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ACCESS TO AGRICULTURAL FINANCE, FARMER TRAINING AND PERFORMANCE OF SMALL HOLDER FARMERS: A CASE OF ONE ACRE FUND IN JINJA DISTRICT.

BY

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MARCH, 2021

PLAN A

DECLARATION

I Nanzigwa Godfrey, hereby declare that this is my original research dissertation and has never been submitted in any other institution of higher learning for any academic award.

Signature ..... Date.....04:03:2021

APPROVAL

This dissertation has been submitted with the approval of my supervisors whose signatures are appended below.

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DEDICATION

I dedicate this research work to my loving mother; Gertrude Namugabo, Dalton, Jerusha, Donald, Keziah and all my classmates who shared some information with me regarding this dissertation.

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LIST OF ABBREVIATION

CSRL	-	Centre for sustainable Rural Livelihood
FAO	-	Food and Agricultural organization
FTDA	-	Farmer Training and Development Assistance
NAADs	-	National Agricultural Advisory Services
NGOs	-	Non-Governmental Organization
NORC	-	National Opinion Research Centre
NPM	-	Natural Pest Management
SPSS	-	Statistical Package for Social Scientists
UNECE	-	United Nation Economic Commission for Europe
WTO	-	World Trade Organization

ABSTRACT

The purpose of this study was to examine the relationship between access to agricultural finance, farmer training and performance of smallholder farmers taking a case of One Acre Fund in Jinja district. The study specific objectives were: to Examine the relationship between access to agricultural finance and performance of smallholder farmers; relationship between farmer training and performance of smallholder farmers, and relationship between access to agricultural finance, farmer training and performance of smallholder farmers. A cross sectional survey design was adopted; both quantitative and qualitative research approaches were used on a sample size of 118 respondents. Data was obtained using closed ended questionnaires and semi-structured interview guide. Data was processed using SPSS v.20 to generate Pearson correlations and regression analysis results. The study found out that access to agricultural finance was positively related with performance of smallholder farmers at r=.859. It was also revealed that farmer training was positively related with performance of smallholder farmers at r=.840. Furthermore, the study revealed that both access to agricultural finance and farmer training were significant predictors of performance of smallholder farmers. Both combined account for 80.5% (Adjusted R^2=.805) in variance of performance of smallholder farmers but access to agricultural finance was the highest predictor with beta value = .694 as compared to beta value = .160 of farming training. Based on the findings, the study recommended that One Acre Fund should put a lot of emphasis on availing agricultural finance inform of loans and farm inputs to smallholder farmers in order to maintain high performance. Putting more efforts in training smallholder farmers on keeping farm records would also be very important and additionally providing training to smallholder farmers on how to invest loans given to them and teach them how to use farm inputs and equipment provided.

CHAPTER ONE
INTRODUCTION

1.1 Background to the study

Agriculture plays a crucial role in the economies of low developing countries (Anamand Muhammad, 2017). In Uganda, agriculture is the backbone of the country's economy, employing 70% of the population, and contributing half of Uganda's export earnings and a quarter of the Gross Domestic Product (World Bank Report, 2018). The agricultural sector presents investment opportunities for smallholder farmers, profit oriented companies and non-government organisations. It is also one of government's strategic priorities targeted for the transformation of the economy from a peasantry to a modern prosperous society.

Consequently, the government, farmer associations and non-government organisations extend agricultural finance and farmer training to smallholder farmers to improve their performance in terms of quality and quantity of produce. Smallholder farmers targeted are characterised by; traditional farming methods, low returns as regards quality and quantity, small acreage ranging from less than one hectare to 10 hectares, dependency on family labour for production and the use part of the produce for family consumption (FAO, 2013; Soyemi, 2014; Verter and Bečvářová, 2015; World Bank, 2016).

Smallholder farmers receive agricultural finance extended in form of interest free loans and farm inputs. This is in agreement with Nin and Yu (2014) who described agricultural financing as a structured way of financing agriculture initiatives to reduce risks commonly associated with traditional commercial banks. He further asserts that agricultural finance takes the form of loans, insurance, and farm inputs such as machinery, fertilizers and improved seeds. Additionally, the government, farmer associations and non-government organisations also provide farmer training to their beneficiaries so that they are able to utilize the loans and farm inputs received. According to Ampaire and Rothschild (2010), farmer training provided by governments, privately run extension service providers and non-governmental organisations includes training and capacity development packages that vary from one or two day workshops, seminars, on-farm training and demonstrations, to field visits. They further contend that in farmer training, smallholder farmers are equipped with working knowledge of the principles of agricultural production and sustainability, pre-cultivation preparation, land preparation, planting, record keeping and post-harvest handling.

In Jinja district, smallholder farmer training is provided by the government of Uganda through the National Agriculture Advisory Services (NAADS) that trains farmers in crop production, animal husbandry, record keeping, poultry, Banana planting, coffee growing, post-harvest handling, among other fields. This is in addition to providing farm inputs such as improved seeds, fertilizers, cows, goats and birds to farmers. One Acre Fund, an international non-government organization also provides agricultural finance and training to smallholder farmers in Jinja district. The organisation launched operations in 2016 and currently supports over 3600 farmers with incentives and interest free loans in form of farm inputs such as hybrid maize seeds, fertilisers, drying sheets and solar lamps (One Acre Fund Report, 2018). The value of this package is calculated in monetary terms and famers pay back in instalments to One Acre Fund.

To ensure that farm inputs provided to smallholder farmers are used appropriately to improve the quality and quantity of farm produce, One Acre Fund trains smallholder farmers in garden preparation, plant spacing, weeding, record keeping, use of the different fertilisers and post-harvest handling. Agricultural financing practices and farmer trainings are presumed to mutually reinforce the performance of smallholder farmers and act as catalysts for driving high and quality production. As One Acre Fund continues to provide agricultural finance and farmer training to improve the performance of smallholder farmers, farmers in Jinja district are still characterised by low returns and low quality produce (Atukunda, 2019). This therefore, prompted the researcher to carry out a study on the relationship between access to agricultural finance, farmer training and the performance of smallholder farmers taking a case of One Acre Fund in Jinja District.

1.2 Statement of the problem

The performance of smallholder farmers in Jinja district has enlisted support from government, farmer associations and non-government organisations. Ugandan government for example, through the NAADS program provides farm inputs and training to smallholder farmers (Auditor General's Report, 2017). Non-government organisations such as One Acre Fund provide hybrid maize seeds, fertilisers, drying sheets on loan and trains farmers in best farming practices in Jinja as their model district (One Acre Fund Report, 2018). While smallholder farmers participating in such programs were expected to improve the quality and quantity of their output, majority of the smallholder farmers in Jinja district continue to realize low harvests of poor quality. It is not clear what underlies the continued low harvest levels and failing quality

of farm output despite the increased access to farm inputs, loan facilities and farmer training sessions by smallholder farmers up to a tune of $450,000 which is approximately $125 (Ugx, 462,500) per farmer (One Acre Fund M&E Report, 2019). The researcher therefore, examined the relationship between access to agricultural finance, farmer training and the performance of smallholder farmers.

1.3 Purpose of the study

The study sought to examine the relationship between access to agricultural finance, farmer training and performance of smallholder farmers.

1.4 Objectives of the study

(i) To establish the relationship between access to agricultural finance and performance of smallholder farmers.
(ii) To establish the relationship between farmer training and performance of smallholder farmers.
(iii) To establish the relationship between access to agricultural finance, farmer training and performance of smallholder farmers.

1.5 Research questions

(i) What is the relationship between access to agricultural finance and performance of smallholder farmers?
(ii) What is the relationship between farmer training and performance of smallholder farmers?
(iii) What is the relationship between access to agricultural finance, farmer training and performance of smallholder farmers?

1.6 Scope of the Study

The scope of this study was categorized into three components; subject, geographical and time scope.

1.6.1 Subject Scope

The study focused on the performance of smallholder farmers as the dependent variable while access to agricultural finance and farmer training were the independent variables.

1.6.2 Geographical Scope

The study was carried out in Jinja district where One Acre Fund operates. It covered the sub-counties of Budondo, Central Division, Busedde, Buwenge rural, Kakira, Masese, Butagaya, Buyengo, Mafubira, Buwenge town council, and Mpumudde.

1.6.3 Time scope

The study took a period of one year and ten months that is; from May 2019 to March 2021

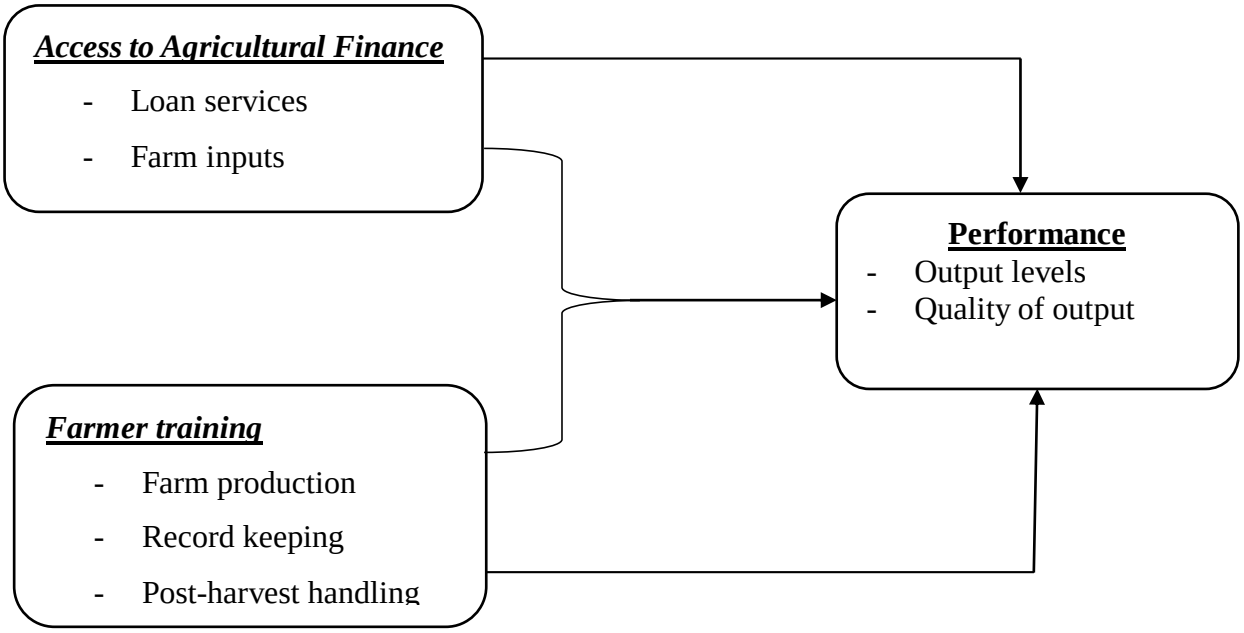
1.7 Significance of the study

The study will help smallholder farmers appreciate services provided by One Acre fund and other development agencies that train and finance farming activities.

The study made recommendations that will guide agricultural extension experts on farmer financing and training options that improve the performance of smallholder farmers.

The study will contribute to literature on access to agricultural finance and farmer training in relation to the performance of smallholder farmers. It will provide valuable information academicians and scholars who may be interested in furthering research on related variables.

1.8 Conceptual Framework



Source: Adapted and modified by researcher from literature Irungu (2013)

Figure 1: Conceptual framework

The Figure 1.1 above reflects the conceptual framework of the study, it is seen that access to agricultural finance and farmer training were considered key factors in determining the performance of smallholder farmers. Access to agricultural finance was operationalized as loan services, farm inputs while farmer training was operationalized as farm production, record keeping and post-harvest handling. It was hypothesized that if farmers are financed and trained, their performance in terms of output levels and quality of output would increase. The researcher examined access to agricultural finance and farmer training on the performance of smallholder farmers who are beneficiaries of One Acre Fund interventions in Jinja district.

CHAPTER TWO
LITERATUREREVIEW

2.1 Introduction

This chapter presents a review of the related literature that has been critically studied and selectively adopted for the purpose of the study. Relatively rich scholarly works including journals articles, book chapters, reports as well as professional complements were considered as relevant sources of the literature that was reviewed.

2.2 Performance of smallholder farmers

According to Ghosh, (2013) performance of smallholder farmers is defined as results or achievements in the field of agriculture including all aspects of land-fertility, marketing, technology and labor productivity. However, FAO (2013) looked at agricultural performance in terms of output levels and the quality of the outputs. The FAO indices of agricultural production show relative levels of aggregate volume of agricultural production for each year in comparison with a chosen base period, at country, regional or world levels. Similarly, Wayback, (2013) revealed that performance of smallholder farmers can be looked at in terms of output and also the quality of produces to meet the needs of consumers.

According to Preckel, (2013) output is the amount or units of something produced. In agriculture, output is the number of produces produced. According to Wayback, (2013), in his study, output was looked at and measured as the market value of final output, which excludes intermediate products such as corn feed used in the meat industry. In short, output is compared to input. However, Preckel, (2013) stated that output value may be compared to many different types of inputs such as labour and land which may make its computation difficult.

On the other hand, quality of produce is defined as the standard of something as measured against other things of a similar; the degree of excellence of something (Guillemo, 2011). The quality of agricultural produces also mostly depends greatly on the intended use. However, United Nation Economic Commission for Europe (UNECE) through its Working Party on Agricultural Quality Standards (WP.7) and its specialized sections, developed internationally agreed commercial quality standards for agricultural produce. The standards were based on existing national standards, industry and trade practices which have to be reviewed and amended regularly (UNECE, 2017). It was further revealed that with ever-growing international trade in agricultural produce, there are over 100 standards that have to be adopted

for the purpose of qualities and these international commercial quality standards cover a wide range of perishable products and dried produces (UNECE, 2017). It was further revealed that quality sometimes depends on a person, nation or region.

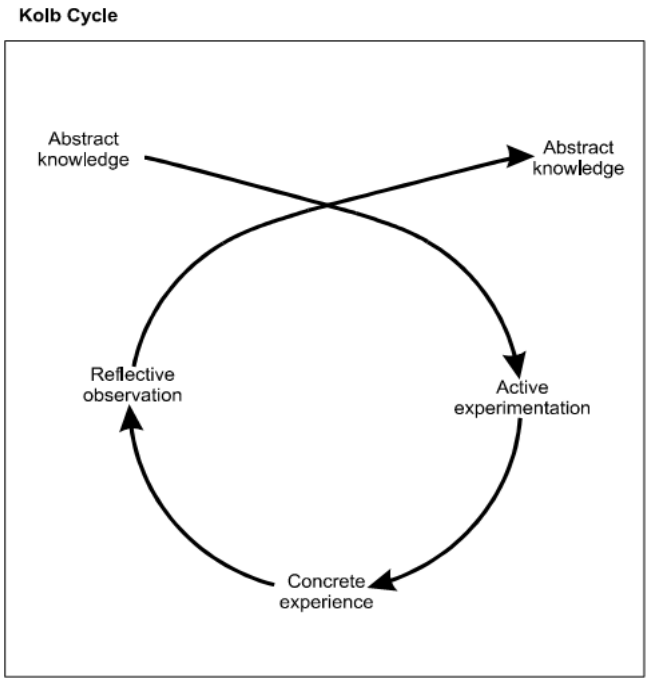
However, to have higher agricultural performance meeting all agricultural constructs of high output and high quality, the smallholder farmers need to have a good access to agricultural financ and farmer training (Rahman and Zeba, 2011). Lack of access to credit facilities and farmer training is almost universally indicated as a key problem for smallholder (Takwa, Anyika and Nkiemboupoh, 2018). Without access to agriculture finance and farmer training, the performance of smallholder farmers will remain low. Agriculture financing clearly explained in the pecking order theory which looks at different sources of financing (Mayers and Majluf, 1984). While farmer training is deeply explained by Kolb's theory of learning which goes ahead to explain different forms of training needed by smallholder farmers (King, 2000; Kolb, 1984). These theories are explained below.

2.3 Pecking order theory

Pecking order theory states that financing increases with asymmetric information and that financing comes from three sources, internal funds, debt and new equity (Mayers and Majluf, 1984). The theory goes ahead to state that financing is a key factor in the growth of any business. However, to benefit from a source of finance, one has to go for the source of finance which has low cost which include processing and interest costs. In the theory, it was revealed that there are different sources of finance which include; internal financing, debt, lastly raising equity. Hence: internal financing is used first; when that is depleted, then debt is considered. This theory maintains that businesses adhere to a hierarchy of financing sources and prefer internal financing when available, and debt is preferred over equity if external financing is required when the interest rate on debt is low. Thus, the form of a debt a person chooses depends on the interest rate charged (Wamuntu, 2017). Therefore, since smallholder farmers do not have enough internal financing sources, they end up going for external sources of low interest rates. External sources of finance available have been loans and grants from government, NGOs, private financial institutions and individual persons. This theory is applicable in this study since One Acre Fund is an NGO that offers agricultural financing services in form of loans, machinery and other farm inputs to smallholder farmers at low interest rates.

2.4 Kolb's learning theory

The learning theory was developed by David Kolb in 1984. The theory states that with effective and continuous learning, people get to know how to do things better. He developed a learning cycle, which consists of four different stages, which are abstract knowledge, active experimentation, concrete experience and reflective observation (Kolb, 1984).



Source: Kolb, 1984

Figure 2: Kolb cycle of training

Theory revealed that learning is a process that is repeated but each cycle is different because the learner would have been exposed to more experiences than in the previous cycles. Therefore, the proceeding cycles are usually more developmental than the ones before. Therefore, farmers going through these stages of learning will be exposed to both theory and practical knowledge of carrying out agricultural activities on their farms. On-farm training like farm production and off-farm activities such as record keeping and post-harvest handling can be covered in this style of learning since the theory is not limited to a single area of learning. The more the farmers continuously learn through learning stages, the more they get knowledge and skills to be applied on their farms to boost the yields which made theory applicable in this study.

2.5 Access to agricultural finance

According to Bank of Uganda (2016), agriculture financing is a form of funding with the aim of facilitating the provision of medium and long term financing to projects engaged in agriculture and agro-processing, focusing mainly on commercialization and value addition. World Bank further revealed that agro-financing covers aspects of agricultural processes from the planting to marketing phase of the sector value chain. Agricultural finance is strategically important for eradicating extreme poverty and boosting shared prosperity. Agricultural financing in form of agricultural loans grows income of farmers which helps smallholder farmers to acquire better technologies and other farm inputs. According to Bank of Uganda (2016) an agriculture loan is an overdraft facility which could be used to meet the cost of farming, cultivation and working capital activities for agri-business and associated activities. Irungu, (2013) revealed that smallholder farmers who had access to agriculture loans bought high quality farm inputs ranging from seeds, animal breeds to machinery which made them perform better than smallholder farmers who didn't have access to agriculture loan.

However, Kisaka (2015) revealed that agricultural financing is not only in form of loans but also inform of farm inputs. According to Hodges, Buzby and Bennett (2011), agricultural farm inputs are products permitted for use in farming. These include but not limited to feedstuffs, fertilizers and permitted plant protection products as well as cleaning agents and additives used in food production.A study by African Development Bank in 2016 revealed that smallholder farmers who received agricultural financing inform of inputs like machinery which were mostly tractors, irrigation systems and spraying pumps had prepared large pieces of land and had very high yields. This resulted into faster rate of poverty alleviation by raising the incomes of smallholder farmers (African Development Bank, 2017).

2.6 Access to agricultural finance and Performance of smallholder farmers

According to Abedullah, Khalid, and Kouser (2009), when smallholder farmers get access to agriculture loans at low interest, they add value on their farms. Farmers purchase high quality seeds and breeds that mature fast and give high yields. With access to loans, smallholder farmers develop the capacity to acquire high quality machinery to be used in farm production process and also handling of farm outputs hence maintaining the quality of the produce (Agrics, 2017). With agricultural loans, agricultural productivity can be increased, smallholder farmers' incomes raised, more people fed and indeed, the general economic welfare enhanced (Irungu,

2013). Accessing low interest agricultural loans is the quickest way for boosting agricultural production in that it enables farmers to timely purchase the required inputs and machinery for carrying out farm operations.

Access to agricultural finance affects farm productivity because farmers facing binding capital constraints tend to use lower levels of inputs in their production activities compared to those not constrained (Nyamwamu, 2016). Further, revealed that access to financing facilitates optimises input use like improved hybrid seeds, new farm machinery, fertilizers among others which improve farmers' performance. Similarly, access to finance allows farmers to satisfy their cash needs induced by the agricultural production cycle and consumption requirements (Mohammad, 2012). Therefore, providing farmers with credit, fertilizers, improved seeds, farm machinery and other relevant farm input improves their agricultural performance.

According to Lakoussan (2017), access to finance is important to all actors engaged within agriculture value chain. Farmers need finance to buy inputs, pay man labor, and to maintain their farms. In the vegetable partnership in Benin, lack of funding to access improved seeds and fertilizers substantially affected smallholder farmers' capacities, specifically women and youth to increase their production for meeting market demands, and increase their revenues (Odoemenem and Obinne, 2010). This was also observed in the cassava partnership in Nigeria where farmers needed financing to acquire improved stems, fertilizers and agrochemicals to increase their production and supply cassava (Badiru, 2009). This means, if smallholder farmers are well financed, they can acquire improved inputs which makes agriculture less tiresome hence increase in farm produces.

According to Riaz et al, (2012), access to agricultural credit by farmers was essential to ensure that performance improved to both farmers and financial institutions. The results of the study implied that agricultural efficiency and performance of microcredit receiving farms is about one per cent higher than that of microcredit non-receiving farms. This could be interpreted as the positive impact of microcredit on farm performance (Wadud, 2013). Similarly, farmers in most poor countries including Uganda lack the required capital for enhancing agricultural performance (IFPRI, 2012a). For instance, in Nigeria, IFPRI (2008a) found that farmers who do not use yield-enhancing inputs like fertilizers had lower productivity compared to those who use them. Similarly, Dharmasiri (2009) opine that funds required for purchase of land,

irrigation equipment, livestock feeds, seeds, chemicals and machineries is a very significant factor for enhancing agricultural productivity. Therefore, one of the ways for smallholder farmers to improve their performance is to have clear and flowing access to agricultural financing.

Access to agriculture finance has a great influence on agriculture production in Ghana (Aminue and Adjei, 2015). In their study, it was revealed that small and marginal farmers, as a result of participating in the agriculture financing programs have allocated a higher percentage of their land for the cultivation of high-yielding varieties and consequently, improved productivity. It was also revealed that the users of microfinance credits brought 81.5 percent of their cultivable land under high-yielding varieties production compared to 56 percent of the non-users. Therefore, smallholder farmers who have access to microfinance credits perform better the farmers who don't have access to any form of agricultural financing.

On the other hand, Mason (2013) argued that the influence of financing on agriculture production is not always positive. They revealed that providers of micro credit have not generally addressed the credit need of small and marginal farmers because of their priority of funding to the poor and because of some perceived problems which include, among others; risk of investing in agriculture; seasonality of agricultural production; poor loan repayment performance of agricultural lending; and the technical nature of agriculture production system. Therefore, if finance providers are profit oriented, they will not fully fund the agricultural activities of smallholders hence low performance (Mason, 2013). This means if there are factors that make it highly risky for lenders or finance providers to provide loans to small holder farmers, it will consequently push some farmers out of the field and the overall agriculture performance of smallholder farmers will fall.

2.7 Farmer training

Ampaire and Rothschild (2010) argued that farming training offers trainees working knowledge of the principals of production, covering topics such as; agricultural production and sustainability, introduction to the crop husbandry, pre-cultivation preparations, seed selection, land preparation, planting/transplanting, record keeping, post-harvest handling among others. Van and Finuola (2013) revealed that farmer training is an important tool widely utilized by development programs worldwide. Government and private organizations run extension services as well as non- governmental organizations offer training packages to the smallholder

farmers in their areas. However, Ampaire and Rothschild, (2010), revealed that different farmers need different trainings. They identified three areas as; farm production, record keeping and post-harvest handling to be key areas which need emphasis when training smallholder farmers which are further explained below.

Farmers need critical skills and knowledge in farm production (FAO, 2013). FAO revealed that operating a farm (even a very small one!) can be expensive and risky. Therefore, to increase a farmer's chance for success, that farmer should receive training in skills and knowledge that minimize risk, maximize efficiency & productivity, and manage costs (Ampaire and Rothschild, 2010). In their study in Uganda, they further revealed that most farmers need trainings in seeding, transplanting, soils setup, irrigation, pest & disease and weed management. If what is trained is put in practice, the farm production will be high (Ampaire & Rothschild, 2010).

Record keeping which is the activity of documenting, organizing and sorting information is an important tool in agricultural production (Jane and Jennifer, 2014). They further revealed that record keeping is important for the farmer to be able to evaluate the performance of the enterprise and is a basis for management decisions such as crop yields, performance per animal etc. Record keeping at farm level is also important for research, policy development and extension (Abegaz et al., 2008). With no written records, farmers have to depend on their memory while making decisions regarding their farm practices which is not good because they end-up making poor decisions which affect their performance. Therefore, to have high yields, farmers ought to keep accurate farm records to help them in making appropriate agriculture investment decisions.

In agriculture, post-harvest handling is very important. It is a stage of crop production immediately following harvest which involves cooling, cleaning, sorting and packing (Beckles, 2012). When a crop is removed or separated from its parent plant, it begins to deteriorate which calls for proper handling techniques.For instance, rough handling during harvesting and after harvesting can cause mechanical injuries, which can affect the post-harvest quality, and shelf life of harvested crops mostly fruits. Some will not be fit to sell and others will fetch little price in the market hence low performance (Arah, Ofori, Kumah and Amaglo, 2015). Suitable post-harvest handling practices are needed to maintain the quality and extend the shelf life of harvested crops. They further revealed that some of the handling practices which include,

cleaning and disinfecting, sorting and grading, packaging, transportation and good storage are very key for the farmer to fetching high price of their produces. Costa (2015) revealed that due to poor post-harvest handling methods, Uganda losses about 20% of fruits, vegetables, and root crops. In many circumstances, these losses are aggravated by the poor transportation due to bad roads, and poor storage facilities in the rural areas where smallholder farmers operate (Costa, 2015). Reduction in this wastage may significantly save smallholder farmers from losing large sums of money.

2.8 Farmer Training and Performance of Smallholder Farmers

Gray, Parker & Kemp (2009) opine that human capital directly influences agricultural performance by determining the way in which inputs are used or combined by farmers. They revealed that farmer training improves the way farmers carry out agriculture. They revealed that farmers who are equipped with human capital have the ability to mechanize agriculture hence high agricultural yields. Similarly, the World Bank Report (2008) revealed that farmers' education and extension training are very important for enhancing farm production. Investment in the form of human capital such as education, extension and training to farmers lead to increase in agricultural productivity. The quality of human capital determines whether and how technology will be adopted; technology choice determines the inputs and physical capital to be used on the farm. Therefore, trained smallholder farmers have the knowledge to adopt and utilize high technology and other technological inputs which increases their farm performance.

In the study by, Hofisi (2011), it was revealed that smallholder farmers need to be trained. Training farmers on modern methods of farming, pest control, soil conversation, weed controls among others can make it possible for farmers to hit their farm targets. Training bridges the information gap between the early farmers who solely depended on the indigenous knowledge, locally available resources and biological pest control whose performances were very low (Hofisi, 2011).Therefore, the extension of training both formal and informal has a positive relationship with the performance of smallholder farmers.

Extension services have generally responded to the day-to-day production problems that farmers face (Kahan, 2013). Though in the past the training given to farmers was traditional, the situation today has changed as farmers are even offered trainings to respond to market opportunities. Training and extension in farm management has become relevant, and increasingly in demand. Vermeulen (2008) revealed that highly trained and specialized farmers

know where to obtain the information needed to make better management decisions and find solutions to problems affecting the agricultural farms. Trained smallholder farmers have skills and knowledge to evaluate new options and learn how to successfully produce and market high-value products (Kahan, 2013). Therefore, smallholder farmers can increase the farm performance if they receive proper training both on-farm and off-farm.

In spite of training not always being accessed or well-tailored to smallholder farmers' needs, it's revealed that that training generally is regarded as a means of facilitating farmers to adopt innovations that lift farm productivity and increase farm profitability (Reimers and Klasen 2013). Not only does training and education allow smallholders farmers to improve productivity, but also improves their management by enhancing their decision-making skills (Asadullah and Rahman, 2009). This means that appropriate training helps farmers to readily and more accurately assess and adopt superior technologies and change farm practices from which they can potentially derive commercial advantage

In attempting to deal with low performance of smallholder farmers, the importance of training them cannot be underestimated (Kathleen and Chris, 2009). In their study, skills gained through farmer training improve their productivity, increase adaptability to deal with change and crisis, and facilitate the diversification of livelihoods to manage risks that are at a premium in their area of operation. They further revealed that the skills are an issue of survival. Providing these skills effectively is one of the key challenges of rural development, but it has not always been well met, usually because the contextual factors that prevent small farmers from accessing and applying training have not been addressed (Kathleen and Chris, 2009). This means when the smallholder farmers are effectively trained, they will be in position to manage farmer risks while making diversifications on their farms hence increasing farm productivity.

2.9 Access to agricultural finance, Farmer training and Performance of smallholder farmers

Although land size was found to be a major criterion for accessing agriculture credit financing, knowledge on how to use the loan was also vital (Olagunju and Ajiboye,2010). Therefore, farmers in Nigeria were subjected to training on how to invest the funds given to them. Similarly, Abu, Al-Khaza'leh, Reiber and Al-Baqain (2015) revealed that smallholder farmers are often given funds to invest in agriculture but lack basic agriculture trainings. Further, they recommended that on top of offering agriculture credits to smallholder farmers, they should be

trained to equip them with knowledge and skills necessary for carrying out their agricultural activities.

The larger the household land size, the less likely the need for external financing but due to low levels of education, farmers in Malawi lacked skills in agriculture especially modern technology which affected their agriculture production (Sebu, 2013). Similarly, Njuguna and Nyairo (2015) found that in Kenya, 45% of farmers had access to finance but 70% of them lacked skills and their agriculture performance was very low. Therefore, they recommended that farmers should be trained on top agriculture finance for them to boost their performances.

The need for credit and training arise because modern technology meant to enhance agriculture production was costly and so sophisticated, farmers' personal resources and skills were inadequate, and hence firms adopting modern technology were more likely to seek external financing and more training (Rahman and Zeba, 2011). In their study, they revealed farmers who sought agriculture financing and training had performed better compared to those who sought only agriculture financing. However, it was not clear if training farmers alone can increase the performance of smallholder farmers (Rahman and Zeba, 2011; Atkinson and Messy, 2012).

Anina (2010) in her study on improving access to credit for smallholder farmers in Mozambique: Lessons from government efforts in developing countries of Africa and Asia. The study results revealed that access to credit for smallholder farmers in Mozambique improved farmers' performance. However, farmers did not perform as expected due to lack of human expertise since they lacked training on modern methods of farming (Anina, 2010).

Similarly, access to credit is hypothesized to help poor households by giving them another strategy to cope with risk: in the case of a shock, the household could borrow money rather than liquefying assets, limiting consumption, or selling off-farm labour. This has allowed farmers to avoid risk-reducing income diversification strategies and precautionary saving to instead invest in high-return activities (Finket al., 2014). Additionally, Ali et al., (2014) revealed that financial institutions that offer credit to farmers, also offer them some trainings on how to invest the funds. This means access to finance alone is not enough to improve farmers' performance when farmers themselves are trained on how to do farming and how to control funds given to them.

2.10 Literature gap

Generally, from these studies presented in literature review, there are some study carried out on access to agriculture finance, farmer training and performance of smallholder farmers. However, the studies carried out are still few and most of the studies presented in the literature review were carried out side Uganda. There is no single study that has been carried out combining all the three variables of access to agriculture finance, farmer training and performance of smallholder farmer. This study therefore covered this gap by carrying a study combining all the three variables while examining the relationship between access to agriculture finance, farmer training and the performance of smallholder farmers that operate under One Acre Fund in Jinja District.

CHAPTER THREE
RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents the Research methodology that was employed to the study. It described the research design, target population, the sampling design and size, data collection methods and procedures, validity and reliability of the instruments, data analysis techniques and ethical considerations.

3.2 Research Design

The study used a cross sectional survey design where both quantitative and qualitative research approaches were considered. The researcher used the quantitative approach to yield unbiased results which was generalised to a larger population. Qualitative research approach was used to collect non–numerical data and allowed respondents to give in-depth information about study objectives (Mugenda and Mugenda, 2003).This study design covered both descriptive and numerical data and it showed how study variables are related to each other.

3.3 Study Population and Study Area

The study was carried out in Jinja district because it is one of the district where One Acre Fund operates. The study considered only farmers operating under One Acre Fund and Officials of One Acre Fund. The study covered the whole district of Jinja in the areas of Budondo, Buwenge rural, Masese, Busedde, Buwenge town council, Kakira, Mpumudde, Butagaya, central division, Buyengo and Mafubira. According to Atukunda, (2019), Jinja district alone have around 3600 farmers that operate under One Acre Fund interventions. These farmers were involved in crop growing mostly maize, beans, vegetables, among other crops.

3.4Sampling procedure and Sample size

3.4.1 Sampling procedure

The researcher used purposive sampling technique on officers of One Acre Fund and simple random sampling technique on farmers. Only Officers of One Acre Fund who had the necessary information for the study were purposely selected. Under simple random sampling, all farmers under One Acre Fund had equal chances of being part of the study (Amin, 2005). The researcher first obtained a list of all farmers under One Acre Fund in Jinja district from One Acre Fund Offices, thereafter, the research randomly selected farmers basing on the list. This method was used because all farmers had the required information for the study.

3.4.2 Sample size

The researcher drew this sample size of farmers from the total population of 3600farmers in Jinja district that operate under One Acre Fundusing Yamane's formula developed in 1967 as shown below.

$$\mathbf{n= \frac{N}{1+N\,(e^2)}}$$

Where

N– Population = 3600

e - Standard error = 10%

n- Sample size = ?

$$n= \frac{3600}{1+3600(0.1^2)}$$

$$n= \frac{3600}{1+36}$$

$$n= \frac{3600}{37}$$

n= 99 Respondents

However, the researcher also considered 19 officers of One Acre Fund Project out 25 officers in Jinja district that were selected using Krejcie, (1970) Table, hence making a total of 118 respondents altogether. The respondents were distributed as shown in the table below.

Table 1: Showing sample size

Category	Sample size	Sampling technique
Budondo	09	Simple Random Sampling Technique
Buwenge rural	09	Simple Random Sampling Technique
Central Division	09	Simple Random Sampling Technique
Masese	09	Simple Random Sampling Technique
Busedde	09	Simple Random Sampling Technique
Buwenge town council	09	Simple Random Sampling Technique
Kakira	09	Simple Random Sampling Technique
Mpumudde	09	Simple Random Sampling Technique
Butagaya	09	Simple Random Sampling Technique
Buyengo	09	Simple Random Sampling Technique
Mafubira	09	Simple Random Sampling Technique
Officials of One Acre Fund	19	Purposive Sampling Technique
TOTAL	**118**	

3.5 Data Collection instruments

3.5.1 Questionnaires

The researcher used a closed ended questionnaire in this study. The research instrument that was used for this study was a questionnaire administered to respondents by the researcher. This

method of data collection was preferred because it avoids the respondents from giving irrelevant information(Mugenda and Mugenda, 2003). It helped the researcher gather the data with few errors.

3.5.2 Interview Guide

An interview guide was also used in this study. It was designed to maintain consistency and reduce bias (Amin, 2005). The researcher conducted face-to-face oral interviews with the officers of One Acre Fund. The guide was designed with open ended questions. Open ended questions posed led the respondents towards giving data that met the study objectives.

3.6 Data quality control

3.6.1 Validity

To attain validity of the study tools, the researcher subjected them to a pilot test of 10 people. They were given to the research experts including the supervisors for face/expert knowledge validity test and farmers who were not part of the study. They were requested to rank the items either Relevant (R) or Irrelevant (IR) (Trochim, 2009). In line with Amin (2005) recommendation, content validity index of 0.7 qualified the tool as a valid instrument. The Content Validity Index (CVI) for the questionnaire were computed, to ascertain its content validity index, where *CVI= R/(R+IR).*All items scored above 0.7, however, any item that was recommended for adjustment or removal, it was done so.

Table 2: Validity of the Research Instruments

Item	No. Number of items	No. of valid items	CVI
Access to agricultural finance	11	10	0.91
Farmer training	18	16	0.89
Performance of smallholder farmers	10	9	0.9

Source: Primary data 2020

3.6.2 Reliability

Cronbach's alpha values which measures how well a set of items measures a single dimensional construct was used to measure the reliability of the items in the questionnaire (Amin, 2005). A number of questions were used to measure access to agricultural finance, farmer training and

performance of smallholder farmers, the higher the alpha values the better the measuring instrument. However, alpha values of 0.7 and above for categories were considered (Sekaran, 2013). All items indicated that the set of items used to measure these variables were reliable since they all scored above 0.7. Cronbach Alpha values were run using SPSS V.20.

Table 3: Reliability of Research Instruments

Item	No. Number of items	Cronbach Alpha value
Access to agricultural finance	11	0.951
Farmer training	18	0.869
Performance of smallholder farmers	10	0.770

Source: Primary data 2020

3.7 Measurement of Variables

The research study used of nominal, ordinal, and Likert type rating scales during questionnaire design and measurement of variables. The nominal scale was used to measure variables such as gender, marital status and level of education. The ordinal scale was used to measure aspects such as age and time taken carrying farming under One Acre Fund. For this study, three key variables that were measured included, access to agricultural finance in form loan & farm inputs, then farmer training in form of farm production, record keeping & post-harvest handling and performance of smallholder farmers in form of output levels & quality of outputs (Nin & Yu, 2014; Ampaire & Rothschild, 2010). A 5-point Likert scale with respondents answering by (Ticking); (1 – Strongly disagree, 2 – Disagree, 3– Uncertain/Not sure, 4 – Agree and 5 - Strongly agree) was used to collect data, which was used to measure the variables.

3.8 Data collection procedure

The researcher sought permission from the Local administration and One Acre Fund in Jinja District to conduct the study in the area using the researcher introductory letter got from the university. After getting informal consent, the researcher recruited two research assistants to assist in data collection because the sample size was big and the respondents were distant. The research assistants were trained on the research tools in the aspects of: how to use them to avoid mistakes in recording the responses, the meaning of each item of questionnaire and the guide.

The questionnaire was administered by the researcher with the help of research assistants since most of the targeted respondents were of low education levels.

3.9 Data Analysis techniques

Data collection led to data processing and analysis. Data collected from the field using questionnaires and interviews was edited and coded for completeness and accuracy of information at the end of every field data collection day.

3.9.1 Quantitative data

The quantitative data was analysed using of Statistical Package for Social Scientists (SPSS) version 20 and percentages, correlations and regression were run. Data was analysed using Pearson correlations to determine the degree of linear dependence between the independent and dependent variables. This technique was preferred since it was efficient and gave straight formal analysis. A multiple linear regression was also run to know how much each of the independent variables predicted the dependent variable. After data analysis, the results were presented in tabulation.

3.9.2 Qualitative data

All the qualitative data collected from interview was edited on a continuous basis to ensure completeness. Data collected with the use of interview schedules was put into meaningful and exhaustive categories. Content analysis was used to analyze the data collected to determine the adequacy of the information, credibility, usefulness and consistency (Mugenda & Mugenda, 2013). Data collected was categorized according to emerging variables from each question in the interview guide. All data sources were triangulated during the analysis to increase validity of the study. Outstanding and relevant quotations, sentences, statements and expressions were picked and used in the study to reflect the actual feelings of the respondents. Narrative summaries were used to gain valuable insights by putting the data back together, not in their raw form, but in re-ordered form to tell stories from the points of view of different participants.

3.10 Ethical considerations

The researcher endeavored to uphold ethical issues while administering the research instruments. Informed consent was sought from respondents and concerned authority before collecting data and participation was on the willingness of the respondents. All information from respondents was kept confidentially and private. The study findings were also presented without manipulation in favor or interests of the outcomes.

CHAPTER FOUR

PRESENTATION, ANALYSIS AND INTERPRETATION OF FINDINGS

4.1 Introduction

This chapter presents background information about the respondents included in the study. It also presents inferential statistical findings based on the specific objectives of the study which included to establish the relationship between access to agricultural finance and performance of smallholder farmers, the relationship between farmer training and performance of smallholder farmers and the relationship between access to agricultural finance, farmer training and performance of smallholder farmers.

4.2 Background Information of the Respondents

Respondents were asked about their gender age, marital status, education level and time spent in One Acre Fund and findings regarding this information is shown in table below;

Table 4: Background Information of the respondents

Item	**Category**	**Frequency**	**Percentage**
Gender	Female	60	50.8
	Male	58	49.2
	Total	**118**	**100.0**
Age-Group	18-29	9	7.6
	30-39	53	44.9
	40-49	42	35.6
	50 and above	14	11.9
	Total	**118**	**100.0**
Marital status	Married	81	68.6
	Single	20	16.9
	Divorced	6	5.1
	Widow	11	9.3
	Total	**118**	**100.0**
Level of education	No formal education	3	2.5
	Primary	24	20.3
	Secondary	44	37.3
	Diploma	31	26.3
	Degree	16	13.6
	Total	**118**	**100.0**

Number of years spent with One Acre Fund	Less than a year	6	5.1
	1-3 years	39	33.1
	4 years and above	73	61.8
	Total	**118**	**100.0**

Source: Primary data 2020

4.2.1 Gender of the Respondents

The frequency table 4 above reflected that total number of respondents that participated in the study and were female at 50.8% while 49.2% were male. This implied that majority of the smallholder farmers under One Acre Fund were female. The results also implied that females are involved in agriculture more than males.

4.2.2 Age-Group of the Respondents

Results indicated that only 7.9% of the respondents were between 18-29 years, majority 44.9% were aged between 30-39 years while 35.6% were between 40-49 years and lastly 11.9% were aged 50 years and above. The results implied that One Acre Fund mostly targets the younger generation of less than 50 years as compared to older generation of more than 50 years.

4.2.3 Marital status of the respondents

From table 4 above results showed that majority 68.6% of the respondents were married as compare 16.9% who were single while widows scored 9.3% and those that separated accounted for 5.1%. These results implied that people who married are more involved in agriculture with the help of One Acre Fund. This is because the families with a bigger obligation to feed them.

4.2.4 Level of education of the respondents

Results from table 4 above, indicated that the number of respondents who achieved primary level were 20.3%, those with secondary level were 37.3%, diploma level accounted for 26.3%, then 13.6% had achieved degrees while 2.5% had not acquired any formal education. The results implied that One Acre Fund mostly targeted low educated farmers, that why majority of the respondents were of primary and secondary levels.

4.2.5 Number of years spent with One Acre Fund

Results from the above table 4 indicated that at One Acre Fund, majority of the respondents had spent 4 years and above, 33.1% had spent between 1-3 years under One Acre Fund while5.1% had spent less than a year. This signifies that majority of the respondents had worked with One Acre Fund for a good time. Therefore, they were in good position to give reliable information.

4.3 Inferential statistics

To obtain the relationship between the study objectives, inferential statistics of correlation analysis and regression analysis were employed. Correlation analysis was used to determine the nature of relationship that existed between study variables. Regression analysis was used to establish whether independent variables of access to agricultural finance and farmer training predicted variances in dependent variable that is performance of smallholder farmers.

4.3.1 Correlation analysis

Correlation analysis determines the degree of the relationship between two or more variable. To investigate this relationship among the constructs, a correlation table was generated. The summary of these findings is indicated in the table below.

Table 5: Pearson's Correlation for study variables

Items	**1**	2	3	**4**	5	6	7	**8**
Access to Agricultural Finance (1)	**1**							
Agriculture Loan (2)	.980**	1						
Farm Inputs (3)	.970**	.903**	1					
Farmer Training (4)	**.910****	**.921****	**.846****	**1**				
Farm Production (5)	.864**	.876**	.802**	.931**	1			
Record Keeping (6)	.702**	.718**	.643**	.812**	.654**	1		
Post-harvest Handling (7)	.778**	.779**	.735**	.852**	.682**	.561**	1	
Performance of Smallholder Farmers(8)	**.849****	**.852****	**.799****	**.840****	**.776****	**.662****	**.738****	1

** Correlation is significant at the .01 level (2-tailed).

4.3.1.1 Relationship between access to agricultural finance and performance of smallholder farmers

The above table 5 indicated (r=.849, p<0.01) between access to agricultural finance and performance of smallholder farmers. The results therefore indicated that there was a strong positive and significant association between access to agricultural finance and performance of smallholder farmers. The implication of the results is that an increase in access to agricultural finance would lead to a positive change in performance of smallholder farmers. The results also further indicated that components of access to agricultural finance were significant with a strong positive relationship with performance of smallholder farmers under One Acre Fund including agriculture loan (r=.852, p<0.01) and farm inputs (r=.799, p<0.01). The results also implied that an increase in size of agricultural loans and farm inputs would result into a positive change in the performance of smallholder farmers under One Acre Fund.

In line with follow up interviews with One Acre Fund officials, it was revealed that;

> *"We offer agricultural finance service to only farmers who are members of One Acre Fund. We finance them through offering them loan and farm inputs like fertilizers, hybrid seeds, tarpaulins, pesticides and other related equipment like hoes on credit. Positive results are visible, as farm production has doubled compared to output before One Acre Fund intervention. For example; a harvest of 10 bags of maize from a one-acre farm as compared to 5 bags before One Acre Fund financing."*

This is a justification that access to agricultural finance by smallholder farmers under One Acre Fund in Jinja was principal in enhancing farmers' performance. Some farmers have excess produces to sell on top of being food secure. It is therefore evident that when the farmers get access to agricultural finance, their performance will increase.

4.3.1.2 Relationship between farmer training and performance of smallholder farmers

From the above table 5, results revealed that there was a strong positive and significant relationship between farmer training and performance of smallholder farmers (r=.840, p<0.01). The results therefore implied that an increase in farmer training is associated with an increase in performance of smallholder farmers under One Acre Fund. The results further indicated that components of farmer training have a strong positive and significant relationships with performance of smallholder farmers including farm production (r=.776, p<0.01), record keeping (r=.662, p<0.01) and post-harvest handling (r=.738, p<0.01). Therefore, a positive

change in each of these components would lead to a positive change in the performance of smallholder farmers under One Acre Fund.

In line with follow up interviews with One Acre Fund officials, it was revealed that;

> *"Yes, we offer training to our members at group levels on weekly basis. Farmers are trained in different fields both on-farm and off-farm. On-farm training mostly focuses on garden preparation, crop spacing, pests and weed controls. While off-farm trainings mostly focus on post-harvest handling like storage, transportation, packaging and record keeping. Though record keeping is still a problem to some farmers, the quality of their produces has improved and can meet market standards even when they are kept for long in stores."*

This justifies that training offered to smallholder farmers under One Acre Fund in Jinja has improved their performance. Farmers are capable of storing their produces and sell them when the prices are high. It is therefore evident that farmer training is positively associated with the performance of smallholder farmers.

4.3.2 Regression analysis

The regression analysis was used to determine how the independent variables (access agricultural finance and farmer training) predicted variances in dependent variable (performance of smallholder farmers). The results are summarized in table below.

Table 6: Regression between access to agricultural finance, farmer training and performance of smallholder farmers

Model Summary						
Model	***R***	***R Square***	***Adjusted R Square***	***Std. Error of the Estimate***	**F**	**Sig.**
1	.905[a]	.819	.805	.37927	58.832	.000[a]
a. Predictors: (Constant), Farmer Training, Access to Agricultural Finance, Marital status, Level of education, Age-Group, Gender, Number of years spent						
Regression coefficients						

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.918	.236		3.883	.000
	Gender	-.209	.089	-.122	-2.344	.071
	Age-Group	.104	.063	.094	1.657	.101
	Marital status	.039	.047	.047	.845	.401
	Level of education	.036	.045	.039	.801	.425
	Number of years spent	-.062	.060	-.058	-1.020	.310
	Access to Agricultural Finance	.474	.073	.694	6.473	.000
	Farmer Training	.138	.090	.160	1.545	.006

From the regression analysis in table 6 above, it was revealed that there is a significant positive relationship between all variables of individual factors of (gender, age, marital status, level of education & years spent in One Acre Fund), access to agricultural finance, farmer training and performance of smallholder farmers at (r=.905). The results also indicated that the combination of individual factors of respondents, access to agricultural finance and farmer training accounts for 80.5% of the variance in performance of smallholder farmers (Adjusted R^2=.805). This means that the remaining 19.5% is due to other factors that were not considered in this study.

The results revealed that individual factors of respondents including gender, age, marital status, level of education & years spent in One Acre Fund are not statistically significant since all their significance level are greater than 0.05 (p>0.05). The results also revealed that access to agricultural finance positively predicts performance of smallholder farmers under One Acre Fund at 69.4% (Beta value = .694) and it's statistically significant at (Sig=.000). This means that a unit increase in agricultural finance by One Acre Fund leads to 0.694 increase in the performance of smallholder farmers, and a unit decrease in agricultural finance by One Acre Fund leads to 0.694 decrease in the performance of smallholder farmers.

The results further showed that farmer training also positively predicts performance of smallholder farmers under One Acre Fund at 16.0% (Beta value = .160) and it's statistically significant at (Sig=.006). This means that a unit increase in farmer training by One Acre Fund leads to 0.160 increase in the performance of smallholder farmers, and a unit decrease in farmer training by One Acre Fund leads to 0.160 decrease in the performance of smallholder farmers.

CHAPTER FIVE

DISCUSSION OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the discussion of findings, conclusion and recommendations of the study based on the research objectives which were to examine the relationship between access to agricultural finance and performance of smallholder farmers, the relationship between farmer training and performance of smallholder farmers and the relationship between access to agricultural finance, farmer training and performance of smallholder farmers.

5.2 Discussion of findings

Under this section, the study presented the findings compared and contrasted them with the available literature.

5.2.1 Relationship between access to agricultural finance and performance of smallholder farmers

The findings revealed that access to agricultural finance was significant and positively related to performance of smallholder farmers under One Acre Fund. In line with the correlation, the regression results also revealed that access to agricultural finance was a determinant of the performance of smallholder farmers. Giving smallholder farmers loans of low interest rates and farm inputs like seeds of beans, maize, coffee among others accompanied by fertilizers like NPK, DAP, improves their farm productivity. Some farmers are able to harvest averagely 10 bags of maize in one acre. In agreement with the findings, Lakoussan (2017) opines that farmers and their organizations need finance to buy inputs, pay man labor, and to maintain their farms. Access to agricultural financing may facilitate optimal input use and have a major impact on farmers' performance (Nyamwamu, 2016). The small and marginal farmers as a result of participating in the agriculture financing programs have allocated a higher percentage of their land for the cultivation of high-yielding varieties and consequently, improved productivity (Aminue & Adjei, 2015). Providing financial assistance to smallholder farmers increases the performance of farmers and providing loans at low interest rates helps smallholder farmers buy or hire more land for farming. Furthermore, giving farmers farm tools can help them cultivate large farmland in a shorter period. Farm inputs like irrigating systems and pumps can help farmers to grow crops even during the dry seasons.

5.2.2 Relationship between farmer training and performance of smallholder farmers

From the findings, it was revealed that there was a significant positive relationship between farmer training and performance of smallholder farmers. Likewise, the results from regression analysis also supported the correlation and the qualitative results on the association between farmer training and performance of smallholder farmers. The findings of the study provide justification that farmer training increases performance of smallholder farmers. In agreement with the findings, Kahan (2013) opines that farmers who are well trained acquire needed skills and knowledge to evaluate new options and learn how to successfully produce and market high-value products than the ones not trained. Human capital such as education, extension and training to farmers is needed and leads to an increase in agricultural productivity (World Bank Report, 2008). Hofisi (2011) concurred that trainings of both on-farm and off-farm expose farmers to the modern way of farming including production, post-harvest handling mechanisms that in long run increases the farmers' incomes. Trainings modern methods of farming like irrigation; weed, pest and disease control improves the level and quality of output of farmers. Similarly, post-harvest trainings like storage, packaging and transportation methods will improve the quality of the produces hence fetching high prices in the market.

5.2.3 Relationship between access to agricultural finance, farmer training and performance of smallholder farmers

Regression analysis revealed that both access to agricultural finance and farmer trainings were significant predictors of performance of smallholder farmers under One Acre Fund. The finding also provided justification that farmer training on top of accessing agricultural finance; farmer training is a key factor in increasing performance of smallholder farmers. In line with findings, Njuguna and Nyairo (2015) opine that access to agricultural financing alone is not enough. In their study, it was revealed that 45% of farmers had access to finance but 70% of them lacked skills, therefore, there was a need to first train them. Institutions that offer credit to farmers, also offer them some trainings on how to invest the funds (Ali *et al.*, 2014). Access to agricultural finance and farmer training go hand in hand. A well agricultural financing strategy accompanied by proper farmer trainings on-farm, off-farm and post-harvest handling, puts the smallholder farmers in position to yield more incomes from their farming activities.

5.3 Conclusion

The findings validate that access to agricultural finance from One Acre Fund was an integral part of smallholder farmers' performance. This indicates that access to agricultural finance in

form of loans and farm inputs like improved seeds, pesticides, fertilizers and farm machinery positively affected the performance of smallholder farmers in terms of quantity and quality of output. This is a justification that access to agricultural financing was vital in improving performance of smallholder farmers. Therefore, it is concluded that increase in agricultural financing by One Acre Fund increases the performance of smallholder farmers.

The findings on the relationship between farmer training and performance of smallholder farmers indicated a positive and significant relationship. This is a justification that for One Acre Fund to achieve a high performance of smallholder farmers there is need to train farmers on modern methods of farming, post-harvest handling methods and farming record keeping to track the performance of each farmer. Therefore, the study concluded that provision of trainings to farmers increases their performance.

The findings showed that access to agricultural finance; farmer training and performance of smallholder farmers are positively related. This is an indication that farmer training on top of agricultural financing increases the relationship with performance of smallholder farmers. This access to agricultural finance combined with farmer training lead to a higher performance of smallholder farmers in terms of quality and quantity produced. In additional, the study concluded that access to finance alone is not enough to improve farmers' performance when farmers themselves are not trained on how to do farming and how to control funds given to them. Therefore, besides providing them agricultural finance, smallholder farmers need also to be trained mostly on how invest the finances given to them, practice modern methods of farming, post-harvest handling methods and proper record keeping.

5.4 Recommendation

Access to agricultural finance was found to be a major predictor of performance of smallholder farmers. One Acre Fund should therefore, put a lot of emphasis on availing agricultural financing inform of loans and farm inputs in order to double the performance of smallholder farmers. It was revealed that farmers who previously harvested 5 bags of maize on one acre before joining One Acre Fund were able to harvest 10 bags of maize from the same size of land after receiving agricultural finance support from a One Acre Fund

The findings revealed that smallholder farmers are not good at keeping farm records. Some did not even have any record on their farm operations. Therefore, One Acre Fund should train the

farmers on how to record and keep farm records. Additionally, explain to the farmers the importance of record keeping.

The study also revealed that some farmers lacked enough knowledge and skills on the use of farm inputs. One Acre Fund should therefore, provide additional training to smallholder farmers on how to invest loans given and farm inputs like seeds, fertilizers, etc. provided to them

5.5 Limitations to the study

During compiling and computing of data for this study, some challenges were encountered. For instance, there were errors in the information provided which led to ultra-vires data. However, this was mitigated through data cleaning.

Another limiting factor was found in obtaining information from the respondents, as some of them were rigid. They claimed that such information was highly confidential. To overcome this limitation, the respondents were explained to exactly what the intention of the study was about and that their information was to be kept with utmost confidentiality.

Traversing through all the sampled respondents was not easy and it was costly to the researcher given that these respondents were far apart. However, the researcher and research assistants were able to ride motor cycles that were relatively cheap.

5.6 Areas of for further study

(i) The study was restricted to the farmers operating under One Acre Fund. Therefore, the extent to which these findings can be generalized to all farmers is not clear. There is need to conduct further research using other farmers who do not operate under One Acre Fund.

(ii) Since One Acre Fund operates in other countries like Kenya, Rwanda among others, comparative studies should be carried out in other countries to check if the results are similar or different.

(iii) The study focused on the relationship between the study variables. It did not consider the challenges faced by One Acre Fund while delivering services to the farmers. Therefore, further studies should examine the challenges faced by One Acre Fund when delivering their agricultural service.

REFERENCES

Abedullah, N., Khalid, M., and Kouser, S. (2009). The role of agricultural credit in the growth of livestock sector. *Pakistan Vet. Journal*, 29(2), 81-84.

Abegaz. S, Awgichew. K, Yami. A, Abebe. G, Zewde. S., and Hirpa A. (Eds.). (2008). Records and record keeping. (Chapter thirteen): *Sheep and goat production handbook for Ethiopia.* Editors: Yami A and Merkel R.C. Retrieved from: http://www.esgpip.net/HandBook/Chapter13.html

Amin, M. E. (2005). *Social science research:* Conception, methodology and analysis. Makerere University.

Aminu S., and Adjei S. A. (2015). Microfinance impact on agricultural production in Ghana: *International journal of academic Research & Reflection*: Vol.3. ISSN 2309-0405.

Ampaire. A., and Rothschild M. F. (2010).*Pigs goats and chickens for rural development; Small holder farmers' experience in Uganda. Livestock Research for Rural Development:* Retrieved from: http://www.lrrd.org/lrrd22/6/ampa22102.htm.

Anam. A., and Muhammad, S. (2017). Agriculture in Pakistan and it's impact on economy. *International Journal of advanced science and technology*. Vol.103, 47-60.

Anina, T. M. (2010). *Improving access to credit for smallholder farmers.* University of Mozambique, Mozambique: Unpublished Masters of Science in Agriculture (Agricultural Economics); 2010.

Arah. I. K., Amaglo, H., Kumah, E. K., and Ofori, H. (2015). Preharvest and postharvest factors affecting the quality and shelf life of harvested tomatoes. *A mini review International Journal of Agronomy*. Article ID 478041, 6 pages.

Asadullah, M.N., and Rahman, S. (2009). Farm productivity and efficiency in rural Bangladesh. *The role of education revisited, Applied Economics*, 41, 17–33.

Atkinson, A., and Messy, F. (2012).*Measuring Financial Literacy: Results of the OECD / International Network on Financial Education (INFE)*. OECD Working Papers on Finance, Insurance and Private Pensions, No. 15. Paris.

Atukunda D. (2019).*Targets and expected performance of One Acre Fund:* Jinja, Uganda

Auditor General Report. (2017). *The financial statement of National Agriculture Advisory Services:* Kampala, Uganda.

Badiru, I.O (2009). *Review of small farmer access to agricultural credit.* Logos, Nigeria.

Beckles, D. M. (2012).Factors affecting the postharvest soluble solids and sugar content of tomato (SolanumlycopersicumL.) fruit. *Postharvest Biology and Technology*, vol. 63, 129–140.

Costa, S. (2015).*Taking it to scale: Post Harvest Loss Eradication in Uganda 2014- 2015.* UN World Food Programme.

CSRL. (2010).*Livestock: Iowa State University*. Retrieved from: http://www.srl.ag.iastate.edu/News/livestock.php.

Dharmasiri, L. M. (2009). *Applicability of Cobb-Douglas Function in Measuring Spatial Variation of Agricultural Productivity in Sri Lanka*. Peradeniya: University of Peradeniya.

Gray, I. D., Parker W. J., and Kemp, E. (2009).Farm Management Research: a Discussion of Some of the Important Issues. *Journal of International Farm Management*, pp.56-70

Guillemo P. M. (2011). *Quality of agricultural products in relation to physical conditions*: ISBN: 978-90-481-3584-4.

Herrero, M., Thornton, P. K., and Bernués, A. (2014). Exploring future changes in smallholder farming systems by linking socio-economic scenarios with regional and household models. *A Journal on Global Environmental Change*, vol. 24, pp. 165–182.

Hodges, R. J., Buzby, J. C., and Bennett, B. (2011). Postharvest losses and waste in developed and less developed countries: Opportunities to improve resource use. *Journal of Agricultural Science*, 149, 37–45.

Hofisi. (2011). *Suitability of the farmer field schools learning process for the resource poor farmer:* Zambezi valley, Zimbabwe.

Irungu, G. W., and Makori M. (2016). Determinants of performance of agriculture projects in Kenya. *The strategic Journal of Business & change management*, Vol.3 ISS.4(26), pp462-480.

Kahan. D, (2013).*The role of the farm management specialist in extension*. FOA-UN: Rome.

Kathleen, C., and Chris, G. (2009). *Training for Rural Development: Agricultural and Enterprise Skills for Women Smallholders: City & Guilds Centre for Skills Development*, West Smithfield, London, EC1A 9DD.

King C.A. (2000).*Systematic processes for facilitating social learning*. University of Agricultural Sciences Uppsala Sweden: Unpublished PhD Thesis; 2000.

Kolb D.A. (1984). *Experiential Learning: Experiences as the source of Learning and Development*, Prentice-hall, New Jersey.

Lakoussan, E. (2017). *Promo Fruits Benin: Agricultural producers at the heart of agribusiness development*. Muscle Shoals; ICRA, Wageningen; KIT, Amsterdam.

Markus, H., Thomas, R., John, S., Christopher, B., & Julio, B. (2014). Agri food Industry Transformation and Small Farmers in Developing Countries. *Article in World Development,* 37(11), 1717-1727.

Mason, R. D. (2013). Who Gets What? Determinants of Loan Size and Credit Rationing Among Microcredit Borrowers: Evidence from Nicaragua. *Journal of International of Development*, 26, 77–90.

Mugenda, O. M. and Mugenda, A. (2003).*Research Methods Quantitative and Qualitative Approaches*. Makerere-Kampala, Uganda.

Nin P, A., and Yu (2014).*Improved performance of agriculture:* Sahara, Africa South.

Njuguna, E., and Nyairo, N. (2015). Formal Conditions that Affect Agricultural Credit Supply to Small-scale Farmers in Rural Kenya: Case Study for Kiambu County. *International Journal of Sciences: Basic and Applied Research (IJSBAR)*,20(2), 59-66.

NORC. (2012). *Impact evaluation of the farmer training and Development activity in Hondrous*: Washington, DC 20005. United States of America

Nyamwamu, P. (2016). *Factors Affecting the Financial Performance of Small and Medium Scale Chicken Farming Enterprises in Eldoret South Sub-County, Kenya*. Retrieved from: https://ssrn.com/abstract=3118173 and http://dx.doi.org/10.2139/ssrn.3118173.

Odoemenem, I.U., and Obinne, C.P.O (2010). *Assessing the factors influencing the utilization of improved cereal & vegetable production technologies by small scale farmers*. Benin.

Olagunju, F., and Ajiboye, A. (2010). Agricultural lending decision: A tobit regression analysis. *African Journal of Food and Agriculture, Nutrition and Development*, 10 (5),2515-2541.

One Acre Fund. (2019). *2018 Annual Impact*: M&E Report Country Report- April 2019, Uganda.

One Acre Fund.(2018). *Activities and performance of One Acre*. Fund Annual Report, Uganda.

Pauleen, M. (2017).*Importance of various farm inputs in agriculture*: Retrieved from: http://shambaza.com/blog/importance-of-various-farm-inputs-inagribusiness.html.

Preckel, P. V., Thomas W., and Nin, A. (2013).Bridging the Gap between Partial and Total Factor Productivity Measures Using Directional Distance Functions. *American Journal of Agricultural Economics*, 85 (4):928–942.doi:10.1111/1467-8276.00498. ISSN 0002-9092.

Rahman, J., and Zeba, S. (2011). Trends and composition of institutional credit to the agriculture sector during the post-reform period in India. *African Journal of Business Management,* 5(27),236-245.

Reimers, M., and Klasen, S. (2013). Revisiting the role of education for agricultural productivity. *American Journal of Agricultural Economics,* 95, 131–152.

Sebu, J. (2013). *Farm households' access to credit: Who needs and who gets?* Evidence from Malawi: Doctoral Dissertation, University of Kent, United Kingdom.

Soyemi, O. D. (2014). Women farmers' agricultural information need and search behaviour in North Central Nigeria. *A journal on Information and Knowledge Management*, 4(8), 39–44.

UNECE. (2017). *Agriculture Quality Standards*: Retrieved from: htt://www.unece.org/trade/agr/welcome.html.

Van Elsen, T., and Finuola, R. (2013).*Policies and strategies of Green Care in Europe*. – In: Gallis, C. (Ed.): Green Care for Human Therapy, Social innovation, Rural Economy and Education. Nova Science Publishers: 189-213, New York.

Verter, N., and Bečvářová, V. (2015).An analysis of yam production in Nigeria.*ActaUniversitatisAgriculturaeetSilviculturaeMendelianaeBrunensis*, 63(2), 659–665.

World Bank Report. (2008). *Agriculture: A driver of growth and poverty reduction*. Retrieved from http://www.worldbank.org/en/country/uganda/publication/

World Bank Report. (2018). *Closing the potential-performance divide in Ugandan Agriculture:* 1818H street, NW Washington, DC 20422, USA.

World Bank Report.(2018). *Agriculture finance and Agriculture insurance.* Washington, DC: World Bank Publications.

World Bank. (2016). *World development report and Digital dividends*. Washington, DC: World Bank Publications.

APPENDICES

APPENDIX I: QUESTIONNAIRE FOR FARMERS

Dear respondent

I am **GODFREY NANZIGWA, (2017/HD10/1713U),** a student at Makerere University Business School. This questionnaire is intended to facilitate the study on "To examine the relationship between Access to agricultural finance, Farmer training and Performance of smallholder farmers: A case of One Acre Fund in Jinja District". The study is for academic purposes and is carried out as partial requirement of the award of the Degree of Master of Business Administration (Project Management option) of Makerere University. As a key stakeholder, you have been selected to provide vital information that will facilitate the study. Your response will be treated with utmost confidentiality.

Instructions to Respondents

1. Respond to questions by ticking (√) in the most appropriate box
2. There should be only one option selected for every question
3. Name of the respondent need not to appear on the questionnaire.

SECTION A: Background information about the respondent

A1. Gender

Male ☐ Female ☐

A2. Age bracket in years

18 –29 ☐ 30-39 ☐ 40-49 ☐ 50 years and over ☐

A3. Marital status

Married ☐ Single ☐ Divorced ☐ Widow ☐

Others……

A4. Highest level of education attained

No formal education ☐ Primary ☐ Secondary ☐

Diploma ☐ Degree ☐ Others:.....

A5. Number of years spent carrying out farming under One Acre Fund

Less than a year ☐ 1-3 Years ☐ 4 years and above ☐

SECTION B: ACCESS TO AGRICULTURAL FINANCE

ACCESS TO AGRICULTURAL FINANCE		Strongly disagree	Disagree	Uncertain	Agree	Strongly agree
		1	2	3	4	5
N/S	**AGRICULTURAL LOAN**					
B1	The loans given to me are of low interest rates					
B2	I don't need a collateral security to get a loan					
B3	I enjoy the short-term loans given to me					
B4	I enjoy the long term loans given to me					
B5	One Acre Fund gives me enough grace period to invest the loans					
B6	I get no difficult in repaying the loans					
	FARM INPUTS					
B7	One Acre Fund gives me hydride seeds					
B8	One Acre Fund gives me new improved breeds					
B9	I am provided with pesticides					
B10	I am provided with farm machinery like tractor services					
B11	I am provided with farm fertilizers and manure					

SECTION C: FARMER TRAINING

FARMER TRAINING		Strongly disagree	Disagree	Uncertain	Agree	Strongly agree
		1	2	3	4	5
N/S	**FARM PRODUCTION**					
C1	I get training on new methods of crop growing					
C2	I get training on new methods of animal rearing					
C3	I get training on pest management and disease control					
C4	I get training on weed control					
C5	I get training on production cost management					
C6	I get training on production risk minimization measures					
C7	I get training on new methods of soil conservation					

	RECORD KEEPING					
C8	All crop production volumes are recorded					
C9	Performance per animal are recorded					
C10	I have computerized record keeping system					
C11	I record in books and on sheets					
C12	One Acre Fund officials checks the accuracy of my record keeping system					
C13	All operations on my farm are clearly recorded					
	POST HARVEST HANDLING					
C14	I get training on new storage methods					
C15	I get training on produce transportation methods					
C16	I get training on packaging methods					
C17	I get training on sorting and grading					
C18	I get training on cleaning and disinfecting of produces					

SECTION D: PERFORMANCE OF SMALLHOLDER FARMERS

PERFORMANCE OF SMALLHOLDER FARMERS		**Strongly disagree**	**Disagree**	**Uncertain**	**Agree**	**Strongly agree**
		1	**2**	**3**	**4**	**5**
N/S	**OUT PUT LEVELS**					
D1	My family is food secure					
D2	I have excess produces to sell					
D3	I get enough money from sell of my produces					
D4	The produces I get are appropriate to the size of land I use					
D5	The produces I get are appropriate to the labor I put in					
	QUALITY OF PRODUCES					
D6	My produces attract more buyers					
D7	Am always recognized by One Acre Fund due to high quality produces					

D8	The produces satisfy the needs of consumers					
D9	My produces have no any harm to the users					
D10	My produces meet the quality standards					

END

THANK YOU

APPENDIX II: INTERVIEW GUIDE FOR ONE ACRE FUNDOFFICIALS

Section A: Access to agriculture finance

1) Does One Acre Fund offer agriculture financing services to farmers?
2) Does One Acre Fund give loans to farmers?
3) If yes, which kind of loans and loan terms does One Acre Fund offer to the farmers?
4) Does One Acre Fund offer farm inputs to farmers?
5) If yes, which kind of farm inputs does One Acre Fund give to the farmer?

Section B. Farmer Training

1) Does One Acre Fund offer training to farmers?
2) Does One Acre Fund offer farm production trainings to farmers?
3) If yes, which kind of farm production training does One Acre Fund offer to farmers?
4) Does One Acre Fund offer Record Keeping training to farmers?
5) If yes, which Record Keeping training does One Acre Fund offer to the farmers?
6) Does One Acre Fund offer Post harvest handling training to farmers?
7) If yes, which post-harvest handling training does One Acre Fund offer to farmers?

Section C: Performance of smallholder farmers

1) Do you think the output levels of smallholder farmers under One Acre Fund have improved?
2) If yes, in your opinion, how has output levels of smallholder farmers improved?
3) Do you think the quality of produces of smallholder farmers have improved?
4) If yes, in your opinion, how has the quality of produces of smallholder farmers improved?

END

THANK YOU