IMPACT OF AGRICULTURAL FINANCING IN PERFORMANCE OF SMALLHOLDER FARMERS: A CASE OF AGRICULTURAL INPUTS TRUST FUND BORROWERS IN MOROGORO, TANZANIA

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A DISSERTATION SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF PROJECT MANAGEMENT (MPM)

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CERTIFICATIONS

The undersigned certifies that she has read and hereby recommends for acceptance by the Open University of Tanzania, a dissertation entitled: Impact of agricultural financing in performance of smallholder farmers: A case of AGITF borrowers in Morogoro region, in the partial fulfillment of the requirement of Master of Project Management at the Open University of Tanzania.

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Dr. Janeth Isanzu

Supervisor

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Date

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DECLARATION

I, **Imani Ally Matimbwa,** do hereby declare that, the work presented in this dissertation is original. It has never been presented to any other university or institution. Where other people's works have been used, references have been provided. It is in this regard that I declare this work as originally mine. It is hereby presented in partial fulfillment of the requirement for the Degree of Masters of Project Management (MPM).

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Signature

05/05/2025

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Date

DEDICATION

This work is dedicated to my beloved parents; the late mother and late father who died many years back to thank them for bringing me to life. I know that their love, humor and generosity always left me curiously of the feel of being with a Parents who left me with pain of missing someone special. I know they are missed by the family of Matimbwa but I miss them more. “May Almighty God rest their soul in peace”

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Thanks, God, for the mysterious gift of life that he gave to me. My existence in this world, strength and good health I have are upon the almighty's giving. I intently thank God for all I have in my life. I keep praying for guidance and protection as I strive through challenges for the intended success.

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ABSTRACT

This study was conducted to assess the impact of agricultural financing in performance of smallholder farmers who benefited from Agricultural Inputs Trust Fund (AGITF) in the Morogoro region, Tanzania. The study was specifically aimed to determine the influence of modern agricultural technologies, contribution of credit accessibility and contribution of market accessibility on performance of smallholder farmers. The Risk Aversion Theory was employed as it influencing farmers' decision-making regarding agricultural investments, production choices, and financial management. The study employed probability sampling techniques to select respondents of the study. The data was collected by using questionnaires administered to 136 respondents sampled using Taro Yamane (1967 sample size determination formula. The data was analyzed using descriptive statistical analysis, factor analysis, and multiple regression analysis. The findings showed that there is a positive outlook among smallholder farmers towards modern agricultural technologies and credit accessibility. Furthermore, market accessibility has a positive impact as it is perceived as instrumental in enhancing economic outcomes. The regression analysis and factor analysis showed that, Market accessibility consistently emerges as a significant predictor of various performance outcomes. Modern technologies showed a marginally significant negative association with some indicators while credit accessibility fails to show significant effects on most performance indicators. Lastly, the study recommended that agricultural financing requires a multifaceted approach for better improvement.

Keywords: *Agricultural Financing, Smallholder Farmers, Agricultural Inputs Trust Fund, Modern Agricultural Technology.*

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AGITF	Agricultural Inputs Trust Fund
GDP	Gross Domestic Product
IFC	International Finance Corporation
LR test	Likelihood Ratio Test
MIVARF	Marketing Infrastructure, Value Addition and Rural Finance
OLS	Ordinary Least Square
OUT	The Open University of Tanzania
SACCOS	Savings and Credit Cooperative Societies
SPSS	Statically Package for Social Sciences
STATA	Statistical software for data science
URT	United Republic of Tanzania
VICOBA	Village Community Banking

CHAPTER ONE

INTRODUCTION

1.1 Overview

This chapter elaborates the background of the study, statement of the problem, research objectives including general objective and specific objectives, research questions, significance of the study, scope of the study and organization of the study.

1.2 Background of the Study

According to the International Finance Corporation (IFC, 2023), the contributions of smallholder farmers in agricultural sector and the agricultural economy are recognized all over the world as they are stewards of over 80 percent of the world's farms by producing around one third of the world's food. Investing in smallholder farmers has the potential to eradicate food insecurity and extreme poverty globally (Mushi, et al., 2023). However, regardless of its important role, the agricultural sector still faces several obstacles including the lack of access to financing sources and market services; therefore, there is a need for a financing model that is able to provide stimulus to agricultural businesses to increase their production (Lestari, 2019).

In Indonesia, farmers are susceptible to being entangled with moneylender's practices because it is not easy for them to get capital from formal financial institutions. The difficulties are arising because the agricultural sector is considered to have high risk due to its dependence on natural factors (Nur, et al., 2022). In Africa, vulnerability to climate change affects the livelihoods of smallholder farmers across the continent, causing failure to meet the increasing demand for food and the

challenges of the agricultural sector. Therefore, there is a need for a transition from the current unsustainable production practices to sustainable ones by introducing new innovations and long-term investments technology through financial sectors that can allow all agricultural actors to adopt sustainable agricultural practices (Mapanje. et Al., 2023).

Studies that were done in Africa show that there is a relationship between financial management practices and performance of small-scale agricultural enterprises (Mang'ana et al., 2023). Hence, the financial sectors play a key role as they contribute to poverty reduction and economic growth. But the big challenges facing smallholder farmers in the rural economy, being excluded from formal financial services, that limits poverty reduction, sustained growth, employment, and development in rural areas (Mapanje, et al., 2023).

Additionally, the under financing of the agricultural sector in Kenya slows its growth and led to an impact on the health of the population, causing about 7 million people to face an acute food crisis in 2021 and more than 30% of children under the age of five suffered from acute malnutrition (Murungi, 2023). Agricultural productivity has been low because of using outdated farming technology, poor irrigation facilities, traditional farming methods, and small holdings (Lee, 2018). In Rwanda, the government has created more financial inclusion for the purposes of promoting the access of smallholder farmers to micro-credit which causes a significant impact to the annual agricultural growth that has averaged over 6 percent since 2007 (Taremwa, et al., 2021).

The challenge is common to rural farmers in Tanzania, who make up about 80 percent of the country's population (Onwunali, 2018). The main goal of agricultural financing is to improve food production in order to secure national food security (Obioma, et al., 2021). In this regard, many smallholder farmers are excluded from productivity-enhancing financial services, and are thus unable to secure much needed capital and lack the buffer against adversity and shocks that financial services offer (Paloma et al., 2020).

In that case, Tanzania has been showing commitment to agricultural financing by establishing Agricultural Inputs Trust Funds (AGITF) to improve agricultural production and productivity with much focus on the smallholder farmers who are the key players in the agricultural sector (AGITF, 2022). The main objective of AGITF is to bridge the gap left out between the availability of inputs and farm implements by ensuring that agricultural inputs are readily available and can be accessed by smallholder farmers through revolving funds (Sylister, 2021). The AGITF was established as a form of government support to provide soft loans to farmers, therefore allowing for easier borrowing.

This study employed the Risk Aversion Theory. The theory states that the objective function of peasant households is to secure the survival of the household by avoiding risk (Mendola, 2007). The risk-averse behaviours differ among the farmers based on the scope of the management strategies that they employ to combat risk. It is justified that poor farmers in terms of human capital and finance have no capacity to manage the risk encountered on their large sized farms (Girma, et al., 2023). There

are positive relations between risk aversion and implementation of adaptation measures, but farmers are more likely to adopt low-risk adaptation strategies but less likely to invest in risky new techniques that they are not familiar with (Schrieks, et al., 2023). Therefore, there is a need for intervention of financial institutions to improve and sustain farming practices amd market accessibility (Lee, 2018). Therefore, the study seeks to address the impact of agricultural financing to the agricultural performance of smallholder farmers especially in credit accessibility, market accessibility and adoption of modern agricultural technologies.

1.3 Statement of the Problem

One of the key issues affecting the productivity and income of smallholder farmers is the limited adoption of modern agricultural technologies. Many farmers still rely on traditional farming methods, which are less efficient and more vulnerable to climate variability and pests which make them facing constraints in accessing agricultural financing services (IFC, 2023). Tanzania is among the country dominated by smallholder farmers whose farming is predominantly by rain-fed with traditional farming techniques which expose them to poverty and constrained them to access finance and market support (Onwunali, 2018).

Statistics shows that in the year 2019/2020, area under irrigation in Tanzania Mainland was 2.3%, area planted with improved seeds 22.1%, usage of fertilizers was 20.2% and 95.4% farmers reported to use hand hoe. Other farming implements reported to be used by smallholder farmers, were oxen (27.8%), ox plough (26.5%), hand sprayer (17.9%) and tractors is 10.2% (United Republic of Tanzania - URT, 2021). Financial support to smallholder farmers will increase their productivity and

hence increase in the overall agricultural outputs, improving profitability, market access and improve agricultural risks management (Lee, 2018).

Despite of the significance of financial services, still the number of smallholder farmers accessing financial services is very minimal. According to URT, (2021), the number of household members who received credits from different sources for agricultural activities during 2019/20 agricultural year in Tanzania were 294,618 (3.8%) out of 7,837,405 households involved in agricultural activities. For the households that borrowed money, 291,035 households were in Mainland Tanzania, while 3,583 households were in Tanzania Zanziba.

About 375,838 out of 501,794 households (75%) in Morogoro region were engaged in agricultural activities (URT, 2022). The region had 16,007 households (5.5%) that borrowed money for agricultural activities in Tanzania Mainland. The sources of credits received were categorized as family, friends or relative; bank, cooperative; saving and credit societies; trade/trade store; private individual; NGO/project; and others sources. It was also observed that only 25.9% of members obtained credit from family, friends or relatives, 22.3% obtain from cooperatives source, 16.9% obtain credit service from private individual and 2.7% obtain from other source of credit (URT, 2021). The adoption of modern technologies in the region is stll low, majority of the households reported to use hand hoe at 94.6%, followed by panga (88.7%), tractor (33.7%) and plough (26.5%).

Many studies on the impact of agricultural financing in performance of smallholder farmers were done. The study focusing on the access of credit, effect of agricultural

financing, factors influencing access and participation in the markets (Mapanje, et al., 2023; Lee, 2018; Angaha and Atong, 2020; Akrong et al., 2021 and Usman and Callo-Concha, 2021) Despite a wealth of empirical works on the impact of agricultural financing, still the adoptions of modern agricultural technologies, access to finance and market accessibility remain the greatest challenges that many smallholders' farmers face. Moreover, Angaha and Atong (2020), suggested that interest rate and agricultural credit guarantee scheme funds have positive and significant relationship between commercial financial institution and agricultural sector because an increase in interest rate discourages farmers and other investors from borrowing and thus less agricultural investment and output.

However, market accessibility is among challenges encountered smallholder farmers especially in rain season. About 78.4% of households during short rain and 85.1% in long rains indicated that there is marketing challenge especially low market price faced. Other reported marketing challenges were market being too far, lack of buyers and lack of market information (URT, 2021).

1.4 Research Objectives

1.4.1 General Objective

To assess the impact of agricultural financing in the performance of smallholder farmers who benefited from AGITF in Morogoro region, Tanzania.

1.4.2 Specific Objectives

Achieving specific objectives aimed at identifying the factors significantly influence the performance of smallholder farmers in Tanzania. The following are specific

objectives of this study; -

i. To determine the influence of modern agricultural technologies on the performance of smallholder farmers in Morogoro region, Tanzania.
ii. To examine the contribution of credit accessibility on the performance of smallholder farmers in Morogoro region, Tanzania.
iii. To examine the contribution of market accessibility in the performance of smallholder farmers on Morogoro region, Tanzania.

1.5 Research Questions

To effectively examine the factors influencing the performance of smallholder farmers, it is essential to formulate clear and focused research questions, that providing a framework for investigating the role of specific objectives, the adoption of modern technologies, credit accessibility, and market accessibility. The following are three research questions for this study.

i. What are the influences of modern agricultural technologies on performance of smallholder farmers in Morogoro region, Tanzania?
ii. What are the contributions of credit accessibility on performance of smallholder farmers in Morogoro region, Tanzania?
iii. What are the contributions of market accessibility on performance of smallholder farmers in Morogoro region, Tanzania?

1.6 Significance of the Study

With regard to the study, the methodology underlying the research include questions provided an answer to the impact of agricultural financing in performance of smallholder farmers. Also, quantitative analyses quantified the magnitude and

statistical significance of the impact. It is also encompassed ethical considerations researchers should adhere to ensure the integrity and ethical conduct of the study.

Theoretically the study is significantly because it provides insights into how individuals make decisions under uncertainty. This is crucial for showing individual behavior in various contexts, including financial decision making and informing policy interventions aimed at managing and mitigating risks in society. The study also is empirically significance because its findings highlight the knowledge regarding agricultural financing and fills the gap toward financing smallholder farmers. Also, the study provides recommendations on the way forward towards providing better agricultural financing services and effectiveness of such interventions because there is significant relationship exist between agricultural expenditure and the economic growth (Angaha & Atong, 2020).

The study also is practically significance as it provides insights for policymakers, development practitioners, and financial institutions including AGITF to design more effective interventions tailored to the specific needs and contexts of the farmers. Additionally, the study is helpful to other researchers who need to conduct studies on the impact of agricultural financing to smallholder farmers.

1.7 Scope of the Study

The study focused on the AGITF borrowers in Morogoro region. The region was deliberately selected in this study and the units of enquiry were drawn from AGITF Officers, Agricultural Extension Officers, and Loan Beneficiaries (smallholder farmers). The region is selected because its major economic activities are agriculture

and most of people engaged in agriculture are smallholder farmers who grow a wide variety of annual and perennial crops (URT, 2022).

1.8 Organization of the Study

This research dissertation organized in five chapters. Chapter one covers introduction of the study including chapter overview, background of the study, statement of the problem, objectives of the study, research questions, significance of the study, scope of the study and organization of the study. Chapter two covers literature review both theoretical literatures and empirical literatures. It also covers overviews, definition of key terms, research gap and conceptual framework. Chapter three covers research methodology including chapter overview, research philosophy, research approach, research design, study area, survey population, sample size, sampling technique, variables and measurements, data collection, data analysis, and ethical issues.

Furthermore, Chapter four presents the findings and discussion obtained from the field including overview, response rate, respondents characteristics, detailed data analysis and discussion of the findings including the influence of modern technologies in performance of smallholder farmers, contribution of credit accessibility and contribution of market accessibility in performance of smallholder farmers. Chapter five covers conclusions and recommendations including overview, summary of the findings, Implication of the study, conclusion, recommendations, limitation of the study and suggested areas for further studies. After chapter five, there are references sited in this research proposal and appendices.

CHAPTER TWO

LITERATURE REVIEW

2.1 Overview

This chapter is about methodological aspects through which research was undertaken. It associated with review in various literature which entirely regarding with research topic including definition of key terms, theoretical literature review, empirical literature review, knowledge gap and conceptual framework.

2.2 Definition of Key Terms

2.2.1 Agricultural Financing

Agricultural finance is an economic science that deals with farmers or an organization borrowing funds from credit agencies with key interest of investing in agricultural activities (Lee, 2018). Taremwa, et al., (2021), define agricultural finance as valuable instrument used in the expansion of production in agribusiness. Additionally, Onwunali, (2018), defined agricultural finance as the financial services that cover the access of modern technologies, credit and market that help farmers on the entire agricultural value chain such as input supply, production, processing and marketing. The definition of Onwunali, (2018) fit the study because there is strong relationship between agricultural financing and performance of smallholder farmers. Agricultural investments are capital intensive, and for farmers to be more efficient and productive, need credit access, market access and modern technologies in order to acquire high quality inputs (Mapanje, et al., (2023).

2.2.2 Smallholder Farmers

Mpeku and Urassa, (2022), defined smallholder farmers as subsistence farmers with

poor incomes. They are farmers who dependent on agriculture for their economic livelihoods, own less than two hectares farms and they are constrained by lack of capital assets that would enable them to increase agricultural productivity, food security and income (Kamara, et al., 2019).

According to IFC, (2023), Kihoma, (2021) and Baregu, (2018), smallholder farmers are farmers managing farms of 4 hectares or less who selling agricultural produce as the main income source, lowest levels of formal financial service uptake and contribute a significant amount to overall income. As they constrained with lack of capital, the definition of smallholder farmers should be based on assets and income and not just farm size. As a matter of fact, it argued that, the concept of smallholder, can be extended to all facets such as access to input, access to capital asset, access to markets, and market orientation (Kamara, et al., 2019),

2.2.3 Agricultural Inputs Trust Fund

Agricultural Inputs Trust Fund (AGITF) is a government institution under the Ministry of Agriculture established by an Act of Parliament No.9 of 1994 as revolving fund for agricultural financing (Sylister, 2021). The Fund was established as an alternative way of financing in order to ensure sustainable supplies of agricultural inputs, farm structures and machinery loans to smallholder farmers by being responsive to agricultural development needs in Tanzania for improving financial accessibility and agricultural productivity. The Fund issuing various loans such as farm machinery (new tractors), rehabilitation of tractors, agricultural, livestock and fisheries inputs, power tillers, irrigation infrastructures, processing machines, combine harvester, farm implements, livestock keeping, and farm

operations cost (AGITF, 2022).

2.2.4 Modern Agricultural Technology

Modern agricultural technology is that technology help to improve efficiency of smallholder agriculture and enabling wider adoption of sustainable agricultural practices (Mapanje. et al., 2023). According to Mpeku and Urassa, (2022), when a person adopts something new, they are doing something different from what they were doing previously, such as adopting or using a new product, or learning and performing a new activity. The agriculture technology is emerging solutions encompass how farmers receive payment, obtain finance, protect against risk, access markets, optimize production, and manage data and supply chains (IFC, 2023). It focuses not just on boosting incomes and yields but also on supply chain traceability and certification a response to growing consumer demand

2.2.5 Credit Accessibility

Credit accessibility refers to the ease with which individuals or businesses can obtain loans or other forms of credit from financial institutions. Smallholder farmers most often require smaller amounts of credit for working capital (IFC, 2023), that helps them acquire command over the consumption goods, fixed and working capital and enhancing agricultural productivity (Lee, 2018). Additionally, farmers with access to credit are more likely to adopt modern farming technologies, use improved agricultural inputs, acquire larger land size and hire labour, which intends to increase their farming productivity (Mpeku & Urassa, 2022).

2.2.6 Market Accessibility

Market accessibility refers to the easiness with which consumers or businesses can

enter and participate in a market to sell goods and services. The participation of smallholder farmers in market channels has a positive effect on their income (Paloma, 2020). Agriculture is a significant driver for growth and a major source of income, employment and food security for the rural population, however, among the major constraints to full exploitation of agricultural potential are limited access to market infrastructure in rural area and inadequate value addition in agricultural produce (Onwunali, 2018).

2.3 Theoretical Literature Review

2.3.1 Risk Aversion Theory

Risk aversion theory was propounded by Lipton in 1968 and then propagated by Ellis in 1992 to challenge over profit maximization model (Mendola, 2007). The theory argues that poor smallholder farmers are risk-averse and they attempt to increase family security rather than maximizing profit (Masuku & Masuku, 2014). According to Girma, et al., (2023), agricultural production is faced with various risks that arise from the natural, economic and socio-political environment which are significantly caused of production losses. Lipton argued that smallholder farmers are purely risk-averse, because they have to secure their household needs from current production or otherwise face starvation (Mendola, 2007). Risk and time preferences are found to play an important role in adaptation decisions.

Risk averse farmers are more likely to implement adaptation measures that are adjustments to their current livelihood practices, and less willing to invest in adaptation measures that require a shift to other livelihood activities (Schrieks, et al., 2023). Attempting such factors will require an improved extension service, good

infrastructure, liberalization of markets and good technologies. On the other hand, risks cause welfare loss and brings social unrest and this in turn bring about rural to urban migration (Girma, et al., 2023). Mujuru et al., (2022) revealed that profits are strongly and positively influenced by resource use, area of cultivated farmland and inputs utilization in the production systems.

2.3.2 Strengths of Risk Aversion Theory

According to Shee, (2019), explained that risk perception is among the factors that discourage farmers' adoption of new technologies. Therefore, the theory plays a crucial role by influencing farmers' decision-making processes regarding agricultural investments, production choices, and financial management. It affects smallholder farmers' ability to access formal financial services because the financial institutions always perceive agriculture as a high-risk sector. The theory also enables farmers to face their challenges and securing affordable agricultural financing services to invest in agriculture and mitigate possible risk (Awunyovitor, 2018).

2.3.3 Weakness of Risk Aversion Theory

The weakness of Risk Aversion Theory is that it assumes farmers exhibit homogeneous risk preferences, characterized by a preference for certain outcomes over uncertain ones. However, research suggests that risk preferences vary widely across individual farmers including high-risk aversion attitudes, medium-risk aversion attitudes and low-risk aversion attitudes (Girma, et al., 2023). Ignoring this heterogeneity can lead to inaccurate predictions about behavior.

2.3.4 Justification for Choosing a Risk Aversion Theory

Risk aversion theory is relevant to agriculture because it considers behavioral

factors, implications for access to finance and risk management strategies. Paloma, (2020), said that the occurrence of various risks makes some smallholders more risk-averse and likely to pursue more subsistence-oriented activities. The study done by Sagemüller, (2023), investigated that the people who live in risk areas in rural Pakistan exhibit significantly higher risk aversion. Therefore, the theory provides a theoretical framework for understanding how farmers perceive and respond to their risks, influencing their decisions regarding production, access to finance, and financial management.

2.4 Empirical Literature Review

Various researchers (Mapanje, et al., (2023), Mang'ana et al., (2023), Lee, (2018), Obioma, et al., (2021), Angaha and Atong, (2020), Taremwa, et al., (2021), Mpeku and Urassa, (2022), Kamara, et al. (2019), Murungi, (2023), Onwunali, (2018)), Akrong et al., (2021) and Usman and Callo-Concha, 2021 conducted studies on the agricultural financing and market participation among smallholder farmer. The study conducted by Obioma, et al., (2021), to examine the effect of Agricultural Financing on the Performance of the Agricultural Sector in Nigeria, found that there is the significant and long-run effect of the Agricultural Credit Guarantee Scheme on the Contributions of agriculture to Gross Domestic Product (GDP).

Furthermore, the study on the Agricultural Financing and Economic Growth in Nigeria to examine the efficacy of agricultural financing on economic growth, recommended that there is a great need to improve significantly government budget allocation to agriculture and develop better frameworks that enhance more funds to the agricultural sector and financial institutions to assist government on this struggle

(Angaha & Atong, 2020).

Mapanje, et al., (2023), conducted a study on Financing Sustainable Agriculture in Sub-Saharan Africa to review the role of Financial Technologies. He came up with findings that FinTech was much needed for sustainable agriculture because most financial products accessed by smallholder farmers in the selected countries helped them in addressing production and marketing challenges. The study of Lee, (2018), on the Effect of Agricultural Financing on Agricultural Productivity in Kenya argued that water development financing was significant and had a positive effect on agricultural productivity while agricultural asset financing had a negative but significant effect.

Additionally, the study in regulation and agriculture financing in Kenya concluded that the introduction of the interest capping regulation resulted in increases in the proportion and growth in agro-lending compared with the pre-interest cap period (Murungi, 2023). Moreover, Taremwa, et al., (2021), conducted a study on the impact of agricultural credit access on agricultural productivity among maize and rice smallholder farmers in Rwanda. The research found that, productivity was increased by 44% among the farmers who accessed credit. They concluded that, agricultural credit access had a more significant impact on maize productivity but had no impact on rice productivity.

In the study of financial management practices and performance of agricultural small and medium enterprises in Tanzania, Mang'ana et al., (2023), found that working capital management practices and financing management practices have significant

positive influence on both financial and organizational performance of the surveyed agro enterprises. Another study done by Mpeku and Urassa, (2022) on Access to Bank Loans and Smallholder Farmers' Paddy Productivity in Mvomero District found that, the major challenges in accessing bank loans were high interest rates, loan inadequacy, and high collateral demand. Despite all, it was reported that access to credit has a positive impact on the productivity of paddy farmers.

However, market accessibility is critical to smallholder agricultural production in stimulating increased productivity and enhancing poverty alleviation. The study done by Akrong et al., (2021) to analyze the factors influence access to and the level of participation in high value mango markets by smallholder farmers in Ghana found that participation in high value markets was influenced by various factors including education, household income, farming experience, distance to the road, and access to credit. Therefore, they recommended that intensive education and access to credit to be given to capacitate smallholder farmers to enable them to understand and meet the requirements of high value markets.

Moreover, market accessibility influences the dietary diversity and food security for smallholder households in many ways. On the household survey to examine the relationship between market access and the dietary diversity and food security in the Yayu area of southwestern Ethiopia in early 2018, results found that households located far from market centers consumed not only less diverse foods but also spent less on food consumption than households located close to market centers (Usman & Callo-Concha, 2021).

Assessment of the financial products and services extended to smallholder farmers in the Marketing Infrastructure, Value Addition and Rural Finance (MIVARF) programme in Iringa region found that, the Programme has contributed to improvement in the socio-economic wellbeing of the farmers in rural areas of Iringa, Tanzania (Onwunali, (2018). Therefore, the relevance of smallholder farming to African agricultural growth and development will be meaningless if adequate investment is not focused on addressing the challenges and exploiting the opportunities faced by the smallholder farmer (Kamara, et al. 2019).

Table 2.1: Summary of the Previous Related Studies

S/N	Authors' Name & Year	Aim of The Study	Variables Examined	Data Analysis Methods Used	Main Findings
1	Mapanje, et al., (2023)	Financing Sustainable Agriculture in Sub-Saharan Africa: A Review of the Role of Financial Technologies	Financial sustainability	Scoping review methodology	FinTech was much needed for sustainable agriculture in Sub-Sahara
2	Mang'ana et al., (2023)	financial management practices and performance of agricultural small and medium enterprises in Tanzania	Financial Management practices	Descriptive Analysis	Working capital, management practices and financing management practices have significant positive influence to agro enterprises
3	Lee, (2018)	Effect of Agricultural Financing on Agricultural Productivity in Kenya	Effect of Agricultural financing	Descriptive Analysis	water development financing was significant and had a positive effect on agricultural productivity
4	Obioma, et al., (2021)	Examine the effect of Agricultural Financing on the Performance of Agricultural Sector in Nigeria	Effect of Agricultural financing	Statistical Analysis	There is significant and long run effect of Agricultural Credit Guarantee Scheme on Contributions of agriculture to GDP
5	Angaha and Atong, (2020)	Agricultural Financing and Economic Growth in Nigeria	Agricultural finance sustainability	Ordinary Least Square (OLS) technique	There is great need to improve significantly government budget allocation to agriculture
6	Taremwa, et al., (2021)	Impact of agricultural credit access on agricultural productivity among maize and rice	Access to agricultural credit	Propensity scores matching techniques	Increased productivity by 44% among the farmers who accessed credit

S/N	Authors' Name & Year	Aim of The Study	Variables Examined	Data Analysis Methods Used	Main Findings
		smallholder farmers in Rwanda			
7	Mpeku and Urassa, (2022)	Access to Bank Loans and Smallholder Farmers' Paddy Productivity in Mvomero District	Financial accessibility	Descriptive and inferential statistics analysis	Access to credit has a positive impact on the productivity of paddy farmers.
8	Kamara, et al. (2019)	The Relevance of Smallholder Farming to African Agricultural Growth and Development	Relevance of Smallholder Farming	Reviews the body of knowledge	Adequate investment should focus on addressing the challenges and exploiting the opportunities faced by the smallholder farmer.
9	Murungi, (2023)	Regulation and agriculture financing in Kenya	Bank size, equity, asset quality, liquidity, revenue and bank concentration	Random effects technique	The introduction of the interest capping regulations resulted in the growth in agri-lending compared with the pre-interest cap period
10	Onwunali, (2018)	Assessment of the financial products and services extended to smallholder farmers	Financial Products and Services	Descriptive and inferential statistical techniques.	The MIVARF Programme has found to contribut to improvement in the socio-economic wellbeing of the farmers in rural areas of Iringa, Tanzania
11	Akrong et al., (2021)	What factors influence access to and the level of participation in high value mango markets by smallholder farmers in Ghana	level of participation in high value mango markets	A triple hurdle model	Participation in high value markets was influenced by various factors including education, household income, farming experience, distance to road and access to credit
12	Usman and Callo-Concha, 2021	Does market access improve dietary diversity and food security? Evidence from Southwestern Ethiopian smallholder coffee producers	Market access	Multivariate regression analysis	Households located far from market centers consumed not only less diverse foods but also spend less on food consumption than households located close to market centers

Source: Researcher's Construct, (2024).

2.5 Research Gap

The study of the impact of agricultural financing in performance of smallholder farmers in Tanzania has little coverage of contextualized gaps. Most of the reviewed

researcher's studies had been done outside the country. Out of twelve studies in empirical reviews, only three were conducted in Tanzania, the remaining conducted outside Tanzania. For example, Mapanje, et al., (2023) generalize Sub-Saharan African Countries, Lee, (2018) and Murungi, (2023) concentrated in Kenya, Angaha and Atong, (2020) concentrated in Nigeria, Taremwa, et al., (2021) in Rwanda, and Kamara, et al., (2019) conducted their study in African countries in general. Therefore, there is a need to study the impact of agricultural financing on the performance of smallholder farmers in Morogoro region, Tanzania.

The studies also have a theoretical gap in the application of Risk Aversion Theory which explains the positive adaptation behaviour factor of smallholder farmers (Schrieks, et al., 2023). Despite its positivity to adaptation behaviour, the theory was not reviewed by most researchers in their studies. Most reviewed studies have different theories like technological diffusion theory, big push theory, economic theory, financial intermediary theory and other theories. Therefore, the study will provide new insight, and fill the unknown knowledge of theory toward agriculture financing gaps (Onwunali, 2018). Moreover, the study employed descriptive research methodology to describe the characteristics of the population that is being studied. This design always focuses more on what of the research subject than why the research subject (Sospeter, 2019). Missing interpretations and being unable to capture the results clearly are also considered the methodological gap of this study.

2.6 Conceptual Framework

Figure 2.1 of the conceptual framework indicates that the performance of smallholder farmers (dependent variable) is influenced by agricultural financing

which is measured in three variables, including modern technology, credit accessibility, and market accessibility. According to Onwunali, (2018), a framework highlighting the smallholder farmers access to financial services will undoubtedly improving their productive assets, hence improve productivity or performance.

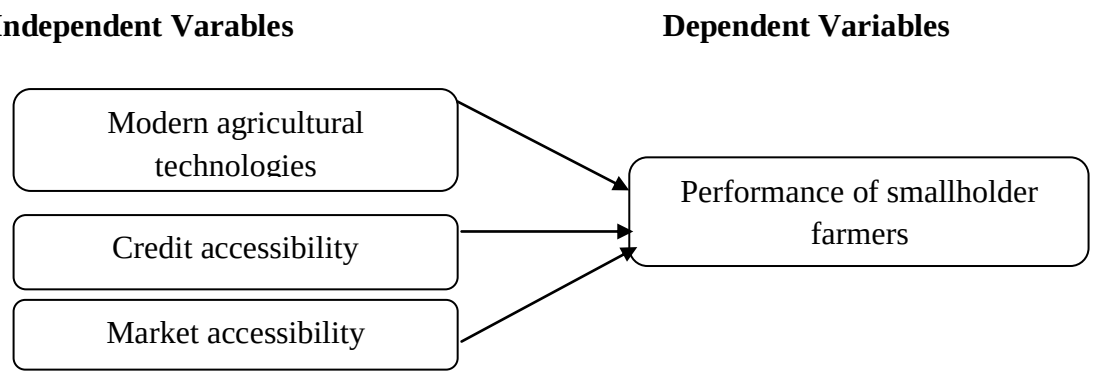

Figure 2.1: The Conceptual Framework among key Variables

Source: Researcher's Construct, (2024).

2.7 Formulated hypothesis

Due to the discussed theories, the formulate hypotheses that the study will aim to test are the following:

Hypothesis 1 (H1): There is a significant positive relationship between the use of modern agricultural technologies and the performance of smallholder farmers in Morogoro Region, Tanzania.

Hypothesis 2 (H2): Credit accessibility has a significant positive effect on the performance of smallholder farmers in Morogoro Region, Tanzania.

Hypothesis 3 (H_3): Market accessibility significantly enhances the performance of smallholder farmers in Morogoro Region, Tanzania.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Overview

This chapter of research methodology aimed to explain and justify the philosophy used, research approach and design, survey population, sample size, sampling technique, area of the study and variables and measurements. The chapter also, explains and justifies about data collection methods, data analysis including descriptive statistics, multiple linear regression and its assumptions, reliability, validity and ethical consideration issues.

3.2 Research Philosophy

In the context of this study, the positivism research philosophy was used. Positivism is a methodological philosophy in quantitative research that is employed to produce empirical evidence through systematic observation and measurement of the impact of agricultural financing to smallholder farmers (Pham, 2018). It focuses on quantifiable data to establish causal relationships between agricultural financing and the outcomes for smallholder farmers. However, the philosophy employed to develop the interpretation of a single independent variable which provides a link with a dependent variable.

3.3 Research Approach

A research approach is the procedure selected by the researcher to collect, analyse, and interpret data. In this study, the quantitative approach was used, where by numerical values derived from questionnaires were used to explain and describe the phenomena of interest (Taherdoost, 2022). Quantitative data from the questionnaire

were analyzed using the Statically Package for Social Sciences (SPSS) whereby descriptive statistics is determined (Mpeku & Urassa, 2022).

3.4 Research Design

According to Mpeku and Urassa, (2022), the study employed a cross-sectional research design whereby data was collected once from smallholders and other officials from the Morogoro region through a research questionnaire. The design was suitable for the study as it enables to obtain data while at the same time allowing the determination of cause-and-effect relationships among variables. The study adopted a descriptive research design, because it enables the use of quantitative methods and techniques that are suitable for analyzing numerical data in the study.

3.5 Study Area

The study was conducted in the Morogoro region, Tanzania. The region is purposefully selected for the study due to the availability of smallholder farmers constituting the majority of the population in the region and the availability of financial institutions, specifically banks that give out loans to smallholder farmers (Mpeku & Urassa, 2020). According to URT, (2022), the region has 7 financial institutions, 83 active Savings and Credit Cooperative Societies (SACCOS), and 1,534 Village Community Banks (VICOBA), also contributing largely to regional agricultural production (URT, 2022, URT, 2021). Therefore, it is possible to find AGITF beneficiaries in this region.

3.6 Survey Population

According to the 2022 census, the Morogoro region has a total population of 3,197,104, male 1,579,869, and female 1,617,235, with 7 districts, 9 councils, 209

wards, 673 villages, and 295 streets (URT, 2022). The study population covered smallholder farmers who benefited from AGITIF in the Morogoro region. The beneficiaries were sampled randomly to avoid bias. Other respondents were AGITF officers and agricultural extension officers in the Morogorgo region. Moreover, according to the Morogoro website accessed in March 2024, the region has 462 agricultural extension officers. In this study, at least 27 extension officers will be surveyed, from 9 councils. Also, according to the Agricultural Inputs Trust Fund, Morogoro has 130 beneficiaries, with 13 staff associated with loan disbursement and recovery.

Table 3.1: Population Distribution

S/N	Category	Population
1.	Smallholder farmers (AGITF Beneficiaries)	130
2.	Agricultural Extension Officer	27
3	AGITF Operation Officers	13
	Total	**170**

Source: Researcher's Construct, 2024

3.7 Sampling design

This section comprehensively addresses the sampling issues in the study including sampling procedure, frame, size and unit. This study employed a probability sampling technique to select respondents to the study. The primary aim of sampling is to obtain a representative sample composed of a small number of units or instances drawn from a much larger group or population (Rahman, et al., 2022). Under probability sampling, simple random sampling (lottery method) is employed to select respondents, including smallholder farmers who are key players of the study (Girma, et al., 2023). The technique is also employed by extension officers and AGITF officers. The reason for applying simple random sampling was to avoid bias among selecting respondents. Through the lottery method, the names of respondents

were listed on the pieces of paper, folded, and mixed thoroughly. The folded pieces of paper were thrown on the table and picked accordingly.

The determination of sample size considered the total population. According to Usman, (2021), explained that, the study employed survey research design is considered most appropriate because variables lends' itself to the use of measurement materials, which yield precision and objectivity. He added that using the Taro Yamane (1967) sample size determination formula, a sample from various population can participate in the study as follows;

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

Where: n = Sample size,
N = Population size,
e = Level of precision. A 95% confidence level and P = 0.5 are assumed.

Therefore: Smallholder farmers sample (n) = $N / [1 + N (e)^2]$

$n = 130/[1+130(0.05)^2] = 98$

Agricultural Extension Officer (n) = $N / [1 + N (e)^2]$

$n = 27/[1+27(0.05)^2]$

$n = 25$

AGITF operation officer's sample (n) = $N / [1 + N (e)^2]$

$n = 13/[1+13(0.05)^2]$

$n = 13$

Table 3.2: Distribution of the Study Sample

S/N	Category	Population	Sample
1.	Smallholder farmers (AGITF Beneficiaries)	130	98
2.	Agricultural Extension Officer	27	25
3	AGITF Operation Officers	13	13
	Total	**170**	**136**

Source: Researcher's Construct, 2024.

3.8 Response Rate

The response rate is the proportion of respondents who participated in the study, relative to the total number of individuals in the sample. The response rate is often

viewed as an important criterion for judging the quality of a survey (Wu, et al., 2022). The response rate is calculated using the formula:

$$\text{Response Rate (\%)} = \left[\frac{\text{Number of Responses Received}}{\text{Total Number of Sampled Participants}} \times 100 \right]$$

3.9 Variables and Measurements

The variables and measurements provide a comprehensive framework for assessing the various dimensions of agricultural financing and its impacts in performance of smallholder farmers. The study examined three independent variable and one dependent variable as shown in table 3.3.

Table 3.3: Descriptions of the Study Variables

S/N	Variables	Indicators	Measurement	References
1.	**Dependent Variable** Performance of Smallholder Farmers	Technical efficiency, Income generation, Living standard, Farm growth, Increased Productivity, Employment, Risks management, Farming Sustainability	Likert Scale	Mpeku and Urassa, (2022), Onwunali, (2018), Taremwa, et al., (2021), Mapanje, et al., (2023), Obioma, et al., (2021), Angaha and Atong, (2020),
2	**Independent Variable** i) Modern Agricultural Technologies	Improved agricultural inputs, farming practices, crop losses, yield stability, and irrigation farming	Likert Scale	Kiros and Meshesha (2022), Bonnke et al., (2022), Miano, et al., (2023), Lee, (2018), Kamara, et al., (2019), Mapanje, et al., (2023)
	i) Credit Accessibility	Proper information on financial matter, absence of AGITF Office, collateral, climatic change, agricultural risk transfer like insurance, interest rates, credit rrepayment schedule, grace period, credit charges, multiple credit and proper selection of farm project	Likert Scale	Mpeku and Urassa, (2022), Bonnke et al., 2022), Kamara, et al. (2019), Onwunali, (2018), Taremwa, et al., (2021), Mapanje, et al., (2023), Obioma, et al., (2021), Nkilijiwa & Sanka, (2021), Mrindoko, (2022)
	ii) Market Accessibility	Fair prices, prevailing prices, demand trends, crops to grow, reliance on a single market outlet, value addition, innovative technologies and practices, access to credit, competitionon and markets for agricultural inputs	Likert Scale	Asfaw, et al., (2022), Jjagwe et al. (2022), Kamara, et al., (2019), Mpeku and Urassa, (2022), Mujuru et al., (2022), Mzyece, et al., (2023

Source: Researcher's Construct, (2024).

All three independent variables and one dependent variable were measured by using the Likert Scale. The Likert Scale was consisting of five options (1=strongly disagree, 2=disagree, 3=neither agree nor disagree, 4=agree, and 5=strongly agree).

3.10 Data Collections

The study adopted the use of primary data that was collected using questionnaires by interacting with the respondents (Mwatata, et al., 2019). The data was collected by using a questionnaire only with closed-ended questions for gathering a quantitative information. Closed-ended questions in a questionnaire aimed to limit respondents to obtain information on the magnitude of issues understudy in a quantitative manner. Questionnaires were administered to 98 smallholder farmers, 25 agricultural extension officers and 13 AGITF officers. However, the details provided are confidential, and respondents were free to answer questions.

3.11 Data Analysis

According to Mwatata, et al., (2019), data analysis denotes examining what will be collected in a study and making inferences. The data was analyzed using the descriptive statistical analysis and multiple linear regressions under the SPSS programme and the Statistical Software for Data Science (STATA) programme.

3.11.1 Descriptive Statistics

Descriptive statistics were used to summarize and describe the basic characteristics of a dataset. The study involved descriptive statistical analysis, where frequencies and percentages were involved to generate findings. Then, data was summarized and presented in tables of frequencies and percentages for interpretation and discussion.

The approach provides insights into central tendency, which helps researchers understand the overall patterns and features of the variables under investigation (Lee, 2018).

3.11.2 Multiple Linear Regressions

Multiple linear regression is statistical technique used for inferential analysis to analyze the relationship between a dependent variable and independent variables. In the context of this study, the p-value≤0.05 was used to measure the significance level of association between independent and dependent variables. Multiple linear regressions represented by:

$Y = a+b_1X_1+b_2X_2+b_3X_3+\varepsilon$

where by Y = Dependent variable,

a = Y intercept when the regression line crosses the Y axis,

$b_1 – b_3$ = corresponding coefficients,

X_1 = Modern agricultural technologies

X_2 = Credit Accessibility,

X_3 = Market Accessibility,

ε = Error term.

3.12 Assumptions of Multiple Linear Regressions

Multiple linear regression assumes that the dependent variable and the independent variable were tested through the normal distribution test, multicollinearity test and homoscedasticity of variances test. According to Lestari, (2019) and Alita, et al., (2021), the normality test ensures that the data to be analyzed is normally distributed because non-normally distributed variables can distort relationships and significance

tests. Researchers can test this assumption by visual inspection of data plots, or P-P plots which give researchers information about normality. On the other hand, the test is carried out to see whether there is a linear relationship between one independent variable and other independent variables. If the relationship is not linear, the results of the regression analysis will underestimate the true relationship. Moreover, the variance of the errors or residuals in a regression model is tested by homoscedasticity of variances to check the spread of the data points around the regression line remains consistent across the range of values of the predictor variable.

3.13 Reliability

According to Sürücü and Maslakçi, (2020), reliability is defined as an indicator of the stability or consistency of the measured values obtained in repeated measurements under the same circumstances using the same measuring instrument. To ensure reliability of the collected data, the data gathering tools were pre-tested in the study area, before the actual data collection to guarantee familiarity and clarity (Mpeku & Urassa, 2022). The Cronbach's alpha coefficient is commonly used to test the reliability of measures and instruments (Sospeter, 2019). The test-retest method predicts the reliability, and the general opinion is that a correlation value of 0.70 and above indicates that the measuring instrument provides test-retest reliability (Sürücü and Maslakçi, 2020).

Table 3.4: Reliability test results

Constructs	Number of indicators	Cronbach's Alpha	Interpretation
Influence of modern agricultural technology	5	0.7	Reliable
Contribution of credit accessibility	11	0.7	Reliable
Contribution of market accessibility	11	0.7	Reliable

Source: Researcher's Construct, (2024).

3.14 Validity

According to Kubai, (2019), validity is the extent to which an instrument measures what is supposed to be measured and explains the truth of research findings. Validity is a crucial feature the measuring instrument should have in order to yield beneficial results (Sürücü and Maslakçi, 2020). To ensure validity, all questionnaires were pre-tested in the relevant study areas; modifications were made before actual data collection for the purpose of measuring theoretical meaning, concepts and consistency of language used to represent concepts in order to detect irrelevant, ambiguous, and redundant questions (Sospeter, 2019).

3.15 Ethical Consideration

The researcher observed the ethical issues related to his study. According to the Open University of Tanzania (OUT, 2020), researchers need to maintain the integrity of the profession, intellectual honesty, confidentiality, acceptability of research results, conflict of interest, observation and avoiding offending respondents. Researchers are expected to adhere to the highest standards of quality and rigour and should reflexively engage with ethical issues that may impact individuals participating in the research as well as the wider groups whose interests are intended to be addressed through that research (Richter, et al., 2020). Therefore, the Open University reviewed the proposal for ethical issues and approval before data collection.

CHAPTER FOUR

FINDINGS AND DISCUSSION

4.1 Overview

This chapter presents the findings and discussion obtained from the field. The chapter has been composed of an overview, response rate, respondent characteristics, detailed data analysis and discussion of the findings.

4.2 Data cleaning

Data cleaning plays an essential role in improving the quality of data service. This is to detect and remove errors or inconsistencies from data to improve the quality of data. Data quality problems are present in single data collections, such as files and databases Wang, et al., (2020). In this study, missing data were addressed through listwise deletion methods, as the proportion of missing values was minimal, thus reducing its impact on the statistical validity of the analysis. This approach was chosen because the missing data appeared to be randomly distributed, making it a suitable method for handling missing values without introducing biases that could arise from imputation or systematic missingness.Also, outliers in the dataset were also carefully examined, and any value identified as an outlier was treated appropriately and cautiously using the Winsorization method. This approach helped in minimizing the influence of extreme values on the statistical analysis while preserving the integrity of the dataset.

4.3 Response Rate

During the study, 136 questionnaires were distributed to respondents. All questionnaires were returned fully, which is equivalent to a response rate of 100%, which is capable

for statistical analysis. The provided information from respondents was then analysed to develop conclusion for this study.

4.4 Respondents Characteristics

This section covered the general characteristics of the respondents from the field area including sex, age, marital status, education level and their experience in agricultural finance.

4.4.1 Respondents of Age by Sex

Table 4.1 displays the distribution of respondents by age and sex, with a total sample size of 136 individuals. The field results showed that out of 136 respondents, 105 were males and 31 were female. The largest group of respondents is in the "above 50" age category, comprising 93(68.38%) of the total sample, with a nearly equal distribution between females 21(67.74%) and males 72(68.57%). The 41-50 age group represents 21(15.44%) of the sample, with a higher percentage of females 6(19.35%) compared to males 15(14.29%). The 31-40 age group accounts for 19(13.97%) of the respondents, predominantly male 17(16.19%) compared to females 2(6.45%). The youngest age group, 21-30, constitutes only 3(2.21%) of the sample, with females making up a higher proportion 2(6.45%) than males 1(0.95%). Overall, the data shows a significant skew towards older respondents, particularly in the "above 50" category, with a higher overall participation of males across all age groups.

Table 4.1: Respondents of Age by Sex

Age	Respondents	Sex		
		Female	**Male**	**Total**
21-30	Frequencies	2	1	3
	Percentages	6.45	0.95	2.21
31-40	Frequencies	2	17	19
	Percentages	6.45	16.19	13.97
41-50	Frequencies	6	15	21
	Percentages	19.35	14.29	15.44
Above 50	Frequencies	21	72	93
	Percentages	67.74	68.57	68.38
Total	Frequencies	31	105	136
	Percentages	100	100	100

Source: Field Data, (2024).

4.4.2 Respondents of Marital Status by Sex

Table 4.2 presents the marital status of respondents by sex, showing both the frequencies and column percentages. Among females, 20(64.52%) are married, which is the most common marital status, followed by 4(12.9%) who are single or widowed, and 3(9.68%) who are divorced. There are no separated females. For males, 78(74.29%) are married, again the most prevalent status, followed by 10(9.52%) who are single, 8(7.62%) who are widowed, 7(6.67%) who are divorced, and a small 2(1.9%) who are separated. The total number of respondents is 31 females and 105 males. This distribution indicates that the majority of both male and female respondents are married, with a slightly higher proportion of married males compared to females.

Table 4.2: Respondents of Marital Status by Sex

Marital status	Respondents	Sex		
		Female	Male	Total
Divorced	frequencies	3	7	10
	Percentages	9.68	6.67	7.35
Married	frequencies	20	78	98
	Percentages	64.52	74.29	72.06
Separated	frequencies	0	2	2
	Percentages	0	1.9	1.47
Single	frequencies	4	10	14
	Percentages	12.9	9.52	10.29
Widowed	frequencies	4	8	12
	Percentages	12.9	7.62	8.82
	frequencies	31	105	136
Total	Percentages	100	100	100

Source: Field Data, (2024).

4.4.3 Respondents of Education Level by Sex

The analysis of education levels by sex among 136 respondents reveals distinct patterns. The majority of respondents have completed primary education, with 9(29.03%) of females and 38(36.19%) of males falling into this category, making it the most common education level overall 47(34.56%). Secondary education follows, with 3(9.68%) of females and 16(15.24%) of males, totaling 19(13.97%). Notably, a significant portion of respondents, particularly males, have attained higher education: 12(11.43%) of males have a bachelor's degree, and 14(13.33%) hold a master's degree or higher, compared to 6(19.35%) and 3(9.68%) of females, respectively. However, 7(22.58%) of females and 14(13.33%) of males reported never receiving education, indicating a disparity in educational attainment between the sexes. Overall, males tend to have higher levels of educational attainment compared to females in this sample as indicated in Table 4.3.

Table 4.3: Respondents of Education Level by Sex

Education level	Respondents	Sex		
		Female	Male	Total
Bachelor degree/ equivalent	frequencies	6	12	18
	Percentages	19.35	11.43	13.24
Certificate	frequencies	2	3	5
	Percentages	6.45	2.86	3.68
Diploma	frequencies	1	8	9
	Percentages	3.23	7.62	6.62
Master Degree and above	frequencies	3	14	17
	Percentages	9.68	13.33	12.5
Others (Specify)				
Never get Education	frequencies	7	14	21
	Percentages	22.58	13.33	15.44
Primary education	frequencies	9	38	47
	Percentages	29.03	36.19	34.56
Secondary education	frequencies	3	16	19
Bachelor degree/ equivalent	Percentages	9.68	15.24	13.97
Total	frequencies	31	105	136
	Percentages	100	100	100

Source: Field Data, (2024).

4.4.4 Respondents of Experience in Agricultural Financing by Sex

Table 4.4 presents the distribution of respondents' experience by sex, showing both frequencies and column percentages for each category of experience. Among the 136 respondents, the majority have 11-15 years of experience, with 14(45.16%) of females and 47(44.76%) of males falling into this category. For those with 6-10 years of experience, 10(32.26%) are female and 25(23.81%) are male. A smaller proportion of respondents have 1-5 years of experience, with 4(12.9%) of females and 19(18.1%) of males. The fewest respondents have over 15 years of experience, accounting for 3(9.68%) of females and 14(13.33%) of males. Overall, males

dominate each experience category, and the most common experience range for both sexes is 11-15 years.

Table 4.4: Respondents of Experience in Agricultural Financing by Sex

Experience in agricultural financing	Respondents	Sex		
		Female	Male	Total
1-5	Frequencies	4	19	23
	Percentages	12.9	18.1	16.91
6-10	Frequencies	10	25	35
	Percentages	32.26	23.81	25.74
11-15	Frequencies	14	47	61
	Percentages	45.16	44.76	44.85
above 15	Frequencies	3	14	17
	Percentages	9.68	13.33	12.5
Total	Frequencies	31	105	136
	Percentages	100	100	100

Source: Field Data, (2024).

4.5 Detailed Data Analysis

The main objective of this study was to assess the impact of agricultural financing in performance of smallholder farmers who benefited from AGITF in the Morogoro region. To obtain the responses from smallholder farmers and agricultural officers, several questionnaires were addressed, which were measured by a likert-scale consisting of five options (1=strongly disagree, 2=disagree, 3=neither agree nor disagree, 4=agree, and 5=strongly agree).

Descriptive statistics were performed based on the three independent variables, which include modern agricultural technology, credit accessibility, and market accessibility. Additionally, the principle component analysis was conducted to compute the highest loaded factor scores. Then the internal consistency test using Cronbach's Alpha Method to test the reliability was conducted for the attributes used to measure the independent variables and the Likelihood Ratio Test (LR test) to

indicate the relationship between variables.

4.5.1 Influence of Modern Technologies in Performance of Smallholder Farmers

The analysis reveals a strong positive perception of modern agricultural technologies among smallholder farmers as indicated in Table 4.5. A significant majority of respondents 76(55.9%) strongly agree that modern agricultural technologies influence the use of improved agricultural inputs, with 39(28.7%) also agreeing. Similarly, a substantial 108(79.4%) strongly agree that these technologies drive the transition from traditional rain-fed farming to irrigation farming, highlighting the strong impact of modern technologies on farming practices. The data also shows that modern agricultural technologies are perceived to significantly reduce crop losses during post-harvest practices and improve yield stability, with over half of the respondents expressing strong agreement in these areas.

Table 4.5: Descriptive Statistics for Modern Agricultural Technologies

Statement	SD	D	N	A	SA	Total
Modern agricultural technologies influence smallholder farmers in the usage of improved agricultural inputs such as fertilizer, seed and pesticides	0	3	18	39	76	136
	0.00%	2.20%	13.20%	28.70%	55.90%	100.00%
Modern agricultural technologies influence smallholder farmers in adoption of improving farming practices	0	0	3	76	57	136
	0.00%	0.00%	2.20%	55.90%	41.90%	100.00%
Modern agricultural technologies reducing crop losses during post-harvesting practices	0	6	17	38	75	136
	0	4.40%	12.50%	27.90%	55.10%	100.00%
Modern agricultural technologies improving yield stability for smallholder farmers	4	17	18	89	8	136
	2.90%	12.50%	13.20%	65.40%	5.90%	100.00%
Modern technologies influence diversion from traditional farming (rain fed farming) to irrigation farming	0	0	11	17	108	136
	0.00%	0.00%	8.10%	12.50%	79.40%	100.00%

(Likert scale: SD = Strongly Disagree, D = Disagree, N= neither agree nor disagree, A = Agree, SA = Strongly Agree)
First row has frequencies and second row has column percentages

Source: Field Data, (2024)

Overall, the findings suggest that smallholder farmers overwhelmingly recognize the benefits of modern agricultural technologies across various aspects of farming. The high levels of agreement and strong agreement across most statements indicate that these technologies are viewed as crucial in enhancing farming efficiency, productivity, and sustainability. However, the presence of neutral responses and a few disagreements, particularly in the context of yield stability, suggests that there might be some variability in how different technologies are perceived or applied by farmers. This could be an area for further exploration to ensure broader acceptance and utilization of modern agricultural technologies.The internal consistency using Cronbach's Alpha Method was conducted to test the reliability of the five attributes used to measure the influence of modern agricultural technologies on the performance of smallholder farmers as indicated in table 4.6.

Table 4.6: Internal Consistency using Cronbach's Alpha Method

Description	Result
Reversed item	✓ Modern agricultural technologies improving yield stability for smallholder farmers
Average inter item covariance	0.13
Number of items in the scale	5
Scale reliability coefficient	0.37

Source: Field Data, (2024)

The analysis of the scale reliability coefficient using Cronbach's Alpha Method for the construct "influence of modern mechnologies in performance of smallholder farmers in Morogoro region" reveals a coefficient of 0.37, which is significantly below the commonly accepted threshold of 0.7 for acceptable reliability. This suggests that the items within the scale may not be consistently measuring the intended construct. Additionally, the presence of a reversed item four said modern

agricultural technologies improving yield stability for smallholder farmers might be contributing to this low reliability. The average inter-item covariance of 0.1272876 indicates weak correlations among the items.

Furthermore, the factor analysis of the influence of modern agricultural technologies on the performance of smallholder farmers shows significant findings. The factor analysis identified two principal factors with factor 1 explaining 31.17% and factor 2 explaining 22.70% of the variance, together accounting for 53.87% of the cumulative variance. The LR test result indicates a strong relationship between modern technologies and improvements in farming practices, with a chi-square value of 43.22 and a p-value of 0.0000, suggesting that the model fits the data well as indicated in table 4.7. Modern agricultural technologies notably enhance the usage of improved inputs like fertilizers, seeds, and pesticides, lead to the adoption of better farming practices, reduce crop losses during post-harvesting, improve yield stability, and facilitate the shift from traditional rain-fed farming to more efficient irrigation farming. Overall, these technologies significantly contribute to the enhanced performance and productivity of smallholder farmers.

Table 4. 7: Factor analysis for Modern Agricultural Technology

Factor	Eigenvalue	Difference	Proportion	Cumulative
*Factor1	1.565	0.436	0.313	0.313
*Factor2	1.129	0.185	0.226	0.539
Factor3	0.943	0.087	0.189	0.727
Factor4	0.856	0.349	0.171	0.898
Factor5	0.507	.	0.102	1
LR test: independent vs. saturated: chi2(10) = 43.22 Prob = 0.0000 * Retained factor				

Source: Field Data, (2024).

4.5.2 Contribution of Credit Accessibility

Data on the contribution of credit accessibility in the performance of smallholder farmers reveals several significant insights. The availability of proper information on financial matters is crucial for farmers, with a substantial 119(87.5%) agreeing or strongly agreeing that it influences credit access. This suggests that providing clear and accessible financial information can greatly enhance farmers' ability to secure credit. Additionally, the absence of AGITF offices nearby is another critical barrier, with 99(72.8%) of respondents agreeing or strongly agreeing that it makes credit access difficult, as displayed in table 4.8. This indicates a need for more localized financial services to support farmers in accessing credit.

Conversely, factors like adverse climatic changes and the lack of collateral also play significant roles in credit accessibility. While 87(64%) agree or strongly agree that adverse climatic changes impact farmers' ability to meet financial obligations, 127(93.4%) believe that lack of collateral prevents small farmers from qualifying for credit. This highlights the importance of addressing these barriers through mechanisms such as agricultural risk transfer services and flexible collateral requirements.

Furthermore, lower interest rates are overwhelmingly seen as beneficial, with 131(96.3%) agreeing or strongly agreeing on their positive influence on financial performance. Proper project selection is also seen as a critical factor, though opinions vary more, reflecting diverse views on how project management influences financial outcomes. Overall, the data underscores the need for targeted interventions in information dissemination, local financial services, risk management, and financial conditions to improve credit accessibility and performance for smallholder

farmers.

Table 4.8: Descriptive Statistics for Credit Accessibility

Statement	SD	D	N	A	SA	
Availability of proper information on financial matter influence farmers to credit access	0	8.0	9.0	70.0	49.0	136.0
	0.0%	5.9%	6.6%	51.5%	36.0%	100.0%
Absence of AGITF Office near by farmers make them difficult to access credit	6.0	13.0	18.0	42.0	57.0	136.0
	4.4%	9.6%	13.2%	30.9%	41.9%	100.0%
Lack of collateral causes small farmers not to qualify for credit accessibility	0	2.0	7.0	73.0	54.0	136.0
	0.0%	1.5%	5.1%	53.7%	39.7%	100.0%
Adverse climatic change influence farmers failing to meet their finance obligations	0.0	18.0	31.0	71.0	16.0	136.0
	0.0%	13.2%	22.8%	52.2%	11.8%	100.0%
Presence of agricultural risk transfer like insurance enable farmers to access financial services easily	2.0	9.0	35.0	54.0	36.0	136.0
	1.5%	6.6%	25.7%	39.7%	26.5%	100.0%
Lower interest rates influence financial performance of smallholder farmers	0.0	0.0	5.0	57.0	74.0	136.0
	0.0%	0.0%	3.7%	41.9%	54.4%	100.0%
Credit repayment schedule considering agriculture seasons increase credit access and performance of farmers	18.0	5.0	19.0	69.0	25.0	136.0
	13.2%	3.7%	14.0%	50.7%	18.4%	100.0%
Agricultural credit issued with consideration to proper grace period increase performance of smallholder farmers	0.0	5.0	6.0	89.0	36.0	136
	0.0%	3.7%	4.4%	65.4%	26.5%	100%
Down payments and other charges before loan disbursement reduce performance of smallholder farmers	20.0	16.0	59.0	20.0	21.0	136
	14.7%	11.8%	43.4%	14.7%	15.4%	100%
Multiple credit to farmers increases performance of smallholder farmers	23.0	47.0	30.0	23.0	13.0	136
	16.9%	34.6%	22.1%	16.9%	9.6%	100%
Proper selection of farm project influences financial access and performance of farmers	0.0	0.0	5.0	71.0	60.0	136
	0.0%	0.0%	3.7%	52.2%	44.1%	100%

(Likert scale: SD = Strongly Disagree, D = Disagree, N= neither agree nor disagree, A = Agree, SA = Strongly Agree)
First row has frequencies and second row has column percentages

Source: Field Data, (2024).

Table 4.9 presents the internal consistency using Cronbach's Alpha Method to test the reliability of the eleven attributes used to measure the contribution of credit accessibility in performance of smallholder farmers.

Table 4.9: Internal Consistency Using Cronbach's Alpha Method

Description	Result
Reversed item	✓ Availability of proper information on financial matters influences farmers to credit access ✓ Absence of AGITF Office near by farmers make them difficult to access credit ✓ Lack of collateral causes small farmers not to qualify for credit accessibility
Average inter item covariance	0.13
Number of items in the scale	11
Scale reliability coefficient	0.34

Source: Field Data, (2024).

Based on the provided results in table 4.9, the scale reliability coefficient for the construct "contribution of credit accessibility in performance of smallholder farmers" is 0.34, which is below the threshold level of 0.7. This indicates that the scale's internal consistency is insufficient, suggesting that the items may not be measuring the construct reliably. The average inter-item covariance of 0.13, combined with the low reliability coefficient, further supports this conclusion. In particular, the reversed items, such as the impact of proper information availability and proximity of AGITF offices on credit access, may be contributing to this issue if not aligned well with the rest of the scale.

Based on the factor analysis of the contribution of credit accessibility in the performance of smallholder farmers in table 4.10, four key factors were identified as significant: availability of proper information on financial matters, proximity of AGITF offices, availability of collateral, and the impact of adverse climatic conditions. The factor analysis with a chi-squared test statistic of 139.64 ($p < 0.0001$) indicates a robust relationship between these factors and credit accessibility. The results suggest that proper information, accessibility to financial institutions, and collateral are critical for improving credit access and subsequently enhancing

smallholder performance. Furthermore, adverse climatic conditions significantly hinder credit access, highlighting the need for targeted support such as agricultural risk transfer mechanisms. These insights underscore the importance of addressing both financial and environmental factors to optimize credit accessibility and performance among smallholder farmers.

Table 4.10: Factor Analysis for Credit Accessibility

Factor	Eigenvalue	Difference	Proportion	Cumulative
*Factor1	2.109	0.728	0.192	0.192
*Factor2	1.381	0.139	0.126	0.317
*Factor3	1.242	0.118	0.113	0.43
*Factor4	1.124	0.166	0.102	0.532
Factor5	0.958	0.042	0.087	0.619
Factor6	0.916	0.057	0.083	0.703
Factor7	0.859	0.044	0.078	0.781
Factor8	0.815	0.162	0.074	0.855
Factor9	0.653	0.08	0.059	0.914
Factor10	0.573	0.203	0.052	0.966
Factor11	0.37	.	0.034	1
LR test: independent vs. saturated: chi2(55) = 139.64 Prob>chi2 = 0.0000 *Retained Factor				

Source: Field Data, (2024)

4.5.3 Contribution of Market Accessibility in Performance of Smallholder

The data in Table 4.11 for market accessibility and its contribution to the performance of smallholder farmers reveals a strong overall agreement on its positive impacts. The majority of respondents strongly agree that market accessibility allows smallholder farmers to sell their produce at fair prices 89(65.4%) and facilitates access to information about prevailing prices 89(65.4%). This access to market information and fair pricing is crucial, as it enables farmers to make informed decisions about their production and marketing strategies. Additionally, market accessibility is viewed as essential for enabling farmers to diversify their crops and market outlets, reducing reliance on a single crop or outlet 89(65.4%), and improving their ability to access credit and finance by providing marketable produce for loans 101(74.3%).

Conversely, there is less agreement on aspects related to accessing markets for processed or value-added products 89(65.4% strongly agree), and accessing markets for inputs such as seeds, fertilizers, and machinery 71(52.2%) strongly agree. The relatively lower agreement on these aspects might suggest that while market accessibility significantly enhances some aspects of performance, there may be gaps in the accessibility of value-added markets and agricultural inputs. Overall, the strong agreement on market accessibility's role in providing fair prices, market information, and credit access underscores its critical contribution to the improved performance of smallholder farmers.

Table 4.11: Descriptive Statistics for market accessibility

Statement	SD	D	N	A	SA	Total
Market accessibility allows smallholder farmers to sell their produce at fair prices.	0	2	9	36	89	136
	0.0%	1.5%	6.6%	26.5%	65.4%	100.0%
Access to markets provides information about prevailing prices.	3	8	18	89	18	136
	2.2%	5.9%	13.2%	65.4%	13.2%	100.0%
Access to markets provides information about demand trends.	0	0	0	29	107	136
	0.0%	0.0%	0.0%	21.3%	78.7%	100.0%
Market accessibility enables farmers to make proper decisions about what crops to grow.	0	0	11	71	54	136
	0.0%	0.0%	8.1%	52.2%	39.7%	100.0%
Market accessibility reduces farmer's reliance on a single crop or market outlet.	0	4	7	89	36	136
	0.0%	2.9%	5.1%	65.4%	26.5%	100.0%
Market accessibility facilitates value addition and linkages along the agricultural value chain.	0	1	10	107	18	136
	0.0%	0.7%	7.4%	78.7%	13.2%	100.0%
Smallholder farmers can access markets for processed or value-added products.	0	0	18	29	89	136
	0.0%	0.0%	13.2%	21.3%	65.4%	100.0%
Smallholder farmers can access markets for inputs such as seeds, fertilizers, and machinery.	6	5	36	18	71	136
	4.4%	3.7%	26.5%	13.2%	52.2%	100.0%
Access to markets incentivizes smallholder farmers to adopt innovative technologies and practices that meet market requirements and consumer preferences.	3	1	8	88	36	136
	2.2%	0.7%	5.9%	64.7%	26.5%	100.0%
Market accessibility can improve smallholder farmers' access to credit and finance by providing marketable produce for loan transactions.	2	4	10	101	19	136
	1.5%	2.9%	7.4%	74.3%	14.0%	100.0%
Market accessibility enhances competitiveness and ability to seize market opportunities among smallholder farmers.	2	4	7	105	18	136
	1.5%	2.9%	5.1%	77.2%	13.2%	100.0%

(Likert scale: SD = Strongly Disagree, D = Disagree, N= neither agree nor disagree, A = Agree, SA = Strongly Agree)

First row has frequencies and second row has column percentages

Table 4.12 displays the internal consistency using Cronbach's Alpha Method ofr the eleven attributes used to measure the contribution of market accessibility in performance of smallholder farmers.

Table 4.12: Internal Consistency Using Cronbach's Alpha Method

Description	Result
Reversed item	Market accessibility allows smallholder farmers to sell their produce at fair prices.
Average inter item covariance	0.20
Number of items in the scale	11
Scale reliability coefficient	0.7

Source: Field Data, (2024).

The scale reliability coefficient for the construct "contribution of market accessibility in performance of smallholder farmers" is 0.7, which meets the common threshold for acceptable reliability. This indicates that the scale is sufficiently reliable for measuring the construct, suggesting that the items within the scale consistently capture the concept of market accessibility and its impact on smallholder farmers' performance. The average inter-item covariance of 0.20 supports this, as it reflects a moderate level of correlation between items, reinforcing the coherence of the scale.

Overall, the scale is reliable and can be used to assess how market accessibility contributes to the performance of smallholder farmers, though there might be room for further refinement to enhance reliability. Additionally, the factor analysis of contribution of market accessibility in the performance of smallholder farmers reveals four principal components with eigenvalues greater than 1, which together explain 62.92% of the variance. The factors are associated with market accessibility, including aspects such as information on prices and demand trends, value addition,

and the ability to make informed decisions.

The significant chi-squared test result (Prob>chi2 = 0.0000) indicates a strong relationship between these factors and credit accessibility. Specifically, improved market accessibility enhances smallholder farmers' ability to sell their produce, access inputs, and adopt innovative technologies, all of which facilitate their access to credit. Overall, market accessibility is crucial, as it not only provides valuable information and opportunities but also directly impacts the farmers' capacity to obtain financial support and enhance their performance.

Table 4.13: Factor analysis for Market accessibility

Factor	Eigenvalue	Difference	Proportion	Cumulative
*Factor1	3.02	1.532	0.275	0.275
*Factor2	1.488	0.24	0.135	0.41
*Factor3	1.248	0.084	0.114	0.523
*Factor4	1.164	0.178	0.106	0.629
Factor5	0.986	0.045	0.09	0.719
Factor6	0.941	0.234	0.086	0.804
Factor7	0.707	0.079	0.064	0.869
Factor8	0.629	0.126	0.057	0.926
Factor9	0.503	0.24	0.046	0.972
Factor10	0.263	0.213	0.024	0.996
Factor11	0.05	.	0.004	1

LR test: independent vs. saturated: chi2(55) = 529.45 Prob>chi2 = 0.0000 *Retained Factor

Source: Field Data, (2024).

4.6 Multiple Regression Analysis

The multiple linear regression technique used for inferential analysis to check the relationship between a dependent variable and independent variables. It was used to measure the significance level of association between independent and dependent variables. The ordered logistic regression model is used for analyzing ordinal dependent variables where the categories have a meaningful order but the distances between categories are not necessarily equal. The model summary, which

demonstrates the relationship between independent variables and the indicators of dependent variable was shown in tables 4.14–4.20

4.6.1 Increased Technical Efficiency

The results indicate that market accessibility is significantly positively associated with increased technical efficiency among smallholder farmers (p = 0.000). This suggests that as market accessibility improves, technical efficiency is likely to increase. Modern technologies show a marginally significant negative association (p = 0.08), while credit accessibility does not show a significant effect (p = 0.904). The overall model is statistically significant (Prob > chi2 = 0.000), indicating that at least one predictor is significant in explaining the outcome as indicated in table 4.14.

Table 4.14: Model Summary for Technical Efficiency

Increased Technical efficiency	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
Modern Technologies	-.565	.323	-1.75	.08	-1.199	.068	*
Credit Accessibility	.048	.396	0.12	.904	-.729	.824	
Market Accessibility	2.14	.408	5.25	0.0	1.34	2.939	***
Mean dependent var		2.088		Number of obs		136	
Pseudo r-squared		0.119		Prob > chi2		0.000	
*** p<.01, ** p<.05, * p<.1							

Source: Field Data, (2024)

4.6.2 Improved Living Standards of Smallholder Farmers

Market accessibility has a significant positive effect on improving the living standards of smallholder farmers (p = 0.043) as indicated in table 4.15. Modern technologies and credit accessibility do not show significant effects (p = 0.819 and p = 0.268, respectively). The overall model is not statistically significant (Prob > chi2 = 0.192), indicating limited overall explanatory power for the predictors in this context.

Table 4.15: Model Summary for Living Standards

Improved Living standard of smallholder farmers	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval	Sig
Modern Technologies	-.072	.313	-0.23	.819	-.685	.542	
Credit Accessibility	-.46	.415	-1.11	.268	-1.274	.353	
Market Accessibility	.79	.391	2.02	.043	.023	1.557	**
Mean dependent var		3.176		Number of obs		136	
Pseudo r-squared		0.019		Prob > chi2		0.192	
*** p<.01, ** p<.05, * p<.1							

Source: Field Data, (2024).

4.6.3 Enhances Farm Growth among Smallholder Farmers

Market accessibility is significantly associated with enhanced farm growth among smallholder farmers (p = 0.003), suggesting it plays a crucial role in farm expansion. Modern technologies and credit accessibility do not show significant effects (p = 0.801 and p = 0.246, respectively) as displayed in table 4.16. The overall model is statistically significant (Prob > chi2 = 0.024), indicating that the predictors as a whole are meaningful in explaining farm growth.

Table 4.16: Model Summary for Farm Growth

Enhances Farm growth among smallholder farmers	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval	Sig
Modern Technologies	-.097	.384	-0.25	.801	-.849	.655	
Credit Accessibility	-.56	.483	-1.16	.246	-1.506	.387	
Market Accessibility	1.273	.431	2.96	.003	.429	2.117	***
Mean dependent var		1.353		Number of obs		136	
Pseudo r-squared		0.051		Prob > chi2		0.024	
*** p<.01, ** p<.05, * p<.1							

Source: Field Data, (2024)

4.6.4 Increased Productivity for Smallholder Farmers

Table 4. 17: Model Summary for increased Productivity

Increased Productivity to smallholder farmers	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval	Sig
Modern Technologies	-.068	.321	-0.21	.833	-.697	.561	
Credit Accessibility	-.515	.42	-1.23	.22	-1.338	.308	
Market Accessibility	.653	.396	1.65	.099	-.123	1.43	*
Mean dependent var		2.456		Number of obs		136	
Pseudo r-squared		0.016		Prob > chi2		0.298	
*** p<.01, ** p<.05, * p<.1							

Source: Field Data, (2024).

The analysis shows that market accessibility has a marginally significant positive effect on productivity (p = 0.099). However, modern technologies and credit accessibility do not show significant effects (p = 0.833 and p = 0.22, respectively). The overall model is not statistically significant (Prob > chi2 = 0.298), suggesting that the predictors have limited explanatory power for productivity.

4.6.5 Increased Employment Generation among Smallholder Farmers

Market accessibility significantly increases employment generation among smallholder farmers (p = 0.002). Neither modern technologies nor credit accessibility show significant effects (p = 0.396 and p = 0.284, respectively). The overall model is statistically significant (Prob > chi2 = 0.012), indicating that the predictors collectively contribute to explaining employment generation as indicated in table 4.18.

Table 4.18: Model Summary for Increased Employment Generation

Increased employment generation among smallholders' farmers	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval	Sig
Modern Technologies	-.289	.34	-0.85	.396	-.956	.378	
Credit Accessibility	-.457	.427	-1.07	.284	-1.294	.379	
Market Accessibility	1.238	.401	3.09	.002	.453	2.023	***
Mean dependent var		1.809		Number of obs		136	
Pseudo r-squared		0.045		Prob > chi2		0.012	
*** p<.01, ** p<.05, * p<.1							

Source: Field Data, (2024)

4.6.6 Enhance Farming Sustainability among Smallholder Farmers

Table 4.19 shows that, none of the variables; modern technologies, credit accessibility, or market accessibility show significant associations with enhancing farming sustainability, with p-values of 0.924, 0.748, and 0.344, respectively. The

overall model is not statistically significant (Prob > chi2 = 0.818), indicating that the predictors do not explain variations in farming sustainability.

Table 4.19: Enhance Farming Sustainability among Smallholder Farmers

Enhance Farming Sustainability among smallholder farmers	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval	Sig
Modern Technologies	.027	.285	0.10	.924	-.532	.586	
Credit Accessibility	-.119	.369	-0.32	.748	-.842	.605	
Market Accessibility	.328	.346	0.95	.344	-.351	1.007	
Mean dependent var		3.029		Number of obs		136	
Pseudo r-squared		0.003		Prob > chi2		0.818	
*** p<.01, ** p<.05, * p<.1							

Source: Field Data, (2024).

4.6.7 Enhance Smallholder Farmers' Ability to Manage Risks

Credit accessibility shows a marginally significant negative effect on smallholder farmers' ability to manage risks (p = 0.069), suggesting that increased credit accessibility might not necessarily lead to better risk management. Modern technologies and market accessibility do not show significant effects (p = 0.404 and p = 0.609, respectively) as indicated in table 4.20. The overall model is not statistically significant (Prob > chi2 = 0.188), indicating limited explanatory power of the predictors for risk management.

Table 4.20: Enhance Smallholder Farmers' Ability to Manage Risks

Enhance smallholder farmers' ability to manage risks such as pests, disease etc.	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval	Sig
Modern Technologies	-.418	.5	-0.83	.404	-1.398	.563	
Credit Accessibility	-1.151	.633	-1.82	.069	-2.392	.09	*
Market Accessibility	.286	.56	0.51	.609	-.811	1.384	
Mean dependent var		1.875		Number of obs		136	
Pseudo r-squared		0.047		Prob > chi2		0.188	
*** p<.01, ** p<.05, * p<.1							

Source: Field Data, (2024).

4.6.8 Regression Coefficients

The regression coefficient was practiced to compare the contribution of each independent variable dependent variable. Spearman's Correlation rank was used to increase the evidence resulting from the ordered logistic regression model as shown in Table 4.21.

Table 4.21: Spearman's Correlation Coefficient

Statistic	Value
Number of Observations	136
Spearman’s (rho)	0.3091
p-value	0.0003

Source: Field Data, (2024).

From the table 4.21 above, the Spearman's rank correlation coefficient of 0.3091 indicates a moderate positive relationship between market accessibility and the performance indicators of smallholder farmers, suggesting that as market accessibility improves, the performance of smallholder farmers tends to increase. The p-value of 0.0003 strongly rejects the null hypothesis that market accessibility and performance indicators are independent, providing robust evidence of a significant association between these variables. This result underscores the importance of enhancing market access to potentially improve various performance outcomes for smallholder farmers.

4.7 Discussion of the Findings

This section consists of discussion of presented findings. The analysis was done according to the objectives of the study. The main objective of this study was to assess the impact of agricultural financing in performance of smallholder farmers

who benefited from AGITF in the Morogoro region. The study also had three specific objectives, namely; determination of the influence of modern agricultural technologies, examination of the contribution of credit accessibility, and examination of the contribution of market accessibility in the performance of smallholder farmers in the Morogoro region.

4.7.1 Influence of Modern Technologies in Performance of Smallholder Farmers

This objective aimed to assess the influence of modern technology in performance of smallholder farmers in the Morogoro region. The Cronbach's Alpha analysis reveals a coefficient of 0.37, which is significantly below the commonly accepted threshold of 0.7 for acceptable reliability. Furthermore, the factor analysis found modern technology to be significant but needs better alignment with practical needs and challenges faced by farmers. The LR test result indicates a strong relationship between modern technologies and improvements in farming practices, with a chi-square value of 43.22 and a p-value of 0.0000, suggesting that the model fits the data.

However, descriptive statistics reveal that there is a generally positive perception of modern agricultural technologies among smallholder farmers. A significant majority of respondents 76(55.9%) strongly agree that modern agricultural technologies influence the use of improved agricultural inputs, with 39(28.7%) also agreeing. Similarly, a substantial 108(79.4%) strongly agree that these technologies drive the transition from traditional rain-fed farming to irrigation farming, highlighting the strong impact of modern technologies on farming practices. The data also shows that

modern agricultural technologies are perceived to significantly reduce crop losses during post-harvest practices and improve yield stability, with over half of the respondents expressing strong agreement in these areas.

According to Kiros and Meshesha (2022), farmers usually obtain low crop production due to the lack of capital to enhance productivity in developing countries. Among the factors involved in low productivity is a proper use of agricultural inputs, such as low dosages of fertilizer due to a lack of modern agricultural technology. Agricultural financing enhances agricultural sector to make use of advanced technologies to improve farm productivity. It is considered more than just another source of inputs because it determines the access to the vital resources for farmers, such as land, labour, and farming implements that revamp agricultural development and production efficiency (Bonnke et al., 2022).

Furthermore, farming practices can be adopted by the influence of the transformation of modern agricultural technologies to overcome challenges and achieve better livelihoods among smallholder farmers. Kiros and Meshesha (2022), argued that agricultural finance is regarded as a key factor in farming production, helping poor farmers to maintain consumption of basic necessities, adopt advanced technology and raise their incomes.

Additionally, the researcher also collected data to ascertain the influence of modern agricultural technologies in reducing crop losses during post harvesting practices. Crop losses can occur at various stages, such as handling, storage, processing, and transportation. Miano, et al., (2023) argued that the lack of and having inadequate

post-harvest technologies leads to waste of the cowpea leaves when they are in season and a limited supply of the same when not in season. However, they added that in order to extend the consumption period, appropriate storage methods are essential. Crop losses have negative effects as it reduces both the quality and quantity of the crop as well as rendering it unsafe for both human and animal consumption (Midamba & Kizito, 2022). In addition, access to finance to buy farm assets affects productivity directly since farmers facing capital constraints end up using low levels of technology that are ineffectively applied and thus reduce the expected output as compared to farmers not constrained (Lee, 2018).

Moreover, the findings imply that smallholder farmers were aware of modern technologies in improving yield stability as well as performance of smallholder farmers. In most of sub-Saharan Africa smallholder farmers employ agricultural systems characterized by low input and low yield, which is the most critical factor affecting profitability and competitiveness of smallholder farmers. Furthermore, many smallholder farmers lack the skills and resources required to engage in commercialized agriculture and hence produce at the subsistence level (Kamara, et al., 2019). Improving financial services can help farmers make investment decisions, particularly in modern technology that could help increase crop yields and strengthen their food security (Mapanje, et al., 2023).

The modern technology also influences diversion from traditional farming (rainfed farming) to irrigation farming. Agricultural productivity has been low in the developing countries, particularly in Tanzania, because of the use of outdated farming technology like poor irrigation facilities and traditional farming methods

(Lee, 2018). Modern technologies have a reflective influence on the transition from traditional rainfed farming to irrigation farming as it provides efficient irrigation systems and improve water management. Embarking on a huge irrigation project will help to eliminate gaps caused by dry seasons, which will allow for the uninterrupted supply of agricultural output all year round (Obioma, et al., 2021).

Generally, the research findings showed that smallholder farmers recognize the benefits of modern agricultural technologies across various areas of farming. The high levels of agreement and strong agreement across most statements indicate that these technologies are viewed as crucial in smallholder performance. Additionally, the presence of neutral responses and a few disagreements, suggests that there might be some variability in how different technologies are perceived or applied by farmers.

4.7.2 Contribution of Credit Accessibility

The second objective of the study was the contribution of credit accessibility. In this objective, the researcher aimed to examine the contribution of credit accessibility in the performace of smallholder farmers in the Morogoro region. Based on the scale reliability coefficient for the construct "contribution of credit accessibility in performance of smallholder farmers", the analysis gave a coefficient of 0.34, which is below the threshold level of 0.7. This indicates that the scale's internal consistency is insufficient, suggesting that the items may not be measuring the construct reliably. However, factor analysis identified four factors as significant: availability of proper information on financial matters, proximity of AGITF offices, availability of collateral, and the impact of adverse climatic conditions.

The factor analysis with a chi-squared test statistic of 139.64 ($p < 0.0001$) indicates a robust relationship between these factors and credit accessibility. However, adverse climatic conditions significantly hinder credit access, highlighting the need for targeted support such as agricultural risk transfer mechanisms. Additionally, Descriptive statistics data on the contribution of credit accessibility to the performance of smallholder farmers also reveal several significant insights.

Proper information plays a critical role in supporting smallholder farmers' access to financial products and services. Emphasize on the information accessibility can support more farmers in knowing about available services as well as improving their capability to improve their practice and production (Onwunali, 2018). The availability of proper information on financial matters significantly influences farmers' access to credit. Accurate, relevant, and timely information empowers farmers to make informed decisions about borrowing, understand financial products, and navigate the credit application process.

According to Mpeku and Urassa, (2022), increasing farmers' awareness of farming activities can increase productivity, enhance farmers' creditworthiness, and increase access to financial services. Additionally, provision of agricultural finance-related information through farmers' groups is important and likely to change the risk attitude toward credit for youth farmers who are not currently accessing agricultural credit from financial institutions (Bonnke et al., 2022). On the other hand, AGITF typically provides crucial financial support for agricultural investments, making it easier for farmers to obtain loans for purchasing inputs like seeds, fertilizers, farm equipment and machinery. The absence of an AGITF Office near farmers

significantly hinders their access to credit. Due to its importance, there is a need for the intervention of credit agencies to improve and sustain farming practices (Lee, 2018).

Additionally, lack of collateral is a significant barrier that prevents many small farmers from qualifying for credit accessibility. Collateral serves as security for lenders, reducing their risk of loan default. According to Kamara, et al. (2019), most smallholder farmers are poor and vary considerably in their productive capital assets such as land size and land tenure that make them more difficult for them to use their land as collateral when attempting to access loans. This implies that, without sufficient collateral, farmers are often seen as high-risk borrowers, which can lead to loan rejections or unfavorable borrowing terms. This statement was agreed upon by an overall 93.4% of respondents to indicate seriousness of a lack of collateral in credit accessibility.

The findings also implied that, adverse climatic changes have a profound impact on farmers, often intensifying their challenges in meeting financial obligations and sustaining agricultural livelihoods. This statement was agreed upon and strongly agreed upon by overall 87(64%) of respondent to indicate climate change can lead to unpredictable weather patterns. Smallholder farmers in Tanzania are constrained by limitations of subsistence farming practices that leave them vulnerable to climate change effects, hence lack of access to finance (Onwunali, 2018). Agricultural credit acts as a potent safety net against climatic change effects since a farmer can use an irrigation system during periods of drought, thus ensuring sufficient water supply for more water intensive crops (Taremwa, et al., 2021).

The presence of agricultural risk transfer mechanisms, such as insurance, plays a crucial role in enabling farmers to access financial services more easily. Insurance is an important climate risk mitigation tool for smallholder agriculture in Tanzania and Africa, as it serves as a critical enabler for farmers to access financial services more easily by reducing risk, enhancing creditworthiness, and promoting long-term investment in agricultural productivity (Mapanje, et al., 2023). Additionally, the insurance programs safeguard smallholder farmers and provide financial help in the event of crop loss due to natural catastrophes, diseases, or pests. They also encourage farmers to use sophisticated technology, high-value inputs, and modern agricultural processes (Obioma, et al., 2021).

The findings also showed that lower interest rates are overwhelmingly seen as beneficial, with 131(96.3%) agreeing or strongly agreeing on their positive influence on financial performance. According to Onwunali, (2018), interest rates have the ability to affect the cost of borrowing money, investment decisions, and the profitability of the agricultural sector by influencing borrowing, spending and investing. In addition, interest rate has a negative relationship with agricultural output because an increase in interest rate discourages farmers and other investors from borrowing and thus less agricultural investment and output (Angaha & Atong, 2020).

Credit repayment schedule considering agriculture seasons also increases credit access and performance of farmers. Repayment immediately after receiving the loan on a weekly basis is not adequate, especially for farmers who are mainly into

agricultural activities. This does not support agricultural development because agriculture requires that harvesting be done before funds can be generated (Onwunali, 2018). Always, farmers agreed to repay their loans when their crops are harvested, and if the harvesting time may not be good due to various reasons, farmers could not repay their loans periodically as per pre-arranged agreement. In this case, the credit repayment schedule without considering agriculture seasons does not encourage the farmers to use formal financial credit on rigid repayment period forms (Kiros & Meshesha (2022). The repayment schedule also, should observe the proper grace period to increase the performance of smallholder farmers by reducing initial financial pressure, improving cash flow management, and increasing financial resilience.

Other contribution of credit accessibility in performance of smallholder farmers depend on down payments and other charges before loan disbursement, multiple credits and proper selection of farm projects. According to Nkilijiwa and Sanka, (2021), farmers preferences for credit sources are determined by the credit costs. This is also argued by Mrindoko, (2022), that the major factors hindering smallholder farmers' access to credit were reported to be the high cost of acquiring the loan among others. Multiple credit can provide the necessary financial resources to invest in various aspects of agricultural activities but not significantly improve performance. Furthermore, proper selection of farm projects is crucial for enhancing financial access and the performance of smallholder farmers. Proper selection of farm projects aligning them with market demand, optimize productivity, manage risks, and achieve long-term financial stability.

4.7.3 Contribution of Market Accessibility in Performance of Smallholder

The third objective of the study was the contribution of market accessibility in performance of smallholder farmers. In this objective, the researcher aimed to examine how market accessibility is contributing to the performance of smallholder farmers in the Morogoro region. The findings for scale reliability coefficient using Cronbach's Alpha Method for the construct "contribution of market accessibility in performance of smallholder farmers" have a coefficient of 0.7, which meets the common threshold for acceptable reliability. This suggests that the items within the scale consistently capture the concept of market accessibility and its impact on smallholder farmers' performance.

Additionally, the factor analysis of contribution of market accessibility reveals four principal components with eigenvalues greater than 1, which together explain 62.92% of the variance. The factors are associated with market accessibility, such as information on prices and demand trends, value addition, and the ability to make informed decisions. The significant chi-squared test result (Prob>chi2 = 0.0000) indicates a strong relationship between these factors and credit accessibility.

However, the descriptive statistics for market accessibility and its contribution to the performance of smallholder farmers reveal a strong overall agreement on its positive impacts. The majority of respondents strongly agree that market accessibility allows smallholder farmers to sell their produce at fair prices 89(65.4%), prevailing prices 89(65.4%), demand trends 107(78.7%), crops to grow 71(52.2%), reliance on a single market outlet 89(65.4%), value addition 107(78.7%), innovative technologies and practices 88(64.7%), access to credit 101(74.3%), competition 105(77.2%) and

markets for agricultural inputs 71(52.2%). However, the data reveals minimal levels of strong disagreement across all statements, indicating a robust consensus among respondents on the beneficial impacts of market accessibility for smallholder farmers. The relatively lower agreement on these aspects might suggest that while market accessibility significantly enhances some aspects of performance, there may be gaps in the accessibility of value-added markets and agricultural inputs.

Market accessibility indeed allows smallholder farmers to sell their produce at fair prices, which significantly impacts their financial performance and overall wellbeing. According to Mzyece, et al., (2023), price has a positive effect on quantity sold and positively affects the amount of produce that farmers would sell. The amounts to produce also depend on the prevailing price. Market information enables smallholder farmers to receive information like price before selling. It is vital because it enables farmers to make maximum decisions on at which market to sell, when to sell, and at what price (Asfaw, et al., 2022; Jjagwe et al.2022). By understanding market trends and prices, farmers can optimize their selling strategies, improve their bargaining power, and plan their finances more effectively. Additionally, the demand trend is essential to farmers for optimizing their production, marketing strategies, and overall financial performance.

According to Kamara, et al., (2019), smallholder farmers still produce in a system characterized by low yield, which is the critical factor affecting profitability and competitiveness, which makes them unprepared to meet the complex demands of agricultural business. Access to markets provides smallholder farmers with critical information about demand trends, that is essential for optimizing their production,

marketing strategies, and overall financial performance. Through market information, farmers can know the demand quantity of produce before selling (Asfaw, et al., 2022). Furthermore, market accessibility is significantly important to smallholder farmers in making informed decisions about what crops to grow.

Market access increases the opportunities for livelihood diversification and income generation, which can, in turn, empower the household to purchase a variety of food crops from local markets (Usman & Callo-Concha, 2021, and IFC, 2023). It also, empowers farmers to make informed decisions about crop selection by providing critical insights into market demand, profitability, and consumer preferences. Additionally, enhanced market accessibility empowers farmers to reduce their reliance on a single crop or market outlet by providing options to diversify and explore multiple markets. By accessing diverse markets, farmers can mitigate risks associated with price fluctuations, and enhance their resilience to external shocks. This increases production as well as poverty alleviation that results in an increase in farm profits through an increase in marketable produce, which will positively impact employment and income (Mujuru et al., 2022).

Through market accessibility, smallholders were significantly incentivized to adopt innovative technologies and practices, which fostering value addition along the agricultural value chain and enhancing access to the market for processed products. Through market accessibility, farmers can add value to their products through processing and differentiation, establish stronger relationships with buyers and processors, and integrate into broader domestic and international markets. It is also incentivizing smallholder farmers using communication technologies through electronic

media, such as cell phones, that will enable them to access price information for their products (Mzyece, et al., 2023). When farmers have the opportunity to sell their produce in broader and more lucrative markets, they are more likely to invest in methods that can increase yield, improve quality, and meet the specific requirements and preferences of consumers.

There is a positive relationship between market participation and access to credit (Asfaw, et al., 2022). Financial limitations severely limit the market participation of smallholder farmers (Mpeku & Urassa, 2022). Market accessibility can increase the economic opportunities for smallholder farmers by enhancing their ability to secure credit and finance. This, in turn, can lead to increased investment in agricultural productivity and overall economic development. Access to credit is a solution for the financial constraint of farmers to expand on improved inputs, thereby increasing production, which is reflected in increased market participation. (Asfaw, et al., 2022). It also enhances the competitiveness and ability of smallholder farmers to seize market opportunities that contribute to the sustainability and growth of their agricultural enterprises.

Additionally, productive systems are characterized by low input and low outputs, affecting profitability and competitiveness **(**Kamara, et al., 2019). It is also revealed that education is crucial to enhancing market participation to obtain new modern techniques of agricultural production and therefore increases the market surplus. It also enhances skills and knowledge to improve competence and access to new opportunities (Asfaw, et al., 2022). Better market access means that smallholder farmers can gain faster access to agricultural inputs that induce farm productivity,

which results in higher performance (Usman & Callo-Concha, 2021). This access not only improves their productivity and profitability but also supports sustainable farming practices and long-term agricultural development. Low input use is among potential reasons for the low yield (Mpeku & Urassa, 2022). In line with that, farmers who received training on production, obtained slightly higher yields, perhaps due to the use of recommended agricultural inputs, especially pesticides to prevent and control pests and diseases (Jjagwe, et al., 2022).

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Overview

This chapter summarizes, concludes and makes recommendations in line with the findings of the study, which after being implemented, will help to improve the effectiveness of agricultural financing among smallholder farmers in the study area. It also outlines the implication of the study, limitations and suggested areas for further studies.

5.2 Summary of the Study

This study to assess the impact of agricultural financing in the performance of smallholder farmers was conducted in the Morogoro, Tanzania where the smallholder farmers who benefited from AGITF were assessed. The study specifically aimed to determine the influence of modern agricultural technologies in the performance of smallholder farmers, to examine the contribution of credit accessibility and to examine the contribution of market accessibility in performance of smallholder farmers in the Morogoro region, Tanzania.

This study employed a probability sampling technique to select respondents to the study. The data were collected by using a questionnaire only with closed-ended questions for gathering quantitative, information which was administered to 136 respondents. The collected data were analyzed using descriptive statistical analysis, factor analysis, and multiple regression analysis. The findings showed that there is a positive outlook among smallholder farmers towards modern agricultural technologies, particularly in their adoption of improved inputs, farming practices,

and irrigation methods. Moreover, the findings underscore the critical role of proper financial information and infrastructure in facilitating credit access for farmers. Furthermore, the data underscores a robust consensus on the positive impact of market accessibility among smallholder farmers. Market access is perceived as instrumental in enhancing economic outcomes by providing fair pricing, vital market information, and opportunities for value addition along the agricultural value chain.

The regression analysis and subsequent factor analysis provide valuable insights into the factors affecting smallholder farmers' performance. Market accessibility consistently emerges as a significant predictor of various performance outcomes. This positive association highlights the critical role of market access in enabling smallholder farmers to enhance their operations and achieve better results. Conversely, modern technologies and credit accessibility show mixed or limited significance across different models. Modern technologies have a marginally significant negative association with some indicators while credit accessibility fails to show significant effects on most performance indicators, indicating that factors beyond mere availability of credit are influencing smallholder outcomes.

5.3 Implication of the Study

5.3.1 Implication to Policy Advocacy

Policymakers should advocate the policies that support the development and adoption of modern agricultural technologies, ensuring they are accessible and beneficial to smallholder farmers. Government and financial institutions might prioritize expanding access to credit and financial services for smallholder farmers to sustain and amplify these gains.

5.3.2 Research and Innovation

Support research and innovation in agricultural financial products tailored to the needs of smallholder farmers, promoting sustainable and inclusive agricultural development.

5.3.3 Implications to AGITF

The AGITF should expand their network and improve rural infrastructure to reduce logistical barriers to accessing financial services. This will design better interventions, and maximize the positive impacts of agricultural financing on smallholder farmers' performance.

5.4 Conclusion

The study concludes that agricultural financing played a pivotal role in enhancing the performance of smallholder farmers in the Morogoro region. By providing the necessary capital, financial stability, and risk mitigation, AGITF has enabled farmers to increase productivity, improve their livelihoods, and contribute to the overall economic development of the region. The overall findings showed that modern technology and credit accessibility positively influence the performance of smallholder farmers, but their influences were not significant. However, the study concludes that there is a positive relationship between market accessibility and the performance of smallholder farmers, where an increase in market accessibility increases the farmer’s performance with very significant influence.

5.5 Recommendations

The study comes up with several recommendations for the better improvement of smallholder performance farmers in Morogoro and Tanzania in general. The

recommendations are mainly based on the objectives of the study as follows;

i. Modern agricultural technologies: The government and agricultural stakeholders should promote the adoption of modern agricultural technologies by providing regular training programs, demonstrations, and subsidies for essential farming equipment and improved agricultural inputs. This will help enhance productivity and income levels for smallholder farmers.

ii. Credit accessibility: Financial institutions, NGOs, and government agencies should design flexible and affordable credit schemes tailored to the needs of smallholder farmers. Efforts should also be made to raise awareness about available financial services and improve farmers' financial literacy to encourage responsible borrowing and efficient use of credit. The AGITF also, should expand its network and improve rural infrastructure to reduce logistical barriers in accessing financial services.

iii. Market accessibility: Local authorities and policymakers should invest in infrastructure development, such as roads and market facilities, to improve market accessibility. Additionally, initiatives to strengthen farmers' cooperatives and market information systems should be supported to enable farmers to access fair and competitive markets for their produce.

5.6 Limitation of the Study

The main limitation of this study covers only smallholder farmers who benefited from AGITF in the Morogoro region. The sample of AGITF borrowers was not representative of the entire smallholder farmer population in the Morogoro region. Another limitation is about financial products. AGITF offers specific types of

financial products that do not address all the needs of smallholder farmers. Lastly, funds were also another limitation for the researcher during the study.

5.7 Suggested Areas for Further Studies

This study was not exhaustive; therefore, the researcher proposes the need to carry out further studies on other factors that have not been studied that may influence the sustainability of other projects. The areas include policy advocacy that supports the development and adoption of modern agricultural technologies, ensuring they are accessible and beneficial to smallholder farmers. The other area is investing in capacity-building programs that equip farmers with skills in technology adoption, market analysis, and financial management to enhance their resilience and competitiveness.

Furthermore, market integration to foster partnerships and market linkages that enable smallholder farmers to access diverse markets for their produce and value-added products is another area for further study. In addition, other areas are associated with monitoring and evaluation; continuously monitor the implementation and impact of financial and technological interventions to adapt strategies based on evolving farmer needs and market dynamics.

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APPENDICES

Appendix 1: Research Questionnaire

THE IMPACT OF AGRICULTURAL FINANCING IN PERFORMANCE OF SMALLHOLDER FARMERS: A CASE OF AGITF BORROWERS IN MOROGORO REGION

To respondent,

My name is Imani Ally Matimbwa student of Master of Project Management from the Open University of Tanzania. I am doing research on the Impact of Agricultural Financing in Performance of Smallholder Farmers: A Case of AGITF Borrowers in Morogoro Region as a requirement for the fulfillment of my study. I assure you that, the contents of this questionnaire will be absolutely confidential; no any information will be disclosed.

PART A: CHARACTERISTICS OF THE RESPONDENTS

S/N	Please Tick (√) the Appropriate	
1	Sex of respondents	Male ( ) Female ( )
2	Age (Years)	21-30 ( ) 31-40 ( ) 41-50 ( ) above 50 ( )
3	Marital status	Single ( ) Married ( ) Separated ( ) Widowed ( ) Divorced ( )
4	Level of education	Certificate ( )
		Diploma ( )
		Bachelor degree/ equivalent ( )
		Master Degree and above ( )
		Others (Specify)
5	Experience in agricultural financing	1-5 ( ) 6-10 ( ) 11-15 ( ) above 15 ( )

SECTION B: THE IMPACT OF AGRICULTURAL FINANCING IN PERFORMANCE OF SMALLHOLDER FARMERS

Kindly tick (√) in the appropriate box on the statement concerning to the impact of agricultural financing in performance of smallholder farmers in Morogoro Region to

indicate your level of agreement. The ratings are on the following scale, (1=strongly disagree, 2=disagree, 3=neither agree nor disagree, 4=agree, and 5=strongly agree).

S/N	Statement	1	2	3	4	5
1	Agricultural financing increased Technical efficiency among smallholder farmers					
2	Agricultural financing enhances smallholder farmers to increasing their income generation					
3	Agricultural financing improved Living standard of smallholder farmers such as food security, access to resources and other Services					
4	Agricultural financing enhances Farm growth among smallholder farmers					
5	Agricultural financing Increased Productivity to smallholder farmers					
6	Agricultural financing increased employment generation among smallholders' farmers					
7	Agricultural financing enhances Farming Sustainability among smallholder farmers					
8	Access to agricultural financing enhance smallholder farmers' ability to manage risks such as pests, disease etc.					

SECTION C: INFLUENCE OF MODERN TECHNOLOGIES IN PERFORMANCE OF SMALLHOLDER FARMERS IN MOROGORO REGION

Kindly tick (√) in the appropriate box on the statement concerning to the influence of modern technologies in performance of smallholder farmers in Morogoro Region to indicate your level of agreement. The ratings are on the following scale, (1=strongly disagree, 2=disagree, 3=neither agree nor disagree, 4=agree, and 5=strongly agree).

S/N	Statement	1	2	3	4	5
1	Modern agricultural technologies influence smallholder farmers in the usage of improved agricultural inputs such as fertilizer, seed and pesticides					
2	Modern agricultural technologies influence smallholder farmers in adoption of improving farming practices					
3	Modern agricultural technologies reducing crop losses during post-harvesting practices					
4	Modern agricultural technologies improving yield stability for smallholder farmers					
5	Modern technologies influence diversion from traditional farming (rain fed farming) to irrigation farming					

SECTION D: CONTRIBUTION OF CREDIT ACCESSIBILITY IN PERFORMANCE OF SMALLHOLDER IN MOROGORO REGION

Kindly tick (√) in the appropriate box on the statement concerns to the contribution of credit accessibility in performance of smallholder in Morogoro Region to indicate your level of agreement. The ratings are on the following scale, (1=strongly disagree, 2=disagree, 3=neither agree nor disagree, 4=agree, and 5=strongly agree).

S/N	Statement	1	2	3	4	5
1	Availability of proper information on financial matter influence farmers to credit access					
2	Absence of AGITF Office near by farmers make them difficult to access credit					
3	Lack of collateral causes small farmers not to qualify for credit accessibility					
4	Adverse climatic change influence farmers failing to meet their finance obligations					
5	Presence of agricultural risk transfer like insurance enable farmers to access financial services easily					
6	Lower interest rates influence financial performance of smallholder farmers					
7	Credit repayment schedule considering agriculture seasons increase credit access and performance of farmers					
8	Agricultural credit issued with consideration to proper grace period increase performance of smallholder farmers					
9	Down payments and other charges before loan disbursement reduce performance of smallholder farmers					
10	Multiple credit to farmers increases performance of smallholder farmers					
11	Proper selection of farm project influences financial access and performance of farmers					

SECTION E: CONTRIBUTION OF MARKET ACCESSIBILITY IN PERFORMANCE OF SMALLHOLDER FARMERS IN MOROGORO REGION

Kindly tick (√) in the appropriate box on the statement concerns to the **contribution of market** accessibility in performance of smallholder in Morogoro Region to indicate your level of agreement. The ratings are on the following scale, (1=strongly

disagree, 2=disagree, 3=neither agree nor disagree, 4=agree, and 5=strongly agree).

S/N	Statement	1	2	3	4	5
1	Market accessibility allows smallholder farmers to sell their produce at fair prices.					
2	Access to markets provides information about prevailing prices.					
3	Access to markets provides information about demand trends.					
4	Market accessibility enables farmers to make proper decisions about what crops to grow.					
5	Market accessibility reduces farmer's reliance on a single crop or market outlet.					
6	Market accessibility facilitates value addition and linkages along the agricultural value chain.					
7	Smallholder farmers can access markets for processed or value-added products.					
8	Smallholder farmers can access markets for inputs such as seeds, fertilizers, and machinery.					
9	Access to markets incentivizes smallholder farmers to adopt innovative technologies and practices that meet market requirements and consumer preferences.					
10	Market accessibility can improve smallholder farmers' access to credit and finance by providing marketable produce for loan transactions.					
11	Market accessibility enhances competitiveness and ability to seize market opportunities among smallholder farmers.					

Thank you for your participation

Appendix 2: Research clearance letters – Morogoro Region

THE UNITED REPUBLIC OF TANZANIA

MINISTRY OF EDUCATION, SCIENCE AND TECHNOLOGY

THE OPEN UNIVERSITY OF TANZANIA

Ref. No OUT/PG201907805 **6th May, 2024**

Regional Administrative Secretary,

P.O BoX 650,

MOROGORO.

Dear RAS,

RE: RESEARCH CLEARANCE FOR MR IMAN ALLY MATIMBWA PG201907805

2. The Open University of Tanzania was established by an Act of Parliament No. 17 of 1992, which became operational on the 1st March 1993 by public notice No.55 in the official Gazette. The Act was however replaced by the Open University of Tanzania Charter of 2005, which became operational on 1st January 2007.In line with the Charter, the Open University of Tanzania mission is to generate and apply knowledge through research.

3. To facilitate and to simplify research process therefore, the act empowers the Vice Chancellor of the Open University of Tanzania to issue research clearance, on behalf of the Government of Tanzania and Tanzania Commission for Science and Technology, to both its staff and students who are doing research in Tanzania. With this brief background, the purpose of this letter is to introduce to you **Iman Ally Matimbwa Reg. No PG201907805),** pursuing **Master of Project Management (MPM).** We here by grant this clearance to conduct a research titled **"Impact of Agricultural Financing in Perfomance of Smallholder Famers: A case of AGITF Barrowers in Morogoro**

Region". He will collect Projects his data at your area from 20th May, 2024 to 30th June, 2024.

4. In case you need any further information, kindly do not hesitate to contact the Deputy Vice Chancellor (Academic) of the Open University of Tanzania, P.O.Box 23409, Dar es Salaam. Tel: 022-2-2668820.We lastly thank you in advance for your assumed cooperation and facilitation of this research academic activity.

Yours sincerely,

THE OPEN UNIVERSITY OF TANZANIA

Prof. Gwahula Raphael Kimamala

For: VICE CHANCELLOR

Appendix 3: Research clearance letters – Agricultural Inputs Trust Fund

THE UNITED REPUBLIC OF TANZANIA

MINISTRY OF EDUCATION, SCIENCE AND TECHNOLOGY

THE OPEN UNIVERSITY OF TANZANIA

Ref. No OUT/PG201907805 **6th May, 2024**

Executive Director,

Agricultre Input Trust Fund

P.O BoX 2382,

DODOMA.

Dear RAS,

RE: RESEARCH CLEARANCE FOR MR IMAN ALLY MATIMBWA PG201907805

2. The Open University of Tanzania was established by an Act of Parliament No. 17 of 1992, which became operational on the 1st March 1993 by public notice No.55 in the official Gazette. The Act was however replaced by the Open University of Tanzania Charter of 2005, which became operational on 1st January 2007.In line with the Charter, the Open University of Tanzania mission is to generate and apply knowledge through research.

3. To facilitate and to simplify research process therefore, the act empowers the Vice Chancellor of the Open University of Tanzania to issue research clearance, on behalf of the Government of Tanzania and Tanzania Commission for Science and Technology, to both its staff and students who are doing research in Tanzania. With this brief background, the purpose of this letter is to introduce to you **Iman Ally Matimbwa Reg. No PG201907805),** pursuing **Master of Project Management (MPM).** We here by grant this clearance to conduct a research titled **"Impact of Agricultural Financing in**

Perfomance of Smallholder Famers: A case of AGITF Barrowers in Morogoro Region ". He will collect Projects his data at your area from 20th May, 2024 to 30th June, 2024.

4. In case you need any further information, kindly do not hesitate to contact the Deputy Vice Chancellor (Academic) of the Open University of Tanzania, P.O.Box 23409, Dar es Salaam. Tel: 022-2-2668820.We lastly thank you in advance for your assumed cooperation and facilitation of this research academic activity.

Yours sincerely,

THE OPEN UNIVERSITY OF TANZANIA

Prof. Gwahula Raphael Kimamala

For: VICE CHANCELLOR

Appendix 4: Research Permit – Morogoro Region

THE UNITED REPUBLIC OF TANZANIA
PRESINDENT'S OFFICE
REGIONAL ADMINISTRATION AND LOCAL GOVERNMENT

Telegraphic Address: "REGCOM"
Phones: 2934306/2934305
Fax No: 2601308/2604988
Website: www.morogoro.go.tz
Email: ras.morogoro@tamisemi.go.tz
In Reply please quote:

Regional Commissioner's Office,
Boma Road,
P. O. Box 650,
67117 MOROGORO

Ref. No: AB.175/245/01"R"/12

22h May, 2024

District Administrative Secretary,
Morogoro, Mvomero, Gairo, Ulanga
Malinyi, Kilombero na Kilosa.

Re: RESEARCH PERMIT

Please refer to the above mentioned subject.

2. I am introducing to you **IMAN ALLY MATIMBWA** who is a student from Open University of Tanzania with registration No. **PG201907805** and who at the moment is required to conduct a research in our Region.

3. The Title of Research Is **"Impact of Agricultural Financing in Performance of Smallholder Farmers; A case of AGITF Barrowers in Morogoro Region"**

4. The research permit is valid from 20th **May, 2024 to 30th June, 2024.**

5. Please provide necessary assistance to enable the accomplishment of this activity.

6. Thank you for your cooperation.

Lameck A. Mlimilwa
For: **Regional Administrative Secretary**

Copy: Vice Chancellor,
Open University of Tanzania,
P.O BOX 23409,
Dar es Salaam.
IMAN ALLY MATIMBWA - Researcher

Appendix 5: Research Permit – Agricultural Inputs Trust Fund

UNITED REPUBLIC OF TANZANIA

AGRICULTURAL INPUTS TRUST FUND

Tel. No. 026 2354166
Fax No. 026 23500268
E-Mail: info@agitf.go.tz

S.L.P 2382,
DODOMA

In reply please quote:
Ref. No. CB.272/293/01A/8

Date: 7th June, 2024

Vice Chancellor,
The Open University of Tanzania,
P.O. Box 23409,
DAR ES SALAAM.

RE: RESEARCH PERMIT FOR MR IMANI ALLY MATIMBWA (REG. NO. PG201907805)

Kindly refers your letter Ref. No. OUT/PG201907805 dated 06 May, 2024 concerning the above subject.

2. Agricultural inputs Trust fund (AGITF) received the requisition for research clearance of the research titled "**Impact of Agricultural Financing in Performance of Smallholder Famers: A case of AGITF Barrowers in Morogoro Region".**

3. We would like to inform you that the permission is given for data collection from 7th June, 2024 to 30thJune, 2024. Agricultural inputs Trust fund will be pleased to get a copy of final report of the research in order to improve its operations where necessary.

4. I wish him all the best,

MWANAHIBA MZEE
EXECUTIVE DIRECTOR

Copy: Imani A. Matimbwa – Reseacher (Student)