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Factors affecting credit access from agricultural finance corporations among smallholder farmers in Lamu County.

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FACTORS AFFECTING CREDIT ACCESS FROM AGRICULTURAL FINANCE CORPORATION AMONG SMALLHOLDER FARMERS IN LAMU COUNTY

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JUNE, 2023

DECLARATION

I declare that this dissertation is my original work and has not been previously submitted and approved for the award of a degree by this or any other university. To the best of my knowledge, the research dissertation contains no material previously published or written by another person except where due reference is made in the dissertation itself.

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APPROVAL

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ABSTRACT

Smallholder production accounts for over 75% of the total agricultural output and over 70% of marketed agricultural produce in Kenya. The rate of agricultural credit access among smallholder farmers in Lamu County has been very low, which is a matter of great concern. Agricultural credit access among smallholder farmers is important in ensuring increased food production for food security, sustainable development, and poverty eradication. Therefore, the main focus of this study was thus to examine the factors affecting the rate of credit access from Agricultural Finance Corporation among smallholder farmers in Lamu County, Kenya. The specific objectives were to examine the effects of loan attributes on agricultural credit access, to assess the effects of borrower attributes on agricultural credit access, and to establish the effects of farm attributes on agricultural credit access. The study was based on the discouraged borrower theory as the main theory to ascertain the extent of the self-selection mechanism among smallholder farmers in Lamu concerning agricultural credit and its impact on credit access. In addition, the study utilized the rational choice theory of demand for financial services because the ultimate decision to borrow or not is a choice to be decided by the borrower, and the ability to pay theory was also used to link with the borrower attributes variable in the study with respect to the ability of the borrower to pay back credit at a specified future date. A sample of 500 smallholder farmer households was obtained from two sub-counties through a multistage sampling technique. The data was analyzed using factor analysis and regression analysis. The findings revealed that loan attributes and borrower attributes had a marginal positive effect while farm attributes had a marginal negative effect on agricultural credit access. The study recommends that AFC management should conduct intensive market sanitization among smallholder farmers in Lamu County on their loan requirements, lending terms, and conditions. Informed smallholder farmers will make lending decisions as a rational choice guided by understanding the costs and benefits of the borrowing decision. Also, county and national governments should work in synergy to develop mechanisms that will encourage agricultural credit access among smallholder farmers to enable the commercialization of smallholder farming and sustainable agriculture. This includes issuing title deeds to smallholder farmers with no deeds of land ownership, discharging title deeds charged to settlement schemes, developing county-specific and agricultural enterprise-specific government guarantee schemes for smallholder farmers who do not have collateral. Smallholder farmers should make proper arrangements to make loan applications within the season so as to avoid loan rejection.

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ACRONYMS AND ABBREVIATIONS

AFC: Agricultural Finance Corporation

AgDFI: Agricultural Development Finance Institution

AI Artificial insemination

BOA: Bank of Agriculture

CIDP: County Integrated Development Plan

FLI: Flexible Loan Index

GOK: Government of Kenya

IT: Information Technology

KCSE: Kenya Certificate of Secondary Education

MCA: Multiple Correspondence Analysis

MFI: Micro Finance Institution

SPSS: Statistical Package for Social Sciences

DEFINITION OF TERMS

Credit: Defined as a device for facilitating the temporary transfer of purchasing power from those who have a surplus of it to those who are in need of it. Thus, credit involves a temporary transfer of wealth.

Agricultural Credit: This is the amount of investment funds made available for agricultural production from resources outside the farm sector.

Agricultural Finance: This is a field of study dealing with lending and borrowing by organizations and farmers.

Credit access: This is the relationship between the total amounts of loan disbursed to the farmers to the amount of credit available in a lending institution for lending purposes. This can also be defined as the extent to which the agricultural credit is available across all levels of the society and all levels of the agricultural value chain

Borrower attributes: These are attributes directly related to the borrower that can significantly affect the rate of agricultural credit access by the borrower from a lender.

Farm attributes: These are attributes about the farm and that can significantly affect the extent of agricultural credit access from a given agricultural credit lender.

Loan attributes: These are attributes directly related to the loan offered by the lender and that can significantly affect the rate of agricultural credit access by the borrower from the lender.

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CHAPTER ONE

INTRODUCTION

1.1. Background of the study

Smallholder agriculture has long served as the dominant economic activity for people in sub-Saharan Africa and accounts for about 90% of agricultural production (Douglas, 2014). The term 'smallholder' is commonly linked to the size of the landholding or livestock owned; thus, smallholder farmer derives livelihood from a holding of less than 2 to 5 ha and about 10-20 heads of livestock (Sudha and Ashok, 2002). Sudha and Ashok, (2002) stated that it is also important to recognize that the notion of a smallholder varies widely across different regions of the world, since they are defined primarily in relation to the average landholding size. In South Asia, there are as many as 125 million smallholders with an average land size of 1.6 ha. And eighty percent (80%) have holdings the size of a football field (0.6 ha). In Sub-Saharan Africa, farms are relatively larger (over 5 hectares) in comparison with Asia. Ninety six percent (96%) of the farmers have less than 5 hectares each and over 2/3rd, have less than 1 hectare. In Latin America, small farms are even larger (over 10 hectares). In India, the land ceiling permitted by law for irrigated land is about 7 hectares – the biggest farms in this group might be categorized as small in Latin America (Sudha and Ashok, 2002). It is estimated that there are more than 5 million smallholder farmers in Kenya with an average land holding of 0.2 to 5 acres (Kenya Vision 20230). Smallholder farmers in Lamu County practice mixed farming comprising crops, livestock, and trees. The practice is viable and economically feasible. The farmers own an average individual farm size of 4 acres (CIDP, 2018). In this study, smallholder farmers were defined based on land and livestock holdings, cultivate less than 5 hectares of land and own only 5-10 heads of livestock.

Agricultural credit access is the relationship between the total amounts of loan disbursed to the farmers to the amount of credit available in a financial institution for lending purposes. This can also be interpreted as the extent to which the agricultural credit is available across all levels of the society and all levels of the agricultural value chain (Sankan, 2017). Moreover, credit access can also be interpreted to mean: the number of loans that are successfully approved for disbursement against the total number of applications, the total amount of funds disbursed against the total amount of funds applied for. The credit access rate can be measured as a product of these

comparisons: The percentage of loans approved for disbursement against the total number of loans applied for and the percentage of cash disbursed as loans compared to the total amount of cash available and the percentage of successful applicants against the total number of applicants. (Sankan, 2017). In this study agricultural credit access was defined as the relationship between the amounts of loan disbursed to the stallholder farmers and the potential credit access as depicted by loan applications by the respondents. According to the World Bank annual report (2022) regions disbursed varied amounts of credit to the agricultural sector as a percentage of their total disbursements in the year 2022. Eastern and South Africa region 11%, Western and Central Africa 16%, East Asia and Pacific 13%, Europe and Central Asia 9%, Latin America and the Caribbean 12%, Middle and East and North Africa 12%, and South Asia 2% (World Bank annual report, 2022). On the other hand, banking sector net domestic credit to the agricultural sector in Kenya was 3.1% of the total credit in the fiscal year 2021/22 (CBK, 2022)

A strong and efficient agricultural sector has the potential to enable a country to feed its growing population, generate employment, earn foreign exchange, and provide raw materials for industries (Salami and Arawomo, 2013). Salami and Arawomo, (2013) argue that agricultural credit is a major catalyst for agricultural development and vibrancy which has a multiplier effect on any nation's socioeconomic and industrial fabric, because of its multifunctional nature. Obuobisa-Darko, (2015) defines agricultural credit as the short-term, medium-term, or long-term transfer of purchasing power from a lender to a borrower to allow the latter to acquire the capital of the lender for agricultural purposes, but with confidence in his willingness and ability to repay at a specified future date. Akudugu (2011), Deb and Suri (2013) acknowledge that agricultural credit provides working capital particularly, in rural areas where many impoverished smallholder farmer households live. Scholarly findings have continued to confirm that agricultural credit transforms the living conditions of farming households by increasing their farm productivity to enhance income as well as boosting their self-confidence and well-being (Akudugu, 2011, Deb and Suri 2013 and Elias *et al*., 2015). Adequate credit access, timely and low-cost credit from institutional sources have great importance, especially to small and marginal farmers (Elias *et al*., 2015).

According to Seibel *et al.,* (2005), commercial banks have not managed to close the smallholder farmer finance gap because they focus more on loan products targeting trading activities in urban

areas while paying little attention to the rural population involved in agricultural production. The trend has remained the same as commercial banks have evolved from being credit providers to profit-oriented actors within a market-driven financial system collecting savings from rural farmers and siphoning them off into urban areas (Seibel *et al.*, 2005). Adeoye and Ugalahi (2017) point out that the difficulty of smallholder farmers to participate in agricultural credits/loans has remained a fundamental problem, despite the provision of financial intermediation by the governments in Sub-Sahara Africa. This fate explains the socioeconomic characteristics of farmers and the nature and state of agricultural production across the African sub-region (Adeoye and Ugalahi, 2017). The lending terms and conditions created by commercial banks like collateral and terms of repayments also deny smallholder farmers from accessing credit. In addition, the farmer's characteristics such as level of literacy, income, and degree of awareness of credit availability are regarded as the main factors determining the farmer's access to the formal credit market. Therefore, smallholder farmers in developing countries have relied almost exclusively on informal credit gathering from friends, relatives, village traders, and landlords (Lemessa and Gemechu, 2016).

Bard *et al*., (2000) hold that borrower attributes, loan attributes, and farm attributes may influence the agricultural credit decisions by lenders. Indeed, Zeller (1994) asserts that it is the lenders who decide whether borrowers can absorb available credit based on their lending terms and conditions. Adeoye and Ugalahi, (2017) point out that agricultural financial analysts believe that many times, it is not the lack or insufficiency of credit facilities that are a major problem. But rather that the borrower is sometimes not poised to benefit from available credit due to certain socioeconomic constraints such as age, gender, education, farm management skills, farming experience, and off-farm income. According to Saqib *et al*., (2017), age measured in years is used as a proxy for maturity and experience in farming and implies the potential ability to perform productive work and utilize and repay credit. Mwonge and Naho (2021) found that age has a positive and significant effect on demand for agricultural credit. The odds ratio of the age variable was equal to 14.237, this implied that smallholder farmer's credit demand will increase 14.237 times for one unit increase in age. Saqib *et al*., (2017) found that age negatively and insignificantly influenced access to credit by farmers. Gender is another important borrower attribute and measures whether female or male (Lemessa and Gemechu, 2016; Weber and Musshoff, 2013). Ouattara *et al*., (2022) observed that gender had a negative and statistically significant influence in farmers' choice and

access to credit and that women farmers are more likely than men to borrow from financial institutions. On the contrary, Ha (2015) found gender not to be significant in influencing demand and access for agricultural credit as men borrowed slightly more money than women.

Education, a borrower attribute, is very important in accessing and controlling productive resources including credit, and one of the major factors that influence the decision to absorb credit (CBN, IFC, and World Bank, 2017). Zulfiqar *et al*., (2020), and Musebe *et al*., (2017) examined education in their various studies on agricultural credit in terms of the number of years of schooling. Mwonge and Naho (2021) assessed education in the context of the level of education creating gaps for further studies. The studies observed that education positively and significantly influenced access to agricultural credit. Allahyari *et al*., (2011) define farm management skills as skills required to manage farm production factors and the economic efficiency of an agricultural enterprise to maximize production. Njiru and Mwikamba (2020) found that the farm management skills of the farmer influenced how dairy farmers access agricultural credit and that a unit increase in farmers' management skills would increase access to agricultural credit. The study was based on dairy as a mono-enterprise creating gaps for study on other agricultural enterprises. Farming experience refers to the number of years a farmer has in agricultural practice and can be as long as 60 years in the Southern Punjab region (Zulfiqar*et al*., 2020). Saqib *et al*., (2017) reported that experience was positive and significant in influencing demand for agricultural credit. Ouattara *et al*., (2022) found that experience in rice farming had a negative and insignificant influence on farmers' choice of different credit sources in Côte d'Ivoire. According to Elias *et al.*, (2015), off-farm income measures the availability of other income sources other than farm income. Khatun *et al*., (2014) argue that farm families having off-farm income have more access to credit than that of families having less off-farm income. Ouattara *et al*., (2022) and Zulfiqar *et al*., (2020) point out that farmers involved in an off-farm income-generating activity are less likely to borrow. These findings on borrower attributes are conflicting, creating gaps for further studies.

Loan attribute variables mainly the applied loan amount, collateral/security requirement, repayment flexibility and loan transaction costs (loan fee, transport cost, credit monitoring and administration cost, and opportunity cost of time) affect the rate of agricultural credit access and are critical in the context of money lending. Farmers in their bid to access credit incur transaction

costs. Loan transaction costs mainly involve various charges imposed by lenders beyond payments of interest (Antwi and Ohene-Yankyira, 2017). Ankrah *et al*., (2019) examined the effects of saving mobilization on access to credit among smallholder farmers in the Birim central municipality of Ghana. The transaction cost depicted a negative significant impact on access to credit. The findings may change in a different municipality or country contexts creating gaps for further studies. Collateral refers to any assets that a farmer may offer as security to obtain credit (Odhiambo and Upadhyaya, 2020). Blessings *et al*., (2020) found that collateral has a negative and significant effect on credit demand. This implies that farmers with low or no collateral endowments have low demand for bank credit. Kosgey (2013) found that collateral does not significantly influence access to agricultural credit for farmers who belong to groups. Odhiambo and Upadhyaya, (2020), assert that a loan is considered flexible when the transaction can be reconciled with the cash flow of a farm which is variable. Basu and Srivastava, (2005) argue that borrowers engaged in agriculture are usually having irregular and seasonal earnings that lead them to make unsystematic loan repayments which endear them to lenders with flexible loan repayment frequencies. Odhiambo and Upadhyaya, (2020) found that the level of flexibility is not significantly correlated to access to credit among smallholder farmers in Siaya County. Weber and Musshoff, (2020) pointed out that agricultural firms with flexible microfinance loans have significantly higher credit access probabilities in Madagascar. These are conflicting findings in different geographical contexts creating gaps for further studies. Interest rate and loan duration are not under consideration as loan attributes in this study as they are constant for AFC loans at 10 percent and three years respectively.

Farm attributes including distance to the financial institution, farm productivity, extension services, and technology adoption (greenhouse, irrigation, zero grazing, AI, crop protection, fertigation, and feedlot technologies) are under scrutiny in this study. Gbigbi (2017) and Lemessa and Gemechu, (2016) found that the proximity of a farm household to a formal lending organization is one of the factors that influence the borrowing decision of farm households. Gbigbi (2017) assessed distance in kilometers while Lemessa and Gemechu, (2016) assessed distance in terms of hours taken to access the lending institution. According to Lavison (2013), technology is the knowledge/information that permits some tasks to be accomplished more easily, some services to be rendered, or the manufacture of a product. The availability of credit provides a greater incentive

for farmers to venture into the use of technology that raises productivity and incomes (Awunyo-Vitro, 2018). Mohamed and Temu, (2008) found that the adoption of technology significantly influenced non-credit-constrained households to access credit as opposed to credit-constrained households. Obuobisa-Darko (2015) indicates that technology adoption is significantly influenced by credit access. Extension services are crucial for the success of agricultural activities. Adeoye and Ugalahi, (2017) used probit regression to analyze smallholder food crop farmers' participation in the Bank of Agriculture (BOA) loan scheme in Ogun State, Nigeria. On the other hand, Lemessa and Gemechu, (2016) used a logit model to analyze factors affecting smallholder farmers' access to formal credit. The findings concur that extension services positively and significantly influence farmers' access to formal credit.

This study sought to examine factors affecting credit access from Agricultural Finance Corporation among Smallholder farmers in Lamu County. For this study, the type of farmers that were the subject of discussion here were the smallholder rather than subsistence farmers (who barely interact with the market) or large farmers (who are generally well financed). The study used quantitative research methodologies and smallholder farmer households as the unit of analysis to critically examine the issues at hand, and to comprehend better how loan attributes, borrower attributes, and farm attributes are most likely to affect agricultural credit access among smallholder farmers in Lamu County. The study was anchored on the discouraged borrower theory as the dominant theory (Rostamkalaei, 2017). In addition, the study utilized the rational choice theory of demand for financial services (Becker, 1993) and the ability to pay theory to guide the study to ascertain whether the ability to pay by the borrowers at a specified future date led to increased credit access (Chanda, 2015).

1.1.1. Overview of Smallholder Agricultural Credit in Kenya

According to the World Development Report (2020) using agriculture as the basis for economic growth and development requires a revolution in smallholder farming by improving their productivity, profitability, and sustainability. Kenya Vision 2030 has identified agriculture to be among the six major segments of the monetary feature (alongside tourism, discount, and exchange, manufacturing, money-related administrations, and IT-empowered administrations) anticipated that would drive the economy to an anticipated 10 percent economic development every year over

the following two decades. The Kenyan economy is categorized as agro-based because agriculture accounts for an average of 32 percent of the growth of the economy and approximately 79 percent of the poor population derives their livelihood in rural areas (World Development Report, 2020). Agriculture is subsequently key to the accomplishment of Vision 2030 whose objective will be acknowledged halfway by the advancement of a creative, economically arranged, and present-day Agriculture. To make this progress, smallholder farmers require monetary help for the commercialization of farming (Kenya Vision 2030). The agricultural sector in Kenya is mainly dominated by smallholder farmers. This smallholder production accounts for over 75% of the total agricultural output and over 70% of marketed agricultural produce (GoK, 2018).

Smallholder farmers in Lamu County are poor with low saving rates leading to insufficient owned equity and cash constraints which limit their ability to purchase fertilizers and other inputs (Kilovoo, 2018). Agriculture is the mainstay of the Lamu economy, contributing 90 percent of the total household income (GoK, 2017a). The most commonly practiced farming system in Lamu County is the smallholder mixed farming comprising of crops, livestock, and trees (GoK, 2017a). The main crop production that needs to be financed are maize, cowpea, grams (green & black), finger millet, cassava, pigeon peas, mangoes, coconut, cotton, bixa, and simsim (GoK, 2017a). Livestock production is another important component of agriculture that needs to be financed; the most popular animals reared are cattle, sheep, goats, donkeys, and poultry (GoK, 2017a). Fishing is the main economic activity for the residents of Lamu Island contributing to over 70 percent of incomes to households (CIDP, 2018). However, the current production is low due to lack of financing to enable fisher folks to procure fishing equipment (GoK, 2017a). Credit is needed as an important indirect input to increase agricultural productivity for sustainable development and poverty eradication. Lamu County CIDP (2018) report underpins the need for financing by smallholder farmers in Lamu County to enable the procurement of inputs and capital investment in areas such as value-addition technologies, irrigation infrastructure, and general farm development. Most smallholder farmers are poor and depend solely on proceeds from their farming activities. They also lack a saving culture thus limiting their financial capacity.

Lamu County is characterized by a paucity of suitable formal financial institutions dedicated to serving smallholder farmers with only six commercial banks and four microfinance institutions

mainly in Mpeketoni, and Lamu towns serving majorly the commercial sector (CIDP, 2018). This leaves AFC, a state-owned agricultural development bank, as the only sustainable financial intermediary fully dedicated to providing credit services to agricultural activities in the county as part of government intervention in agricultural financing (CIDP, 2018). The Corporation is an agricultural development finance institution (AgDFI) with a sole mandate to assist in the development of agriculture and agricultural industries by providing credit to farmers (AFC, 2018).

The corporation has endeavored in the past nine years to ensure the flow of sufficient, timely, and cost-effective credit targeting smallholder farmers in Lamu County. However, there exists an insufficiency deficit between the credit supply by AFC and credit absorbed by farmers in Lamu County (AFC, 2020). The set annual target for disbursement of Kenya Shillings One Hundred Million has remained elusive with the corporation achieving a paltry 20 percent, 33 percent, and 40 percent over the last three fiscal years despite the expansion in the size of the agricultural sector and increasing need for financing (AFC, 2020). The corporation has employed a plethora of strategies and enhanced its institutional capacity and efficiency by using technology and employing adequate competent staff to ensure sustainable business in Lamu County (AFC, 2020). It offers a rich menu of loan products designed to ensure sustainable development, priced at a low-interest rate of 10 percent to reach the greatest number of rural smallholder farmer households. The corporation offers different types of loans targeting smallholder farmers: Seasonal crop credit, water development loans, livestock loans, fisheries loans, cash crop loans, horticultural loans, and farm infrastructure loans (AFC, 2020).

1.2. Statement of the Problem

Smallholder farmers are important components and contributors to the Kenyan economy and food security. Agricultural credit is a critical component that could help improve smallholder productivity and reduce extreme poverty, supporting the generation of self-employment in the rural sector farming and non-farming activities for investment in working capital, and one of the core strategies for alleviating poverty in most developing countries (Das, 2018). The insufficiency deficit between the credit supplied by the government intermediaries and credit absorbed by smallholder farmers not only constrains the commercialization of smallholder agricultural production but also calls for further investigation (Kenya Vision 2030). In the recent past,

agricultural productivity has been declining in Kenya posing a threat to food security and increasing poverty levels (GoK, 2018). One important approach to increasing productivity is through enhancing agricultural credit access by smallholder farmers to enable them to acquire essential inputs for production and acquire modern technologies (Kenya Vision 2030). The Kenyan government through vision 2030 has identified agricultural credit as an important contributor to increased agricultural production and commercialization of agriculture (Kenya Vision 2030).

Low levels of agricultural credit access by smallholder farmers have been aggravated by; - the inability of formal financial institutions to lend to smallholder farmers, lack of tangible collateral such as titles to land, and lack of valuable assets (AFC, 2020). The situation is compounded by inadequate laws to help speed up the liquidation of assets for the benefit of lending institutions when borrowers default (AFC, 2020). Despite the government's efforts to intermediate agricultural credit financing by establishing institutions such as AFC, many smallholder farmers in rural areas still have credit access constraints (AFC, 2020). Smallholder farmers have organized informal credit group arrangements to try to increase their levels of credit access. However, such credit is limited in amounts due to low funds mobilization restricted by membership and geographical spread and hence the need for intermediation by formal financial institutions (AFC, 2020).

Agricultural credit is needed by farmer households in Lamu County where 32 percent of the population are poor (GoK, 2017a). Farming is the main economic activity with the majority of farmers being smallholder farmers operating in five agro-ecological zones: Coastal lowland (CL) Coconut-cassava zone (CL-3), Cashew nut-cassava zone (CL-4), Livestock-millet zone (CL-5) and Lowland ranching zone (CL-6). The zones come with different credit needs and also present a diversity of social cultural and economic backgrounds which define the borrower attributes, farm attributes and the appropriate loan attributes (CIDP, 2018). Therefore, it was not clear as to what extent the borrower, loan and farm attributes influenced credit access from AFC among the smallholder farmers in Lamu County. It is against this background that this study was conducted to examine the borrower, loan, and farm attributes and how they influence agricultural credit access, the results will contribute to the body of knowledge on agricultural credit management. In addition, it is only through understanding the factors that affect agricultural credit access – loan, borrower, and farm attribute - that an integrated approach to financing agriculture could be adopted that could

help in establishing linkages between various agricultural value chain actors and supporters (Gichira, 2010).

1.3. Objectives of the Study

The general purpose of this study was to examine factors affecting agricultural credit access from Agricultural Finance Corporation among Smallholder farmers in Lamu County.

Specific Objectives

i. To examine the effect of loan attributes on agricultural credit access from Agricultural Finance Corporation among Smallholder farmers in Lamu County.
ii. To assess the effect of selected borrower attributes on agricultural credit access from Agricultural Finance Corporation among Smallholder farmers in Lamu County.
iii. To examine the effect of farm attributes on agricultural credit access from Agricultural Finance Corporation among Smallholder farmers in Lamu County.

1.4. Research Questions

i. Do the loan attributes affect agricultural credit access from Agricultural Finance Corporation among Smallholder farmers in Lamu County?
ii. Do the borrower attributes affect agricultural credit access from Agricultural Finance Corporation among Smallholder farmers in Lamu County?
iii. Do the farm attributes affect agricultural credit access from Agricultural Finance Corporation among Smallholder farmers in Lamu County?

1.5. Scope of the study

The study was conducted on the smallholder farmer households in Lamu County in Kenya as the unit of analysis. The agricultural sector was one of the first to fully devolve the function of service provision to the county governments underscoring the importance of undertaking the study at the county level. Lamu County was selected because though it has high potential in agricultural production the county still suffers from food insecurity and poverty. Kilovoo (2018) in the study of the role of women farmers in household food security in Lamu County, found that only 42.9% of the households were food secure, 36.5% were vulnerable while 20.6% were food insecure a trend that has been worsened by climate change. It is estimated that 32 percent of the total Lamu

population is poor (GoK, 2017a). In 2016, approximately 60 percent of the population in Lamu West and 66 percent of that in Lamu East needed food assistance (GoK, 2017a). Lack of capital is a major impediment to the achievement of food security, sustainable development, and poverty eradication among households in Lamu County (Kilovoo, 2018). This informed the interest to carry out this study with a focus on smallholder households.

The choice of AFC was based on the fact that it is a strategic state corporation mandated to provide credit to farmers to ensure increased food production for food security, poverty eradication, and sustainable development. AFC has a branch network of 47 branches of which Lamu County has one located in Mpeketoni. However, the county has continued to witness food insecurity and poverty among households. Therefore, the need to examine the factors affecting agricultural credit access by smallholder farmer households in Lamu County was important in this study. The study considered the time frame between the years 2020 – 2022 since it falls within the time when Lamu County experienced considerable security, political stability, and adequate rainfall providing an enabling environment for farming and agribusiness. The study was to be conducted for a period of one year as from 23rd August 2022. Agricultural credit access was examined as the dependent variable in terms of the loan applications by the smallholder farmers. The independent variables were the loan attributes, farm attributes and borrower attributes. Loan attributes had the sub-variables which included – transaction costs, applied loan amount, collateral and repayment flexibility. Farm attributes included – technology adoption, distance to AFC, farm productivity and extension services. Borrower attributes included – gender, age, farming experience, farm management skills, education level and off-farm income sources.

In 2012, the government of Kenya through the Minister of Agriculture commissioned the AFC office in Mpeketoni, Lamu County. It was expected that farmer households within Lamu County will utilize the credit facilities provided by the strategic business unit. Therefore, smallholder farmer households within Lamu County participated in this study.

1.6. Significance of the study

The study is expected to benefit AFC Management and stakeholders including the government of Kenya and farmers.

AFC Management - To effectively perform its role, AFC management needs to continually examine and assess its external and internal work environments. One such approach is through research findings by different research bodies. This study will enable AFC managers to establish the strengths and weaknesses of its loan products based on the loan attributes from the viewpoint of the farmers on the demand side to enable improvement of AFC credit access for the realization of its legal mandate: poverty eradication, food security, and sustainable development. Moreover, the study will enable AFC managers to review the loan products and processes to develop multiple arrays of innovative, demand-driven loan products to attract more smallholder farmers to borrow and upscale the rate of credit access.

National and County Governments - This study examined the effect of loan attributes, assessed the effect of borrower attributes and established the effect of farm attributes on agricultural credit access from Agricultural Finance Corporation among Smallholder farmers in Lamu County. This is because agricultural credit is a vital tool for agricultural development. Therefore, the findings from this study will help the national and county governments to come up with policies regarding financing of smallholder around the loan and farm attributes, specifically issuance of land title deeds to smallholder farmers, government guarantees schemes or county specific/ agricultural enterprise specific guarantee schemes to enable improvement in agricultural credit access among the smallholder farmers in Lamu County. This is because agriculture is a devolved function to the County government.

Smallholder Farmers - This study is premised on the examination of factors affecting credit access from Agricultural Finance Corporation among Smallholder farmers in Lamu County. Therefore, this study is significant to the smallholder farmers as it endeavors to improve agricultural credit access by encourage smallholder farmers improve on the limiting factors under the loan, borrower and farm attributes to better credit access for rural transformation, poverty eradication, food security, and sustainable development. The key area to be addressed will be smallholder farmers' compliance to the terms and conditions set by the lender.

CHAPTER TWO

LITERATURE REVIEW

2.1. Introduction

This chapter summarizes the information from theories and researchers who have carried out their research in the same or related fields of study.

2.2. Theoretical Review

The theoretical framework of this study is based on three theories: The discouraged borrower theory which was used as the dominant theory to ascertain the extent of the self-selection mechanism among smallholder farmers in Lamu and how it impacts agricultural credit access based on the borrower, loan, and farm attributes. The rational choice theory of demand for financial services demonstrates a good basis for explaining how individual economic decisions are affected by borrower attributes of which credit decisions are no exception. Ability to pay theory which links with the borrower and farm attributes variable in the study concerning the ability to pay back credit at a specific future date. The multi-theoretical approach was adopted to put into perspective the credit access phenomenon using the theoretical assumptions to facilitate the understanding of the credit access concept using three variables; borrower attributes, loan attributes, and farm attributes to build new knowledge.

2.2.1. Discouraged Borrower Theory

Kon and Storey (2003) developed the first theoretical model explaining discouraged borrowers, defined as good borrowers that do not apply for financing for fear of rejection as demand side theory. They conclude that the application cost, the screening error, and the informational environment play a role in determining discouragement levels on the demand side of the credit supply. More specifically, they show that as good (bad) borrowers learn their actual quality, the number of discouraged borrowers decreases (increases). Through their decision on whom to provide credit and to whom not, financial institutions represent the major external ex-ante selection device, every borrower has to face (Hain and Christensen 2014). However, a less discussed and (perhaps related) less visible selection mechanism is the self-selection that borrowers do in their decision-making regarding whether to apply for external funding or not as informed by their

demand for agricultural credit. Borrowers who hesitate to declare their demand are known as "discouraged borrowers" (Rostamkalaei, 2017). These are good borrowers who do not apply for a bank loan because they anticipate that their application will be rejected even when there is an oversupply of credit (Kon and Storey, 2003). They refuse to ask for credit, not because they rely on other sources of finance, or they do not need it, but because they fear their applications being turned down (Kon and Storey, 2003). The fear of rejection may discourage borrowers to enter the credit application process in the first place, despite an unfulfilled desire for additional finance. This fear may be justified or not. In the case where the credit application would have been turned down anyway, discouragement represents an effective self-constraining mechanism, and such category is denoted as 'appropriate discouraged borrowers' (Freel *et al*., 2012). In the case of borrowers who would have been accepted by the lender but did not enter the credit application process due to discouragement, an 'inappropriate discouraged borrower' situation occurs. Estimates suggest that one-third to half of all discouraged borrowers could be labeled "inappropriately discouraged" (Freel *et al*, 2012). The finance system has been reluctant to lend to smallholder farmers due to the precarious nature of agricultural production (Malobo, 2018) and failure to understand the financial risk profile of smallholder farmers which is often informal in nature (Salami and Arawomo, 2013). The negative risk profile discourages smallholder farmers from borrowing as they do not perceive themselves as acceptable borrowers in the agricultural credit market. This creates latent demand for credit which affects the rate of credit access by smallholder farmers.

This theory informed this study as evidenced by two special categories of respondents – those whose loan applications were rejected and those who had never applied for agricultural credit. Therefore, it resonates with the study respondents as either 'appropriate discouraged borrowers' or 'inappropriate discouraged borrowers'. Among those whose applications were rejected there were the 'appropriately discouraged borrowers' and among those who never applied for agricultural credit there were the 'inappropriately discouraged borrowers'. The inexpedient phenomenon of 'inappropriately discouraged borrowers' potentially has implications regarding missed opportunities for borrowers to pursue their objectives of investments and growth. This is a pervasive phenomenon that is likely to have deterrent effects not only on credit access rate but also on overall economic growth. The theory was used to ascertain the extent of the self-selection

mechanism among smallholder farmers in Lamu and how it impacted agricultural credit access in terms of loan applications, loan rejections and non-application rate by respondents.

The theory has a limitation as it puts more emphasis on the application costs facing borrowers as the underlying cause of discouragement (Kon and Storey 2003). These include financial costs (where owing to a lack or incomplete credit history, borrowers may incur substantive costs in collecting and transmitting additional pieces of information required by a bank); in-kind costs (including additional time required to complete application documentation and liaise with the bank); and psychic costs (including the discomfort which many borrowers experience in passing on information about themselves to a third party). However, the cause of discouragement according to this study are the loan attributes which include the transaction cost, applied loan amount, collateral requirement and repayment flexibility.

2.2.2. Rational Choice Theory of Demand for Financial Services

Rational choice theory refers to a set of guidelines that help understand economic and social behaviour. The theory originated in the eighteenth century and can be traced back to political economist and philosopher, Adam Smith. The theory postulates that an individual will perform a cost-benefit analysis to determine whether an option is right for them. It also suggests that an individual's self-driven rational actions will help better the overall economy. The rational choice theory looks at three concepts: rational actors, self-interest, and the invisible hand. The rational choice theory of demand for financial services posits that decisions are guided by an understanding of the costs and benefits associated with each option (Becker, 1993). The theory, generally, starts with the consideration of the choice behaviour of the individual borrower making the decision. The proponents of the rational choice theory believe that the individual making the decision is a "representative" of a group in a financial market, such as smallholder farmers. The analysis of the rational choice theory of demand for financial services generally involves a description of the desire for financial services (savings, credit, and money transfer services). The individuals face the problem of choice among services provided by the intermediaries, for instance, to take or not to take credit services provided. The approach of the rational choice theory is based on the fundamental principle that the choices made by individuals are the best choice to help them achieve their objectives in light of all the uncontrollable factors. The utility function is used by the rational

choice theory as a mathematical function that assigns a numerical value to each of the possible alternatives the individual making the decision faces. The demand for financial services is a function of the decision-making unit and influences credit access (Becker, 1993).

This theory has a limitation on the basis that the assumptions made under the rational choice theory of demand for financial services fail to take into account the fact that the success of the outcome of a decision is also influenced by the conditions that are not within the control of the individual making the decision. In this study there are the loan attributes (transaction cost), which is not within the control of the borrower. Despite this criticism, the theory informed this study as it demonstrated a good basis for explaining how individual economic decisions are affected by rational choices guided by an understanding of the costs and benefits associated with each option such as the transaction costs as a loan attribute. The bounded rationality theory proposed that, although individuals are rational in making decisions, their rationality in any decision-making is limited by the tractability of the issues they make decisions about. In addition, it is influenced by the time available to make the decision and the cognitive limitations of their state of mind. This means that their decision is influenced by the contingent claims associated with access to the services provided by financial intermediaries. This was evident in this study where it was observed that transaction cost as a loan attribute had a positive and significant influence on agricultural credit access. This imply that smallholder farmers will apply for credit even if the transaction cost as a loan attribute increases and this is informed by a rational choice of demand for financial services as guided by an understanding of the costs and benefits associated with the decision to borrow.

2.2.3. Ability to pay theory

The ability-to-pay theory was first used in taxation and it postulates that people with the ability to pay more should pay a higher percentage of their income (Chanda, 2015). It was espoused by Adam Smith, considered the father of economics, in 1776. In banking, the ability to pay is called “capacity.” It is used by lending institutions to determine a borrower's ability to make his interest and principal repayments on a loan, using his or her disposable income or cash flow. The link between credit access and the ability to pay is captured by a framework that posits that there will be increased credit access where borrowers have the ability to pay or are perceived by lenders to

be having the ability to pay (Chanda, 2015). This theory was used to expound on the borrower attributes variable in the study. Lenders use the ability to pay as a metric for assessing the debt obligations of the borrower in the current and future. Chanda (2015) used the ability-to-pay theory to investigate whether a predictive model of student loan default could be built with data from an institution's three-year default rate cohort study. There are two elements to the ability to pay theory. The first element recognizes the shortage of financial capital as the reason for borrowing funds. If the projected financial benefits are greater than the overall costs of the program; the ability to pay theory states that an individual with limited financial resources will justify taking a loan (s) to achieve their goal. The second element of the ability to pay theory addresses the borrower's resources to repay the funds borrowed. The theory implies that individuals with sufficient ample income or with financial assistance from friends and family can repay borrowed funds if the total resources surpass the monthly repayment requirements.

This theory informed this study as it puts more emphasis on the borrower's ability to pay given the fact that credit is advanced to be repaid at a specified future date. It implies that borrowers must borrow amounts that they have the ability to pay with ease, either direct from their financed project incomes, off-project income sources, or from financial assistance. Framers with food crop and cash crop projects or just crop and livestock projects have reduced enterprise risks due to project diversification, which boosts their ability to pay metric as the projects can supplement each other in terms of income generation for loan repayment. The ability to pay theory was used to examine the extent of the ability to pay borrowed funds among smallholder farmers in Lamu County and how it affects credit access. The study found that borrower attributes had a positive and significant effect on agricultural credit access, this included the off-farm income sources which enhances the borrowers' ability to pay. This implies that smallholder farmers with sufficient off-farm income can repay borrowed funds because the total resources surpass the monthly repayment requirement. Financial prudence dictates that lenders must lend to borrowers based on their score on the ability (capacity) to pay metric. Lending to borrowers with a poor score on ability (capacity) to pay may lead to a pile-up of non-performing loans and losses to the lenders which impact negatively on credit access. However, the ability to pay theory has limitations as it ignores other aspects that affect credit quality: cash flow projections, the viability of the agricultural project, the character of the borrower, and previous loan records (Ochung, 2013). These aspects are captured under the 5Cs

credit appraisal model: Character, capital, capacity, condition, and collateral. Character is defined as the customer's willingness and determination to repay the loan, regardless of unforeseen adversity. Capital (financial condition) is a snapshot picture of the financial condition of the applicant at the time of application. It is measured through an assessment of liquidity and solvency. The repayment capacity of a project is its ability to generate sufficient cash flows to repay the loan as well as to make a reasonable return to the investor. Condition (Market Conditions) is the assessment of local market conditions, as well as industry trends, with regard to the intended project. Collateral is a pledge of property or other assets that an individual use as security against borrowed monies (AFC, 2018).

2.3 Empirical Review

Several empirical studies have been conducted over the years on factors influencing credit access among farmers. The Studies have shown conflicting results.

2.3.1 Loan attributes and agricultural credit access

These are attributes directly related to the loan offered by the lender and that can significantly affect the rate of agricultural credit access by the borrower from the lender (Sankan, 2017). Loan attributes restrict the formal demand for credit (Zeller, 1994). Previous studies have examined the effect of lender attributes on credit access, but the results have been conflicting. Loan attributes under consideration: Applied loan amount, collateral/security requirement, repayment flexibility, and loan transaction costs (loan fee, transport cost, credit monitoring, and administration cost, and opportunity cost of time)

Ankrah *et al*., (2019) examined the effect of savings mobilization on access to credit among smallholder farmers in the Birim central municipality of Ghana. IV-Probit and IV-Tobit models were used to analyze a cross-sectional primary data set from 216 respondents. Transaction cost as a covariant was examined in terms of loan application fees and transport costs. The results revealed that transaction cost depicted a negative significant impact on access to credit. This study informed the current as it focuses on the smallholder farmer. However, the research only examined the saving effect on credit accessibility among smallholder farmers in one of the municipalities in the

Eastern region of Ghana. Moreover, the scope of the study is international hence the findings may not be replicated in other geographical orientations.

Blessing *et al.*, (2020) sought to establish the determinants of credit demand among farmers in the Hurungwe District of Mashonaland West province in Zimbabwe. Collateral was described as loan collateral value required in dollars. Collateral had a negative and significant ($P<0.05$) effect on credit demand. The study inferred that farmers with low or no collateral endowments have low demand for bank credit in Zimbabwe. The study informed the current study as it investigated aspects of agricultural credit among farmers in a developing country (Zimbabwe) with many similar characteristics to the country of the current study (Kenya). Kosgey (2013) examined factors influencing accessibility to agricultural credit by grain growers in Uasin Gishu County, Kenya. In the study, the collateral as a loan attribute was a title deed or a registered farmers' group with clean records and the applied loan amount was the actual loan amount requested by an individual farmer in Kenya shillings. The findings revealed that collateral did not significantly influence access to agricultural credit. This was observed among farmers who belonged to groups and hence obtained group loans that do not require security. The findings on applied loan amount revealed that the applied loan amount significantly influenced access to agricultural credit. This indicates that access to agricultural credit increases when farmers can apply for large loan amounts *ceteris paribus*. This study informed the current study as it was based in the local context just as the current study though conducted in different counties.

Odhiambo and Upadhyaya, (2020) conducted a study to determine the level of flexibility in loan products offered to smallholder farmers in Siaya County in Kenya and to examine the effect of flexibility on access to credit. The researchers developed an index variable of loan flexibility using the multiple correspondence analysis (MCA) technique. The flexible loan index (FLI) was described as the measure of the level of flexibility of the short-term (one-year) loans given to farmers. In the study, FLI was computed using an MCA from the six elements of flexible loans. The six elements are grace period, flexible repayment schedules, bullet payments, loan rescheduling, loan refinancing, and lines of credit. The study found that the level of flexibility is not significantly correlated to access to credit. However, the use of the multiple correspondence analysis (MCA) technique and the six elements creates gaps in the study as there is a need to

investigate each of the elements. This informed the current study whereby repayment flexibility was included under the loan attributes. Weber and Musshoff, (2013) investigate how credit access probabilities and loan volume rationing magnitudes for farmers change if the MFI switches to offer flexible microfinance loans, which can account for agricultural production specifics. The results reveal that agricultural firms with flexible microfinance loans have significantly higher credit access probabilities than non-agricultural firms and agricultural firms with standard microfinance loans. The study informed the current study as it was based on farmers as the unit of study. However, the conditions for agricultural production in Madagascar are unique, and the results might change in different country contexts.

2.3.2 Borrower attributes and agricultural credit access

These are attributes directly related to the borrower that can significantly affect the rate of agricultural credit access by the borrower from a lender. Different attributes have been studied by various scholars and their effect on credit access is contested. Age, gender, education, farm management skills, farming experience, and off-farm income sources are indicators under consideration in this study.

Ouattara *et al*., (2022) examined factors that influence rice farmers' choice of credit sources in Côte d'Ivoire. Age in years as a social–demographic characteristic, significantly influenced the choice of credit sources among the smallholder rice farmers. This indicates that elderly rice farmers are more likely to borrow from relatives/friends as opposed to formal financial institutions. Musebe *et al*., (2017) analyzed factors influencing the demand for agricultural credit among farmers in Kapenguria in West Pokot County. Mwonge and Naho (2021) assessed the determinants of credit demand among smallholder farmers in Morogoro, Tanzania. Ha (2015) examined the determinants of access to bank credit among agricultural households in Vietnam. The studies point out that age has a positive and significant effect on the demand for agricultural credit. The findings imply that as borrowers advance in age, they tend to borrow more probably to finance expanded agricultural production to feed their growing household sizes. Also, lending institutions view older borrowers as wiser in the use of credit and less risky hence they advance larger loans to them. Saqib *et al*., (2017) examined the factors influencing farmers' access to agricultural credit in flood areas in Pakistan. They observed a negative and insignificant influence of age on access to credit

by farmers in Pakistan. This implies that farmers' access to credit increases irrespective of age. These studies differ in context, geographical orientation, and findings creating gaps for further studies.

Mwonge *et al*., (2021) and Ouattara *et al*., (2022) observed that gender is statistically significant in farmers' choice and access to credit and that women farmers are more likely than men to borrow from financial institutions. The findings contravene the perception that men dominate households and property ownership in developing countries. The aforementioned aspect is confirmed by Musebe *et al*., (2017) and Ha (2015) who found gender not to be significant in influencing demand and access to agricultural credit as men borrowed slightly more money than women. This is because men who dominate property ownership in the developing world can use them as collateral thus allowing them to borrow higher amounts than women. The findings are conflicting and hence significant to the current study, which is based in Kenya, a developing country.

Musebe *et al*., (2017), Ouattara *et al*., (2022), Saqib *et al*., (2017), Zulfiqar *et al*., (2020), and Ha (2015) examined education in their various studies on agricultural credit in terms of the number of years of schooling or formal education. Mwonge *et al*., (2021) assessed education in the context of the level of education: No formal education, primary education, secondary education, certificate/diploma level, and degree level. Findings from various studies show that the probability of borrowing from financial institutions increases with advancement in the level of education. Well-educated farmers could have a comparative advantage in understanding credit requirements and, therefore, be able to meet the conditions imposed by lenders. These studies differ in the measurement of education indicator in the studies creating gaps for further studies.

Njiru and Mwikamba (2020) evaluated factors influencing access to agricultural credit by small-scale dairy farmers in the Guthunguri sub-location, Kiambu County. Farm management skills were assessed based on the extent to which they influence access to agricultural credit. The findings showed that 31 percent of the farmers felt that their farm management skills influenced access to agricultural credit to a very great extent, 26 percent to a great extent, and 26 percent felt that their management skills did not influence their access to agricultural credit. This implied that on the overall scale, the farm management skills of the farmer influenced how farmers access agricultural

credit and that a unit increase in farmers' management skills would increase access to agricultural credit by 0.265. The study is relevant to this study because it focuses on small-scale dairy farmers who exhibit financial characteristics similar to those of smallholder farmers in the study. However, the study was based on dairy as a mono-enterprise creating gaps for study on mixed enterprises and other agricultural enterprises.

Saqib *et al*., (2017) and Musebe *et al*., (2017) observed that experience was positive and significant in influencing demand for agricultural credit. The findings indicate that the more the farmers gain experience in farming the more they are likely to borrow more *ceteris paribus*. Ouattara *et al*., (2022) found that experience in rice farming, as a social–demographic characteristic, negatively and significantly influence farmers' choice of different credit sources in Côte d'Ivoire. This implies that less experienced rice farmers are more likely to borrow from financial institutions. This seems contradictory and was further explained to mean that less experienced rice farmers may have fewer resources for production than more experienced farmers.

Khatun *et al*., (2014) conducted a study in the Rangpur district, Bangladesh to identify the constraints to accessing credit and its impact on farm households. Off-farm income was described in terms of Bangladesh Taka. The coefficient of off-farm income was positive and significant at the 10 percent level, implying that the farm families having off-farm income had more access to credit than those families having a less off-farm income. This result contradicts Ouattara *et al*., (2022) and Zulfiqar *et al*., (2020) whose findings indicated that off-farm income negatively and insignificantly influenced farmers' accessibility to agricultural credit. The findings imply that farmers involved in an off-farm income-generating activity are less likely to borrow; in other words, these farmers are more likely to use their funds. Their off-farm income may increase their financial capacity, allowing them to finance their farming activities and, therefore, meaning that they are less motivated to borrow in the credit market.

2.3.3 Farm attributes and agricultural credit access

These are attributes pertaining to the farm that can significantly affect the extent of agricultural credit access from a given agricultural credit lender. Distance to the financial institution, farm productivity, extension services, and technology adoption (greenhouse, irrigation, zero grazing, AI, crop protection, fertigation, and feedlot technologies)

Gbigbi (2017) investigated the factors that affect small-scale farmers' to access funds and utilize them for greater efficiency in production in Delta state, Nigeria. Distance from lending institutions was measured in Kilometres in the study. The coefficient of distance was inversely related to access such that a one-kilometer increase in bank distance reduces accessibility. However, it is also not easy to tell how effective the model is in the study given that measures of the predictive power of the model are not indicated in the study. Lemessa and Gemechu, (2016) analyzed factors affecting smallholder farmers' access to formal credit. Distance to the nearest lending institution was measured in hours taken to access the lending institution. Distance to the nearest lending institution was found to be an important factor influencing formal credit use of smallholder farmers at a 5% probability. This means that farmers traveling for shorter hours to access credit from formal financial institutions have a better opportunity to access credit from the institutions. However, the results may be different in other geographical locations.

Mohamed and Temu, (2008) conducted a study to establish the linkages between credit access and the adoption of agricultural technology under the Zanzibar smallholder farm conditions. The study found that extension contacts intensity, household size, number of access to credit, and value of productive assets influence the adoption of agricultural technologies. However; except for the number of accesses to credit, these variables were significant only for the non-credit-constrained households and not for the credit-constrained households. These results suggest the need for targeting credit interventions to farm households that are credit constrained for stimulating the adoption of agricultural technology. However, the study considered the adoption of agricultural technology as a dependent variable while in the current study, it is considered as an indicator of farm attribute, an independent variable. Obuobisa – Darko (2015) investigated the effects of access to credit and the adoption of technology in Cocoa production in Ghana. The results of the study indicated that technology adoption is significantly influenced by credit access. However, technology that requires many years to yield a benefit such as certain tree crops like Cocoa is not viable for smallholder farmers. The current study will revolve around simple technologies applicable to smallholder farmers such as greenhouses, irrigation, zero grazing, artificial insemination, crop protection, fertigation, and feedlots.

Njogu *et al*., (2018) sought to establish the relationship between farm production capacity and agricultural credit access from commercial banks in Kenya. The production capacity was assessed by evaluating the output level against assets employed in production. The study concluded that farm production capacity had a significant positive influence on credit access. However, the study was biased toward livestock (dairy) enterprises as opposed to crop production enterprises. This study will endeavor to fill this research gap by incorporating both livestock and crop enterprises in understanding how farm production capacity influences credit access. Nzomo and Muturi (2014) examined the effect of Agricultural credit programs on the productivity of rural farming households in Kimilili Bungoma Sub County. The findings revealed that credit not only helps to expand the economies of size but also helps to increase the productivity of farms from the available resources. However, agricultural productivity was treated as a dependent variable while in the current study, it is treated as an indicator of farm attribute, an independent variable.

Adeoye and Ugalahi (2017) used simple percentages, means, and probit regression to analyze smallholder food crop farmers' participation in the Bank of Agriculture (BAO) loan scheme in Ogun state, Nigeria. The study found that the higher the number of times the farmers have visited for extension services the higher their chances of participation. The probability increased by 20 percent for a unit increase in extension visits. The study concluded that promoting the frequency of extension visits is crucial to achieving an increased probability of smallholder farmers' participation in the BOA loan scheme. Lemessa and Gemechu, (2016) used descriptive statistics and a logit model to analyze factors affecting smallholder farmers' access to formal credit. Participation of farmer households in the extension package program was found to be associated with access to formal credit for smallholder farmers. This implies that farmers who have frequent contact with extension agents were predicted to have more information that will influence farm households' demand to use credit from formal sources.

2.4 Summary of the Literature Review

Most of the literature generally emphasizes the supply side of the credit market without giving due consideration to the demand side factors that influence household participation in the rural agricultural credit financial markets. The influence of the lender attributes on shaping the farmers'

borrowing decision based on the farm attributes has not been given due consideration. Therefore, the demand side (borrower and farm attributes) and the lender (lender attributes) need to be considered to have an effective and efficient agricultural credit financial market that encourages increased agricultural credit access among smallholder farmers. Studies have looked at agricultural credit access, determinants of credit demand, and choice of credit sources without putting due consideration on agricultural credit access among smallholder farmers in Lamu County, hence the motivation to conduct this study.

2.5. Gaps in Literature Review

Table 2.1 Summary of gaps in the literature review

BORROWER ATTRIBUTES				
Author and Year	**Title**	**Findings and Variables relating to the study**	**Research Methodology**	**Research Gap**
Ouattara N, Xiong X, Bakayoko M, Bi TBAY, Sedebo DA, Ballo Z. (2022)	What Influences Rice Farmers' Choices of Credit Sources in Côte d'Ivoire? An Econometric Analysis using the Multinomial Conditional Logit Model.	The study found that gender, age, education level, farming experience, and off-farm income significantly influence the use of different credit sources.	The multinomial condition Logit model was used in the study.	The scope of the studies was international and may not apply to Kenya.
Khatun, M., Khandoker, S. and Kundu, N.D. (2014)	Constraints to accessing credit and its impact: A study on farm households.	The coefficient of off-farm income was positive and significant at 10% level, implying that the farm families having off-farm income had more access to credit than that of families having less off-farm income.	Probit model used to estimate the probability of accessing credit at farm level	
Saqib, S, E., Kuwornu, J., Ali, U. & Panezai, S. (2017)	Factors determining subsistence farmers' access to agricultural credit in flood-prone areas of Pakistan.	The empirical results revealed that education and farming experience were significant factors in farmers' access to credit. Age negatively and insignificantly influences farmers' access to credit.	Weighted least squares regression was employed to explore the factors influencing access to credit.	
Mwonge and Naho, (2021).	Determinants of credit demand by smallholder farmers in Morogoro, Tanzania.	Access to agricultural credit among smallholder farmers was determined by age of the respondents, gender, and number of years of schooling.	A binary logistic regression model was used in the study.	
Musebe, N., Nyangweso, P. & Kipsat, M. (2017).	Analysis of factors influencing demand for agricultural credit among farmers in Kapenguria, West Pokot, Kenya	Age of the farmer, educational level of the farmer and experience were positive and significant while gender was negative and not significant to demand for agricultural credit.	Translog cost function model was used to analyze data.	The study did not put emphasis on smallholder farmers.

BORROWER ATTRIBUTES				
Author and Year	**Title**	**Findings and Variables relating to the study**	**Research Methodology**	**Research Gap**
Njiru, D and Mwikamba, K. (2020).	Factors influencing access to agricultural credit by Small-scale dairy farmers in Guthunguri Sub-Location, Kiambu County.	Farm management skills of the farmer influenced how farmers access agricultural credit and that a unit increase in farmer's management skills would increase access to agricultural credit by 0.265.	Multiple linear regression was used in the study.	The study was based on dairy as a mono-enterprise creating gaps for study on mixed enterprises and other agricultural enterprises.
Zulfiqar, F., Shang, J., Zada, M., Alam, Q. and Rauf, T. (2020)	Identifying the Determinants of access to agricultural credit in Southern Punjab of Pakistan.	The results revealed that formal education significantly influence access to agricultural credit while the age of the farmer's and off- farm income negatively and insignificantly influence farmer's accessibility to agricultural credit.	This study used the probit model to analyze the data.	The scope of the studies was international and may not apply to Kenya.
Ha, D.T. (2015)	Determinants of access to bank credit for agricultural households in Vietnam	The results show that the level of education of the householder, and value of collateral can affect access to bank credit.	Logit regression model was used in the study.	
LOAN ATTRIBUTES				
Author and Year	**Title**	**Findings and Variables relating to the study**	**Research Methodology**	**Research Gap**
Ankrah, T. M, Yuansheng, J, Osei D. F, Chandio, A and Agbenyo, W. (2019).	The role of savings mobilization on access to credit: a case study of smallholder farmers in Ghana.	The results revealed that transaction cost depicted a negative significant impact on access to credit.	IV-Probit and IV-Tobit models were used in the study.	The scope of the studies was international and may not apply to Kenya.
Blessing, C.R., Svotwa, E., Munyoro, G and Govere, I (2020)	The determinants of credit demand among farmers in Hurungwe District of Mashonaland West Province in Zimbabwe.	Collateral had a negative and significant ($P<0.05$) effect on credit demand.	Frequency statistic, logistic regression analysis and thematic analysis were used for analysing data.	

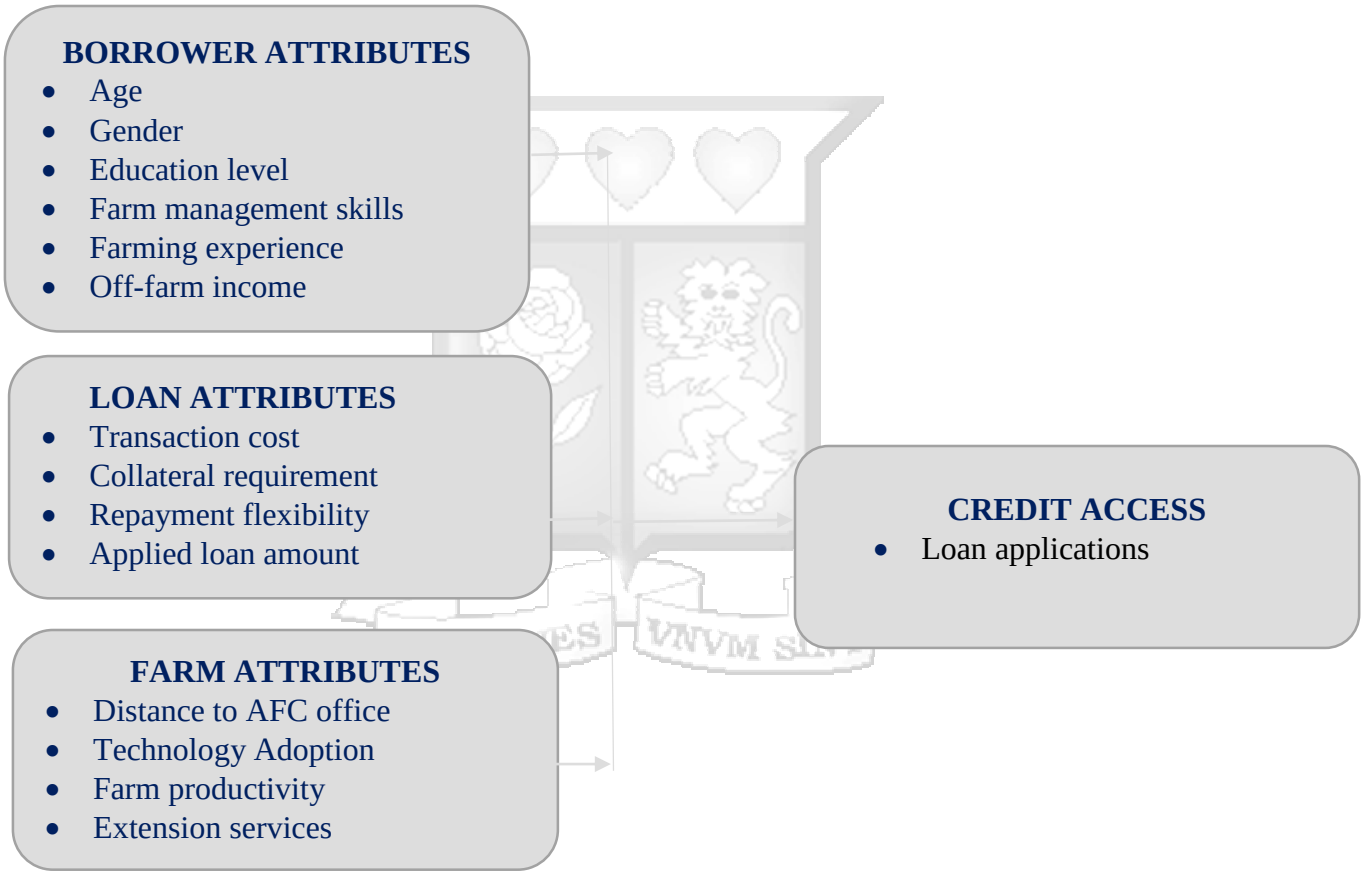
LOAN ATTRIBUTES				
Author and Year	**Title**	**Findings and Variables relating to the study**	**Research Methodology**	**Research Gap**
Odhiambo, F.O. and Upadhyaya, R. (2020)	Flexible loans and access to agricultural Credit for smallholder farmers in Kenya.	The study found that the level of flexibility is not significantly correlated to access to credit.	Ordinary least square (OLS) regression model was used in the study.	The use of multiple correspondence analysis (MCA) technique and the six elements creates gaps in the study as there is need to investigate each of the elements.
Weber and Musshoff (2013)	Can flexible microfinance loans improve credit access for farmers?	The results reveal that agricultural firms with flexible microfinance loans have significantly higher credit access probabilities than non-agricultural firms and agricultural firms with standard microfinance loans.	The authors estimate probit models for the probability of receiving a loan and Heckman models to investigate the magnitude of volume rationing for all micro loan applications and disbursements of the MFI.	The scope of the study was international and the conditions for agricultural production in Madagascar are unique, and the results might change in different country contexts.
Kosgey, Y. K. K. (2013)	Agricultural Credit Access by Grain Growers in Uasin-Gishu County, Kenya.	The findings revealed that applied loan amount significantly influenced access to agricultural credit while collateral did not significantly influence access to agricultural credit.	Binary logit model was used in the study.	It is not easy to tell how effective the model is in investigating given that the measure of the predictive power of the model is not provided in the study.
FARM ATTRIBUTES				
Author and Year	**Title**	**Findings and Variables related to the study**	**Research Methodology**	**Research Gap**
Njogu, Olweny and Njeru (2018)	Relationship Between Farm Production Capacity and Agricultural Credit Access from Commercial Banks.	Findings revealed that a borrower's production capacity had a significant positive influence on credit access.	The double-hurdle model was used in the study using ordinary Probit Model and truncated Tobit model.	Biased towards livestock (dairy) enterprise as opposed to crop production enterprises.
Nzomo, M., & Muturi, W. (2014)	The effect of types of agricultural credit programmes on productivity of Small-scale farming businesses in Kenya: a survey of Kimilili Bungoma Sub County.	The findings revealed that credit not only helps to expand the economies of size but also helps to increase the productivity of farms from the available resources.	Cross-tabulations were done to examine the relationship between variables.	Agricultural productivity is treated as a dependent variable while in the current study it is treated as an indicator for farm attribute, an independent variable.
Gbigbi, T.M (2017)	Are there road blocks to access micro-credit from selected microfinance banks in delta state, Nigeria? Implications for smallholder farmers sustainability	The coefficient of distance was inversely related to access such that one kilometer increase in bank distance reduces accessibility.	The logit model was used to analyze data.	The scope of the study was international. The study was on microfinance and the results may not be the same for other financial institutions.

FARM ATTRIBUTES				
Author and Year	**Title**	**Findings and Variables related to the study**	**Research Methodology**	**Research Gap**
Lemessa and Gemechu, (2016)	Analysis of Factors Affecting Smallholder Farmers' Access to Formal Credit in Jibat District, West Shoa Zone, Ethiopia.	Distance to the nearest lending institution was found to be an important factor influencing formal credit use of smallholder farmers at 5% probability.	Descriptive statistics and logit model were used to analyze data.	The scope of the studies was international. The results may be different for a different geographical location.
Mohamed, K. S., & Temu, A. E. (2008)	Access to credit and its effect on the adoption of agricultural technologies: The case of Zanzibar.	The study found that extension contacts intensity influences adoption of agricultural technologies.	Analysis of data collected done descriptively using STATA 10.0 and SPSS 13.0 computer software as well as econometrically.	
Obuobisa – Darko (2015)	Credit Access and Adoption of Cocoa Research Innovations in Ghana	Results of the study indicated that technology adoption is significantly influenced by credit access.	Logistic regression model was used in the study.	
Adeoye and Ugalahi (2017)	Smallholder Food Crop Farmers' Participation In Bank Of Agriculture (BOA) Loan Scheme In Ogun State, Nigeria	The study showed the determinants of BOA loan scheme participation as: extension visits and farmers households' distance to nearest BOA office	Simple percentages, means and Probit regression were used in the study.	

Source: Researcher (2023)

2.5. Conceptual Framework

The conceptual framework to be used in this study brings together the structural presentation of the relationship between the dependent variable and independent variables. The conceptual framework depicts the assumption that smallholder farmers face challenges in absorbing agricultural credit offered by AFC and that these challenges may be resulting from themselves as the borrowers, AFC loans or orientation of their farms – farm attributes. The study will adopt the conceptual framework as illustrated below.



Independent Variables **Dependent Variable**

Figure 2.1 Conceptual framework on Agricultural Credit Access.

Source: Researcher (2023)

2.6. Operationalization of variables

In this study, the dependent variable is credit access, whereas the independent variables are; borrower attributes (age, gender, educational level, farm management skills, farming experience, and off-farm income), loan attributes (applied loan amount, transaction costs, collateral, and repayment flexibility) and farm attributes (distance to AFC office, technology adoption, farm productivity, and extension services). The variables in the model are selected from the literature based on the models used in prior studies and are measured to enable the collection of data for use in both descriptive and inferential statistics.

Table 2.2 Operationalization of the variables on agricultural credit access

SPECIFIC OBJECTIVE	INDEPENDENT VARIABLE	SUB VARIABLE	MEASUREMENT	SUPPORTING LITERATURE
To assess the effect of selected borrower attributes on agricultural credit access from Agricultural Finance Corporation among Smallholder farmers in Lamu County.	Borrower attributes	Gender of the household head Age Education of the household head Farm management skills Farming experience Off-farm income	- Nominal scale - Ratio scale - Nominal scale - 5 – Point Likert Scale (1 Strongly disagree, 2 Disagree, 3 Somewhat agree, 4 Agree, 5 Strongly agree)	Mwonge and Naho, 2021, Ouattara *et al*., 2022, Musebe *et al*., 2017, Njiru, D and Mwikamba, K. 2020,
To examine the extent to which loan attributes affect agricultural credit access from Agricultural Finance Corporation among Smallholder farmers in Lamu County.	Loan attributes	Applied loan amount Transaction costs comprising every cost apart from interest cost. (Processing fee, application fee, transport cost, collateralization cost, legal cost, monitoring and supervision cost, and opportunity cost) Collateral Repayment flexibility	5 – Point Likert Scale (1 Strongly disagree, 2 Disagree, 3 Somewhat agree, 4 Agree, 5 Strongly agree)	Ankrah *et al*., (2019), Blessing *et al.*, 2020, Kosgey, Y. K. K. 2013, Odhiambo and Upadhyaya, 2020
To establish the effect of farm attributes on agricultural credit access from Agricultural Finance Corporation among Smallholder farmers in Lamu County.	Farm attributes	Distance to the AFC office Technology adoption (greenhouses, irrigation, zero grazing, artificial insemination, crop protection, fertigation and feedlots) Farm Productivity Extension services	5 – Point Likert Scale (1 Strongly disagree, 2 Disagree, 3 Somewhat agree, 4 Agree, 5 Strongly agree)	Gbigbi, T.M. 2017, Mohamed, K. S., & Temu, A. E. 2008, Njogu, Olweny and Njeru 2018, Nzomo, M., & Muturi, W. 2014, Adeoye and Ugalahi 2017
MAIN OBJECTIVE	**DEPEDENT VARIABLE**	**SUB VARIABLE**	**MEASUREMENT**	**SOURCE**

To examine factors affecting credit access from Agricultural Finance Corporation among Smallholder farmers in Lamu County.	Credit access.	• Loan applications	Nominal scale	Sankan, 2017

Source: Researcher (2023)

CHAPTER THREE

RESEARCH METHODOLOGY

3.1. Introduction

This research chapter describes the techniques and procedures used in the collection, processing, and analysis of data. This chapter includes descriptions of the research design used, the study target population, sample size and sampling techniques, data collection methods, techniques for data analysis used in this study, operationalization of the variables, research quality, and ethical considerations.

3.2. Research Philosophy

Philosophy is important in the research process as it opens researchers' minds to other possibilities, which can lead to both an enrichment of research skills and an enhancement in the confidence that one is using the appropriate methodology. Research philosophy is more concerned with the development of knowledge and the nature of that knowledge (Creswell, 2009). The term epistemology (what is known to be true) as opposed to doxology (what is believed to be true) encompasses the various philosophies of the research approach. The purpose of science, then, is the process of transforming things believed into things known: doxa to episteme (Galliers, 1991). Three major research philosophies in the Western tradition of science are positivist (the opposite is interpretivist), pragmatist, and realistic (McMillan & Schumacher, 2010). Positivist claims that the social world can be understood in an objective way using quantitative methods, while interpretivist says that the social world can be interpreted in a subjective manner using qualitative method. Realistic research philosophy is based on the principles of positivist and interpretivist while pragmatist deals with facts using qualitative and quantitative methods (McMillan & Schumacher, 2010). This study was underpinned by positivist research philosophy because the quantitative study outcome was based on an objective and perceived reality as indicated by the responses given by the respondents on their experience and perception on agricultural credit access in Lamu County. The study found that the respondents who had taken credit and those who had not taken credit had different perceptions about agricultural credit. Therefore, the study became social research that sought to objectively establish what smallholder farmers really perceive about

agricultural credit access. It is on this basis that this study was underpinned by positivist as a philosophical approach using quantitative methods of enquiry to get the empirical results.

3.3. Research Design

Research design is defined as a framework for conducting a study that optimizes control over factors that could easily interfere with the validity of the study findings (Burns, Grove, & Gray, 2015). The study employed a descriptive case study design to establish factors affecting agricultural credit access among smallholder farmers in Lamu County. The choice of this design was guided by the fact that the design allows for the investigation of relationships between two variables (or more) without the researcher controlling or manipulating any of them. The researcher adopted case study approach because it makes it easy to collect data which is based on the prevailing circumstances. Besides, it allows addition of new knowledge onto the existing body of knowledge concerning a specific study area for instance agricultural credit access in Lamu County as in this particular study. It was a non-experimental type of quantitative research. The quantitative research method was adopted to collect and analyze data.

3.4. Target Population

Lamu County has a population of 141,909 and 37,963 households and 73% of the households engage in smallholder agriculture as their main economic activity (KNBS, 2019). Therefore, the target population was 27,713 households. The most commonly practiced farming system in Lamu County is the smallholder mixed farming comprising crops, livestock, and trees (CIDP, 2018).

3.5. Sample size

The sample size was determined using an equation suggested by Taro Yumane (1967)

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

Where

n = *Sample size*

N= *Population size (households)*

e = *0.05(Precision level) assuming the confidence level is 95% i.e.:* ± *5*

The sample size based on the equation was 399.98, rounded off to 400 households, however, a sample size of 500 households was a to take care of none response from the respondent. This also reduced the margins of error and ensured more presentation of the smallholder farmers.

3.6. Sampling Techniques

A multistage sampling technique was used in the study. The first stage was the purposive selection of the two sub-counties; Lamu West and Lamu Central. This is because Lamu East mainly consists of islands with tourism as the main economic activity. Lamu West has smallholder crop and livestock production as the main economic activities while Lamu Central has fishing as the dominant economic activity with pockets of smallholder crop and livestock production activities (GoK, 2017a). Lamu central has three wards namely; Shella, Amu Mkomani and Hindi wards while Lamu West has four wards namely; Witu, Mkunumbi, Hongwe and Bahari wards. The second stage was the purposive selection of two wards within the selected two sub-counties: Amu Mkomani and Hindi wards for Lamu Central, and Bahari and Witu wards for Lamu West. These wards were selected because they are dominated by smallholder farming activities. Finally, a random selection of proportional households per ward to make a sample size of 500 households was done. The sample size of the wards was determined by the proportion of smallholder farmer households in each ward.

Table 3.1 Sample frame

Wards	Number of Smallholder Households	Sample Size	Portion of the sample (%)
Lamu Central Sub County			
Amu Mkomani	7,926	143	28.6
Hindi	2,217	40	8
Lamu West Sub County			
Bahari	12,914	233	46.6
Witu	4,656	84	16.8
Total	**27,713**	**500**	**100**

Source: Kenya National Bureau of statistics 2019

3.7. Data Collection Methods

The research data collection instrument was the questionnaire. The questionnaire was developed by the researcher in English language and then interpreted into the local Swahili language by the researcher making it easy for the respondents to comprehend the questions. Household interviews were based on structured questionnaires with four sections: borrower attributes, loan attributes and farm attributes, and agricultural credit access. It consisted of closed and open-ended questions to help in gathering quantitative data. Each questionnaire was administered for a period of between ten to fifteen minutes. The interviews were preferred because of their potential to give accurate information and keep the respondent focused till the questionnaire is completely filled.

Two research assistants were hired and trained to assist in data collection. They had a minimum qualification of KCSE and were trained by the researcher on time management, basic communication skills and research etiquette such as how to introduce themselves to the respondents and clarify to the respondents the purpose of the study, and basic data collection skills.

3.8. Data Analysis

This study used quantitative methods of data analysis. The data was analyzed using the Statistical Package for Social Sciences (SPSS) program. Analytical techniques, including descriptive statistics and inferential statistics, were used for quantitative data analysis. To determine the effect of the variables on the extent to which smallholder farmers absorb agricultural credit from AFC in Lamu County. Confirmatory factor analysis, correlation analysis and regression model were used for data analysis. Data presentation was done using frequencies, percentages, means, standard deviation and estimation coefficients. This was enhanced by offering a narrative interpretation of the results.

Confirmatory factor analysis was done to determine the factors and factor loadings of the sub-variables associated with borrower attributes (age, gender, education level, farm management skills, farming experience, and off-farm income), loan attributes (transaction costs, collateral requirements, repayment flexibility, and applied loan amount), and farm attributes (distance to AFC, technology adoption, farm productivity and extension services). The components were extracted through principal component analysis and rotated through verimax method with Kaiser

Normalization. The main purpose of the confirmatory factor analysis was to confirm the relationship between the three independent variables and their respective multiple sub-variables as indicated in the literature review to justify the use of the three independent variables: loan attributes, borrower attributes and farm attributes to enable efficiency of data analysis using a smaller number of variables. Correlation analysis was done to establish the level of correlation between the dependent and independent variables to ascertain their suitability for further data analysis. Ordinary least square (OLS) linear regression analysis was used to describe the relationship between one dependent variable (**Y**) and the independent variables: loan attributes (**X1**), borrower attributes (**X2**) and farm attributes (**X3**) as per the specific study objectives. Equations (1, 2 and 3) are the individual expression of the least square regression models.

Equation on the effects of loan attributes on agricultural credit access (specific objective one)

$$\mathbf{Y = \beta_0\, 1 + \beta_1 X1 + €1} \qquad \textit{(i)}$$

Where: Where: **Y** - *is the dependent variable - Credit access,* $\boldsymbol{\beta_0}$ **1** - *is the constant for loan attributes,* **β1** - *regression coefficients for loan attributes,* **X1** - *is the independent variables - loan attributes,* **€** - *error term for loan attributes.*

Equation on the effects of borrower attributes on agricultural credit access (specific objective two)

$$\mathbf{Y = \beta_0\, 2 + \beta_2 X2 + €2} \qquad \textit{(ii)}$$

Where: Where: **Y** - *is the dependent variable - Credit access,* $\boldsymbol{\beta_0}$ **2** - *is the constant for borrower attributes,* **β2** - *regression coefficients for borrower attributes,* **X2** - *is the independent variables - borrower attributes,* **€** - *error term for borrower attributes.*

Equation on the effects of farm attributes on agricultural credit access (specific objective three)

$$\mathbf{Y = \beta_0\, 3 + \beta_3 X3 + €3} \qquad \textit{(iii)}$$

Where: Where: **Y** - *is the dependent variable - Credit access,* $\boldsymbol{\beta_0}$ **3** - *is the constant for farm attributes,* **β3** - *regression coefficients for farm attributes,* **X3** - *is the independent variables – farm attributes,* **€** - *error term for farm attributes.*

The regression model summary output results were obtained to get the coefficient of determination (R^2), which explained the level of variance in the outcome variable that can be explained by the predictor variables. ANOVA table output results were used to ascertain existence of significant relationship between the outcome and predictor variables and to determine fitness of the regression model for data analysis as depicted by the value of F distribution (F value). To analyze the specific study objectives, the regression coefficients model output results were used in line with the specific study objectives to examine the effects of loan (**X1)**, borrower (**X2)** and farm (**X3)** attributes on agricultural credit access (**Y)** as determined by their resultant coefficients β_1, β_2 and β_3 respectively. The results from the regression coefficients model output, revealed the effects of a unit change in the loan, borrower and farm attributes on agricultural credit access as either positive or negative depending on the coefficients at $p < 0.05$ significance level. Positive coefficient depicted positive change in the rate of agricultural credit access **(Y)** while negative coefficient depicted negative change in the rate of agricultural credit access **(Y)** as used to explain the study objectives.

3.9. Research Quality

3.9.1 Reliability tests

Cronbach's Alpha (α), internal consistency measure was used in determination of reliability of the instrument. Table 3.3 and 3.4 shows individual Cronbach's alpha for each objective and the overall Cronbach's alpha value of 0.841 which is above the acceptable value of 0.7. This shows that reliability and internal consistency of the research tool items was high.

Table 3.2: Reliability tests

Composite Variable	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	No of items
Loan attributes	.942	.924	8
Borrower attributes	.791	.789	7
Farm attributes	.785	.788	10
Credit access	.765	.763	10

Source: Research Data (2023).

Table 3.3: Overall reliability tests

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	No of Items
.841	.840	35

Source: Researcher Data (2023)

3.9. Diagnostic tests

3.9.1. Data Suitability for factor Analysis

Kaiser-Meyer-Olkin and Bartlett's test is a prerequisite for factor analysis. In other words, a KMO value over 0.5 and a significance level for Bartlett's test below 0.05 suggests there is a substantial correlation in the data to warrant factor analysis (Sharma, 1996). Considering Bartlett's test value of (8305.858; $p < 0.000$) and KMO value (0.909) obtained to test the divisibility of the correlation matrix into factors, the data was determined to be suitable for factor analysis.

Table 3.4 Kaiser-Meyer-Olkin and Bartlett's test results

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.909
Bartlett's Test of Sphericity	Approx. Chi-Square	8305.858
	df	190
	Sig.	0.000

Source: Researcher Data (2023)

3.9.2. Multicollinearity tests

Multicollinearity test was conducted through the variance inflation factor, to determine the degree of correlation between the independent variables using the dataset collected. This was carried before conducting regression analysis and after factor analysis. Variance inflation factor of one (1) indicates that the variables are not correlated, between 1 and 5 indicates that the variables are moderately correlated and greater than 5 indicates that the variables are highly correlated (Sharma, 1996). Therefore, there was no correlation between the variables as evidenced by the variance inflation factor of one (1).

Table 3.5 Multicollinearity test results

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	1.624	0.015		109.491	0.000		
	Loan attributes	0.309	0.015	0.637	20.806	0.000	1.000	1.000
	Farm attributes	-0.075	0.015	-0.154	-5.036	0.000	1.000	1.000
	Borrower attributes	0.193	0.015	0.398	12.983	0.000	1.000	1.000

Source: Researcher Data (2023)

3.10. Ethical Considerations

Formal approval to carry out this study was obtained from the County commissioner of Lamu, ethical clearance was obtained from the ethics committee at Strathmore University and National Commission for Science, Technology, and Innovation (NACOSTI). The researcher further obtained a letter of introduction from the University for Identification. To ensure cooperation the researcher explained the study benefits to the respondents without overstating them, explain to the respondents their rights to privacy and protection, ensured informed consent, and avoided any harm to the respondents. The anonymity of the respondents was protected by ensuring that the questionnaire did not include respondents' names or any other information that may be used to identify them. Participants were informed about their voluntary participation in the study and interviews were conducted in closed set-ups. The researcher ensured that the rights and welfare of the participants are protected by asking them to sign participant's information and consent form.

CHAPTER FOUR

PRESENTATION OF RESEARCH FINDINGS

4.1 Introduction

This chapter entails the analysis of the data collected using the methodology proposed in the previous chapter. The chapter is divided into four main sections. The introduction, the response rate, descriptive statistics, and inferential statistics as guided by the conceptual framework.

4.2 Response rate

The questionnaire response rate was 88.8% as shown in table 4.1 below. The response rate is adequate as it surpasses the average rate of 30% as recommended by Saunders and Lewis (2009). The main reason for non-response was lack of cooperation from the respondents.

Table 4. 1: Response rate

Respondents	Sample size	Returned	Response rate (%)
Total	500	444	88.80%

Source: Researcher Data (2023)

The response rate implies that the quality of the questionnaire was satisfactory. The questions were designed to motivate the respondents to complete and give accurate information. H

4.3 Descriptive Statistics

The purpose of this section is to present descriptive statistics relating to both the outcome and predictor variables. The predictor variables - borrower, loan and farm attributes are presented first followed by the outcome variable - credit access.

4.3.1 Borrower, Loan, and Farm Attributes

The descriptive study outcome on borrower, loan, and farm attributes on the level of agreement or disagreement on statements on their effects on agricultural credit access in Lamu County varied as evidenced by the means and standard deviations. The level of agreement or disagreement was analyzed on a five (5) point Likert scale where 1 strongly disagree, 2 disagree, 3 somewhat agree, 4 agree, and 5 strongly agree.

4.3.1.1 Borrower Attributes

The respondents somewhat agreed to the statements on borrower attributes as evidenced by the overall mean score of 2.83 and a standard deviation of 1.565. The respondents strongly agreed to the statement that agricultural loans are given to both men and women giving the highest mean score of 4.65 and a standard deviation of 1.089. But they strongly disagreed to the statement that agricultural credit is given to men only giving the lowest mean score of 1.32 and a standard deviation of 1.052.

Table 4.2: Borrower Attributes

Statement on Borrower Attributes	Mean	Std. Deviation
I think agricultural loans are given to both men and women	4.65	1.089
I have no farm management skills that enabled me to manage my farm on borrowed funds.	3.19	1.826
I have no farming experience to run my farm on borrowed funds.	3.14	1.844
I have no other income sources to supplement my loan repayment	3.09	1.878
I have not attained formal education that exposes me to borrow a loan	2.82	1.841
I don't think I can be given a loan because of my age	1.60	1.424
I think agricultural loans are given to men only	1.32	1.052
	2.83	**1.565**

N = 444

Source: Researcher Data (2023)

4.3.1.2 Loan Attributes

The loan attributes returned an overall mean score of 3.44 and a standard deviation of 2.024 indicating than on average, the respondents somewhat agreed to the statements on loan attributes. The respondents agreed to the statement that they do not know the acceptable minimum and maximum loan amounts to be applied for, giving the highest mean score of 3.60 and a standard deviation of 1.837. The respondents somewhat agreed to the statement that they have no security to cover the desired loan amount giving the lowest mean score of 3.23 and a standard deviation of 1.943 under the loan attributes.

Table 4.3 Loan Attributes

Statement on Loan Attributes	Mean	Std. Deviation
I do not know the acceptable minimum or maximum loan amount to be applied for.	3.60	1.837
I think the loan processing fee and application fee are too high	3.54	1.842
I think the total cost of time to be spent in processing the credit is too high.	3.48	1.858
I think the cost of collateralization/legal cost is too high	3.47	1.858
I think costs imposed on borrowers for control and monitoring of the credit by the lenders is too high.	3.45	1.863
High transport costs make it difficult to access the credit	3.41	1.865
The loan repayment schedules are not flexible to accommodate my farm production cycle income.	3.31	3.127
I have no security to cover the desired loan amount.	3.23	1.943
	3.44	**2.024**

N = 444
Source: Researcher Data (2023)

4.3.1.3 Farm Attributes

The respondents disagree to the statements on farm attributes as evidenced by a return of an overall mean of 1.81 and a standard deviation of 1.456. The respondents somewhat agreed to the statement that they use irrigation technology in their farms giving the highest mean score of 2.92 and a standard deviation of 1.981. However, the respondents strongly disagreed to the statement that they use greenhouse technology giving the lowest mean score of 1.32 and a standard variation of 1.072.

Table 4.4 Farm Attributes

Statement on Farm Attributes	Mean	Std. Deviation
I use irrigation technology in my farm	2.92	1.981
I use crop protection technology in my farm	2.30	1.858
I can easily reach the lenders to borrow because my farm is not located too far away.	2.22	1.798
My farm productivity can support the loan repayment.	1.85	1.570
I am in contact with extension officers who advises me on farm credit sources.	1.82	1.556
I use fertigation technology in my farm	1.47	1.249
I use artificial insemination technology in my farm	1.43	1.233
I use zero grazing technology in my farm	1.38	1.145
I use feedlot technology in my farm	1.35	1.099
I use greenhouse technology in my farm.	1.32	1.072
	1.81	**1.456**

N = 444
Source: Researcher Data (2023)

4.3.2 Credit Access

The credit access rate among smallholder farmers in Lamu County was the outcome variable in the study. The variable was measured in terms of the loan amount applied in Kenya shillings between the years 2020 – 2022. The amount was measured in ranges of below 200,000, 200,000 – 400,000, 600,000 – 800,000, and 800,000 – 1,000,000.

Table 4. 5 a: Credit access

	Year 2020		Year 2021		Year 2022		Cummulative	
Loan Amount	**Frequency**	**%**	**Frequency**	**%**	**Frequency**	**%**	**Frequency**	**%**
Below 200,000	26	50.0	51	48.1	46	50.0	123	49.2
200,000-400,000	5	9.6	25	23.6	18	19.6	48	19.2
400,000-600,000	2	3.8	17	16.0	13	14.1	32	12.8
600,000-800,000	17	32.7	5	4.7	3	3.3	25	10
800,000-1000,000	2	3.8	8	7.5	12	13.0	22	8.8
Total	**52**	**100.0**	**106**	**100.0**	**92**	**100.0**	**250**	**100**

Source: Researcher Data (2023)

A total of 250 respondents had applied for agricultural credit between the years 2020 – 2021 as compared to 194 who did not make any loan applications. Loan amounts below Kes. 200,000 had the highest number of applicants accounting for 49.2% of the applications and amounts between Kes. 800,000 to Kes. 1,000,000 had the lowest application rate of 8.8%. The year 2021 had the highest number of applicants totaling 106 and the year 2020 had the lowest number of applicants totaling 52. This was due to the negative economic effects of COVID -19.

4.3.2.1 Reasons for rejection and non-application of loans

The study further sought to establish the respondents' perception regarding reasons for rejection of their loans and non-application of loans. These were analyzed based on a five –point Likert scale: 1 strongly disagree, 2 disagree, 3 somewhat agree, 4 agree, and 5 strongly agree.

Table 4. 5 b: Reasons for loan rejection

Statement on reasons for loan rejection	N	Mean	Std. Deviation
Off-season loan applications	10	5.00	0.000
Incomplete information/ farm records	28	3.89	1.315
Perceived lack of profitability of the farm	39	3.79	1.508
Inadequate/poor credit history	30	3.67	1.516
Farming enterprise not sufficiently viable to justify borrowing	29	3.62	1.545
Lack/insufficient or poor collateral	38	2.97	1.979
Incompleteness of the loan application forms	20	2.00	1.338

Source: Researcher Data (2023)

The study finding indicated different responses with respect to reasons for loan rejection among smallholder farmers in Lamu County. The respondents strongly agreed to the statement that other reasons specifically making off-season loan applications was indicated by the respondents as the main reason that led to loan rejection. This reason had the highest mean score of 5.00 and a standard deviation of 0.00. The respondents disagreed to the statement that the incompleteness of the loan application form led to loan rejection. This had the lowest mean score of 2.00 and a standard deviation of 1.338.

Table 4. 5 c: Reason for not applying for the loan

Statement on reason for not applying for the loan	N	Mean	Std. Deviation
Religion	8	4.50	1.414
The interest rates were too high	65	4.43	1.392
The application procedures were too burdensome	65	4.42	1.333
I did not have sufficient collateral or didn't meet/fulfill requirements	65	4.40	1.401
I did not need the loan	8	4.00	1.852
I did not know where to apply for a loan	65	3.40	1.975
I feared making loan repayments	62	3.39	1.978
I did not know how to apply for a loan	65	2.86	1.861
I had borrowed from other relatives and/or friends	60	1.90	1.664
I did not think the loan would be approved	64	1.81	1.622
I did not want to be in debt	58	1.41	1.229
I had adequate savings from my investment to use	59	1.20	0.886
I had borrowed from my spouse	60	1.17	0.763

Source: Researcher Data (2023)

The study finding indicated different responses with respect to reasons for not applying for the loan among smallholder farmers in Lamu County. Respondents strongly agreed to the statement that other reasons which they indicated as religious beliefs deterred them from applying for agricultural credit. This reason had the highest mean of 4.50 and a standard deviation of 1.414.

The respondents strongly disagreed to the statement that the reason for not applying for agricultural credit was because they had borrowed from their spouses. This reason had the lowest mean score of 1.17 and a standard deviation of 0.763.

4.4 Inferential Statistics

The study was conducted to establish the effects of borrower, loan, and farm attributes on agricultural credit access among smallholder farmers in Lamu County. The study adopted inferential analysis - Confirmatory factor analysis, correlation analysis and regression analysis to determine the relationship between the predictor variables and outcome variable.

4.4.1 Factor Analysis

Before the confirmatory factor analysis was done, the twenty-five sub-variables were aligned to the three independent variables as informed by the literature review. Loan attributes had the sub-variables which included – transaction costs, applied loan amount, collateral and repayment flexibility. Farm attributes included – technology adoption, distance to AFC, farm productivity and extension services. Borrower attributes included – gender, age, farming experience, farm management skills, education level and off-farm income sources. Confirmatory factor analysis was done to confirm the factors and factor loadings of the sub-variables under the independent variables as was obtained from the literature review. The rotation converged at three iterations resulting into three factors which explained 72.243% of the total initial eigenvalues percentage variance in the independent variables. Loan attributes accounted for 46.136% of the variance, farm attributes accounted for 14.851% of the variance while borrower attributes accounted for 11.256% of the variance. The sub-variables were confirmed to align with the independent variables. However, the sub-variables of farm productivity and extension services were removed under the farm attributes due to low factor loadings. The resultant factors were used as independent variables in the study as loan, farm and borrower attributes for the correlation and regression analysis.

Table: 4.6 Rotated Component Matrix

	Component		
	Loan Attributes	**Farm Attributes**	**Borrower Attributes**
Legal cost	**0.927**		
Loan monitoring and admin costs	**0.907**		
Opportunity cost of time	**0.906**		
Transport cost	**0.903**		
Application and processing fee	**0.886**		
Applied loan amount	**0.789**		
Collateral requirements	**0.739**		
Repayment flexibility	**0.554**		
Distance to AFC office		**0.856**	
Zero grazing technology		**0.829**	
AI technology		**0.813**	
Feedlot technology		**0.808**	
Fertigation technology		**0.767**	
Crop protection technology		**0.764**	
Irrigation technology		**0.665**	
Greenhouse technology		**0.545**	
Farm productivity		0.440	
Extension Services		0.260	
Loans are given to both men and women			**0.941**
Loans are given to men only			**0.940**
Farming experience			**0.802**
Farm management skills			**0.799**
Education level			**0.766**
Off-farm income			**0.733**
Age			**0.530**

Source: Researcher Data (2023)

4.4.2 Correlation Analysis

The correlation results showed that there was statistically significant relationship between the predictor variables and outcome variables. The results indicated that loan attributes had the strongest relationship with the credit access (r = .637, p = 0.000) followed by the borrower attributes (r = .398, p = 0.000) and then the farm attributes (r = -.154, p = 0.001). Therefore, the correlation test between the predictor variables and outcome variables showed enough correlation to justify regression analysis.

Table 4.7 Correlation Matrix

		Independent Variables			
Dependent Variable		**Loan Attributes**	**Farm Attributes**	**Borrower Attributes**	**Loan Amount**
Loan Amount	Pearson Correlation	.637**	-.154**	.398**	1
	Sig. (2-tailed)	0.000	0.001	0.000	
	N	444	444	444	444

**. Correlation is significant at the 0.01 level (2-tailed).

Source: Researcher Data (2023)

4.4.3. Regression analysis

The regression analysis was carried out to explore the extent to which the dependent variable could be explained by the independent variables in the examinations of the factors affecting agricultural credit access among smallholder farmers in Lamu County. Linear regression analysis was used to describe the relationship between one dependent variable and one independent variable as loan attributes, borrower attributes, and farm attributes as per the specific study objectives. Multiple regression analysis was used in the study to describe the relationship between one dependent variable and three independent variables as per the general study objective.

4.4.3.1 Extent to which loan attributes affect agricultural credit access

4.4.3.1.1 Loan attributes regression model summary

The coefficient of determination R^2 in the linear regression model was 0.406. This implies that 40.6% of the variance in credit access can be explained by loan attributes as the predictor variable.

Therefore, the linear regression summary indicated that the independent variable (loan attributes) have an effect on agricultural credit access.

Table 4.8 Loan attributes regression model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.637[a]	0.406	0.404	0.374

a. Predictors: (Constant), Loan attributes

Source: Researcher Data (2023)

4.4.3.1.2 Loan attributes analysis of variance (ANOVA)

The ANOVA table below shows that the loan attributes statistically and significantly predicted credit access, $F = 301.820$, $p < 0.001$. This indicated that a significant relationship existed between the dependent variable (credit access) and the independent variable (loan attributes) and that the linear regression model was a good fit for the data.

Table 4.9 Loan attributes analysis of variance

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	42.276	1	42.276	301.820	<0.001
	Residual	61.911	442	0.140		
	Total	104.187	443			

a. Dependent Variable: Credit access

b. Predictors: (Constant), Loan attributes

Source: Researcher Data (2023)

4.4.3.1.3 Loan attributes regression coefficient model

Loan attributes linear regression results; $t = 17.373$, $\beta = 0.637$ (standardized coefficient), $p<0.001$. This indicated that the dependent variable (credit access) and the independent variable (loan attributes) could be fitted in the linear regression model adopted by the study. The model was:

$$\mathbf{Y = \beta_0 1 + \beta_1 X1 + €1} \qquad \textit{(i)}$$

Where: Where: **Y** - *is the dependent variable - Credit access,* **β0** 1 - *is the constant for loan attributes,* **β1** - *regression coefficients for loan attributes,* **X1** - *is the independent variables - loan attributes,* **€1** - *error term for loan attributes*

The linear regression model using the standardized coefficient was;

Credit access = 1.624 + (0.637 Loan attributes) + 0.018 (standard error)

The study result indicated that loan attributes had a marginal positive effect on agricultural credit access whereby for every unit change in the aspects of the selected loan attributes, rate of agricultural credit access would be positively affected by 0.637 units using the standardized coefficient.

4.10. Loan attributes regression coefficient

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.624	0.018		91.426	<0.001
	Loan attributes	0.309	0.018	0.637	17.373	<0.001

a. Dependent Variable: Credit access

Source: Researcher Data (2023)

4.4.3.2 Extent to which borrower attributes affect agricultural credit access

4.4.3.1.1 Borrower attributes regression model summary

The coefficient of determination R^2 in the linear regression model was 0.158. This implies that 15.8% of the variance in credit access can be explained by borrower attributes as the predictor variable. Therefore, the linear regression summary indicated that the independent variable (borrower attributes) have an effect on agricultural credit access.

Table 4.11 Borrower attributes regression model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.398[a]	0.158	0.156	0.446

a. Predictors: (Constant), Borrower attributes

Source: Researcher Data (2023)

4.4.3.1.2 Borrower attributes analysis of variance (ANOVA)

The ANOVA table below shows that the borrower attributes statistically and significantly predicted credit access, $F = 82.945$, $p < 0.001$. This indicated that a significant relationship existed between the dependent variable (credit access) and the independent variable (borrower attributes) and that the linear regression model was a good fit for the data.

Table 4.12 Borrower attributes analysis of variance

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	16.462	1	16.462	82.945	<0.001
	Residual	87.725	442	0.198		
	Total	104.187	443			

a. Dependent Variable: Credit access

b. Predictors: (Constant), Borrower attributes

Source: Researcher Data (2023)

4.4.3.1.3 Borrower attributes regression coefficient model

Borrower attributes linear regression results; $t = 9.107$, $\beta = 0.398$ (standardized coefficient), $p<0.001$. This indicated that the dependent variable (credit access) and the independent variable (borrower attributes) could be fitted in the linear regression model adopted by the study. The model was:

$$\mathbf{Y = \beta_0\ 2 + \beta_2 X2 + €2} \qquad \textit{(ii)}$$

Where: Where: **Y** - *is the dependent variable - Credit access,* $\mathbf{\beta_0\ 2}$ *- is the constant for borrower attributes,* **β2** - *regression coefficients for borrower attributes,* **X2** - *is the independent variables - borrower attributes,* **€2** - *error term for borrower attributes.*

The linear regression model using the standardized coefficient was;

Credit access = 1.624 + (0.398 Loan attributes) + 0.021 (standard error)

The study outcome indicated that borrower attributes had a marginal positive effect on agricultural credit access whereby for every unit change in the aspects of the selected borrower attributes, rate

of agricultural credit access would be positively affected by 0.398 units using the standardized coefficient.

4.13. Borrower attributes regression coefficient

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.624	0.021		76.806	<0.001
	Borrower attributes	0.193	0.021	0.398	9.107	<0.001

a. Dependent Variable: Credit access

Source: Researcher Data (2023)

4.4.3.3 Extent to which farm attributes affect agricultural credit access

4.4.3.1.1 Farm attributes regression model summary

The coefficient of determination R^2 in the linear regression model was 0.024. This implies that 2.4% of the variance in credit access can be explained by farm attributes as the predictor variable. Therefore, the linear regression summary indicated that the independent variable (farm attributes) have an effect on agricultural credit access.

Table 4.14 Farm attributes regression model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.154[a]	0.024	0.022	0.480

a. Predictors: (Constant), Farm attributes

Source: Researcher Data (2023)

4.4.3.1.2 Farm attributes analysis of variance (ANOVA)

The ANOVA table below shows that the farm attributes statistically and significantly predicted credit access, $F = 10.762$, $p < 0.001$. This indicated that a significant relationship existed between the dependent variable (credit access) and the independent variable (farm attributes) and that the linear regression model was a good fit for the data.

Table 4.15 Farm attributes analysis of variance

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.477	1	2.477	10.762	<0.001
	Residual	101.710	442	0.230		
	Total	104.187	443			

a. Dependent Variable: Credit access

b. Predictors: (Constant), Farm attributes

Source: Researcher Data (2023)

4.4.3.1.3 Farm attributes regression coefficient model

Farm attributes linear regression results; t = -3.281, β = - 0.154 (standardized coefficient), p<0.001. This indicated that the dependent variable (credit access) and the independent variable (farm attributes) could be fitted in the linear regression model adopted by the study. The model was:

$Y = \beta_0\ 3 + \beta_3 X3 + €3$ *(iii)*

Where: Where: **Y** - *is the dependent variable* - *Credit access,* **β_0 3** - *is the constant for farm attributes,* **β3** - *regression coefficients for farm attributes,* **X3** - *is the independent variables – farm attributes,* **€3**- *error term for farm attributes.*

The linear regression model using the standardized coefficient was;

Credit access = 1.624 + (- 0.154 Loan attributes) + 0.023 (standard error)

The study result indicated that farm attributes had a marginal negative effect on agricultural credit access whereby for every unit change in the aspects of the selected farm attributes, rate of agricultural credit access would be affected negatively by 0.154 units using the standardized coefficient.

4.16. Farm attributes regression coefficient

Model		Unstandardized Coefficient		Standardized Coefficient	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.624	0.023		71.330	<0.001
	Farm Attributes	-0.075	0.023	-0.154	-3.281	<0.001

a. Dependent Variable: Credit access (Source: Researcher Data, 2023)

The study result indicated that loan attributes had the highest and positive effect on agricultural credit access. Borrower attributes had a moderate positive effect on agricultural credit access. Farm attributes had the least and negative effect on agricultural credit access.

CHAPTER FIVE

SUMMARY, DISCUSSION, CONCLUSION, AND RECOMMENDATIONS

5.1 Introduction

This chapter represents findings derived from data analysis to establish the extent to which selected loan, farm and borrower attributes affect agricultural credit access among smallholder farmers in Lamu County. The chapter contains introduction, summary, discussion, conclusion, recommendations, limitations of the study, and suggestion for further research.

5.2 Summary

The main objective of this study was to examine factors affecting credit access from Agricultural Finance Corporation among Smallholder farmers in Lamu County. The focus was on selected loans, farm and borrower attributes. The sample size was 500 smallholder farmers and the response rate was 88.80%. The descriptive study outcome measured using the five (5) point Likert scale indicated that the respondents somewhat agree to a large extent to the statements on loan attributes and borrower attributes while they disagree to a small extent to the statements on farm attributes regarding their effect on agricultural credit access. The study results indicated loan amounts below Kes. 200,000 had the highest number of applicants accounting for 49.2% of the applications. According to the five (5) point Likert-scale statements, the respondents strongly agreed that offseason loan applications led to loan rejection and they agree that religion, high interest rates, lack of sufficient collateral or failing to meet/fulfill requirements and burdensome application procedures discouraged them from applying for agricultural credit as postulated in the discouraged borrower theory.

The data was confirmed to be suitable for factor analysis as determined by KMO values of 0.909 and Bartlett's test (8305.858; $p < 0.000$). Confirmatory factory analysis was done which resulted into three factors explaining 72.243% of the total variance in the variables. Loan attributes accounted for 46.136% of the variance, farm attributes accounted for 14.851% of the variance while borrower attributes accounted for 11.256% of the variance. Farm productivity and extension

services were removed under the farm attributes due to low factor loadings. The correlation analysis results indicated a statistically significant relationship between the predictor and outcome variable with the loan attributes having the strongest relation with agricultural credit access and farm attributes having the weakest relationship with agricultural credit access. The regression analysis findings revealed that loan attributes and borrower attributes had a marginal positive effect while farm attributes had a marginal negative effect on agricultural credit access. Loan attributes had the highest influence on agricultural credit access while farm attributes had the least influence on agricultural credit access.

5.3 Discussion of findings

5.3.1 Extent to which loan attributes affect agricultural credit access

The first research objective under examination in this study was the extent to which selected loan attributes affected agricultural credit access, from agricultural finance corporation among smallholder farmers in Lamu County. The findings showed that the respondents somewhat agreed to the statements on loan attributes with an overall mean score of 3.44 and a standard deviation of 2.024. This implied that a majority of the smallholder farmers in Lamu County are not aware of the lending conditions set by the lenders such as minimum and maximum acceptable loan amounts, loan transaction costs, repayment schedules and collateral requirements. The respondents agreed to the statement that they do not know the acceptable minimum and maximum loan amounts to be applied for, giving the highest mean score of 3.60 and a standard deviation of 1.837. This signified that smallholder farmers in Lamu County do not know the acceptable minimum and maximum loan amount to be applied for in the lending institutions. Which makes it difficult for them to make borrowing decisions. The rational choice theory posit that decisions are guided by an understanding of the costs and benefits associated with each option (Becker, 1993). Kosgey (2013) found that the applied loan amount significantly influenced access to agricultural credit and that access to agricultural credit increases when farmers can apply for larger loan amounts.

The respondents somewhat agreed to the statement that they have no security to cover the desired loan amount giving the lowest mean score of 3.23 and a standard deviation of 1.943. This implied that smallholder farmers in Lamu County have got low or no collateral endowment which affect their demand for agricultural credit. This finding is consistent with Blessing *et al*., (2020) who

found that farmers with low or no collateral endowment have low demand for bank credit in Zimbabwe. The study finding contradicts Kosgey, (2013) who found that collateral did not significantly influence access to agricultural credit. This was observed among farmers who belonged to groups and hence obtained loans that did not require tangible security.

The study result indicated that loan attributes had a positive effect on agricultural credit access whereby for every unit change in the aspects of the selected loan attributes, rate of agricultural credit access would be affected by 0.637 units using the standardized coefficient. The implication of this finding is that lending terms and conditions set by financial institutions will always determine the rate of agricultural credit access among smallholder farmers in Lamu County. Zeller (1994) asserts that it is the lender who decides whether borrowers can absorb available credit based on their lending terms and conditions. This finding is consistent with Bard *et al*., (2000) who found that loan attributes influenced agricultural credit access.

5.3.2 Extent to which borrower attributes affect agricultural credit access

The second research objective under examination in this study was the extent to which borrower attributes affected agricultural credit access from agricultural finance corporation among smallholder farmers in Lamu County. According to the analysis of the five (5) point likert scale, the respondents somewhat agreed to the statements on borrower attributes with an overall mean score of 2.83 and a standard deviation of 1.565. This implied that smallholder farmers in Lamu County think that borrower attributes - age, formal education, farming experience, farm management skills and ability to pay affect agricultural credit access. The respondents strongly agreed to the statement that agricultural loans are given to both men and women giving the highest mean score of 4.65 and a standard deviation of 1.089. But they strongly disagreed to the statement that agricultural credit is given to men only giving the lowest mean score of 1.32 and a standard deviation of 1.052. This outcome denoted that agricultural credit is accessible to smallholder farmers in Lamu County irrespective of gender. The study outcome on gender is consistent with (Musebe *et al*., 2017 and Ha 2015) who found gender not to be significant in influencing demand and access to agricultural credit. The results contradict (Mwonge et al., 2021 and Ouattara et al., 2022) who observed that gender is statistically significant in farmer's choice and access to credit and that women farmers are more likely than men to borrow from financial institutions. The

respondents disagreed to the statement that they can be denied agricultural credit access because of their age and this had a mean score of 1.60 and a standard deviation of 1.424. This implied that smallholder farmers in Lamu County have access to agricultural credit irrespective of age. This finding is consistent with (Saqib *et al*., 2017) who observed a negative and insignificant influence of age on access to credit by farmers in Pakistan.

The study outcome indicated that borrower attributes had a moderate positive effect on agricultural credit access whereby for every unit change in the aspects of the selected borrower attributes, rate of agricultural credit access would change by 0.398 units using the standardized coefficient. This finding concur with Bard *et al*., (2000) who found that borrower attributes influenced agricultural credit decision by the lenders. It can be deduced that smallholder farmers who meet the lending conditions set by the lenders will always have a better chance to obtain agricultural credit from the lending institutions.

5.3.3 Extent to which farm attributes affect agricultural credit access

The third research objective under examination in this study was the extent to which farm attributes affected agricultural credit access, from agricultural finance corporation among smallholder farmers in Lamu County. According to the analysis of the five (5) point Likert scale, the respondents disagree to the statements on farm attributes with an overall mean of 1.81 and a standard deviation of 1.456. This indicated that majority of smallholder farmers in Lamu County have not adopted technology in their farms (irrigation technology, crop protection technology, fertigation technology, AI technology, Zero grazing technology, feedlot technology and greenhouse technology), they cannot easily reach the lenders because their farms are located far away from the lenders, their farms have low productivity to support the loan repayment, and they are not in contact with extension officers to advise them on sources of farm credit. This implied that smallholder farmers in Lamu County have credit access challenges resulting from the orientation of their farms. The respondents somewhat agreed to the statement that they use irrigation technology in their farms giving the highest mean score of 2.92 and a standard deviation of 1.981. However, the respondents strongly disagreed to the statement that they use greenhouse technology giving the lowest mean score of 1.32 and a standard variation of 1.072. This indicated that irrigation technology is the dominant technology adopted by smallholder farmers in Lamu

County to reduce production risks resulting from the vagaries of weather. This makes such smallholder farmers more attractive to lenders as compared to those depending on unpredictable rain fed agriculture. The study results are in line with Obuobisa – Darko (2015) who found that technology adoption is significant in influencing credit access.

The study findings showed that the farm attributes had the least and negative effect on agricultural credit access whereby for every unit change in the aspects of the selected farm attributes, rate of agricultural credit access would change by 0.154 units using the standardized coefficient. The implication of this finding is that farms which are non-credit constrained may not request for agricultural credit as compared to credit constrained farms. This finding is consistent with Bard *et al*., (2000) who found that farm attributes influenced agricultural credit access.

5.4 Conclusion

The study examined the factors affecting credit access from agricultural finance corporation among smallholder farmers in Lamu County. The general conclusion is that the selected borrower and loan attributes had a marginal positive and significant influence on agricultural credit access while farm attributes had a marginal negative and significant influence on agricultural credit access. The loan attributes had the highest influence on agricultural credit access while the farm attributes had the leased influence on agricultural credit access.

The discouraged borrower theory was used as the dominant theory and was relevant to the study. This theory informed this study as evidenced by two special categories of respondents – those whose loan applications were rejected and those who had never applied for agricultural credit considering the demand side of agricultural credit access. Therefore, it resonates with the study respondents as either 'appropriate discouraged borrowers' or 'inappropriate discouraged borrowers'. According to the analysis of the five (5) point Likert scale, the respondents on the demand side strongly agreed to the statement that other reasons specifically making off-season loan applications was indicated by the respondents as the main reason that led to their loans being rejected. This reason had the highest mean score of 5.00 and a standard deviation of 0.00. This implied that smallholder farmers in Lamu County who made off-season loan applications were rejected by the

lenders given the perceived high risk among smallholders involved in primary agricultural production. Also, respondents on the demand side strongly agreed to the statement that other reasons which they indicated as religious beliefs deterred them from applying for agricultural credit. This reason had the highest mean of 4.50 and a standard deviation of 1.414. This was inferred to mean that financial institutions in Lamu County have not developed sharia-compliant agricultural credit facilities for smallholder farmers of the Muslim faith. Therefore, smallholder farmers who fail to make loan applications in season and those of Muslim faith are appropriately discouraged from making loan applications.

5.5 Recommendations of the Research Study

The following recommendations are made based on the theoretical literature, empirical assessment and research findings. The recommendations will be relevant to AFC Management, County and National government, and smallholder farmers.

5.5.1 AFC Management

The research findings have shown that there is a marginal positive and statistically significant influence of selected loan attributes on agricultural credit access. Also, the respondents somewhat agreed to the statements on loan attributes. This implied that a majority of the smallholder farmers in Lamu County are not aware of the lending conditions set by the lenders such as minimum and maximum acceptable loan amounts, loan transaction costs, repayment schedules and collateral requirements. Therefore, it is recommended that AFC management should conduct intensive market sanitization among smallholder farmers in Lamu County on their loan requirements, lending terms and conditions. Informed smallholder farmers will make lending decisions as a rational choice guided by an understanding of the costs and benefits associated with the borrowing decision.

5.5.2 National and County Governments

Agricultural credit is a major catalyst for smallholder agricultural development which has a multiplier effect on economic development at the county level and national level. The respondents somewhat agreed to the statement that they have no security to cover the desired loan amount. Therefore, it is recommended that both levels of the government should work in synergy to develop

mechanisms that will encourage agricultural credit access among smallholder farmers to enable commercialization of smallholder farming and sustainable agriculture. This includes issuing of title deed to smallholder farmers with no deeds of land ownership, discharging title deeds charged to settlement schemes, developing county-specific and agricultural-enterprise specific government guarantee schemes for smallholder farmers who do not have collateral.

5.5.3 Smallholder farmers

Agricultural credit has the potential to transform the living conditions of smallholder farmers. The respondents strongly agreed to the statement that other reasons specifically making off-season loan applications was indicated by the respondents as the main reason that led to their loans being rejected. This implied that smallholder farmers in Lamu County who made off-season loan applications were rejected by the lenders given the perceived high risk among smallholders involved in primary agricultural production. Therefore, it is recommended that smallholder farmers should make proper arrangements to make loan application within the season so as to avoid loan rejection.

5.6 Limitations of the study

The study faced some limitation. Low literacy levels among some respondents, suspicion which led to some of the smallholder farmers being reluctant to give information despite reassurance that the study was confidential. Excessive delays in traveling to Hindi and Witu during data collection due to travelling restrictions caused by the insecurity that was being experienced in Lamu County last year. This prolonged the data collection exercise more than was estimated and restricted movement to areas like Miilihoi and Pandanguo which were declared danger zones.

5.7 Suggestion for further research

The findings add to the existing empirical and conceptual literature on the factors affecting agricultural credit access among smallholder farmers, in particular a selection of loan, farm and borrower attributes. Future studies to consider inclusion of other loan, farm and borrower attributes not covered in this study to help bring out more empirical evidence on credit service quality practices and credit access by farmers. This includes loan attributes like unsecured loans, loan terms, and restructured loans. Farm attributes like adoption of technology in crop production,

adoption of technology in animal production, and adoption of technology in mixed farming. Loan attributes like penalty fee, insurance fee and discharge fee. The items used to describe the loan, farm and borrower attributes in this study and those used to measure credit access may not have been exhaustive. Therefore, there is need for further study to explore other factors and measures to enhance the robustness of the study models and generalizability and validity of the results.

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APPENDICES

APPENDIX I: LETTER OF INTRODUCTION

Ole Sangale Rd, Madaraka Estate,
P.O Box 59857 00200, Nairobi, Kenya.
Cell: +254 703 414/6/7, Twitter: @SBSKenya
Email: info@sbs.ac.ke or vist www.sbs.strathmore.edu

Strathmore UNIVERSITY
BUSINESS SCHOOL

01st August 2022

To Whom It May Concern,

RE: FACILITATION OF RESEARCH – DANIEL OMONDI OCHANDA

This is to introduce Daniel Omondi Ochanda who is a Master of Management in Agribusiness (MMA) Student at Strathmore University Business School, admission number MMA/114729.

As part of our MMA Program, Daniel is expected to do applied research and undertake a project. This is in partial fulfilment of the requirements of the MMA course. To this effect, he would like to request for appropriate data from your organization.

Daniel is undertaking a research paper on **"Factors Affecting Credit Absorption from Agricultural Finance Corporation Among Smallholder Farmers in Lamu County".** The information obtained shall be treated confidentially and shall be used for academic purposes only.

Our MMA Programme seeks to establish links with industry, and one of these ways is by directing our research to areas that would be of direct use to industry. We would be glad to share our findings with you after the research, and we trust that you will find them of great interest and of practical value to your organization.

We appreciate your support and shall be willing to provide any further information if required.

Yours sincerely,

Njoki Kiagiri
Manager – Graduate Programmes
Strathmore University Business School.

Strathmore Business School is a Proud member of:

Association of African Business Schools AABS EFMD AACSB

APPENDIX II: STRATHMORE UNIVERSITY ETHICAL CLEARANCE

Strathmore UNIVERSITY

1st November 2022

Mr Ochanda Daniel Omondi,
ochanda.daniel@strathmore.edu

Dear Mr Ochanda,

RE: Factors Affecting Credit Absorption from Agricultural Finance Corporation Among Smallholder Farmers in Lamu County

This is to inform you that SU-ISERC has reviewed and **approved** your above **SU- master's** research proposal. Your application reference number is **SU-ISERC1457/22.** The approval period is from **1st November 2022 to 31st October 2023.**

This approval is subject to compliance with the following requirements:

i. Only approved documents including (informed consents, study instruments, MTA) will be used
ii. All changes including (amendments, deviations, and violations) are submitted for review and approval by SU-ISERC.
iii. Death and life-threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to SU-ISERC within 48 hours of notification
iv. Any changes, anticipated or otherwise that may increase the risks or affected safety or welfare of study participants and others or affect the integrity of the research must be reported to SU-ISERC within 48 hours
v. Clearance for export of biological specimens must be obtained from relevant institutions.
vi. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal.
vii. Submission of an executive summary report within 90 days upon completion of the study to SU-ISERC.

Prior to commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology, and Innovation (NACOSTI) https://research-portal.nacosti.go.ke/ and obtain other clearances needed.

Yours sincerely,

for: **Dr Ben Ngoye,**
Secretary; SU-ISERC

Cc: Prof Fred Were,
Chairperson; SU-ISERC

STRATHMORE UNIVERSITY INSTITUTIONAL SCIENTIFIC AND ETHICAL REVIEW COMMITTEE
(SU-ISERC)
01-Nov-2022
Email:ethicsreview@strathmore.edu
P.O BOX 59857-00200
NAIROBI-KENYA

APPENDIX III: NACOSTI LICENSE

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION

Ref No: **663950**

Date of Issue: **23/August/2022**

RESEARCH LICENSE

This is to Certify that Mr.. Daniel Omondi Ochanda of Strathmore University, has been licensed to conduct research in Lamu on the topic: Factors Affecting Credit Absorption from Agricultural Finance Corporation Among Smallholder Farmers in Lamu County. for the period ending : 23/August/2023.

License No: **NACOSTI/P/22/19579**

663950

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION

Verification QR Code

NOTE: This is a computer generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application.

PPENDIX IV: APPROVAL BY THE COUNTY COMISSIONER

OFFICE OF THE PRESIDENT
MINISTRY OF INTERIOR AND NATIONAL ADMINISTRATION

COUNTY COMMISSIONER,
LAMU COUNTY,
P.O. BOX 41 – 80500,
LAMU.

Email: lamucounty12@yahoo.com
When replying please quote:

Ref. No. ADM/15/3 VOL. VI/16

Date: 19th December, 2022.

Mr. Daniel Omondi Ochanda,
Id No. 23406131.

RE: RESEARCH AUTHORIZARION.

Following your research authorization request vide NACOSTI licence No. NACOSTI/P/22/19579 to carry out research on, "***Factors affecting Credit Absorption from Agricultural Finance Corporation Among Smallholder Farmers in Lamu County*** for a period ending ***23/08/2023*** and the same is hereby granted.

By a copy of this letter, the Deputy County Commissioners, Lamu County are kindly requested to accord Mr. Daniel Omondi Ochanda the necessary assistance that he may require in order to accomplish his research mission.

Thank you.

COUNTY COMMISSIONER
LAMU COUNTY
P.O. Box 41-80500
LAMU

(G. M. GACHANJA)
FOR COUNTY COMMISSIONER,
LAMU COUNTY.

Copy to:-

County Police Commander,
LAMU COUNTY.

Deputy County Commissioners,
LAMU COUNTY.

County Director of Education,
LAMU COUNTY.

APPENDIX V: PARTICIPANT INFORMATION AND CONSENT FORM

TITLE OF THE PROPOSED STUDY

"FACTORS AFFECTING CREDIT ACCESS FROM AGRICULTURAL FINANCE CORPORATION AMONG SMALLHOLDER FARMERS IN LAMU COUNTY"

SECTION 1: INFORMATION SHEET

Principal Investigator: Mr Daniel Omondi Ochanda
Institutional affiliation: Strathmore Business School (SBS)

SECTION 2: INFORMATION ON THE STUDY

2.1: Purpose of Study

The general purpose of this study is to examine factors affecting credit access from Agricultural Finance Corporation among Smallholder farmers in Lamu County.

2.2: Do I have to take part?

No. Taking part in this study is entirely optional and the decision rests only with you. If you decide to take part, you will be asked to complete a questionnaire to get information on borrower, loan and farm attributes. You are free to decline to take part in the study from this study at any time without giving any reasons.

2.3: Who is eligible to take part in this study?

Smallholder farmers in Lamu County.

2.4: Who is not eligible to take part in this study?

Subsistence farmers (who barely interact with the market)
Large farmers (who are generally well financed)
Non farmers

2.5: What will taking part in this study involve for me?

You will be approached by the interviewer and requested to take part in the study. If you are satisfied that you fully understand the goals behind this study, you will be asked to sign the informed consent form (this form) and then taken through a questionnaire to complete.

2.6: Are there any risks or dangers in taking part in this study?

There are no risks in taking part in this study. All the information you provide will be treated as confidential and will not be used in any way without your express permission. **2.7: Are there any benefits of taking part in this study?**

The information will be used to improve on the rate of agricultural credit access among smallholder farmers in Lamu County.

2.8: What will happen to me if I refuse to take part in this study?

Participation in this study is entirely voluntary. Even if you decide to take part at first but later change your mind, you are free to withdraw at any time without explanation.

2.9: Who will have access to my information during this research?

All research records will be stored in securely locked cabinets. That information may be transcribed into our database but this will be sufficiently encrypted and password protected. Only the people who are closely concerned with this study will have access to your information. All your information will be kept confidential.

2.10: Who can I contact in case I have further questions?

You can contact me, **Mr DANIEL OMONDI OCHANDA**, at SBS, or by e-mail **ochanda.daniel@strathmore.edu** or by phone **+254 723 843 163**. You can also contact my supervisor, **Dr. HELLEN OTIENO**, at the Strathmore Business School, Nairobi, or by e-mail **hotieno@strathmore.edu** or by phone **+254 733 333 825.**

If you want to ask someone independent anything about this research, please contact:

The Secretary–Strathmore University Institutional Ethics Review Board, P. O. BOX 59857, 00200, Nairobi, email ethicsreview@strathmore.edu Tel number: +254 703 034 375

I, _____, have had the study explained to me. I have understood all that I have read and have had explained to me and had my questions answered satisfactorily. I understand that I can change my mind at any stage.

Please tick the boxes that apply to you;

Participation in the research study

[__] I AGREE to take part in this research

[__] I DO NDON'T AGREE to take part in this research

Storage of information on the completed questionnaire

[__] I AGREE to have my completed questionnaire stored for future data analysis

[_] I DO NDON'T AGREE to have my completed questionnaire stored for future data analysis.

Participant's Signature:

_____ Date: _____/_____/_____

DD / MM / YEAR

Participant's Name:

_____ Time: _____ /_____

(Please print name) **HR / MN**

I, _____ (Name of person taking consent) certify that I have followed the SOP for this study and have explained the study information to the study participant named above, and that s/he has understood the nature and the purpose of the study and consents to the participation in the study. S/he has been given opportunity to ask questions which have been answered satisfactorily.

Investigator's Signature:

_____ Date: _____/_____/_____

DD / MM / YEAR

Investigator's Name:

_____ Time: _____ /_____

(Please print name) **HR / MN**

APPENDIX VI: FOMU YA TAARIFA NA RIDHAA YA MSHIRIKI

KICHWA CHA MASOMO INAYOPENDEKEZWA

"MAMBO YANAYOATHIRI KIWANGO CHA KUCHUKUA MIKOPO KUTOKA KWA SHIRIKA LA FEDHA ZA KILIMO MIONGONI MWA WAKULIMA WADOGO KATIKA KAUNTI YA LAMU"

SEHEMU YA 1: HABARI YA UTAFITI

Mtafiti mkuu: Bwana Daniel Omondi Ochanda

Ushirikiano wa kitaasisi: Shule ya Biashara ya Strathmore (SBS)

SEHEMU YA 2: TAARIFA KUHUSU UTAFITI

2.1: Kusudi la Utafiti

Kusudi la jumla la utafiti huu ni kuchunguza sababu zinazoathiri kiwango cha kuchukua mikopo kutoka kwa Shirika la Fedha za Kilimo miongoni mwa wakulima wadogo katika Kaunti ya Lamu.

2.2: Je! Lazima nishiriki?

Hapana. Kushiriki katika utafiti huu ni hiari kabisa na uamuzi unakaa tu na wewe. Ukiamua kushiriki, utaulizwa kukamilisha dodoso ili kupata habari juu ya akopaye, mkopo na sifa za shamba. Uko huru kutamatisha kushiriki katika utafiti huu wakati wowote bila kutoa sababu yoyote.

2.3: Ni nani anayestahili kushiriki katika utafiti huu?

Wakulima wadogo katika Kaunti ya Lamu.

2.4: Nani haifai kushiriki katika utafiti huu?

Wakulima wa kujikimu (ambao huwana uhusiano sana na soko)

Wakulima wakubwa (ambao kwa ujumla wamefadhiliwa vizuri)

Wasio wakulima

2.5: Je! Kushiriki katika utafiti huu kunahusisha nini kwangu?

Utafikiwa na mhojiwa na kuombwa kushiriki katika utafiti. Ikiwa umeridhika kuwa unaelewa kikamilifu malengo yaliyo nyuma ya utafiti huu, utaulizwa kutia saini fomu ya idhini iliyo na habari (fomu hii) na kisha kuchukuliwa kupitia dodoso na kukamilisha.

2.6: Je! Kuna hatari yoyote katika kushiriki katika utafiti huu?

Hakuna hatari katika kushiriki katika utafiti huu. Habari yote unayotoa itachukuliwa kama ya siri na haitatumika kwa njia yoyote bila ruhusa yako ya kuelezea.

2.7: Je! Kuna faida zozote za kushiriki katika utafiti huu?

Habari za kotokana na utafiti huu zitatumika kuboresha kwa kiwango cha kuchukua mkopo wa kilimo kati ya wakulima wadogo katika Kaunti ya Lamu.

2.8: Je! Nini kitatokea kwangu ikiwa nitakataa kushiriki katika utafiti huu?

Ushiriki katika utafiti huu ni wa hiari kabisa. Hata ikiwa unaamua kushiriki mwanzoni lakini baadaye ubadilishe mawazo yako, uko huru kujiondoa wakati wowote bila maelezo.

2.9: Ni nani atakayepata habari yangu wakati wa utafiti huu?

Rekodi zote za utafiti zitahifadhiwa kwenye makabati yaliyofungwa salama. Habari hiyo inaweza kuandikwa katika hifadhidata yetu lakini hii itasimbwa vya kutosha na nywila kulindwa. Ni watu tu ambao wanajali sana utafiti huu watapata habari yako. Habari yako yote itahifadhiwa kwa siri.

2.10: Je! Ninaweza kuwasiliana na nani ikiwa nina maswali zaidi?

Unaweza kuwasiliana nami, Bwana DANIEL OMONDI OCHANDA, huko SBS, au kwa barua pepe ochanda.daniel@strathmore.edu au kwa simu **+ 254 723 843 163**. Unaweza pia kuwasiliana na msimamizi wangu, Dk. HELLEN OTIENO, katika Shule ya Biashara ya Strathmore, Nairobi, au kwa barua-pepe hotieno@strathmore.edu au kwa simu + 254 733 333 825.

Ikiwa unataka kuuliza mtu huru chochote kuhusu utafiti huu, tafadhali wasiliana na:

Katibu – Bodi ya Tathmini ya Maadili ya Taasisi ya Chuo Kikuu cha Strathmore, S.L.P 59857, 00200, Nairobi, barua pepe ethicsreview@strathmore.edu Nambari ya simu: + 254 703 034 375 Mimi, _____, nimejifunza. Nimeelewa yote ambayo nimeisoma na nimeelezewa na maswali yangu yamejibiwa kwa kuridhisha. Ninaelewa kuwa naweza kubadilisha uamuzi wangu katika hatua yoyote.

Tafadhali jibu masanduku ambayo yanahusu wewe;

Ushiriki katika utafiti

[ ] NAKUBALI kushiriki katika utafiti huu

[ ] SIKUBALI kushiriki katika utafiti huu

Uhifadhi wa habari katika dodoso lililokamilishwa

[ ] NAKUBALI kuwa dodoso langu lililokamilishwa lihifadhiwe kwa uchambuzi wa data ya baadaye

[ ] SIKUBALI kuwa dodoso langu lililokamilishwa lihifadhiwe kwa uchambuzi wa data ya baadaye.

Saini ya Mshiriki: _____Tarehe: _____

SK / MZ / MWAKA

Jina la Mshiriki: _____ Wakati: _____

(Tafadhali chapisha jina) **SAA / DK**

Mimi, _____ (Jina la mtu anayechukua idhini) ninathibitisha kuwa nimefuata maagizo kwa utafiti huu na nimeelezea habari ya utafiti kwa mshiriki wa utafiti aliyetajwa hapo juu, na hiyo ameelewa asili na madhumuni ya utafiti na makubaliano ya ushiriki katika utafiti. Amepewa nafasi ya kuuliza maswali ambayo yamejibiwa kwa kuridhisha.

Saini ya Mpelelezi: _____ Tarehe: _____

SK / MZ / MWAKA

Jina la Mpelelezi: _____Wakati: _____

(Tafadhali chapisha jina) **HR / MN**

APPENDIX VII: QUESTIONNAIRE

Interview No: ……. Date ……. Enumerator……

SECTION A: DEMOGRAPHIC INFORMATION

1. What is your gender? [tick where appropriate]
   Male [__] Female [__]
2. What is your religion? [tick where appropriate]
   Christian [__] Muslim [__] others (specify) …….
3. Indicate your age bracket? [tick where appropriate]
   18 -27[__] 28 – 37[__] 38 – 47[__] 48 – 57[__] 57 and above [__]
4. What is your highest level of education? [tick where appropriate]
   Below primary [__] Primary [__] Secondary [__] College [__]
5. What is your marital status? [tick where appropriate]
   Single [__] Married [__] Separated [__] Divorced [__] Widowed [__]
6. How many children do you have?
   Below 5 years …… 6 years to 12 years ……...
   13 years to 18 years …… Above 18 years ……

SECTION B: BORROWER ATTRIBUTES

7. The following statements relate to borrower attributes, tick your level of agreement or disagreement on the effects they have on agricultural credit access in Lamu County on a 5 Likert scale where. 1 Strongly disagree; 2. Disagree; 3. Somewhat Agree; 4 Agree; 5. Strongly Agree?

Statement	1	2	3	4	5
I don't think I can be given a loan because of my age					
I think agricultural loans are given to men only					
I think agricultural loans are given to both men and women					
I have not attained formal education that exposes me to borrow a loan					
I have no farm management skills that enabled me to manage my farm on borrowed funds.					
I have no farming experience to run my farm on borrowed funds.					
I have no other income sources to supplement my loan repayment					

SECTION C: LOAN ATTRIBUTES

8. The following statements relate to loan attributes, tick your level of agreement or disagreement on the effects they have on agricultural credit access in Lamu County on a 5 Likert scale where. 1 Strongly disagree; 2. Disagree; 3. Somewhat Agree; 4 Agree; 5. Strongly Agree?

Statement	1	2	3	4	5
I do not know the acceptable minimum or maximum loan amount to be applied for.					
I think the loan processing fee and application fee are too high					
High transport costs make it difficult to access the credit					
I think the cost of collateralization/legal cost is too high					
I think costs imposed on borrowers for control and monitoring of the credit by the lenders is too high.					
I think the total cost of time to be spent in processing the credit is too high.					
I have no security to cover the desired loan amount.					
The loan repayment schedules are not flexible to accommodate my farm production cycle income.					

SECTION D: FARM ATTRIBUTES

9. The following statements relate to farm attributes, tick your level of agreement or disagreement on the effects they have on agricultural credit access in Lamu County on a 5 Likert scale where. 1 Strongly disagree; 2. Disagree; 3. Somewhat Agree; 4 Agree; 5. Strongly Agree?

Statement	1	2	3	4	5
I can easily reach the lenders to borrow because my farm is not located too far away.					
I use greenhouse technology in my farm.					
I use irrigation technology in my farm					
I use zero grazing technology in my farm					
I use artificial insemination technology in my farm					
I use crop protection technology in my farm					
I use fertigation technology in my farm					
I use feedlot technology in my farm					
My farm productivity can support the loan repayment.					
I am in contact with extension officers who advises me on farm credit sources.					

SECTION E: AGRICULTURAL CREDIT ACCESS

10. Have you obtained any agricultural credit within the last three years? YES [__] NO [__]
If YES, what was the total amount applied for in Kenya shillings?

	AMOUNT IN KENYA SHILLINGS				
YEAR	Below 200,000	200,000 - 400,000	400,000 - 600,000	600,000 - 800,000	800,000 - 1,000,000
2020					
2021					
2022					

11. I would like to ask about the loan amount received [Tick all that apply]

	YEAR		
	2020	**2021**	**2022**
My loan application was rejected			
I received less than the applied amount			
I received the actual applied loan amount			

12. Which financial institution did you approach for the loan facility? AFC [__] BANK [__] SACCO [__] OTHERS [__]
If OTHERS, please indicate …….

13. What was the loan category (ies)? [Tick all that apply]

Loan category	***Response***
Seasonal crop loan	
Cash/permanent crop loan	
Livestock loan	
Horticultural crop loan	
Fisheries loan	
Farm Machinery	
Others (Specify)	

14. If any of your loan applications was rejected, what was the reason(s) for rejection on a 5 Likert scale where 1 Strongly disagree; 2. Disagree; 3. Somewhat Agree; 4 Agree; 5. Strongly Agree? [Tick all that apply]

Statement	1	2	3	4	5
Lack/insufficient or poor collateral					
Perceived lack of profitability of the farm					
Incomplete information/ farm records					
Inadequate/poor credit history					
Incompleteness of the loan application forms					
Farming enterprise not sufficiently viable to justify borrowing					
Any other (please specify)					

17. If you did not apply for a loan, what was the reason(s) for not applying for the loan on a 5 Likert scale where 1 Strongly disagree; 2. Disagree; 3. Somewhat Agree; 4 Agree; 5. Strongly Agree? [Tick all that apply]

Statement	1	2	3	4	5
I did not want to be in debt					
I had adequate savings from my investment to use					

I had borrowed from my spouse					
I had borrowed from other relatives and/or friends					
I feared making loan repayments					
I did not know where to apply for a loan					
I did not know how to apply for a loan					
The interest rates were too high					
I did not have sufficient collateral or didn't meet/fulfill requirements					
The application procedures were too burdensome					
I did not think the loan would be approved					
I did not need the loan					
Any other (please specify)					

THANK YOU

APPENDIX VIII: DODOSO

Nambari ya Mahojiano: ……..…. Tarehe ……..……Enumerator……

SEHEMU A: HABARI ZA DEMOGRAFIA

1. Jinsia yako ni gani? [tiki inapofaa]
   Mwanaume [__] Kike [__]
2. Dini yako ni gani? [tiki inapofaa]
   Mkristo [__] Mislamu [__] Mengine (taja) …….
3. Onyesha kibano yako ya umri? [tiki inapofaa]
   8 -27 [__] 28 – 37 [__] 38 – 47 [__] 48-57– [__] 57 na Zaidi [__]
4. Je! Unakiwango gani cha elimu? [tiki inapofaa]
   Chini ya msingi [__] Msingi [__] Sekondari [__] Chuo [__]
5. Je! Hali yako ya ndoa ni ipi? [tiki inapofaa]
   Sijaolewa [__] Nimeolewa [__] Tumetengana [__] Talaka [__] Mjane [__]
6. Una watoto wangapi?
   Chini ya miaka 5 ……...
   Miaka 13 hadi miaka 18 ..... Zaidi ya miaka 18 ……

SEHEMU B: SIFA ZA AKOPAYE

7. Taarifa zifuatazo zinahusiana na sifa za akopaye, tiki kiwango chako cha makubaliano au kutokubaliana juu ya athari zinazo kwenye uwekaji wa mkopo wa kilimo katika Kaunti ya Lamu kwenye viwango 5 vya Likert. 1 Kutokubaliana sana; 2. Kutokubaliana; 3. Kukubaliana kwa kiasi fulani; 4 Kukubaliana; 5. Kukubaliana sana?

Taarifa	1	2	3	4	5
Sidhani kama naweza kupewa mkopo kwa sababu ya umri wangu					
Nadhani mikopo ya kilimo hupewa wanaume tu					
Nadhani mikopo ya kilimo inapewa wanaume na wanawake					
Sijapata elimu rasmi ambayo inanionyesha kukopa mkopo					
Sina ujuzi wa usimamizi wa shamba ambao uliniwezesha kusimamia shamba langu kwa fedha zilizokopwa					
Sina uzoefu wa kilimo kuendesha shamba langu kwa fedha zilizokopwa					
Sina vyanzo vingine vya mapato kuongeza ulipaji wangu wa mkopo					

SEHEMU YA C: SIFA ZA MKOPO

8. Taarifa zifuatazo zinahusiana na sifa za mkopo, tiki kiwango chako cha makubaliano au kutokubaliana juu ya athari zinazo kwenye uwekaji wa mkopo wa kilimo katika Kaunti ya Lamu kwenye viwango 5 vya Likert. 1 Kutokubaliana sana; 2. Kutokubaliana; 3. Kukubaliana kwa kiasi fulani; 4 Kukubaliana; 5. Kukubaliana sana?

Taarifa	1	2	3	4	5
Sijui kiwango cha chini cha kukubalika au kiwango cha juu cha mkopo					

Nadhani ada ya usindikaji wa mkopo na ada ya maombi ni kubwa sana					
Gharama kubwa za usafirishaji hufanya iwe ngumu kupata mkopo					
Nadhani gharama ya dhamana / gharama ya kisheria ni kubwa sana					
Nadhani gharama zilizowekwa kwa wakopaji kwa udhibiti na ufuatiliaji wa mkopo na wakopeshaji ni kubwa sana					
Nadhani gharama ya jumla ya muda inayotumika katika usindikaji wa mkopo ni kubwa sana					
Sina dhamana kiasi cha mkopo ninachotaka					
Ratiba za ulipaji wa mkopo hazibadiliki kutoshea mapato yangu ya mzunguko wa uzalishaji wa shamba					

SEHEMU YA D: SIFA ZA SHAMBA

9. Taarifa zifuatazo zinahusiana na sifa za shamba, tiki kiwango chako cha makubaliano au kutokubaliana juu ya athari zinazo kwenye uwekaji wa mkopo wa kilimo katika Kaunti ya Lamu kwenye viwango 5 vya Likert. 1 Kutokubaliana sana; 2. Kutokubaliana; 3. Kukubaliana kwa kiasi fulani; 4 Kukubaliana; 5. Kukubaliana sana?

Taarifa	1	2	3	4	5
Naweza kufikia wakopeshaji kwa urahisi kwa sababu shamba langu haliko mbali sana					
Ninatumia nyumba ya plastiki katika shamba langu					
Ninatumia teknolojia ya kunyunyiza katika shamba langu					
Ninatumia teknolojia ya malisho sifuri katika shamba langu					
Ninatumia teknolojia ya kuingiza mbegu katika shamba langu					
Ninatumia teknolojia ya ulinzi wa mazao katika shamba langu					
Ninatumia teknolojia ya kunyunyiza rutuba katika shamba langu					
Ninatumia teknolojia ya kulisha katika shamba langu					
Uzalishaji wangu wa shamba unaweza kusaidia ulipaji wa mkopo					
Ninawasiliana na maafisa wa Kilimo ambao hunishauri juu ya vyanzo vya mkopo wa shamba					

SEHEMU YA E: KIWANGO CHA KUCHUKUA MIKOPO YA KILIMO

10. Je! Umepata deni yoyote ya kilimo ndani ya miaka mitatu iliyopita?
    NDIYO [__] HAPANA [__]
    Ikiwa NDIYO, jumla ya kiasi kilitumika kwa shilingi za Kenya?

	KIASI KWA SHILLINGI YA KENYA				
MWAKA	Below 200,000	200,000 - 400,000	400,000 - 600,000	600,000 - 800,000	800,000 - 1,000,000
2020					
2021					
2022					

11. Ningependa kuuliza juu ya kiasi cha mkopo kilichopokelewa [Chagua yote yanayoambatan]

	MWAKA		
	2020	**2021**	**2022**
Maombi yangu ya mkopo yalikataliwa			
Nilipokea chini ya kiasi kinachotumika			
Nilipokea kiasi halisi cha mkopo kinachotumika			

12. Je! Ni taasisi gani ya kifedha iliyokupa mkopo?
AFC [__] BENKI [__] SACCO [__] MENGINE [__]
Ikiwa MENGINE tafadhali andika …….

13. Je! Kitengo cha mkopo kilikuwa kipi? [Chagua yote yanayoambatana]

Kitengo cha mkopo	***Jibu***
Mkopo wa mazao ya msimu	
Mkopo wa mazao ya kudumu	
Mkopo wa mifugo	
Mkopo wa kilimo bustani	
Mkopo wa ufugaji wa samaki	
Mkopo wa mashine ya shambani	
Mangine (taja)	

14. Ikiwa maombi yako yoyote ya mkopo yalikataliwa, sababu ilikuwa nini ya kukataliwa kwa Viwango 5 vya Likert ambapo 1 hawakubaliani sana; 2. Kutokubaliana; 3. Kukubaliana kwa kiasi fulani; 4 Kukubaliana; 5. Kukubaliana sana? [Chagua yote yanayoambatana]

Taarifa	1	2	3	4	5
Ukosefu wa dhamana ya kutosha au duni					
Kukosekana kwa faida ya shamba					
Habari kamili / rekodi za shamba					
Historia duni ya mikopo					
Kukosea kwa kujaza fomu za maombi ya mkopo					
Biashara ya kilimo haifai vya kutosha kuhalalisha kukopa					
Nyingine yoyote (tafadhali taja)					

15. Ikiwa haukuomba mkopo, ni nini sababu kwa kutoomba mkopo kwa mkopo viwango 5 vya Likert ambapo 1 hawakubaliani sana; 2. Kutokubaliana; 3. Kukubaliana kwa kiasi fulani; 4 Kukubaliana; 5. Kukubaliana sana? [Chagua yote yanayoambatana]

Taarifa	1	2	3	4	5
Sikutaka kuwa katika deni					
Nilikuwa na akiba ya kutosha kutoka kwa uwekezaji wangu kutumia					
Nilikuwa nimekopa kutoka kwa mwenzi wangu					
Nilikuwa nimekopa kutoka kwa jamaa wengine na / au marafiki					

Niliogopa ulipaji wa mkopo					
Sikujua wapi kuomba mkopo					
Sikujua jinsi ya kuomba mkopo					
Viwango vya riba vilikuwa vya juu sana					
Sikuwa na dhamana ya kutosha au sikukidhi / kutimiza mahitaji					
Taratibu za maombi zilikuwa nzito sana					
Sikufikiria mkopo utapitishwa					
Sikuhitaji mkopo					
Nyingine yoyote (tafadhali taja)					

ASANTE

APPENDIX IX: RESEARCH WORK PLAN

Activities	Duration in weeks
Research project proposal development and approval	4 weeks
Literature Review	4 weeks
Developing the data collection instrument	1 week
Fieldwork	2 week
Data analysis and period up to research report approval	2 weeks
Period up to defense presentation of research report findings	1 week
Development of final project work and submission to research coordinator at SSB	5 weeks

Source: Author (2023)

APPENDIX X: RESEARCH BUDGET

ITEMS	QUANTITY	UNIT PRICE	TOTAL AMOUNT KES
Research Assistants (Two)			
Transport	16 days	300	4,800
Meal	16 days	200	3,200
Daily allowance	16 days	500	8,000
Sub Total			**16,000**
Travelling and subsistence expenses			
Transport	16 days	500	8,000
Meal	16 days	300	4,800
Sub Total			**12,800**
Stationery			
Pens and pencils	9	50	450
Stapler	1	400	400
Staples	1	100	100
Writing pads (ream)	1	350	350
Sub Total			**1,300**
Communication			
Airtime	1	3,000	3,000
Sign Language Interpreter	5days	2500	12,500
Sub Total			**15,500**
Printing and Binding			
Internet			5,000
Printing			2,740
Binding			300
Sub Total			**8,040**
GRAND TOTAL			**53,640**

Source: Author (2023)

APPENDIX XI: STUDY RESULTS DISSEMINATION PLAN

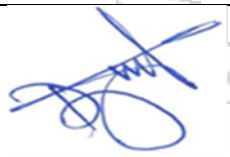
TARGET STAKEHOLDER	TARGET TIMELINE	MODE OF DISSEMINATION
Government of Kenya	1ST September 2023 – 31st December 2023	• Presentation of the finding to the national and county government departments of agriculture**.** • Stakeholders forums
AFC Management	1st September 2023 – 30th September 2023	• Presentation of the final report to the management of AFC.
Smallholder farmers	1st September 2023 – 31st June 2024	• Local chief's barraza's • Using the local model farmers • Collaborating with the agricultural extension officers.

Source: Author (2023)

CERTIFICATE OF FINAL VERSION OF THESIS/DISSERTATION

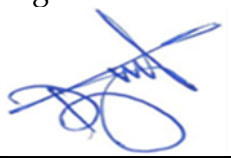
Name of Candidate: Mr. DANIEL OMONDI OCHANDA	Student Number: 114729
Faculty/School/Institute: STRATHMORE BUSINESS SCHOOL	Title of Degree: MASTERS OF MANAGEMENT IN AGRIBUSINESS
Title of Thesis: *"Factors Affecting Credit Access from Agricultural Finance Corporation Among Smallholder Farmers in Lamu County"*	
Postal Address: 8859 – 00300 NAIROBI	Email: ochandadan@gmail.com
Expected date of Graduation: 7th July 2023	
Number of Permanently bound copies submitted: Two (2) ***Final Soft Copy submitted:*** *√Yes* ***□No***	

Please ensure that you show punctuation and italics exactly to ensure that your title appears correctly on your academic transcript. The title recorded here should be EXACTLY as appears on the cover page of your thesis.

Candidate's signature: 	Date: 9th June 2023

GRADUATION CEREMONY (If not attending a Graduation Ceremony, enter 'Not Applicable')
Please list full names and titles of supervisors in the order to be listed on the Graduation Ceremony booklet
Dr. Hellen Otieno, Senior Lecturer and Associate Dean Academic and Student Affairs, Strathmore University Business School.

DECLARATION

We, the undersigned, agree and certify that this is the final version of the thesis and no further alterations will be made.		
Candidate: Mr. Daniel Omondi Ochanda	Signature: 	Date: 9th June 2023
Principal Supervisor: Dr. Hellen Otieno	Signature: 	Date: 9th June 2023
Co- Supervisor	Signature	Date
Director of Graduate Studies	Signature	Date