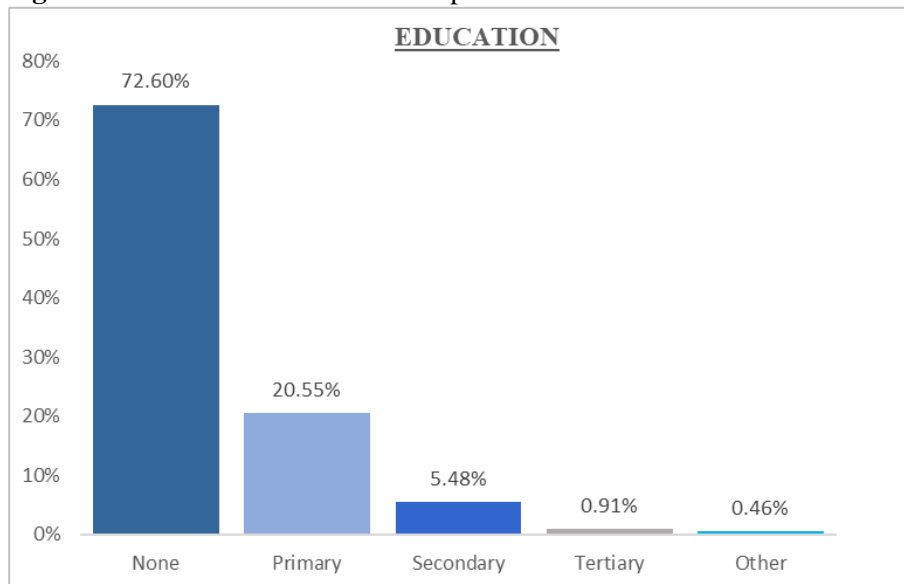
Source: Author

Dependants

Out of the total respondents, 150 reported to have dependants, which represents 68.2% of the total, while 70 respondents had no one depending on them. In this case, dependants included both child and adult dependants. The high dependency ratio in Karamoja has been identified as one of the major contributing factors to the persistent poverty situation in the sub region (UNFPA, 2018). According to the 2016 Uganda National Household Survey, Karamoja Sub region has the highest dependency ratio of 141 which is higher than the national level of 97 (UBOS, 2016).

Figure 6. Dependents
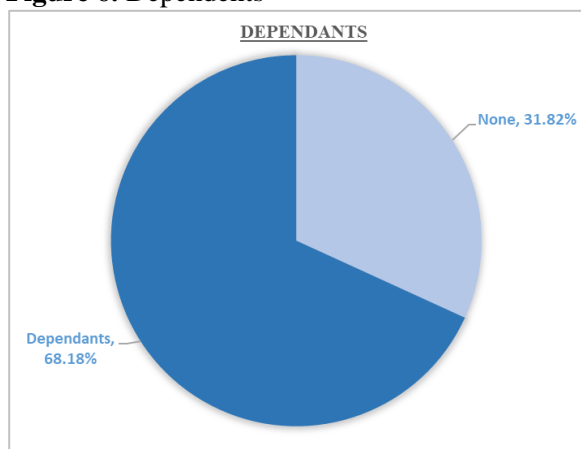
Source: Author

Main Source of Livelihood

Due to the agro-pastoralist nature of the Karamojong, crop farming and livestock rearing were the main source of livelihood for most of the respondents (85.9%). This is in line with the findings of the report by UNFPA (2018). The main crops produced include maize and sorghum. Other crops produced include: beans, cassava, green grams and vegetables such as egg plants, spinach, cabbages, green pepper and onions. The main livestock reared by the respondents were: cows, goats, sheep and birds. A few of the respondents own donkeys as well. Aside from crop farming and livestock rearing, other sources of livelihoods, which constitute the main livelihood sources for the rest of the respondents were: local brewing, charcoal burning, casual labor and collecting and selling of firewood. From the above, charcoal burning, followed by selling of firewood was most practiced as recorded by 4.5% and 4.1% of the respondents respectively.

Other income generating activities practiced by the respondents to complement their main source of livelihood include: stone quarrying/mining, ferrying passengers using motorbikes which is commonly known as "*boda boda*", brick laying and retail of small goods. Among the challenges faced by the respondents in their livelihood efforts, majority reported prolonged dry seasons leading to insufficient water, pasture and food for both livestock and humans. Other challenges reported include insecurity, lack of sufficient income, poor infrastructure, high prevalence of pests and diseases and lack of support from the government.

Figure 7. Main Source of Livelihood
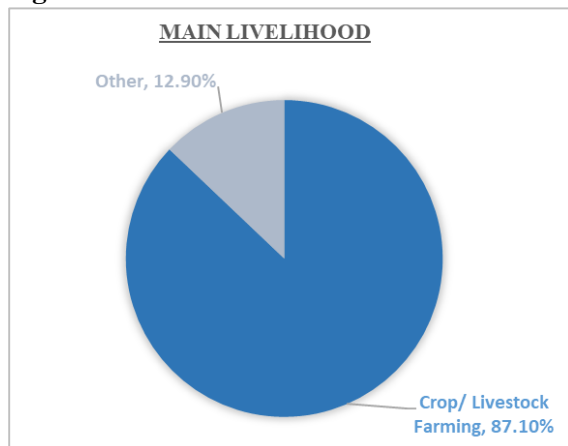
Source: Author

Table 2. Socio economic characteristics of farmers in Nadunget and Tapac Sub counties in Moroto

Variable	APFS Member F	APFS Member %	Non APFS Member F	Non APFS Member %	Total F	Total %
Gender						
Male	67	50.38	37	42.53	104	47.27
Female	66	49.62	50	57.47	116	52.73
Total	133	100	87	100	220	100
Dependants						
Yes	94	70.68	56	64.37	150	68.18
No	39	29.32	31	35.63	70	31.82
Total	133	100	87	100	220	100
Training Attended						
Yes	36	27.69	12	14.12	48	22.33
No	94	72.31	73	85.88	167	77.67
Total	130	100	85	100	215	100
Education Level						
None	97	73.48	62	71.26	159	72.60
Primary	25	0.76	20	22.99	45	20.55
Secondary	8	18.94	4	4.60	12	5.48
Tertiary	1	6.06	1	1.15	2	0.91
Other	1	0.76	0	0	1	0.46
Total	132	100	87	100	219	100
Marital Status						
Married	114	85.71	66	75.86	180	81.82
Single	12	9.02	18	20.69	30	13.64
Divorced	1	0.75	1	1.15	2	0.91
Separated	1	0.75	0	0	1	0.45
Widowed	5	3.76	2	4.60	7	3.18
Total	133	100	87	100	220	100
Age						
<18	0	0	7	8.43	7	3.24
18-24	29	21.80	20	24.10	49	22.69
25-34	60	45.11	34	40.96	94	43.52
35-44	28	21.05	7	8.43	35	16.20
45-54	14	10.53	7	8.43	21	9.72
>54	2	1.50	8	9.64	10	4.63
Total	133	100	83	100	216	100
Employment Status						
Employed	2	1.50	1	1.15	3	1.36
Unemployed	131	98.50	86	98.85	217	98.64
Total	133	100	87	100	220	100

Source: Author

Employment Status

Out of 220 respondents, only 3 (1.36%), were formally/informally employed while the rest (98.64%) were not employed at all. This is in line with the Uganda National Labor Force Survey 2016/2017 whereby 86% of the working age population in Karamoja Sub region are either unemployed, underemployed or in vulnerable employment as compared to 5% in Kampala. This is mainly due to lack of formal education which results to the majority of the youth lacking employable skills. Table 2 below gives a summary of the socio economic characteristics of farmers in Nadunget and Tapac Sub counties.

4.2 Factors that hinder farmer participation in APFS programs

The study consisted of responses from 87 non-APFS members and 133 APFS members. Among the questions asked to the non-APFS members were the reasons for not participating in the APFS programs. Due to the voluntary nature of participation in the APFS programs, it is important to understand the factors that hinder respondents from participating in order to formulate policies that address such factors.

The respondents gave various reasons for not participating in the APFS groups and the major reason was due to lack of knowledge of the existence of APFS groups. Out of 81 respondents, 51 reported not to have any knowledge of the existence of APFS groups which stands for approximately 63% of the total responses. This was followed by 19 respondents (23.5%) who reported that they had too many responsibilities which prevented them from joining the APFS groups. Approximately 4.9% of the respondents were not allowed to join the APFS groups and 2.5% were not interested in joining the APFS groups at all. The remaining 5 respondents (6.2%) did not join the APFS groups for other reasons which included: sickness, lack of information about the date of formation of the APFS groups, failure to attend the formation meetings, the number of members required to form the APFS groups had exceeded and one was too old to join the APFS group. These findings are in line with the study conducted by Davis et al. (2010) in which the main reason as to why farmers fail to participate in FFS groups in Uganda was due to lack of information as reported by 53.2% of the respondents, followed by lack of time.

Figure 8. Reason for not belonging to an APFS Group
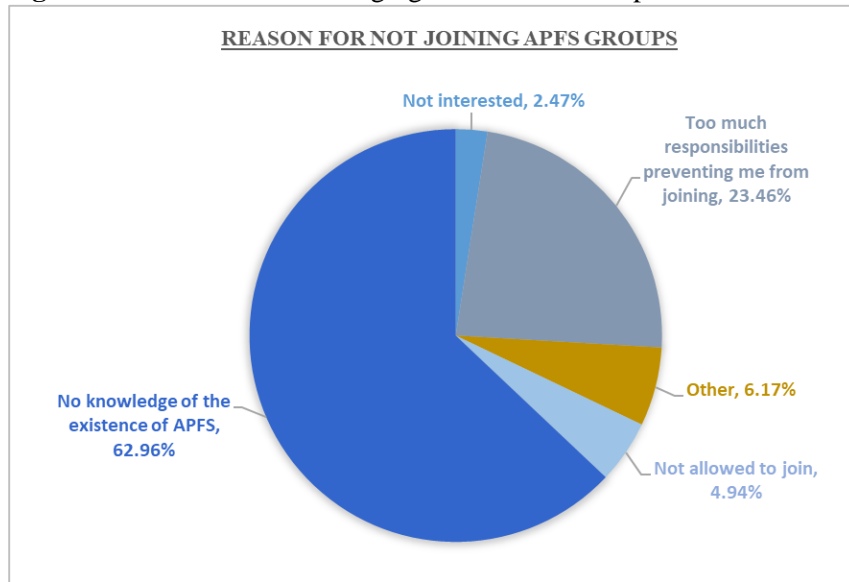
Source: Author

It is therefore important to raise farmers' awareness about APFS programs as well as the long-term benefits associated with participating in APFS groups. Moreover, APFS programs should be tailored in such a way that they are flexible and can easily adapt to the day to day schedule of the beneficiaries.

Table 3. Reasons for non-membership in the APFS groups

Reason	Frequency	%
Lack of knowledge of the existence of APFS groups	51	62.96
Too much responsibilities preventing one from joining	19	23.46
Not allowed to join	4	4.94
Not interested in joining	2	2.47
Other	5	6.17
Total	81	100

Source: Author's calculation based on data from the survey.

4.3 Determinants of farmer participation in APFS programs

The study assumes that a farmer's decision to be a member or not of an APFS group (Y_i) is determined by the farmer's individual and household level characteristics (X_i) that may encourage or hinder their membership status. The error term is also included to capture any other factors that might have been omitted from the model and may influence a farmer's decision to join an APFS group.

The dependent variable analyzed in the study is the participation status of the farmer in an APFS group in terms of APFS group membership and non-membership. The information about

membership status into the APFS groups was obtained for individuals who are economically active and those who are not of school going age. Therefore, a binary dummy variable was used to measure the participation of farmers in the APFS groups (1 = member of an APFS group, 0 = non APFS group member).

The independent variables used in the study include: individual and household level characteristics such as age, gender, marital status, education, dependants, any training, and main livelihood. The age of the farmer is captured as a continuous variable while the remaining variables are captured as dummy variables. Age squared is included to take into account the impact of the life cycle course on the farmer's decision to be a member of an APFS group i.e. participation in the APFS groups increases at first as one gets older, remains relatively constant at some point in time and then starts to decline at a later stage (Adong et al., 2013). A farmer is considered single/ not married if he/ she has never been married, is divorced, separated or widowed, otherwise he/ she is considered as married or in a domestic partnership. A farmer is said to have formal education if he/ she has primary, secondary or tertiary education. Non formal education is captured by a lack of education or if one has taken the Alternative Basic Education for Karamoja (ABEK). The main livelihood captures whether or not crop farming and/ or livestock keeping is the main source of livelihood for the farmer. Other livelihood activities aside from crop farming or livestock keeping have also been captured. Household characteristics such as the number of dependants supported by the respondent have also been included. Table 4 below summarizes further the dependent and independent variables used to conduct the study.

Some issues of concern that were taken into account included missing data. Working with missing data might lead to substantial bias when conducting data analysis, especially if the variable containing the missing values is crucial to the outcome results (Kwak and Kim, 2017). One of the solutions to this problem is to discard the respondents with the incomplete observations on the crucial variables and proceed with the analysis using the complete observations (Haitovsky, 1968). The other option is to substitute a valid answer to the missing information. In this study, the missing data problem was resolved by omission.

A binary probit model was used to investigate the factors that determine farmers' participation in APFS programs in Tapac and Nadunget Sub counties of Moroto District in Uganda. The model

was chosen because the dependent variable (participation in APFS programs) is binary in nature. The following is the specification of the probit model:

$$Y_i = \beta_{0i} + \beta_{1i}X_{1i} + \beta_{2i}X_{2i} + ... + \beta_{ki}X_{ki} + \varepsilon_i$$

where;

Y = is the predicted probability of the event (farmers' participation in APFS programs), where 1 = APFS member and 0 = Non APFS member.

β_0 = constant

β_n = coefficients of the explanatory variables

X_n = explanatory variables

ε_i = error term which is assumed to follow a standard normal distribution ($\varepsilon_i \sim N(0, 1)$)

Table 4. Socio economic determinants of farmer participation in Agro Pastoral Field Schools

Dependent variable	Description	Unit
Y = APFS Status	Membership status of the farmers in Agro Pastoral Field Schools i.e. whether one is an APFS member or not.	1 = APFS member; 0 = Non-APFS member
Independent variables	**Description**	**Unit**
X_3 = Age	Age of the respondent	Continuous variable
X_1 = Marital Status	Marital status of the respondent.	1 = Married or in a domestic partnership; 0 = Single/ not married
X_2 = Education	Level of education of the respondent.	1 = Formal education; 0 = Non-formal education
X_4 = Gender	Gender of the respondent	1 = Male; 0 = Female
X_5 = Main livelihood	Whether or not crop farming and/ or livestock keeping is the main livelihood activity of the farmer	1 = Yes; 0 = No
X_6 = Any Dependants	Whether or not the respondent has any dependants, both adults and children	1 = Yes; 0 = No
X_7 = Any Training	Whether or not the respondent has attended any training on farming, VSLA, adult education among others	1 = Yes; 0 = No

Source: Author

4.3.1 Study Hypotheses

With the aim of investigating the socio economic characteristics that determine farmer participation in APFS groups, the following were the study hypotheses.

Gender

The gender of the respondent was captured as a dummy variable with male = 1 and female = 0. Male farmers have more access to and control over resources than female farmers giving them more freedom to participate in farmer groups (Agidew and Singh, 2018). The study therefore hypothesizes that the coefficient of gender will take on a positive value. This means that male farmers are more likely than their female counterparts to participate in APFS programs.

Age

Age is an important variable in understanding participation of farmers in APFS/ FFS programs. There exist mixed results regarding the effect of one's age on his/ her decision to participate in farmer groups such as APFS/ FFS. Adong et al. (2013) found out that older farmers were more likely by a 0.9 percent probability to join farmer groups than younger farmers. The older one gets, the more experienced and resource endowed he/ she becomes and therefore the higher the likelihood of participating in agricultural projects (Etwire et al., 2013). It is therefore hypothesized that age is positively correlated with one's decision to participate in APFS/ FFS programs. Taking into consideration the effect of the life cycle course on participation, it is expected that the coefficient of age squared will take on a negative sign.

Marital status

Farmers who are married are expected to have a higher desire to participate in APFS/ FFS programs than those who are not married (Adong et al., 2013; Bello, 2020). According to Etwire et al. (2013), married farmers enjoy access to information and resources of the spouse which will increase their likelihood of participating in agricultural projects as compared to non-married farmers. In addition, due to the increased family obligations, married farmers are more concerned about the household's welfare which tends to increase their likelihood to participate in farmer groups (Adesina and Eforuoku, 2016). It is therefore hypothesized that a farmer's marital status is positively associated with their decision to participate in APFS programs.

Level of education

Farmers who have formal education (i.e. primary education or higher), are more likely to participate in APFS/ FFS groups than those with no formal education at all (Bello, 2020; Benin et al., 2008). This could be due to the fact that the more educated one is, the more they gain exposure to a wider range of ideas and therefore gain a liberal perspective as compared to their lesser educated counterparts. Besides, the attainment of knowledge, both formally or informally will enable farmers to understand and appreciate the benefits associated with their participation in APFS programs as well as the costs that could be incurred. According to Adesina and Eforuoku (2016), educated farmers tend to participate more in agricultural projects in order to put into practice the knowledge they have gained. We therefore hypothesize that a farmer's level of education is positively associated with their decision to participate in APFS/ FFS programs.

4.3.2 Pearson Chi-Square test

The Pearson chi-square test was used to investigate whether there exists a significant relationship between the dependent and independent variables. The choice of the method used was dependent on the nature of variables to be investigated. The chi-square test was therefore performed on the dummy independent variables. The null hypothesis of the chi-square test suggests that there exists a significant association between the dependent and independent variables, while the alternative hypothesis states that there exists no significant relationship between the dependent and the independent variables. The chi-square test is therefore employed to investigate the two hypotheses (Turhan, 2020). If the p-value of the chi-square test is greater than the level of significance, then there is sufficient evidence to reject the null hypothesis, otherwise we fail to reject the null hypothesis.

The formula for obtaining the chi-square is given by:

$$\sum \chi^2{}_{i-j} = \frac{(O-E)^2}{E}$$

Where:

O = Observed value

E = Expected value

χ^2 = the chi-square value

From the results of the Pearson chi-square test, only one categorical variable (whether the individual has participated in any training), is found to be statistically significant in explaining the farmer's decision to participate in APFS groups at the 5% level of significance. The marital status of the respondent is found to be significant at the 10% level of significance.

Gender of the farmer

Based on the results of the survey, there were more female participants (52.73%) than male participants (47.27%). The chi-square statistic of 1.30 is not statistically significant at the 5% level. This means that there is no significant relationship between the gender of a farmer and his/ her decision to participate in the APFS groups. Since APFS/ FFS programs empower women by providing opportunities for both men and women to participate in the group activities, it is highly encouraged that targeting of such programs should not be focused on women alone but both genders should be given an equal opportunity, (Friis-Hansen et al., 2012).

Marital status

The marital status of the sample respondents revealed that 81.82% were married. Among the married respondents, 63.33% and 36.67% were found to be members and non-members of the APFS groups respectively. The chi-square statistic of 3.43 is found to be statistically insignificant at the 5% level of significance hence there exists no association between the marital status of the respondents and their participation in the APFS groups. However, the result of the chi-square is found to be statistically significant at the 10% level.

Education

The survey result revealed that 73.52% of the respondents had no formal education. This includes those who have not attended any school before and those who had attended the Alternative Basic Education for Karamoja, which is an informal way of learning. 26.48% of the respondents had attained formal education which includes primary, secondary and tertiary education. The chi-square result of the education variable (0.09) is not statistically significant at the 5% level of significance. Therefore, there exists no relationship between a farmer's education status and his/ her decision to participate in the APFS groups.

Dependants

The respondents were asked if they have any child or adult dependants and the results showed that out of 220 respondents, 31.82% had no dependants at all while 68.18% had dependants. The chi-square result of this variable was 0.97 which was statistically insignificant at the 5% level of significance. This implies that there is no association between having dependants and one's decision to be a member of an APFS group.

Training attended

Out of 215 respondents, 22.33% had attended training on VSLA, farming, business skills, leadership, peace among others. The remaining 77.67% had not participated in any training before. The chi-square result of 5.46 is statistically significant at the 5% level of significance. Therefore, there exists a significant relationship between the training attended and the farmer's decision to participate in APFS programs. Through attending various trainings, farmers are able to gain access to various types of information which contributes towards one's decision to become a member of a farmer group (Adong et al., 2013).

Main livelihood

The results of the analysis showed that 87.10% of the respondents practiced crop farming and/ or livestock keeping as their main source of livelihood. The remaining 12.90% engaged in other activities such as local brewing, charcoal burning, casual labor and sell of firewood to sustain their livelihoods. The chi-square result is 0.54 which is not statistically significant at the 5% level of significance. This implies that having crop farming and/ or livestock keeping as the main source of livelihood does not influence one's decision to become a member of a farmer group.

It can be noted that these findings are not in line with the study hypotheses since it is expected that the gender of the farmer, marital status, age and level of education will be significant in explaining a farmer's decision to participate in APFS programs. The results for the level of education are consistent with the findings of Davis et al. (2010) and might be due to the fact that a larger share of farmers in the two sub counties have no formal education at all and a much smaller share have attained either primary or post primary education. This could be the case for the marital status as well, considering the fact that majority of the respondents are either married or in a domestic partnership. The lack of association between gender and one's decision to participate in an APFS program is in line with the study conducted by Davis et al. (2010) and implies that the APFS groups

are equally accessed by both male and female farmers in the two sub counties. As it will be observed later when conducting the analysis using the probit regression model, the results of age become significant after the introduction of the age squared variable, which accounts for the effect of the life cycle course on one's decision to participate in the APFS groups.

Table 6. Comparisons of selected attributes between APFS membership and non-membership status

Farmer characteristics	Membership status			Chi – square value	P - Value
	Member	**Non-member**	**Total**		
Gender					
Male	67	37	116	1.30	0.254
Female	66	50	104		
Marital status					
Single	19	21	40	3.43	0.064
Married	114	66	180		
Education					
Non formal	98	63	161	0.09	0.764
Formal	34	24	58		
Dependants					
No	39	31	70	0.97	0.326
Yes	94	56	150		
Any training attended					
No	94	73	167	5.46	0.019
Yes	36	12	48		
Main livelihood					
Crop farming and Livestock keeping	115	74	189	0.54	0.464
Other	15	13	28		

Source: Author

4.3.3 Econometric Model

This section presents the results of the binary probit regression model and provides an explanation of the factors that affect farmer participation in the APFS groups (Table 4), controlling for the possible effects of other variables in the regression.

The results of the regression analysis on age were found to be positive and statistically significant at the 5% level of significance, which is in line with our study hypothesis. This implies that older farmers are more likely to join APFS groups than younger farmers by a 26.4 percent probability, which is in line with the findings of Adong et al. (2013). The older one gets, the more experienced and resource endowed he/ she becomes and therefore the higher the likelihood of participating in agricultural projects (Etwire et al., 2013). Controlling for other variables such as gender, marital

status, level of education among others does not alter the results of the regression that much and the result is still statistically significant. The negative sign on the coefficient of age squared is as expected and captures the effect of the life cycle course on one's decision to participate in the APFS groups. This implies that participation in the APFS groups increases at first as one gets older, remains relatively constant at some point in time and then starts to decline at a later stage (Adong et al., 2013).

Training attended by the respondent had a positive regression weight of 0.083, which is significant at the 15% level of significance. This implies that individuals who have attended any training before on VSLA, farming, business skills among others are 8.3 percent more likely to join APFS groups than those who have not attended such training before.

It is also evident that the marital status, gender and main livelihood had positive regression coefficients of 0.082, 0.034, and 0.396 respectively. This implies that holding other factors constant, individuals who are male, married/ in a domestic partnership and practice crop farming and/ or livestock keeping as their main source of livelihood are more likely to join APFS groups than those who are female, single/ not married and depend on other sources of livelihood other than crop farming or livestock keeping. However, the results are not statistically significant at the 5% level of significance.

Other independent variables such as education and having dependants have negative coefficients of -0.039 and -0.143 respectively. This indicates that individuals who lack formal education and those who have no dependants are more likely to join APFS groups than those who have formal education and have dependants. Nevertheless, the results are not statistically significant at the 5% level of significance.

Contrary to the Pearson chi-square test, the results of the regression analysis on age were found to be statistically significant at the 5% level of significance. However, this is true only after the introduction of the age squared variable which accounts for the effect of life cycle course on a farmer's decision to be a member or not of the APFS groups. The results of the regression analysis on gender, marital status and level of education are insignificant at the 5% level of significance which is in line with the findings of the Pearson chi-square test. While investigating the determinants of farmer participation in FFS programs in East Africa, Davis et al. (2010) found education to be statistically insignificant in explaining farmers' decision to participate in FFS

programs in Tanzania. This was attributed to the fact that only a small share of farmers had attended primary and post primary education. Taking this into consideration, the study results for the level of education might be insignificant due to the fact that majority of farmers in the Tapac and Nadunget sub counties have no formal education at all and a much smaller percentage have attained formal education. This could be the case for the marital status as well, considering the fact that majority of the respondents are either married or in a domestic partnership. The lack of association between gender and one's decision to participate in an APFS program is in line with the study conducted by Davis et al. (2010) and implies that the APFS groups are equally accessed by both male and female farmers in the two sub counties. This showcases the potential of APFS programs in promoting gender equality through the involvement of both male and female members of the communities.

Table 5. Statistical results of the probit regression analysis

	Model 1 b/se	Model 2 b/se	Model 3 b/se
APFS Status			
Age	0.264***	0.262***	0.249***
	(0.06)	(0.06)	(0.06)
Age_Sq	-0.004***	-0.003***	-0.003***
	(0.00)	(0.00)	(0.00)
Marital Status		0.085	0.082
		(0.25)	(0.28)
Gender		0.060	0.034
		(0.19)	(0.19)
Education		0.020	-0.039
		(0.21)	(0.22)
Training Attended			0.396
			(0.26)
Dependants			-0.143
			(0.23)
Main Livelihood			0.083
			(0.27)
Constant	-4.141***	-4.227***	-4.019***
	(0.94)	(0.96)	(1.00)

* $p<0.05$, ** $p<0.01$, *** $p<0.001$

CHAPTER V: CONCLUSION AND RECOMMENDATIONS

This study investigated the determinants of farmer participation in Agro Pastoral/ Farmer Field Schools in Nadunget and Tapac Sub counties of Moroto District in Uganda. The results of the study revealed that approximately 53% of the total respondents were female, and majority (73.52%) had no formal education. Despite the voluntary nature of participation in the APFS groups, some farmers failed to participate due to lack of knowledge about the existence of such groups (62.96%), too much responsibilities which prevented one from joining (23.46%), lack of interest (4.94%) and others said that they were not allowed to join (2.47%). Among other reasons cited for not joining the APFS groups, some respondents said that they were too old to join.

The results of the Pearson chi-square test revealed that participating in various trainings for example VSLA, farming techniques, business skills among others is significant in explaining a farmer's decision to participate in the APFS groups at the 5% level of significance. The chi-square result of the marital status was found to be significant at the 10% level of significance. Other explanatory variables are found to be statistically insignificant at the 5% level of significance, which shows that they do not exhibit any relationship with a farmer's decision to participate in the APFS groups. The results obtained for the level of education might be insignificant due to the fact that a larger share of farmers in the two sub counties lack formal education and a much smaller share have attained either primary or post primary education. This could be the case for the marital status as well, considering the fact that majority of the respondents are either married or in a domestic partnership. The lack of association between gender and one's decision to participate in an APFS program implies that the APFS groups are equally accessible to both male and female farmers in Nadunget and Tapac sub counties, showing the potential of APFS programs in promoting gender equality.

The results of the binary probit regression model showed that out of the seven hypothesized independent variables, only one was found to have a significant impact on the farmer's decision to participate in APFS/ FFS programs at the 5% level of significance. With regards to the above, the results confirmed that the farmer's age was found to be positively associated with the decision to participate in APFS groups, implying that older farmers are more willing to participate in APFS groups than younger farmers. This can be attributed to the fact that as one gets older, he/ she becomes more experienced and resource endowed and therefore has a higher likelihood of

participating in APFS groups. The negative sign on the coefficient of age squared captures the effect of the life cycle course on participation, which implies that participation in the APFS groups increases at first as one gets older, remains relatively constant at some point in time and then starts to decline at a later stage. The training attended by the farmer has a positive regression weight and is statistically significant at the 15% level. This illustrates that farmers who have attended training before are more likely to join APFS groups than those who have not. Factors such as marital status, gender and main livelihood are shown to be positively associated with a farmer's decision to participate in APFS groups. However, the results are not significant at the 5% level of significance. Other factors such as the education status and having dependants are shown to be negatively associated with one's decision to participate in APFS groups and the results are statistically insignificant at the 5% level of significance.

Due to the low literacy levels in Karamoja sub-region, it is important to employ appropriate recruitment efforts during the APFS group formation process. This involves using proper channels to relay timely and adequate information about the long-term benefits associated with participating in APFS groups. From the study, it can be shown that the means of communication which are most accessible to farmers in Nadunget and Tapac Sub counties are: "information obtained from village elders" and "personal contacts or meetings". Publicity on the benefits of belonging to an APFS group should therefore be channeled through the respective community leaders and members of the community should be encouraged to share any information related to APFS programs with friends, neighbors and/ or relatives. Since Karamojong is the local language used for communication, any material or means of communication should be done in the Karamojong language in order to get to the majority. Moreover, APFS programs should be tailored in such a way that they are flexible and can easily adapt to the day to day schedule of the beneficiary communities.

Further research should be conducted in other districts where the F-SURE project or other APFS projects are being implemented in Karamoja Sub-region in order to validate the findings. Moreover, an in-depth study is recommended to incorporate other variables such as the size of the farm one owns, distance of the farm to the nearest market or urban center and one's perception towards APFS programs, which will identify further the determinants of farmer participation in APFS/ FFS programs.

REFERENCES

Adesina, T. K., Eforuoku, F. 2016. Determinants of Participation in Youth-in-Agriculture Programme in Ondo State, Nigeria. Journal of Agricultural Extension. http://dx.doi.org/10.4314/jae.v20i2.8

Adong, A., Mwaura, F., Okoboi, G. 2013. What Factors Determine Membership to Farmer Groups in Uganda? Evidence from the Uganda Census of Agriculture 2008/9. Sectoral Department, Economic Policy Research Centre, Kampala, Uganda. Invited paper presented at the 4th International Conference of the African Association of Agricultural Economists, September 22-25, 2013, Hammamet, Tunisia

Africa Mission - Cooperazione E Sviluppo. 2021. Cooperation and Development. https://www.africamission.org/chi-siamo/cooperazione-e-sviluppo.html

Agidew, A. A., Singh, K. N. 2018. Factors affecting farmers' participation in watershed management programs in the Northeastern highlands of Ethiopia: a case study in the Teleyayen sub-watershed. Ecological Processes 7, 15 (2018)

Amin, S., Austrian, K., Chau, M., Glazer, K., Green, E., Stewart, D., Marie, S. 2013. The adolescent girls vulnerability index: Guiding strategic investment in Uganda." New York: Population Council

Bello, A. R. S. 2020. Factors Affecting Respondents' Participation in Farmers Field Schools in Khartoum State, Sudan. Advances in Social Sciences Research Journal, 7(4), 62-70

Browne, S., Glaeser, L. 2010. Karamoja Region Food Security Assessment: Uganda. A Special Report by the Famine Early Warning System Network (FEWS NET)

Chocholata, L. 2020. Farmer field schools, gender equality, social inclusion and community empowerment – Experiences from Uganda - Karamoja sub-region, case study. Rome, FAO. https://doi.org/10.4060/cb0709en

Christoplos, I., Kidd, A. 2000. Guide for Monitoring, Evaluation and Joint Analyses of Pluralistic Extension Support. Lindau: Swiss Centre for Agricultural Extension and Rural Development

Danso-Abbeam, G., Ehiakpor, D.S., Aidoo, R. 2018. Agricultural extension and its effects on farm productivity and income: insight from Northern Ghana. Agric Food Secur 7, 74. https://doi.org/10.1186/s40066-018-0225-x

David, S. 2007. Learning to Think for Ourselves: Knowledge Improvement and Social Benefits among Farmer Field School Participants in Cameroon. Journal of International Agricultural and Extension Education 14(2), 35-49

Etwire, P. M., Dogbe, W., Wiredu, A. N., Martey, E., Etwire, E., Owusu, R. K., Wahaga, E. 2013. Factors Influencing Farmer's Participation in Agricultural Projects: The case of the Agricultural Value Chain Mentorship Project in the Northern Region of Ghana. Journal of Economics and Sustainable Development 4(10), 36-43

FAO and CARE. 2019. Good Practices for Integrating Gender Equality and Women's Empowerment in Climate-Smart Agriculture Programmes. Atlanta. 108 pp. Licence: CC BY-NC-SA 3.0 IGO

FAO. 2013. FAO at work in Karamoja. Supporting communities to build resilience

FAO. 2016. Farmer Field School Guidance Document. Planning for Quality Programmes. Rome: Food and Agriculture Organization

FAO. 2017. Joint UNDP-FAO Project Document. Retrieved March 20, 2021 from https://www.thegef.org/project/food-iap-fostering-sustainability-and-resilience-food-security-karamoja-sub-region

Friis-Hansen, E., Duveskog, E., Taylor, E. 2012. Less noise in the household: the Impact of Farmer Field Schools on Gender Relations. Journal of Research in Peace, Gender and Development (ISSN: 2251-0036). 2, 2. 44-55. http://www.interesjournals.org/JRPGD

Goff, S., Lindner, J.R., Dolly, D. 2008. Factors in Participation and Non-Participation in Farmer Field Schools in Trinidad and Tobago. Proceedings of the 24th Annual Meeting AIAEE, EARTH University, Costarica. 214-224

Haitovsky, Y. 1968. Missing Data in Regression Analysis. Journal of the Royal Statistical Society: Series B 30 (1), 67-82

IPC. 2015. Report of the Integrated Food Security Phase Classification Analysis for Karamoja. Uganda IPC technical working group August 2015

IPC. 2020. Uganda: Overview of the IPC Acute Food Insecurity And Acute Malnutrition Analyses of Karamoja Area, Urban Areas, Refugee Settlements and Host Community Districts. IPC Acute Food Insecurity and Acute Malnutrition Analysis

Isubikalu, P. 2007. Stepping-stones to improve upon functioning of participatory agricultural extension programmes. Farmer Field Schools in Uganda. Wageningen University, PhD thesis

Kimati, U. 2015. An assessment of the factors that impact the level of success of farmer field school training in Tanzania: a descriptive study. Graduate Theses and Dissertations. 14819. https://lib.dr.iastate.edu/etd/14819

Kwak, S. K., Kim, J. H. 2017. Statistical data preparation: management of missing values and outliers. Korean journal of anesthesiology, 70(4), 407–411

Nakalembe, C., Dempewolf, J., Justice, C. (2017). Agricultural land use change in Karamoja Region, Uganda. Land Use Policy, 62, 2–12

Oladele, O., Kgosiemang, D. 2012. Factors Affecting Farmers' Participation in Agricultural Projects in Mkhondo Municipality of Mpumalanga Province, South Africa. J Hum Ecol, 37(1): 19-27 (2012)

Pemsl, D. E., Waibel, H., Witt, R. 2006. Diffusion of information among small-scale farmers in Senegal: the concept of Farmer Field Schools. Proceedings of the German Development Economics Conference, Berlin 2006, No. 30, Verein für Socialpolitik, Ausschuss für Entwicklungsländer, Hannover

Phillips, D., Waddington, H., White, H. 2015. Why targeting matters: examining the relationship between selection, participation and outcomes in farmer field school programs, 3ie Systematic Review 11. London: International Initiative for Impact Evaluation (3ie)

Rhiney, K., Tomlinson, J. 2017. Assessing the role of farmer field schools in promoting pro-adaptive behaviour towards climate change among Jamaican farmers. Journal of Environmental Studies and Sciences 8(5), 86-98

Silva, K. N. N., Broekel, T. 2016. Factors Constraining Farmers Adoption of New Agricultural Technology Programme in Hambantota District in Sri Lanka: Perceptions of Agriculture Extension Officers. 13th International Conference on Business Management 2016. 378-398

Towo, E. 2004. The Gender dimension of rural producers in Tanzania. Working Paper 2004:131. Norwegian Institute for Urban and Regional Research (NIBR)

Turhan, N. S. 2020. Karl Pearson's chi-square tests. Academic Journals 15(9), 575-580

UBOS. 2016. Uganda National Household Survey 2016/2017. Kampala, Uganda; UBOS

UBOS. 2019. Statistical Abstract. Retrieved May 14, 2021 from https://www.ubos.org/wp-content/uploads/publications/01_20202019_Statistical_Abstract_-Final.pdf

UNFPA. 2018. Population Matters. Leaving no one behind in Karamoja. Issue Brief 7

USAID. 2017. Climate Risk Profile. Climate Risk Screening for Food Security - Karamoja Region, Uganda

UNICEF., FAO., WFP. 2017. Food Security and Nutrition Assessment in Karamoja Sub-Region

UNICEF., WFP. 2016. Food Security & Nutrition Assessment Karamoja, Uganda

Waddington, H., Snilstveit, B., Hombrados, J., Vojtkova, M., Phillips, D., Davies, P., White, H., 2014. Farmer Field Schools for Improving Farming Practices and Farmer Outcomes: A Systematic Review (Campbell Systematic Reviews 2014:6). https://doi.org/10.4073/CSR.2014.6

APPENDICES

Appendix 1: Karamoja Sub Region Acute Food Insecurity Overview

Table A.1. Karamoja Acute Food Insecurity

Karamoja Sub Region Acute Food Insecurity June - August 2020											
District	**Total Pop. Analyzed**	**Phase 1**		**Phase 2**		**Phase 3**		**Phase 4**		**Phase 5**		**Area Phase**
		People	**%**	**People**	**%**	**People**	**%**	**People**	**%**	**People**	**%**	
Abim	153,500	61,400	40%	53,725	35%	30,700	20%	7,675	5%	0	0	3
Amudat	134,900	67,450	50%	47,215	35%	20,235	15%	0	0%	0	0	2
Kaabong	125,400	18,810	15%	62,700	50%	31,350	25%	12,540	10%	0	0	3
Karenga	68,500	37,675	55%	20,550	30%	6,850	10%	3,425	5%	0	0	2
Kotido	206,500	72,275	35%	72,275	35%	51,625	25%	10,325	5%	0	0	3
Moroto	118,500	23,700	20%	59,250	50%	29,625	25%	5,925	5%	0	0	3
Nabilatuk	89,700	22,425	25%	26,910	30%	31,395	35%	8,970	10%	0	0	3
Nakapiripirit	113,300	28,325	25%	62,315	55%	22,660	20%	0	0%	0	0	3
Napak	158,300	47,490	30%	71,235	45%	31,660	20%	7,915	5%	0	0	3
Total	**1,168,600**	**379,550**	**32%**	**476,175**	**41%**	**256,100**	**22%**	**56,775**	**5%**	**0**	**0**	
Karamoja Sub Region Projected Food Insecurity September 2020 - January 2021											
District	**Total Pop. Analyzed**	**Phase 1**		**Phase 2**		**Phase 3**		**Phase 4**		**Phase 5**		**Area Phase**
		People	**%**	**People**	**%**	**People**	**%**	**People**	**%**	**People**	**%**	
Abim	153,500	84,425	55%	53,725	35%	15,350	10%	0	0%	0	0	2
Amudat	134,900	67,450	50%	53,960	40%	13,490	10%	0	0%	0	0	2
Kaabong	125,400	37,620	30%	56,430	45%	25,080	20%	6,270	5%	0	0	3
Karenga	68,500	44,525	65%	20,550	30%	3,425	5%	0	0%	0	0	2
Kotido	206,500	82,600	40%	82,600	40%	41,300	20%	0	0%	0	0	3
Moroto	118,500	47,400	40%	53,325	45%	17,775	15%	0	0%	0	0	2
Nabilatuk	89,700	26,910	30%	35,880	40%	22,425	25%	4,485	5%	0	0	3
Nakapiripirit	113,300	39,655	35%	56,650	50%	16,995	15%	0	0%	0	0	2
Napak	158,300	79,150	50%	63,320	40%	15,830	10%	0	0%	0	0	2
Total	**1,168,600**	**509,735**	**44%**	**476,440**	**41%**	**171,670**	**15%**	**10,755**	**1%**	**0**	**0**	

Source: IPC Report, 2020

Appendix 2: Trend in Food Consumption Score (FCS) in Karamoja Sub Region

Table A.2. Karamoja Trend in FCS

Trend in Food Consumption Score (FCS) in Karamoja Sub Region			
Year	Acceptable FCS (%)	Borderline FCS (%)	Poor FCS (%)
2012	59	33	8
2013	43	37	20
2014	40	37	23
2015	50	37	13
2016	48	35	17
2017	55	32	14

Source: WFP and UNICEF Report, 2017

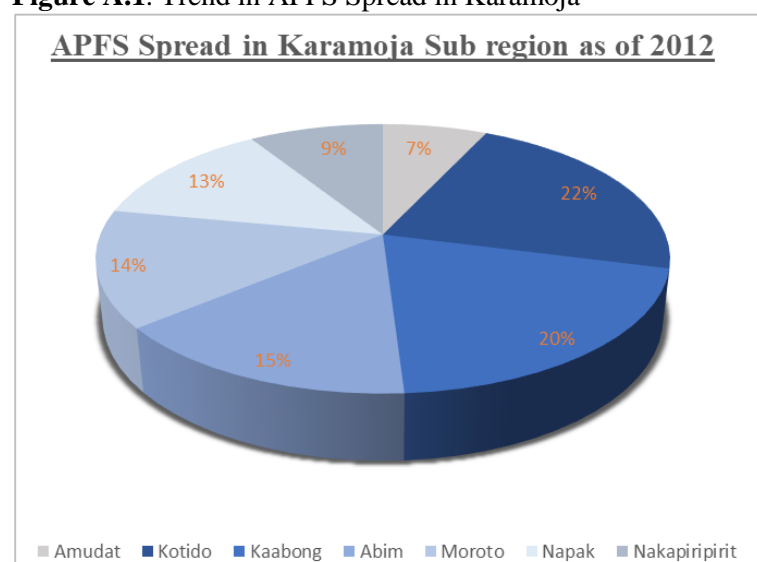## Appendix 3: APFS Spread in Karamoja Sub Region

Table A.3. Trend in APFS Spread in Karamoja

District	Amudat	Kotido	Kaabong	Abim	Moroto	Napak	Nakapiripirit
APFS Spread in Karamoja Sub Region as of 2012	7%	22%	20%	15%	14%	13%	9%

Source: DDRU, FAO Uganda

Figure A.1. Trend in APFS Spread in Karamoja

Source: DDRU, FAO Uganda

Appendix 4: APFS Member Survey Questionnaire

Table A.4. APFS Member Survey Questionnaire

My name is *(Name of the interviewer)* …………………………………………………………………………………… and I work with **C&D**.

The purpose of this interview is to obtain information that will help us understand the *socio-economic* situation of your household. Your participation in the interview is *absolutely voluntary*, the information provided will be used purely for academic or project's purpose and will be treated with absolute *CONFIDENTIALITY*.

Identification number:			
Date of the Interview:	DD	MM	YYYY

<table>
<tr><td colspan="5" align="center">SECTION 100: Location details.</td></tr>
<tr><td>Q.101</td><td>District:</td><td colspan="3">Moroto</td></tr>
<tr><td>Q.102</td><td>Sub county:
(please select only one)</td><td colspan="2">Nadunget</td><td>Tapac</td></tr>
<tr><td rowspan="2">Q.103</td><td rowspan="2">Parish:
(please select only one)</td><td>Lotirir</td><td>Nadunget</td><td>Naitakwae</td></tr>
<tr><td>Katikekile</td><td>Kodonyo</td><td>Tapac</td></tr>
<tr><td>Q.104</td><td>Village:</td><td colspan="3"></td></tr>
<tr><td colspan="5" align="center">SECTION 200: Biodata/ Personal Details.</td></tr>
<tr><td>Q.201</td><td>Surname:</td><td colspan="2">First Name:</td><td>Other Names:</td></tr>
<tr><td></td><td></td><td colspan="2"></td><td></td></tr>
<tr><td>Q.202</td><td>Sex:</td><td colspan="2">Male</td><td>Female</td></tr>
<tr><td>Q.203</td><td>Age:
(in complete years)</td><td colspan="3"></td></tr>
<tr><td>Q.204</td><td>What is the name of your APFS group?</td><td colspan="3"></td></tr>
<tr><td>Q.205</td><td>What is your designation in the APFS group?</td><td colspan="3"></td></tr>
<tr><td>Q.206</td><td>What is your APFS group slogan?</td><td colspan="3"></td></tr>
<tr><td>Q.207</td><td>Do you belong to any other APFS group/s?</td><td colspan="2">1. Yes
2. No</td><td>If No please skip to Q.210</td></tr>
<tr><td>Q.208</td><td>If "Yes" what is/are the name/s of the APFS group/s?</td><td colspan="3"></td></tr>
<tr><td>Q.209</td><td>What is your designation in the APFS group/s?</td><td colspan="3"></td></tr>
</table>

Q.210	What is your marital status? *(please select only one)*	1. Single (Never married) 2. Married or in a domestic partnership 3. Widowed 4. Divorced 5. Separated		
Q.211	Do you have any dependants? *(both children and adults)*	1. Yes 2. No	*If No please skip to Q.213*	
Q.212	If yes then how many are:	*Male children:*	*Female children:*	
		Male adults:	*Female adults:*	
Q.213	What is your highest level of education? *(please select only one)*	1. None 2. Primary 3. Secondary 4. Tertiary 5. University 6. Other specify: ………………………………………….		
Q.214	How many adults in your household are educated?		*If none please skip to Q.216*	
Q.215	If any, please specify the level of education for each?	1. Primary 2. Secondary 3. Tertiary 4. University 5. Other specify: ………………………………………….		
Q.216	If present, how many children in your household attend school? *(before COVID-19)*			
Q.217	If none, what is the reason for not attending school? *(before COVID-19)*			
Q.218	Have you attended any training on farming, VSLA, adult education etc.?	1. Yes 2. No	*If No please skip to Q.221*	
Q.219	If "Yes", what was the name of the training?			
Q.220	What is the name of the organization that trained you?			
Q.221	What is your contact? *(phone number)*			
Section 300: **Livelihood**				
Q.301	What is your main source of livelihood? *(please select only one)*	*Crop farming*	*Livestock keeping*	*Other specify*
Q.302	If "crop farming", what is the main crop produced?			

Q.303	What is the average quantity of the main crop produced per year?		
Q.304	List three main challenges encountered in your livelihood efforts.	*1.* *2.* *3.*	
Q.305	List three other challenges encountered not related to your livelihood efforts.	*1.* *2.* *3.*	
Q.306	How do you supplement your food needs?		
Q.307	Are you formally/informally employed?	*1. Yes* *2. No*	*If No please skip to Q.310*
Q.308	If "Yes" what is your job description?		
Q.309	What is your average salary per month in UGX?		
Q.310	What other income generating activities are you involved in?		
Q.311	Are there any members of your household working away from home?	*1. Yes* *2. No*	
Q.312	Do you own a bank account?	*1. Yes* *2. No*	*If No please skip to Q.314*
Q.313	If "Yes" which type of account do you own?	*1. Personal savings account* *2. Group savings account*	
Q.314	Do you belong to any active VSLA?	*1. Yes* *2. No*	*If No please skip to Q.401*
Q.315	If "Yes" what is the name of the VSLA?		
Q.316	Where is the VSLA located?		
Q.317	What is your designation in the VSLA?		
SECTION 400: **Means of communication**			
Q.401	Which means of communication are accessible to you? *(may select more than one)*	*1. Mobile phone* *2. Television* *3. Radio* *4. Newspaper*	*5. Letter* *6. Village elders* *7. Personal contacts/ meetings* *8. Other specify:*

SECTION 500: **Assets**		
Which of the following assets do you own? *(please specify the quantity)*	1. Land 2. Bicycle 3. Motorcycle 4. Radio 5. Cultivation tools	6. Wheelbarrow 7. Donkey cart 8. Ox plough 9. Grinding mill 10. Other specify:
If you own livestock, how many of the following do you own?	1. Cows 2. Goats 3. Sheep 4. Donkeys	5. Pigs 6. Birds 7. Other specify:
Thank You for Your Time!		

Source: Author

Appendix 5: Non - APFS Member Survey Questionnaire

Table A.5. Non - APFS Member Survey Questionnaire

My name is *(Name of the interviewer)* ……………………………………………………………………………… and I work with *C&D*.

The purpose of this interview is to obtain information that will help us understand the *socio-economic* situation of your household. Your participation in the interview is *absolutely voluntary*, the information provided will be used purely for academic or project's purpose and will be treated with absolute *CONFIDENTIALITY*.

Identification number:			
Date of the Interview:	DD	MM	YYYY

SECTION 100: **Location details.**					
Q.101	District:	Moroto			
Q.102	Sub county: *(please select only one)*	Nadunget		Tapac	
Q.103	Parish: *(please select only one)*	Lotirir	Nadunget		Naitakwae
		Katikekile	Kodonyo		Tapac
Q.104	Village:				
SECTION 200: **Biodata/ Personal Details.**					
Q.201	Surname:	First Name:		Other Names:	

Q.202	Sex:	*Male*	*Female*
Q.203	Age: ***(in complete years)***		
Q.204	Do you belong to any APFS group/s?	*1. Yes* *2. No*	***If No please skip to Q.207***
Q.205	If "Yes" what is/are the name/s of the APFS group/s?		
Q.206	What is your designation in the APFS group/s?		
Q.207	If "No" what is your reason for not joining the APFS group/s? ***(Please select one that most applies to you)***	*1. No knowledge of the existence of such groups* *2. Too much responsibilities which prevent me from joining* *3. I am not interested* *4. I am not allowed to join* *5. Other (specify):*	
Q.208	What is your marital status? ***(please select only one)***	*1. Single (Never married)* *2. Married or in a domestic partnership* *3. Widowed* *4. Divorced* *5. Separated*	
Q.209	Do you have any dependants? ***(both children and adults)***	*1. Yes* *2. No*	***If No please skip to Q.211***
Q.210	If yes then how many are:	*Male children:*	*Female children:*
		Male adults:	*Female adults:*
Q.211	What is your highest level of education? ***(please select only one)***	*1. None* *2. Primary* *3. Secondary* *4. Tertiary* *5. University* *6. Other specify: ………………………………………*	
Q.212	How many adults in your household are educated?		***If none please skip to Q.216***
Q.213	If any, please specify the level of education for each?	*1. Primary* *2. Secondary* *3. Tertiary* *4. University* *5. Other specify: ………………………………………*	
Q.214	If present, how many children in your household attend school? ***(before COVID-19)***		
Q.215	If none, what is the reason for not attending school? ***(before COVID-19)***		

Q.216	Have you attended any training on farming, VSLA, adult education etc.?	1. Yes 2. No		If No please skip to Q.221
Q.217	If "Yes", what was the name of the training?			
Q.218	What is the name of the organization that trained you?			
Q.219	What is your contact? *(phone number)*			

Section 300: **Livelihood**

Q.301	What is your main source of livelihood? *(please select only one)*	*Crop farming*	*Livestock keeping*	*Other specify*
Q.302	If "crop farming", what is the main crop produced?			
Q.303	What is the average quantity of the main crop produced per year?			
Q.304	List three main challenges encountered in your livelihood efforts.	*1.* *2.* *3.*		
Q.305	List three other challenges encountered not related to your livelihood efforts.	*1.* *2.* *3.*		
Q.306	How do you supplement your food needs?			
Q.307	Are you formally/informally employed?	1. Yes 2. No		If No please skip to Q.310
Q.308	If "Yes" what is your job description?			
Q.309	What is your average salary per month in UGX?			
Q.310	What other income generating activities are you involved in?			
Q.311	Are there any members of your household working away from home?	1. Yes 2. No		
Q.312	Do you own a bank account?	1. Yes 2. No		If No please skip to Q.314
Q.313	If "Yes" which type of account do you own?	1. Personal savings account 2. Group savings account		

Q.314	Do you belong to any active VSLA?	1. Yes 2. No	If No please skip to Q.401
Q.315	If "Yes" what is the name of the VSLA?		
Q.316	Where is the VSLA located?		
Q.317	What is your designation in the VSLA?		
SECTION 400: **Means of communication**			
Q.401	Which means of communication are accessible to you? ***(may select more than one)***	*1. Mobile phone* *2. Television* *3. Radio* *4. Newspaper*	*5. Letter* *6. Village elders* *7. Personal contacts/ meetings* *8. Other specify:*
SECTION 500: **Assets**			
Q.501	Which of the following assets do you own? ***(please specify the quantity)***	*1. Land* *2. Bicycle* *3. Motorcycle* *4. Radio* *5. Cultivation tools*	*6. Wheelbarrow* *7. Donkey cart* *8. Ox plough* *9. Grinding mill* *10. Other specify:*
Q.502	If you own livestock, how many of the following do you own?	*1. Cows* *2. Goats* *3. Sheep* *4. Donkeys*	*5. Pigs* *6. Birds* *7. Other specify:*
Thank You for Your Time!			

Source: Author

Appendix 6: Internship Weekly Chronology of Activities

The internship was undertaken at the M&E department of C&D office in Moroto from the beginning of February to the end of May, 2021.

Table A.6. Internship Weekly Chronology of Activities

Period	Key Activities
Week 1	- Arrival in C&D Kampala and Moroto offices. - Introduction to the entire team that I would be working with, mostly the M&E team and the F-SURE project manager, who introduced me to the F-SURE project team working in the field. - Familiarized myself with the tools I will be working with. These included various project documents. - Since the F-SURE project was still in the implementation phase, I was tasked with the responsibility of coming up with the APFS group registration forms, group attendance lists and items distribution lists in order to keep track of the APFS group formalization process. - Started drafting the questionnaire that will be used to gather information on the socio-economic characteristics of the APFS group members.

Week 2	- Accompanied the F-SURE project manager to the field in Nadunget and Tapac sub counties where I was introduced to the APFS facilitators and project assistants. The purpose of the visits was to gather information about the APFS group formalization process which was underway. - We visited one of the APFS groups in Nadunget Sub county, Lotirir Parish, whose members were in the process of conducting elections for the group executive officials. - Reviewed the inception report for the F-SURE project which had been shared to me by the project manager.
Week 3	- Accompanied the F-SURE project manager to Nadunget sub county for a meeting with the project facilitators. The purpose of the meeting was to review the progress achieved with the APFS group formalization process. - Received the equipment to be used for the F-SURE project from C&D office in Kampala and cross-checked this with the delivery note. Later, I sorted out the items to be delivered to Nadunget and Tapac sub counties and prepared the distribution lists to be signed thereafter. - Prepared and reviewed the weekly reporting format to be used by the F-SURE project facilitators to capture the activities that have taken place during a specific week. - Began working on the project database to capture the APFS group and member profiles. The APFS group profile includes all the group information such as the name of the APFS groups, the location details, the number of members in each group disaggregated by sex among others. The member profile captures all the members' details in each group such as the names, age, sex, APFS group designation among others. The database will be updated periodically to record any changes that have taken place since the group formalization stage.
Week 4	- Worked on the VSLA tracking tools such as the loan schedule to track the volumes of savings, loans and total contributions by the APFS groups. - With information obtained from the two project assistants based in Nadunget and Tapac sub counties, I updated the F-SURE database to capture all the required information. - Participated in the enterprise selection process for three APFS groups in Nadunget sub county. The methods used for the enterprise selection were pairwise ranking, selection matrix and profit ranking. This enabled the APFS group members to identify both commercial and learning enterprises, which are the most sustainable, cost effective and profitable. - Prepared a report to brief the project manager about the enterprise selection process in Nadunget sub county.
Week 5	- Performed data checks on the member profile for Nadunget sub county using Microsoft Excel to identify any inconsistencies such as missing data which I communicated to the project assistant who followed up. - Accompanied the project assistant for Nadunget sub county to oversee the APFS group activities. During the visit, we participated in the enterprise selection process for one APFS group which was conducted using both pairwise ranking and enterprise selection matrix. Later, we visited all the APFS groups in Nadunget Parish to distribute various equipment to be used by the group members. - Through the guidance of the M&E officer, I started working on the Indicator Performance Tracking Table (IPTT) for the F-SURE project, which will be used to track the performance of various indicators as required by the project. - Prepared and submitted a report to the F-SURE project manager about the enterprise selection process as well as the items distribution exercise.
Week 6	- Used the APFS group member profile database to capture some summary statistics as requested by the project assistant for Nadunget sub county. These included pie charts and bar graphs to capture measures such as the mean, minimum and maximum age for APFS members. - Assisted the project assistant for Nadunget sub county in compiling the weekly reports which had been submitted by the F-SURE project facilitators. - Attended a joint meeting with members of two APFS groups in Nadunget sub county. The main objective of the meeting was to encourage the APFS members to take the project seriously and discuss the way forward concerning future project activities. Also present at the meeting were two parish chiefs and local council elders. - Attended the AICS meeting held at the M&E office in order to plan for the upcoming KAP survey exercise for the Feeding with Food and Knowledge project.

Week 7	- Edited the IPTT with guidance from the F-SURE project manager and the M&E officer to capture the required indicators.
	- Updated the APFS group and member profiles for Tapac sub county using information provided by the project assistant.
	- Started editing the APFS group constitutions for Tapac sub county which had been drafted in hard copy format.
	- Performed some checks on the data for Tapac sub county and recorded information such as the total count of APFS members, the total count of male and female members and the APFS group status (old and new) in the sub county.
	- Followed the online training on Survey Solutions related to: *getting started with Survey Solutions, Setting up a test survey, Overview of questionnaire designer, Introduction to functions, Lookup tables and Macros tutorial*. This equipped me with the necessary questionnaire design skills required to design the questionnaire for the upcoming AICS KAP survey exercise.
	- Submitted graphical presentations of the analysis performed on the APFS member profile to be included in the inception report being prepared by the project manager.
Week 8	- Harmonized the APFS group enterprise budgets for Nadunget and Tapac Sub counties.
	- Analyzed the member profile for Tapac and Nadunget Sub counties to capture various age dynamics as requested by the project manager.
	- Helped the project assistant for Nadunget Sub county in compiling the weekly reports.
	- Accompanied the F-SURE project manager to Tapac sub county to review the work done by the team in the field.
	- Accompanied the AICS project team to Napak District for the training on animal traction.
Week 9	- Attended the facilitators' training in Nadunget Sub county for the F-SURE project on VSLA and coming up with a Group Action Plan (GAP) for the APFS groups.
	- Designed the Endline KAP Survey Household evaluation questionnaire for the AICS project using Survey Solutions Designer.
Week 10	- Edited the AICS KAP survey questionnaire on Survey Solutions to include skip commands, enabling conditions and validation rules.
	- Had a meeting with the M&E team to review the questionnaire on Survey Solutions and edit accordingly.
	- Accompanied the F-SURE project assistant to Tapac Sub county to distribute the VSLA tool kits to the respective APFS groups.
	- Set up the tablets that will be used for data collection for the AICS project KAP survey exercise. This included downloading and installing the required interviewer applications to be used.
	- Had a meeting with the team from Doctors with Africa (CUAMM) to review the Nutrition related KAP survey questionnaire and proceeded to make the required adjustments on Survey Solutions.
Week 11	- Prepared a template for the constitutions to be used by the APFS groups in Tapac and Nadunget Sub counties, after which I proceeded to harmonize the draft constitutions submitted by the various groups according to the template.
	- Attended the AICS KAP survey enumerators' orientation session to welcome the enumerators and brief them about the upcoming survey.
Week 12	- Helped in organizing the enumerator training for the AICS project KAP survey.
	- Trained the participants and guided them through the questionnaire using Survey Solutions Tester Application.
	- Set up the Personal Demo Server (PDS) provided by Survey Solutions to be used for the pilot survey exercise. After acquiring the Server credentials, I proceeded to create accounts for the team who will be taking part in the survey, i.e. the supervisors and enumerators, then uploaded the questionnaire in the server and created assignments for the entire team.
	- Attended the feedback session after the pilot survey exercise and took note of any challenges experienced in the field with regards to navigating through the questionnaire. After the feedback session, I made the respective adjustments in the questionnaire using Survey Solutions Designer.
	- Uploaded the final version of the questionnaire to the main server that was used for the data collection exercise and proceeded to create assignments for the team members.
	- Briefed the enumerators on how to navigate through the interviewer App, logging in, completing the questionnaires, re-opening the completed questionnaires and uploading the completed questionnaires to the server.

Week 13	- Monitored the server during the actual data collection exercise for the AICS project KAP survey. During the first instances, I had to reassign some questionnaires back to the respective enumerators to perform data checks and data cleaning on their completed questionnaires before re-uploading them back to the server. - Accompanied the enumerators to the field in order to check any problems arising during the data collection exercise and to offer my guidance and support whenever required. - Made some final edits to all the APFS group constitutions for Nadunget and Tapac Sub counties as per the project manager's feedback.
Week 14	- Organized the items to be taken to the field during the KAP survey exercise. - Constantly monitored the server to perform data checks on the questionnaires that had been uploaded so far and communicated any adjustments to be made with the respective enumerators. - Exported the completed questionnaires to Microsoft Excel and performed some summary statistics on the progress of the survey as requested by the M&E officer. - Distributed items for the F-SURE project to the APFS groups in Nadunget Sub county.
Week 15	- Accompanied the enumerators to the field for the final round of the AICS project KAP survey exercise. - Exported all the data collected from the server and shared some key summary statistics with the M&E officer such as the comparison between total number of sub counties and groups reached vs the target number, the total number of respondents interviewed disaggregated by sex and the total number of children under the age of 5 years whose measurements were recorded.
Week 16	- Prepared the exported data for analysis which included data cleaning and communicating any inconsistencies in the data to the M&E officer. - Looked at the indicators required to write the report for the KAP survey and performed some preliminary data analysis as requested by the M&E officer. - Attended the training of APFS group community facilitators in Nadunget Sub county, Lotirir and Naitakwae Parishes. The training covered topics such as: introduction to APFS, history of APFS, basic principles of APFS Agro-Ecosystem Analysis (AESA), Development of a season long calendar, farming as a business, commercial enterprise selection and climate smart agricultural techniques. - Virtually attended the launch of the *Young Africa Works in Uganda: Markets for Youth programme, GOAL*, which is meant to target 300,000 Ugandan youth between the ages of 16 to 35 to access dignified and fulfilling work in the agricultural sector over the next five years

Source: Author