FINANCIAL SERVICES ACCESSIBILITY, FINANCIAL LITERACY, AND INVESTMENT IN LIVESTOCK FARMING AMONG PASTORALIST HOUSEHOLDS IN KENYA

By

MOHAMED A HASSAN

MASTER OF SCIENCE IN COMMERCE (FINANCE AND INVESTMENT)

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NOVEMBER, 2025

DECLARATION

I declare that this dissertation is my original work and has not been previously published or submitted elsewhere for award of a degree. I also declare that this contains no material written or published by other people except where due reference is made and author duly acknowledged.

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Signature:  **Date:** 24/07/2025

I do hereby confirm that I have examined the master's dissertation of

Mohamed Abdi Hassan

And have certified that all revisions that the dissertation panel and examiners recommended have been adequately addressed.

Signature:……. Date: ……../……../2025

Dr. Peter Omae

ABSTRACT

This study examined the effect of financial services accessibility on livestock investment decisions among pastoralist households in Kenya. The specific objectives were to assess the effect of credit facilities, mobile banking adoption, financial literacy, and access to savings platforms on livestock investment decisions, and to evaluate whether cultural attitudes moderate these relationships. The study was guided by three theoretical frameworks. The Theory of Planned Behavior was used to explain how attitudes, perceived behavioral control, and subjective norms influence financial decision-making. The Financial Intermediation Theory provided a basis for understanding how financial institutions help mobilize resources and reduce transaction costs. The Technology Acceptance Model was applied to explain how perceived usefulness and ease of use affect the adoption of mobile banking services among pastoralist communities. The study adopted a descriptive and inferential research design. A multistage sampling technique was used to select 400 respondents from eight counties, and 303 valid responses were analyzed. Data were collected using structured questionnaires and analyzed using descriptive statistics, Pearson correlation, and multiple linear regression. The regression model produced an R-squared value of 0.589, showing that 58.9 percent of the variation in livestock investment decisions was explained by the four financial predictors. Financial literacy had the strongest positive effect on investment in livestock farming ($\beta = 0.692$, $p < 0.001$). Mobile banking adoption ($\beta = 0.583$, $p < 0.001$), access to savings platforms ($\beta = 0.468$, $p < 0.001$), and credit availability ($\beta = 0.169$, $p < 0.05$) also showed statistically significant influence. Cultural attitudes, tested as a moderating variable, did not produce significant interaction effects, indicating that investment behavior is mainly influenced by financial access and capability rather than cultural beliefs. The study concludes that financial services, especially those that improve literacy, digital access, and savings options, play an important role in supporting livestock investment and improving household economic stability. It recommends that policymakers develop financial education programs suited to pastoralist communities, expand mobile banking infrastructure in remote areas, and create flexible credit products that consider informal income patterns and lack of collateral. Financial institutions should work with community-based groups to design savings mechanisms that are culturally appropriate, while development agencies should help link informal savings groups to formal financial systems. These findings provide evidence that targeted financial interventions can improve investment behavior and strengthen livelihoods among pastoralist households. Future research should consider using longitudinal designs and mixed methods to explore changes in financial behavior over time and to better understand the role of cultural factors in investment decisions.

Key Words: *Financial Services Accessibility; Credit Facilities; Mobile Banking Adoption; Financial Literacy; Savings Platforms; Cultural Attitudes; Livestock Investment; Pastoralist Households; Kenya; Financial Inclusion.*

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DEDICATION

This research proposal is dedicated to my wife Qamar Sheikh whose unwavering support, encouragement, and belief in my academic journey have been a source of inspiration.

I also dedicate this work to the pastoralist communities of Kenya, whose lived experiences and resilience continue to motivate the pursuit of knowledge and solutions aimed at improving livelihoods through inclusive financial systems.

May this study, once completed, contribute meaningfully to the empowerment of underserved populations and the advancement of evidence-based policy and practice.

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ACRONYMS AND ABBREVIATIONS

Acronym/Abbreviation	Meaning
ASALs	Arid and Semi-Arid Lands
FAO	Food and Agriculture Organization
GDP	Gross Domestic Product
IFC	International Finance Corporation
KNBS	Kenya National Bureau of Statistics
M-Pesa	Mobile Money Transfer Service by Safaricom
PWB	Psychological Well-Being

GLOSSARY

Terms	Operational Definition
Financial Inclusion	The accessibility and usage of financial services that enable households to manage risks, build assets, and improve livelihoods (Pomeroy et al., 2020).
Livestock Investment	The choices made by pastoralist households regarding livestock acquisition, management, and sales, influenced by financial access and economic conditions (Mayala, Katundu & Msuya, 2019).
Savings Platforms	Formal and informal financial instruments or institutions that enable households to store and manage their financial resources (Ndung'u & Oguso, 2021).
Cultural Attitude	The set of beliefs, norms, and values that shape household financial behaviors and investment decisions within a given community (Bonna & Amoah, 2019).
Mobile Banking	The use of mobile technology to access financial services, including payments, transfers, and savings (McGregor, 2013).
Credit Facilities	Financial mechanisms that provide households with access to loans or credit for investment in livestock and other economic activities (Al-Qudah et al, 2020).
Financial Literacy	The ability of individuals to understand and effectively use financial tools and concepts to make informed decisions (Zait & Bertea, 2015).
Risk Management	Strategies employed by households to mitigate uncertainties related to financial and livestock investments (Korir, 2011).
Market Participation	The extent to which households engage in livestock trade, influenced by financial access and economic incentives (Boughton et al., 2007).

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Stock keeping is a crucial economic activity for pastoralists, contributing to their livelihood needs and cushioning against shocks (International Livestock Research Institute, 2022). Farming investment includes livestock acquisition, animal health and veterinary services, and livestock improvement (USAID 2018). Livestock is a vital part of rural livelihoods, food sources, income, and employment globally. The Food and Agriculture Organization (FAOSTAT, 2020) estimates that livestock supplies 40% of the monetary value of agricultural products and helps 1.3 billion people in food insecurity. Livestock farming varies globally, with pocketed intensive systems in western countries and extensive animal raising in Africa and pastoralist systems in South America and Asia (Simpkin et al., 2020). In developing countries, livestock is an income generator and a vital livelihood asset for the rural poor, providing insurance and income diversity (Baltenweck et al., 2020).

Regionally, livestock investment plays a vital role in the livelihoods of pastoralists across Africa, particularly in arid and semi-arid regions. According to IFAD (2024), livestock supports income generation, food security, and poverty alleviation, with nomadic farming prevalent in countries like Kenya, Ethiopia, and Somalia. Despite livestock's economic and social importance, pastoralist communities face persistent challenges such as drought, disease, and constrained financial opportunities. Addressing these barriers through targeted livestock investment can enhance productivity and drive sustainable development.

In Kenya, livestock serves as a cornerstone of pastoralist wealth and livelihood, particularly in ASAL areas where it contributes approximately 12% of GDP and sustains over 10 million people (Kaimba, Njehia & Guliye, 2021). Recognizing the factors that influence livestock investment is therefore critical to developing inclusive financial and policy frameworks. Access to credit facilities remains essential for stimulating livestock investment. Globally, credit boosts agricultural productivity (World Bank, 2021), while in rural Africa, microfinance and cooperative models play a key role in expanding access (IFC, 2023). In Kenya, credit enables pastoralists to acquire healthier livestock and expand herds (Barrett et al., 2021; Binswanger-Mkhize, 2022). Mobile banking has transformed financial transactions, especially in remote regions (GSMA, 2024). Innovations like M-Pesa have increased economic inclusion and accessibility to financial services (Jack & Suri, 2024). In Kenya, mobile banking allows pastoralists to securely save, transfer, and receive money, thereby influencing livestock investment choices (Mburu, Massima & Kaberia, 2021).

Financial literacy is also a key determinant. As defined by Lusardi & Mitchell (2024), it enhances financial decision-making and investment outcomes. In African contexts, literacy initiatives improve financial management and empower rural communities (Atkinson & Messy, 2022). Pastoralists in Kenya benefit from targeted training that improves their capacity to mobilize resources and make informed investment decisions (Lusardi & Mitchell, 2024; Atkinson & Messy, 2022). Finally, access to savings platforms supports pastoral investment. Globally, savings underpin financial stability and future planning (Kim et al., 2021). In Africa, secure savings tools help rural communities invest prudently (Dupas & Robinson, 2023). In Kenya, improving savings access can help pastoralists build financial strategies for livestock investment, including infrastructure for animal health and productivity (FAO, 2021).

1.1.1 Livestock Investment Decisions among Pastoralist

Livestock investment among pastoralists involves the strategic expenditure of capital, people, and technologies to improve animal production productivity and efficiency. This involves purchasing animals, constructing production structures, and implementing improvements in practices (Kabore, 2020). Pica-Ciamarra et al. (2024) add veterinary costs, feed, forage, nutrition costs, and knowledge enhancement projects to the definition of livestock investment. Otte et al. (2022) explore intangible drivers, such as knowledge transfer capabilities, innovations, and new technologies, as sustainable productivity drivers. Livestock investment not only enhances livelihood resilience and sources of household income but also contributes to the overall economic growth of pastoralists.

At the global level, recent studies have highlighted the need to invest in livestock systems for different levels of development to support food security. The Food and Agriculture Organisation (2020) suggests that targeted capital investment in crops and livestock sectors can increase output by up to 25%. This investment leads to technological advancements, end-to-end value chains, job creation, and income enhancement for rural dwellers (Seré, 2020). It goes beyond animal procurement and structures, embracing sustainable practices and enhancing the value chain. This investment encompasses financial, technical, and institutional dimensions, enabling long-term economic change and improved food security outcomes.

Regionally in Africa, livestock investment is a key determinant of socio-economic development and a key resilience asset among pastoral societies. Enahoro et al. (2021) found that increased funding for livestock production in Sub-Saharan Africa has increased productivity by nearly 1.8%. Investment in veterinary facilities and improved animal husbandry has reduced

mortality rates and improved herds (Mutabazi and Boniface 2021). Chiliswa and Omamo (2024) argue that these financial interventions help address liquidity fluctuations and improve climate change coping abilities among pastoralists. The study suggests that quality livestock investment promotes sustainable farming practices and rural welfare in Africa.

In the Kenyan context, investment in livestock plays a significant role in enhancing the sources of income and food baskets. The International Livestock Research Institute (2023) reports that capital investment in animal health technologies, breeding, and proper animal stock structures has increased productivity by 18% in the last decade. Chiliswa and Omamo (2024) argue that targeted credit facilities and capacity-building programs help pastoralists tackle market fluctuations and climactic challenges. Local studies show that effective financial management is crucial for the consolidation and economic well-being of pastoral people. These findings call for policy reforms to promote an environment conducive to investing in Kenya's livestock sector.

1.1.2 Financial Access

Financial access refers to the ability of the population to acquire and use various financial goods and services, including credit, savings, insurance, and digital financial services (Beck et al, 2021). It is a comprehensive set of measures that depends on the level of financial literacy of users. Digitalization has changed financial inclusion from traditional transactions to outreach, transforming ownership of a bank account from a sinister experience to a powerful tool for economic activity. The intensity of usage depends on the level of financial literacy of users (Beck et al, 2021; Ononiwu et al, 2024).

At the global level, financial access has undergone structural transformation due to innovation in technology and policy reforms. According to the World Bank (2020), digital

financial services have expanded access to banking, reaching millions of previously excluded individuals and raising global financial inclusiveness by 31% in the last decade. CGAP (2023) highlights that mobile banking innovations continue to benefit low-income users by minimizing transaction costs and facilitating credit availability. This expansion is built on a dynamic ecosystem of credit facilities, savings, payments, and transfers that collectively form the basis of financial inclusion. From these global trends, it is evident that inclusive financial systems have become central to sustainable development efforts.

At the regional level, many African countries have prioritized financial access as a core development strategy. As reported by the African Development Bank (2021), recent initiatives have led to over 60% of adults now utilizing basic financial services across the continent. IFC (2022) underscores that targeted digital finance solutions have significantly boosted credit access and saving practices, particularly among low-income populations. These innovations have reinforced financial reliability and supported growth in agriculture and small-scale enterprises. The overarching goal within the region has been to leverage financial inclusion as a tool for resilience, economic diversification, and poverty alleviation.

In Kenya, financial access is increasingly seen as a catalyst for economic empowerment and inclusive growth. The Central Bank of Kenya (2022) indicates that approximately 80% of individuals now have access to financial services, largely due to the rise of mobile money technologies and progressive policy reviews. Mwangi (2023) notes that digital financial platforms have played an instrumental role in stimulating rural development by improving access to affordable credit, savings tools, and insurance products. These platforms are gradually displacing conventional banking models by offering accessible and low-cost alternatives. Kenya's experience

demonstrates how localized financial innovations can transform investment behavior, reduce inequality, and support long-term poverty reduction.

In addition to financial and infrastructural constraints, cultural attitudes significantly influence investment in livestock farming among pastoralist households (Mayala, Katundu & Msuya, 2019). Traditional norms regarding livestock ownership, gender roles in financial decision-making, and communal saving practices shape how pastoralists engage with financial services (Yazew, 2024). For example, livestock is often regarded not only as an economic asset but also as a symbol of prestige and lineage, which affects decisions related to selling, investing, or diversifying (Kagunyu & Wanjohi, 2022). Furthermore, cultural skepticism toward mobile banking and formal credit, often rooted in mistrust or unfamiliarity, may moderate the effectiveness of financial interventions. Recognizing these cultural dynamics is essential for designing inclusive financial strategies that align with pastoralist values and behaviors and for understanding how cultural factors interact with financial access variables to influence investment outcomes.

1.1.3 Pastoralism in Kenya

Pastoralism serves as both an economic backbone and cultural identity for numerous Kenyan communities, especially in arid and semi-arid regions. These areas, receiving irregular rainfall between 200 and 600 millimeters annually, face recurring challenges related to water scarcity, pasture degradation, and resource-based conflict (Kenya Red Cross and British Red Cross, 2023). Millions of households depend on livestock not only for sustenance and trade but also for social capital. Their investment decisions are influenced by traditional knowledge, financial access, and climate-related uncertainties. Mobility remains a key adaptive strategy, as

pastoralists migrate seasonally in response to ecological pressures and market demands (Amina, 2024).

Despite its significance, the pastoral economy remains underserved by formal financial systems. Many households continue to rely on informal financing, such as loans from traders or family. Access to credit, mobile banking, and savings platforms is still limited due to low financial literacy and infrastructural barriers (Kenya Red Cross and British Red Cross, 2023). Shoats are typically owned by poorer households, while camels represent wealth among more financially stable families. These investment patterns are shaped by climatic conditions and socio-economic factors, with financial exclusion further constraining the ability of pastoralists to respond to market opportunities or build resilience.

Structural barriers also impede livestock productivity and health. Periodic droughts and minimal veterinary support force reliance on indigenous medicine and limit herd stability (Kenya Red Cross and British Red Cross, 2023). Access to Sharia-compliant financial products remains inadequate, resulting in reluctance to engage with conventional institutions. This exclusion restricts financing for expansion or diversification, leaving many pastoralists vulnerable to environmental shocks and economic downturns. The prevailing lack of formal infrastructure continues to discourage long-term investment, especially in disease control and livestock upgrading strategies.

However, emerging financial inclusion initiatives show promise in transforming the sector. According to Amina (2024), programs that integrate mobile banking, healthcare, education, and climate-smart water management are advancing pastoralist resilience. Innovations like mobile money provide secure transaction platforms, while infrastructure and market connectivity enhance financial autonomy. Although these initiatives are in nascent stages, they underscore the potential

of blending traditional systems with modern financial tools to support sustainable pastoral livelihoods. As access widens, pastoralists are better positioned to stabilize herds, plan investments, and adapt to shifting ecological and economic landscapes (Amina, 2024).

1.2 Statement of the Problem

Investment in livestock farming among pastoralist households in Kenya is central to economic resilience and food security. The livestock sector contributes approximately 12 percent to Kenya's GDP and supports over 70 percent of rural livelihoods in arid and semi-arid lands (ASALs), where pastoralism is dominant (KNBS, 2023). Despite this significance, pastoralist communities face persistent challenges that limit their ability to invest effectively in livestock. These challenges include limited access to formal financial services, low levels of financial literacy, and underutilization of mobile banking platforms. The absence of tailored financial products and weak integration of savings platforms further constrain investment behavior. These gaps are particularly acute in pastoralist regions, where livestock remains the primary economic asset and financial innovations are yet to be fully adopted. Addressing these constraints requires localized empirical research that links financial access variables to livestock investment behavior in a statistically grounded manner.

Globally, rangelands cover more than a quarter of the earth's land surface and support millions of poor households in developing countries (Zerga, 2025). Zhang and Wu (2020) emphasize that financial inclusion is vital for pastoral sustainability, yet access to credit in China's pastoral regions remains inconsistent. Their study highlights the need for credit facilities but does not present a comprehensive picture of financial access, limiting the development of holistic investment strategies. Wane et al. (2020) further note that the economics of pastoralism remain underexplored, especially regarding financial market development and mobile money usage.

These studies underscore the need for more granular research that captures the role of financial intermediaries in shaping investment behavior among pastoralists. However, they fall short of addressing localized financial constraints and behavioral factors that influence investment in livestock farming.

Regionally, African pastoralists face structural barriers to accessing financial and water resources. Mfinanga, Erick, and Mdoe (2024) found that water access significantly affects household income in Tanzania's pastoralist communities. However, their cross-sectional design may not capture long-term financial effects. Tura and Tekalegni (2023) examined pastoral livelihoods in Ethiopia, focusing on market accessibility and veterinary services, but did not address financial literacy or mobile banking. These studies affirm the need for micro-level research tailored to specific localities, especially regarding mobile money and credit facilities. Despite macro-level studies on emerging markets in Africa, there remains a lack of granular evidence on financial affordability and mobile banking usage among pastoralists in Kenya. This gap limits the development of targeted financial interventions that could enhance livestock investment outcomes.

Locally, pastoralists in Kenya face threats that directly affect livestock productivity and household welfare. Environmental degradation, recurrent droughts, and poor pasture quality due to climate change, coupled with limited access to veterinary and financial services, intensify competition for scarce resources (Mogeni, 2024). According to Mburu, Kaiser, and Sousa-Poza (2023), shocks such as drought significantly influence livestock stock dynamics in northern Kenya, but their household panel study did not examine financial literacy or mobile banking adoption. Lutta et al. (2021) identified market distance and group marketing practices as key determinants of livestock market participation in Tana River County, yet their study did not explore the role of financial intermediaries. These gaps point to the need for empirical research that examines how

credit facilities, mobile banking, financial literacy, and savings platforms influence investment in livestock farming among Kenya's pastoralist households.

This study is therefore necessitated by the absence of robust, localized empirical evidence linking financial access variables to investment in livestock farming among pastoralist households. It seeks to address this conceptual gap by theorizing the role of credit facilities, mobile banking, financial literacy, and savings platforms in shaping investment behavior. It also responds to contradictory empirical findings by testing these relationships through a structured, statistically grounded methodology. Finally, it fills the contextual gap by focusing specifically on Kenya's pastoralist regions, where financial innovations remain underutilized and livestock remains the cornerstone of economic survival.

1.3 General Objective

The general objective of this study is to establish the effect of financial services accessibility, financial literacy, and mobile banking adoption on livestock investment decisions among pastoralist households in Kenya.

1.3.1 Objectives of the Study

- **i.** To determine the effect of credit facilities accessibility on investment in livestock farming among pastoralist households in Kenya.
- **ii.** To establish the influence of mobile banking adoption on investment in livestock farming among pastoralist households in Kenya.
- **iii.** To determine the effect of accessibility to dairy livestock savings facilities on investment in livestock farming among pastoralist households in Kenya.

iv. To establish the influence of financial literacy on investment in livestock farming among pastoralist households in Kenya.

v. To evaluate the moderating effect of cultural attitude on the relationship between access to financial services and investment in livestock farming among pastoralist households in Kenya.

1.4 Research Hypothesis

i. What is the effect of credit facilities accessibility on investment in livestock farming among pastoralist households in Kenya?

ii. How does mobile banking adoption influence investment in livestock farming among pastoralist households in Kenya?

iii. What is the effect of accessibility to dairy livestock savings facilities on investment in livestock farming among pastoralist households in Kenya?

iv. How does financial literacy influence investment in livestock farming among pastoralist households in Kenya?

v. Does cultural attitude moderate the relationship between access to financial services and investment in livestock farming among pastoralist households in Kenya?

1.5 Justification of the Study

The focus of this study was to investigate and come up with strategies that may help in improving the levels of investment in livestock among the pastoralists in Kenya. There are some research gaps observed here concerning financial access, mobile banking, financial literacy, and savings platforms, particularly among the pastoralist communities whose dependency on livestock is critical. Several studies centre on the issues affecting the pastoralist communities at broad international, regional, and national levels, like lack of credit facilities and limited research

information on the profitability of pastoralism. This research will help to fill these conceptual gaps and will offer certain specifics for the territory in question. At the regional level, the pastoralists in Africa are hampered in their efforts to access both financial services and human resources. Yet this knowledge is missing in the case of Kenya; thus, this study will complement contextual data and analysis to the existing literature. Furthermore, program 5 of the study will seek to examine the influence of financial literacy, the use of mobile money for banking, and access to saving mechanisms on investment in live stocks in Kenya.

1.6 Significance of the Study

1.6.1 Pastoralists

The study will be crucial in providing the pastoralists of Kenya with valuable information required in the investment in their livestock by putting into consideration the credit facilities, usage of mobile money, financial education, and savings. Knowledge of these factors may help in improving productivity and, therefore, the economy of the pastoralist communities.

1.6.2 Financial Institutions

These observations will enable financial institutions to have better insight into the needs and barriers to the provision of services among pastoralist communities. It may also be used by banks and other financial service providers to design better financial products and services that are relevant to the pastoralist communities. Financial inclusion can ultimately help boost a local economy and make it more resilient.

1.6.3 Policymakers

The study will provide policymakers with analytical perspectives regarding the major determinants of investment in livestock in Kenya among the pastoralist community. The results revealed here will be beneficial in framing policies and strategies in the future for financial inclusion, mobile money usage, financial literacy, and access to savings mechanisms. These policies can help in sustainable economic development and poverty reduction in the pastoral areas.

1.6.4 Academics and Researchers

The study will therefore help to bridge existing research gaps by establishing the relationship between financial access, mobile banking, financial literacy, and savings platforms among the pastoralist communities. These findings can be useful in future research, promoting more investigations of combined strategies that would improve the quality of the livelihoods of the pastoralist populations.

1.6.5 Development Practitioners

The development practitioners working in the pastoral regions can benefit from the study conclusions, where they can form and deploy ideal strategies that benefit the pastoralists. Based on the positive correlation expressed above, efforts that aim at increasing financial access, embracing the use of mobile money, increasing financial literacy, and encouraging saving can reach and transform a higher number of pastoralist development benchmarks.

1.7 Scope of the Study

The study involved the pastoralists in the Republic of Kenya. It assessed the effect of credit facilities, mobile money, knowledge, and savings on the investment in livestock. The research therefore included the collection of primary data through the use of questionnaires to make sure

that the research investigation offered the right information. The target population in this research comprised the pastoralist population: both the males and females in the targeted location who practice livestock farming and have used financial services. Geographical contiguity and content relevance further guarantee that the results obtained from the study are of paramount importance and useful to the target community in Kenya.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter entails a detailed review of relevant theories and empirical studies addressing financial inclusion and its influence on livestock investments. It focuses on four key areas: availability of credit facilities, mobile banking adoption, financial literacy, and access to savings platforms, highlighting their roles in promoting financial inclusion among pastoral households. By examining theoretical frameworks and existing research, the chapter identifies knowledge gaps and sets the foundation for understanding how these factors contribute to sustainable economic development in regions like Kenya.

2.2 Theoretical Review

2.2.1 Financial Intermediation Theory

Financial Intermediation Theory, developed by Gurley and Shaw (1960), explains the role of financial institutions in mobilizing savings and allocating credit by acting as intermediaries between surplus and deficit units. These institutions reduce transaction costs, manage risk, and address information asymmetry, thereby enhancing the efficiency of financial systems. The theory has evolved to accommodate technological innovations such as mobile money platforms, agency banking, and digital savings tools, which extend financial services to previously excluded populations. In contexts where formal banking infrastructure is limited, intermediaries like fintech platforms become essential in bridging financial gaps. This adaptability makes the theory relevant for analyzing financial access in underserved regions, including pastoralist communities.

The theory is particularly applicable to this study, which investigates how access to credit facilities, mobile banking, savings platforms, and financial literacy influence investment in livestock farming among pastoralist households in Kenya. These financial tools function as intermediaries that lower logistical barriers and improve access to capital. Mobile platforms such as M-Pesa and Equitel facilitate secure transactions, savings, and credit access, enabling pastoralists to invest in livestock with reduced risk and improved liquidity. By reducing the need for physical banking infrastructure and offering flexible financial products, these intermediaries empower households in remote areas to make productive investment decisions. The theory thus provides a robust framework for understanding how financial innovations contribute to economic resilience in marginalized settings.

Moreover, Financial Intermediation Theory supports the conceptualization of financial literacy as a mechanism that enhances the effectiveness of financial intermediaries. Informed users are better positioned to evaluate financial products, manage risk, and engage with mobile banking platforms. This aligns with the study's focus on behavioral and institutional factors that shape investment outcomes. The theory also accommodates the moderating role of cultural attitudes, which may influence how pastoralists perceive and utilize financial services. By integrating both structural and behavioral dimensions, Financial Intermediation Theory offers a comprehensive lens through which to examine the relationship between financial access and investment in livestock farming. Its relevance to Kenya's pastoralist context is reinforced by empirical evidence showing that financial intermediation improves resource allocation and supports inclusive growth (Gurley and Shaw, 1960; Suri & Jack, 2016).

2.2.2 Capability Approach Theory

The Capability Approach Theory, developed by Amartya Sen (1980), provides a human-centered framework for evaluating development by focusing on individuals' real freedoms to achieve outcomes they value. Rather than measuring welfare solely through income or utility, the theory emphasizes the expansion of capabilities, defined as the substantive opportunities people have to lead lives they have reason to value. These capabilities are shaped by access to resources, institutional arrangements, and social conditions. In development contexts, the theory is particularly relevant for assessing how structural constraints limit individuals' ability to convert available resources into meaningful achievements. It shifts the focus from mere provision of services to the actual empowerment of individuals to make informed and autonomous choices.

This study adopts the Capability Approach Theory to explain how financial access mechanisms such as mobile banking, credit facilities, savings platforms, and financial literacy enhance the capabilities of pastoralist households in Kenya to invest in livestock farming. These financial tools do more than provide transactional services; they expand the range of economic choices available to pastoralists, enabling them to plan, save, and invest in ways that improve their livelihoods. Mobile banking platforms reduce geographic and infrastructural barriers, allowing users in remote areas to access credit and savings without relying on physical banks. Financial literacy further strengthens these capabilities by equipping individuals with the knowledge to evaluate financial products and make strategic investment decisions. The theory therefore supports the study's emphasis on empowerment through financial inclusion.

The Capability Approach also accommodates the influence of cultural attitudes, which may affect how individuals perceive and utilize financial services. In pastoralist communities, traditional norms around livestock ownership, saving behavior, and risk aversion can shape financial decision-making. By recognizing these contextual factors, the theory allows for a

nuanced understanding of how financial access interacts with social and cultural dynamics to influence investment behavior. This makes it particularly suitable for localized studies that seek to understand not just economic outcomes, but the broader conditions under which those outcomes are pursued. Empirical evidence supports this perspective, showing that financial inclusion initiatives improve individual capabilities and contribute to sustainable development (Dupas & Robinson, 2013; Kandpal & Mehrotra, 2019).

2.2.3 Theory of Planned Behavior

The Theory of Planned Behavior, developed by Ajzen (1991), explains how human behavior is guided by three core components: attitudes toward the behavior, subjective norms, and perceived behavioral control. Attitudes reflect the individual's evaluation of the behavior, subjective norms represent perceived social pressure, and perceived behavioral control refers to the ease or difficulty of performing the behavior. These components collectively shape behavioral intentions, which in turn influence actual behavior. The theory is widely applied in behavioral economics, health studies, and technology adoption research, particularly in contexts where individual decision-making is influenced by both personal beliefs and external social factors. Its emphasis on intention formation makes it suitable for analyzing how individuals adopt financial innovations.

This study applies the Theory of Planned Behavior to examine the motivational factors influencing pastoralist households in Kenya to adopt mobile banking, savings platforms, and other financial services. In these communities, behavioral intentions are shaped by affordability, trust in financial systems, perceived ease of use, and prevailing cultural norms. For example, if mobile banking is perceived as secure and socially endorsed, pastoralists are more likely to adopt it for

livestock-related transactions. Perceived behavioral control also plays a role, as limited digital literacy or poor network coverage may hinder adoption. By analyzing these behavioral drivers, the theory helps explain variations in financial inclusion and investment behavior among informal households. It aligns with the study's focus on understanding how psychological and social factors interact with financial access to influence investment in livestock farming.

Furthermore, the Theory of Planned Behavior accommodates the moderating role of cultural attitudes, which may reinforce or inhibit behavioral intentions. In pastoralist settings, traditional beliefs about livestock ownership, gender roles in financial decision-making, and communal saving practices can influence how financial services are perceived and utilized. These cultural norms may either support or resist the adoption of mobile banking and credit facilities. By integrating these behavioral and cultural dimensions, the theory provides a comprehensive framework for understanding the adoption of financial innovations in marginalized communities. Empirical studies have shown that fintech adoption is significantly influenced by behavioral intentions, especially in informal economies where trust and usability are critical (Ajzen, 1991; Kim, 2020).

2.3 Empirical Review

2.3.1 Availability of Credit Facilities and Investment in Livestock Farming among Pastoralist

Globally, Carrer et al. (2020) conducted a study in São Paulo, Brazil, analyzing the effectiveness of rural credit policies in promoting Integrated Crop-Livestock Systems (ICLS). Using data from 175 farmers, the study employed statistical analysis to evaluate the role of credit in supporting investments in fixed capital and operational costs for ICLS adoption. The findings

revealed that rural credit significantly enhanced ICLS uptake, driven by factors like access to extension services and market infrastructure. However, the study did not explore the long-term sustainability of such credit interventions, presenting methodological gaps. Additionally, the study lacked focus on informal households, creating contextual gaps in understanding how similar policies could benefit pastoral communities in regions like Rift valley, North Eastern, and Eastern regions of Kenya. These gaps underline the need for tailored rural credit mechanisms to meet the specific needs of marginalized populations.

In India, Tanti et al. (2022) examined the role of institutional support, including credit availability, in adopting climate-smart agricultural practices in Odisha. The study collected data from 248 farm households and employed probit models to determine key adoption drivers such as subsidies, field demonstrations, and access to credit. Results showed that institutional factors significantly influenced the adoption of innovative practices, including micro-irrigation and drought-resistant seeds. Despite its contributions, the study's focus on general agricultural technologies left empirical gaps in understanding credit's specific role in livestock investments. Additionally, it overlooked challenges unique to informal households, such as limited collateral and financial literacy, which are critical in rural credit adoption.

In Africa, Silong and Gadanakis (2020) investigated rural farmers' access to credit in Nasarawa State, Nigeria. The mixed-methods study involved 216 participants and employed logit and multinomial logit models to analyze factors influencing credit demand. Findings indicated that only 47.6% of farmers accessed credit, with significant disparities based on gender, education, and group membership. Semi-formal credit sources were the most accessible, particularly for women. However, the study did not adequately address population gaps, such as gender-specific financial challenges. Methodological gaps were also evident in the triangulation of qualitative and

quantitative findings to deepen insights into barriers faced by informal households in adopting credit solutions.

Similarly, Girma (2022) conducted a systematic review and meta-analysis of 42 studies on credit access and agricultural technology adoption in Ethiopia. The results demonstrated that access to credit improved technology adoption by 1.23 units, with factors like collateral and total livestock holding influencing outcomes. The findings underscored credit's potential to foster agricultural investments but highlighted practical gaps in addressing collateral requirements, which limit informal households' credit uptake. Theoretical gaps were also identified in linking credit access to specific livestock investments, a critical area for sustainable agricultural development.

In Kenya, Wagacha and Odini (2020) explored farmers' access to credit information in Kiambu County. Using a descriptive design and stratified random sampling, the study surveyed 150 farmers to assess their information needs and credit usage patterns. Findings indicated that farmers prioritized information on loan availability and interest rates, with cooperatives and banks serving as the main credit providers. However, the study revealed practical gaps in information dissemination and evidence gaps in evaluating the effectiveness of these credit facilities in supporting livestock investments. Addressing these gaps is vital for fostering financial inclusion among pastoralists in arid regions like Rift Valley, Northeastern, and Eastern of Kenya.

Lastly, Kaviku et al. (2024) examined microfinance credit uptake among smallholder dairy farmers in Maara Sub-County, Kenya. Using the Heckman selection model on a sample of 384 respondents, the study found that schooling years, household size, and group membership significantly influenced credit uptake and size. Despite its strengths, the study overlooked regional variations in credit uptake, presenting methodological gaps. Furthermore, the study did not address

conceptual gaps in understanding how microfinance institutions could tailor credit products to meet the unique needs of informal pastoralist households investing in livestock.

2.3.2 Mobile Banking Adoption and Investment in Livestock Farming among Pastoralist

Globally, Adhitya and Sembel (2020) analyzed the impact of mobile banking technology adoption on financial and stock performance among big banks in Indonesia. The study utilized secondary data from seven banks, analyzing financial metrics such as capital adequacy and liquidity through F-test, T-Test, and regression methods. Findings revealed that mobile banking adoption strengthened banks' financial performance by enhancing their capital adequacy ratios, while non-performing loans negatively impacted liquidity. Although this study focused on institutional benefits, it failed to explore how mobile banking adoption influenced individual investment decisions, particularly in rural or informal settings. This creates a critical contextual gap in understanding how mobile banking facilitates livestock investments in low-income households globally.

Baumüller (2022) assessed the transformative potential of mobile phone technology in enhancing agricultural services for farmers in developing countries. Through a review of global trends, the study identified that SMS- and voice-based interfaces offered valuable but limited financial tools due to the constraints of low-tech phones. While highlighting opportunities for expansion through advanced mobile networks, the study fell short of investigating the direct relationship between mobile banking adoption and livestock-related investments. This omission presents a knowledge gap critical to evaluating mobile banking's role in fostering economic resilience among rural pastoralists in contexts like, Kenya.

In Africa, Kouandou and Laajimi (2025) studied the influence of mobile banking on adopting modern agricultural technologies in Côte d'Ivoire. Using data from the Harmonized Survey on Household Living Conditions and applying regression analysis with instrumental variables, the study found that mobile banking increased the likelihood of adopting inorganic fertilizers by 30%. The findings emphasized mobile banking's potential as a savings tool to promote agricultural technology adoption. However, the study did not address mobile banking's impact on livestock investment, leaving an empirical gap in understanding how these platforms specifically influence pastoralist communities.

Emeana et al. (2020) explored mobile-enabled agricultural services (m-Agri) across Africa, focusing on their provision and sustainability. The review highlighted how mobile platforms facilitated access to financial services and agricultural inputs for smallholder farmers. However, the study concluded that literacy, cultural dynamics, and resource constraints posed significant adoption barriers, often undermining m-Agri services' intended outcomes. Practical gaps remain in addressing these barriers, particularly in designing user-friendly mobile banking solutions tailored to enhance livestock investments among African pastoralists.

Locally, Krell et al. (2021) examined smallholder farmers' use of mobile-enabled services for agricultural and livestock information in central Kenya. A survey involving 577 farming households revealed that only 25% used mobile phones for accessing livestock-related information, despite widespread smartphone ownership. The study identified factors such as education and membership in farmer organizations as critical to increasing mobile services adoption. However, it did not assess the impact of mobile banking on actual livestock investments, presenting a population gap relevant to informal households in Kenya.

Chelang'a (2024) investigated the role of mobile phone technology in reducing market asymmetry for livestock farmers in pastoral drylands of Kenya. Using weekly livestock price data over 11 years and analyzing market participation dynamics through econometric models, the study revealed that mobile phone access improved market integration and price transparency. Despite these contributions, the study overlooked the potential of mobile banking adoption to enhance savings and credit for livestock investments, leaving both practical and conceptual gaps critical for advancing financial inclusion among pastoralist communities.

2.3.3 Financial Literacy and Investment in Livestock Farming among Pastoralist

Globally, Ephrem and Wamatu (2021) examined the role of financial literacy in improving income from sheep fattening enterprises in rural Ethiopia. The study integrated participatory training sessions for smallholder farmers using adapted manuals to impart knowledge on budgeting, planning, and personal money management. Results indicated that farmers equipped with financial literacy skills achieved better outcomes in their sheep fattening businesses, including improved financial goal-setting and reduced economic vulnerability. However, the study did not assess the direct link between financial literacy and livestock investment decisions, presenting a knowledge gap crucial to understanding this relationship in contexts like Kenya. Additionally, it overlooked gender-specific challenges in financial literacy uptake, leaving population gaps unaddressed.

Raza et al. (2023) explored determinants of financial literacy and its impact on credit accessibility among rice farmers in Pakistan. Using logistic regression on primary data collected from Central Punjab and Khyber Pakhtunkhwa, the study identified variables such as educational background, annual income, and proximity to banking services as key drivers of financial literacy

levels. Findings revealed moderate financial literacy among farmers, with significant impacts on their ability to access formal credit services. While the study highlighted barriers like collateral and fear of borrowing, it lacked focus on informal households and the specific impact of financial literacy on livestock investments. This creates empirical and contextual gaps relevant to livestock farming communities in rural areas.

In Africa, Ankrah Twumasi et al. (2023) assessed the relationship between financial literacy and farmland abandonment in Ghana. Using survey data from 572 households and endogenous switching regression, the study demonstrated that financial literacy significantly reduced farmland abandonment among low-income households and female farmers. Financial education programs were recommended to address literacy gaps among rural populations. However, the study did not examine the role of financial literacy in livestock investments, presenting conceptual gaps in its application to agropastoral systems. Practical gaps also remain in designing gender-sensitive financial literacy programs for rural populations.

Proscovia et al. (2021) investigated the influence of informal financial literacy training on rural farmers' knowledge and behavior in Uganda. Using a propensity score matching approach, the study found higher financial knowledge scores among trained farmers, particularly in goal-setting and managing finances. However, there were no significant differences between trained and untrained farmers in overall financial literacy scores, attributed to spillover effects. The study lacked focus on specific outcomes such as livestock investments, presenting evidence gaps critical to understanding the role of informal financial education programs in improving pastoralist livelihoods.

Locally, Njogu and Olweny (2022) analyzed the effect of financial literacy on credit access within the livestock sector in Murang'a County, Kenya. Using a cross-sectional survey design with

a sample of 384 respondents and employing a double-hurdle model, the study revealed that financial literacy significantly enhanced farmers' ability to access formal credit. This improvement was linked to better alignment between credit needs and financial practices. Despite these findings, the study did not examine financial literacy's direct impact on livestock investments, leaving both conceptual and methodological gaps unexplored.

Kenyanya and Ndegwa (2024) investigated financial literacy as a moderating factor in enhancing coffee productivity among smallholder farmers in Murang'a County, Kenya. Using structured questionnaires with 232 respondents, the study highlighted financial literacy's role in strengthening farmers' ability to manage market accessibility and credit challenges. While the study provides valuable insights into financial literacy's influence on agricultural productivity, it failed to explore its role in livestock investments, presenting critical theoretical and practical gaps relevant to pastoral communities like Turkana, Maasai, Somali, Borana, and others, primarily live in the nation's arid and semi-arid lands.

2.3.4 Access to Savings Platforms and Investment in Livestock Farming among Pastoralist

Globally, Batista and Vicente (2020) conducted a randomized controlled trial in rural Mozambique to evaluate the impact of mobile savings accounts on agricultural investments. The study involved primary farmers and their closest farming friends, with interventions providing remunerated mobile savings accounts. Findings revealed that access to mobile savings increased agricultural investments, particularly in fertilizers, while non-remunerated accounts led to reduced savings due to network free-riding. Despite these insights, the study did not explore the role of savings platforms in livestock investments, presenting a critical empirical gap. Additionally, the

study's focus on remunerated accounts leaves practical gaps in understanding the broader applicability of mobile savings for informal households.

Kubinska et al. (2023) examined saving and investment behaviors in the digital era across Poland, India, and the USA. Using behavioral finance models, the study analyzed the relationship between financial literacy, saving propensity, and investment diversification. Results indicated that digital savings platforms enhanced financial decision-making but were influenced by psychological factors such as trust and risk tolerance. However, the study did not address savings platforms' role in agricultural or livestock investments, leaving conceptual gaps in understanding their impact on rural households in developing countries.

In Africa, Ankrah Twumasi et al. (2020) investigated the effect of savings mobilization on credit access among smallholder farmers in Ghana. Using cross-sectional data and IV-Probit and IV-Tobit models, the study found that savings mobilization significantly improved credit access and loan sizes. Factors such as land ownership, education, and household size positively influenced savings behavior. However, the study focused on credit access rather than direct investments, leaving empirical gaps in understanding how savings platforms influence livestock investments. Practical gaps also remain in designing savings products tailored to the needs of rural farmers.

Bostedt et al. (2021) analyzed saving and borrowing behaviors among agropastoralists in West Pokot County, Kenya, using survey data from 2007 and 2017. Findings showed an increase in households with savings from 57% to 71%, attributed to the growing use of informal group-based savings organizations. The study highlighted the role of savings in enhancing financial inclusion but did not explore its direct impact on livestock investments, presenting evidence gaps. Additionally, methodological gaps exist in assessing the long-term sustainability of group-based savings mechanisms for pastoralist communities.

Locally, Gikonyo et al. (2022) examined household savings and the adoption of climate-smart agricultural technologies in Nyando Basin, Kenya. Using descriptive statistics and probit models on a sample of 122 households, the study found that saving households adopted more climate-smart technologies compared to non-saving households. While the study emphasized the importance of savings in agricultural investments, it did not address livestock-specific investments, leaving conceptual gaps. Furthermore, the study did not explore the role of formal savings platforms, presenting practical gaps in scaling savings solutions for pastoralist households.

2.3.5 Moderating Effect of Cultural Attitude

Lapinski et al. (2022) examined the influence of culture and social norms on behavioral decisions related to grassland conservation among ethnically Tibetan pastoralists in Western China. The study adopted a qualitative approach, utilizing interviews and participant observation to analyze how explicit and implicit communication about norms shaped conservation behaviors. The findings revealed that descriptive norms (what is commonly done) and injunctive norms (what is socially appropriate) strongly influenced decision-making, particularly under policy changes or environmental stress conditions. The study highlights how interpersonal communication and ecological factors contribute to investment behaviors but fails to quantitatively measure the moderating effect of cultural attitudes on financial decisions. Additionally, the study was conducted in a Tibetan pastoralist setting, making it contextually different from Kenyan pastoralist households, who face distinct economic constraints related to financial service access and livestock investments.

Kinati et al. (2022) explored empowerment resources, decision-making, and gender attitudes among livestock keepers in Ethiopia. The study adopted a mixed methods approach,

incorporating pairwise ranking and quantitative interviews using Ryff's psychological well-being (PWB) items to assess the importance of decision-making resources. The research identified gender-based differences in empowerment preferences, with men prioritizing financial and livestock-related decisions, while women valued crop production and social relations. Psychological well-being emerged as a critical empowerment resource, with autonomy and self-acceptance significantly influencing decision-making. Despite these insights, the study does not explicitly address how cultural attitudes moderate financial decisions, particularly within livestock investments. Furthermore, the research focuses on gender-based perceptions rather than broader socio-cultural influences on financial behavior, making it conceptually limited in examining cultural attitudes as a moderating variable.

Eshete & Molla (2021) investigated the cultural significance of medicinal plants among Guji semi-pastoralist communities in Ethiopia, highlighting the role of indigenous knowledge in health-related decisions. The study employed semi-structured interviews, focus group discussions, and participant observations to collect data from 98 medicinal plant species used for treating ailments. While the findings underscore the deep-rooted nature of traditional knowledge in decision-making, they do not explore financial investment behaviors, particularly how cultural attitudes shape economic choices. The study is valuable in illustrating the transmission of indigenous knowledge and the reliance on traditional systems but presents a knowledge gap in linking these cultural attitudes to financial services adoption and livestock investment strategies among pastoralists.

Ng'ang'a (2022) assessed cultural drivers of brucellosis and treatment pathways among agro-pastoralists in Kilombero District, Tanzania. The study applied a cross-sectional design, incorporating 333 structured interviews, 39 in-depth interviews, 16 key informant interviews, and

7 focus group discussions. The findings revealed low awareness and misconceptions surrounding brucellosis, with pastoralists attributing illness symptoms to supernatural causes rather than zoonotic transmission. The study illustrated how deep-seated cultural beliefs influence health-related behaviors; however, it does not investigate financial decision-making, particularly regarding livestock investments. Although valuable in showing cultural resistance to change, the research presents a conceptual gap in understanding how similar socio-cultural attitudes impact financial service adoption and investment behavior.

2.4 Knowledge Gaps

Table 2.1
Knowledge Gaps

Article (APA Style)	Key Variables/Concepts	Methodology	Key Findings	Implications for Future Research (Knowledge Gap)
Carrer et al. (2020)	Rural credit, adoption of Integrated Crop-Livestock Systems (ICLS).	Survey of 175 farmers in São Paulo, Brazil; statistical analysis.	Rural credit positively impacts ICLS adoption by supporting fixed capital and operational costs.	Methodological gaps in long-term sustainability assessment; contextual gaps in adapting credit policies for arid regions like the Rift Valley, Northeastern, and Eastern Kenya.
Tanti et al. (2022)	Credit availability, climate-smart agriculture (CSA) adoption.	Probit models on data from 248 households in Odisha, India.	Institutional factors, including credit availability, significantly enhanced CSA adoption but focused on general agriculture technologies.	Empirical gaps in credit's role in livestock-specific investments; contextual gaps in addressing informal households' needs.

Silong & Gadanakis (2020)	Credit access, gender disparities, education.	Mixed methods (logit and multinomial logit models) with 216 participants in Nigeria.	Credit demand influenced by education, group membership, and gender, with semi-formal credit sources dominating access.	Population gaps in understanding gender-specific financial barriers; methodological gaps in triangulating findings.
Girma (2022)	Credit access, agricultural technology adoption.	Meta-analysis of 42 studies using random effect and meta-regression models.	Credit access improves technology adoption by 1.23 units but is limited by collateral issues.	Practical gaps in addressing collateral challenges; theoretical gaps in credit access for livestock investments.
Wagacha & Odini (2020)	Credit information access, farmers' loan needs.	Descriptive research design with a sample of 150 farmers; stratified random sampling.	Farmers prioritize information on loan availability and interest rates; cooperatives and banks are primary providers.	Evidence gaps in evaluating credit facility effectiveness; practical gaps in addressing farmers' limited access to funds.
Kaviku et al. (2024)	Microfinance credit, dairy farming, socio-economic factors.	Heckman selection model on data from 384 respondents.	Education, household size, and group membership significantly influenced microfinance credit uptake.	Conceptual gaps in understanding regional dynamics; methodological gaps in exploring credit adoption variations.
Adhitya & Sembel (2020)	Mobile banking adoption, financial performance.	Secondary data analysis from seven banks; F-Test, T-Test, and regression methods.	Mobile banking adoption improved banks' capital adequacy ratios but had no direct implications for individual investments.	Contextual gaps in linking mobile banking to individual livestock investments.

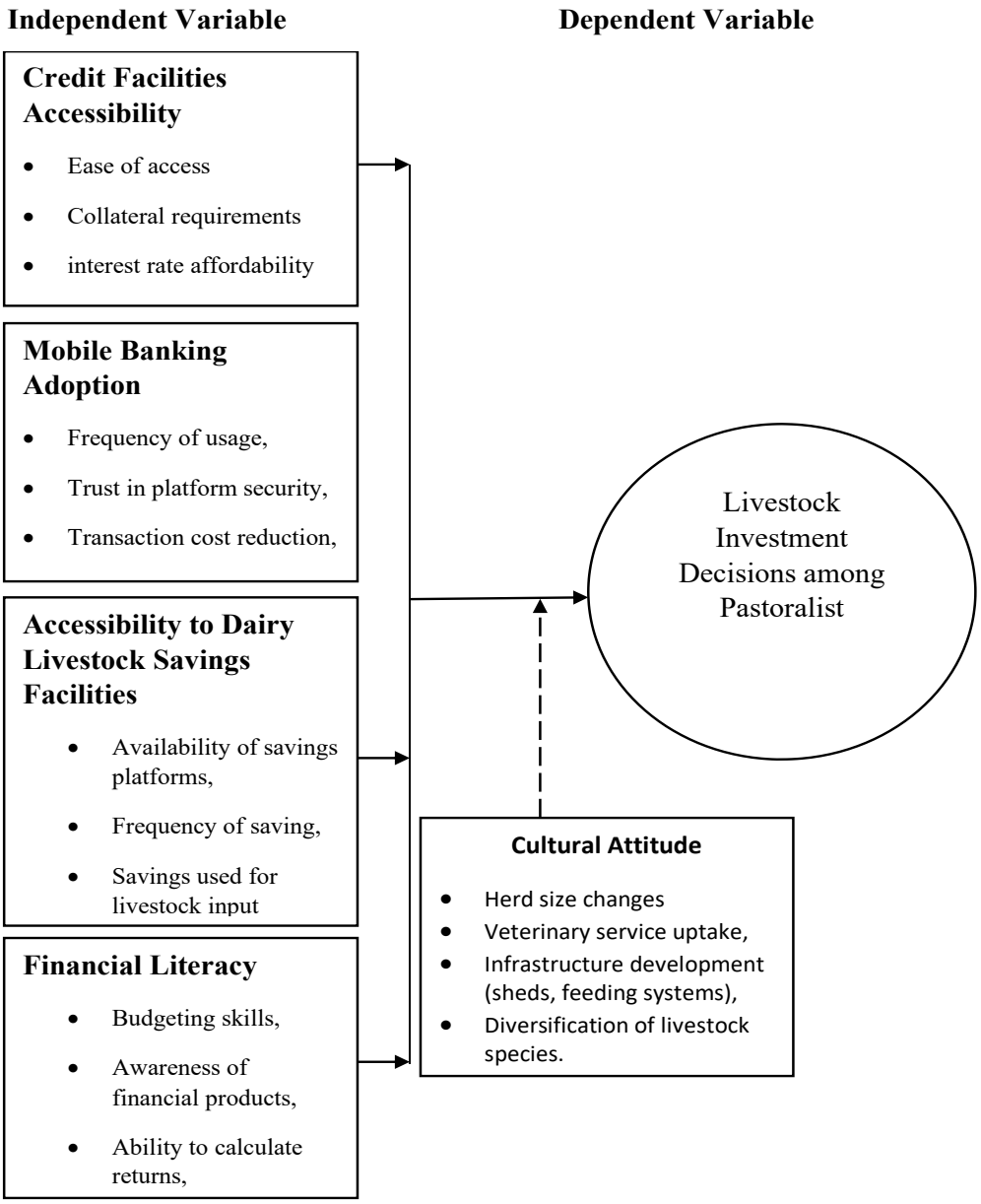
Baumüller (2022)	Mobile technology adoption, agricultural innovation.	Review of global trends in mobile technology adoption in agriculture.	Mobile-based financial tools have limited functionality on low-tech phones, constraining their effectiveness.	Knowledge gaps in understanding the relationship between mobile banking and livestock investments.
Kouandou & Laajimi (2025)	Mobile banking, agricultural technology adoption.	Regression analysis with instrumental variables on Harmonized Survey data from Côte d'Ivoire.	Mobile banking increased adoption of modern agricultural inputs but did not explore its role in livestock investments.	Empirical gaps in mobile banking's influence on livestock investments; conceptual gaps in addressing pastoralist communities.
Krell et al. (2021)	Mobile phones, agro-meteorological information.	Survey of 577 households in central Kenya; statistical analysis.	Only 25% of farmers used mobile phones for livestock-related information despite widespread phone ownership.	Population gaps in understanding mobile services' impact on informal livestock investments.
Chelang'a (2024)	Mobile phone access, livestock market linkages.	Econometric analysis (VECM and Tobit models) on market price and household panel data over 11 years.	Mobile phones improved market integration and price transparency but failed to address banking functionalities for livestock investments.	Practical and conceptual gaps in evaluating mobile banking for savings and credit in livestock investments.
Ephrem & Wamatu (2021)	Financial literacy, sheep fattening, rural income.	Participatory training sessions; qualitative and descriptive analysis.	Financial literacy improved financial goal-setting and reduced vulnerability but	Knowledge gaps in examining direct financial literacy impacts on livestock investments; population gaps in

			lacked focus on livestock investment linkages.	gender-specific training.
Raza et al. (2023)	Financial literacy, credit access, banking inclusion.	Logistic regression on data from rice farmers in Pakistan.	Financial literacy moderately influenced credit access but lacked direct assessment of livestock-related financial behaviors.	Contextual and empirical gaps in applying findings to rural livestock systems.
Njogu & Olweny (2022)	Financial literacy, credit access in livestock subsector.	Cross-sectional survey of 384 farmers; double-hurdle model analysis.	Financial literacy significantly improved credit access among livestock farmers.	Conceptual gaps in linking financial literacy with livestock investments.
Batista & Vicente (2020)	Mobile savings, agricultural investments.	Randomized controlled trial in Mozambique.	Mobile savings increased agricultural investments but focused on fertilizers rather than livestock investments.	Empirical gaps in exploring savings impacts on livestock investments; practical gaps in broadening the scope of mobile savings applications.
Kubinska et al. (2023)	Digital savings, saving propensity, investment diversification.	Behavioral finance analysis across Poland, India, and the USA.	Digital savings platforms enhance financial decision-making but are influenced by psychological factors like trust and risk tolerance.	Conceptual gaps in linking digital savings with livestock investments in developing country contexts.
Ankrah Twumasi et al. (2020)	Savings mobilization, credit access.	Cross-sectional survey and IV-Probit models on Ghanaian	Savings mobilization improved credit access but	Empirical gaps in linking savings mobilization directly to

		smallholder farmers.	focused on general credit needs rather than livestock-specific investments.	livestock investments; practical gaps in designing savings platforms for rural users.
Gikonyo et al. (2022)	Household savings, adoption of climate-smart agriculture (CSA).	Ordered probit models and descriptive statistics with data from 122 households in Kenya.	Saving households adopted more CSA technologies, but the study overlooked livestock-specific investments.	Conceptual gaps in understanding savings' impact on livestock adoption; practical gaps in scaling savings initiatives for pastoral communities.
Bostedt et al. (2021)	Saving and borrowing behavior, group-based savings organizations.	Survey-based household data from agropastoralists in Kenya over a 10-year period (2007-2017).	Group-based savings organizations increased savings participation but lacked assessment of livestock investment outcomes.	Evidence gaps in evaluating the direct impact of savings on livestock investments; methodological gaps in assessing long-term sustainability.

2.5 Conceptual Framework

Figure 2.1
Conceptual Framework



Source: Author (2025)

2.6 Operationalization of Variables

Variable	Description	Measurement Indicators	Supporting Citations
Credit Facilities	Financial mechanisms that provide households with access to loans or credit for investment in livestock and other economic activities.	• Ease of access • Collateral requirements • Interest rate affordability	Al-Qudah et al. (2020) Carrer et al. (2020) Silong & Gadanakis (2020)
Mobile Banking	Use of mobile technology to access financial services, including payments, transfers, and savings.	• Frequency of usage • Trust in platform security • Transaction cost reduction	McGregor (2013), Kouandou & Laajimi (2025), Chelang'a (2024).
Financial Literacy	Ability of individuals to understand and effectively use financial tools and concepts to make informed decisions.	• Budgeting skills • Awareness of financial products • Ability to calculate returns	Zait & Bertea (2015), Ephrem & Wamatu (2021), Njogu & Olweny (2022)
Savings Platforms	Formal and informal financial instruments or institutions that enable households to store and manage their financial resources.	• Availability of savings platforms • Frequency of saving • Savings used for livestock input	Ndung'u & Oguso (2021), Batista & Vicente (2020), Bostedt et al. (2021)
Cultural Attitude	Set of beliefs, norms, and values that shape household financial behaviors and investment decisions within a given community.	• Influence on financial decisions • Resistance to formal financial tools • Alignment with modern practices	Bonna & Amoah (2019), Lapinski et al. (2022), Kinati et al. (2022)
Livestock Investment	Choices made by pastoralist households regarding livestock acquisition, management, and sales, influenced by financial access and economic conditions.	• Herd size changes • Veterinary service uptake • Infrastructure development • Diversification of species	Mayala, Katundu & Msuya (2019), Pica-Ciamarra et al. (2024), Otte et al. (2022)

CHAPTER 3

METHODOLOGY

3.1 Introduction

This chapter details the methodological framework employed to achieve the research objectives and address the hypotheses. It outlines the research design, target population, sampling techniques, data collection instruments, and procedures used to gather the data. Additionally, the chapter describes how the data was analyzed and presented, ensuring alignment with the study's objectives. Emphasis is placed on the reliability and validity of the instruments, along with the diagnostic tests conducted to validate the regression model. This methodological approach ensures the study provides robust and actionable insights into the impact of financial inclusion on livestock investments in Kenya.

3.2 Research Design

A research design is the structured approach that outlines how a study is conducted, ensuring alignment between the research objectives, data collection, and analysis methods (Creswell, 2014). This study adopts a descriptive research design, which is suitable for systematically documenting the characteristics and dynamics of financial inclusion tools such as access to credit facilities, mobile banking adoption, financial literacy, and savings platforms, and their influence on livestock investment decisions (Kothari, 2004). Descriptive research allows for the quantification of relationships among variables and the identification of patterns in behavior and decision-making among pastoralist households. The study employed multiple linear regression analysis to measure and interpret the effects of the identified financial access indicators on livestock investment outcomes. This design is appropriate for generating reliable, actionable

insights and supports the development of evidence-based interventions aligned with the study's overall objective.

3.3 Target Population

The target population refers to the entire group of individuals or units relevant to a study, sharing characteristics that align with the research objectives (Creswell, 2014). This study targeted pastoralist households across Kenya, focusing on regions where livestock investment decisions are central to economic survival. According to the Kenya National Bureau of Statistics (KNBS), the pastoralist population in Kenya is estimated to be approximately 8 million people, primarily residing in arid and semi-arid counties such as Garissa, Isiolo, Marsabit, Wajir, Turkana, Samburu, and Mandera. These communities heavily depend on livestock for their livelihoods, making them a relevant population for examining the impact of financial inclusion on livestock investment decisions.

Selecting this population was justified as it reflected the diverse socioeconomic conditions of pastoralists, who often experience challenges accessing financial services such as credit facilities, mobile banking, financial literacy programs, and savings platforms. By targeting pastoralist households across multiple counties in Kenya, the study aimed to generate insights applicable to a wide range of regions, ensuring a deeper understanding of financial access barriers and opportunities within pastoral economies. The study focused on adult household heads responsible for financial decision-making and livestock management, ensuring that the findings contribute to sustainable financial inclusion strategies tailored to pastoralist communities.

3.4 Sample Size and Sampling Technique

The sample size refers to the subset of the population selected for the study, ensuring it represents the target population while remaining manageable in terms of resources and time

(Creswell, 2014). For this study, the estimated pastoralist population in Kenya is approximately 8 million people, primarily residing in arid and semi-arid counties such as Garissa, Isiolo, Marsabit, Wajir, Turkana, Samburu, and Mandera (Kenya National Bureau of Statistics, 2019). Since conducting a census across this population was impractical, multistage sampling was employed to ensure broad representation while managing logistical constraints (Kothari, 2004).

The Yamane (1967) formula was applied to determine the sample size:

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

Where:

n = Sample size

N = Population size (8,000,000)

e = Margin of error (5% or 0.05)

$$n=\frac{8,000,000}{1+8,000,000(0.05^2)}$$

$$n=\frac{8,000,000}{1+8,000,000(0.0025)}$$

n=400

Thus, the sample size was 400 respondents, which was statistically sufficient to provide reliable and valid results for the study. Given the broad geographical spread, multistage sampling was applied, first selecting counties with significant pastoralist populations, then narrowing down to specific sub-counties using cluster sampling, and finally employing simple random sampling within selected clusters. This approach ensures fairness and randomness in the selection process

while allowing comprehensive analysis of the relationship between financial services and livestock investment decisions among pastoralist households in Kenya.

3.4.1 Multistage sampling

Step 1: Selection of Counties with Significant Pastoralist Populations

Using cluster sampling, counties with substantial pastoralist populations were selected based on national data.

Table 3.1
National Data

Region	Selected Counties	Estimated Pastoralist Population
Northern Kenya	Garissa, Wajir, Mandera	1,900,000
Upper Eastern Kenya	Isiolo, Marsabit	1,500,000
Rift Valley	Turkana, Samburu	2,300,000
Other ASAL areas	Kajiado, Baringo	2,300,000

Step 2: Selection of Sub-Counties from Each County

After identifying counties, sub-counties with the highest pastoralist households were selected.

Table 3.2
Selected Sub-Counties

County	Selected Sub-Counties
Garissa	Lagdera, Balambala
Wajir	Wajir East, Wajir South
Isiolo	Garbatulla, Merti
Marsabit	Laisamis, North Horr
Turkana	Turkana West, Loima
Samburu	Samburu North, Samburu East

Step 3: Simple Random Sampling within Selected Clusters

From the selected sub-counties, households were chosen using simple random sampling to ensure unbiased representation.

Table 3.3

Selected Clusters

Sampling Level	Method	Example
County Selection	Cluster Sampling	Turkana, Wajir, Garissa
Sub-County Selection	Purposive Sampling	Turkana West, Loima
Household Selection	Simple Random Sampling	Selecting pastoralist household heads

Step 4: Final Sample Distribution across Counties

The 400 respondents was proportionally distributed across selected counties based on pastoralist population density.

Table 3.4

Sample Distribution

County	Pastoralist Population	Percentage	Allocated Sample Size
Garissa	960,000	12%	48
Wajir	1,200,000	15%	60
Isiolo	800,000	10%	40
Marsabit	800,000	10%	40
Turkana	1,600,000	20%	80
Samburu	800,000	10%	40
Kajiado	1,040,000	13%	52
Baringo	800,000	10%	40
Total	**8,000,000**	**100%**	**400**

County	Percentage of Pastoralist Population	Allocated Sample Size
Garissa	12%	48 respondents
Wajir	15%	60 respondents
Isiolo	10%	40 respondents
Marsabit	10%	40 respondents
Turkana	20%	80 respondents
Samburu	10%	40 respondents
Kajiado	13%	52 respondents
Baringo	10%	40 respondents

3.5 Data Collection Instruments

Data collection instruments refer to the tools used to gather information relevant to the research objectives, ensuring the validity and reliability of the data collected (Kothari, 2004). This study employed a structured questionnaire designed to capture quantitative data on the relationship between access to financial services and livestock investment decisions among pastoralist households in Kenya. Given the diverse target population across multiple counties, the questionnaire was designed to accommodate responses from pastoralist communities with varying financial access experiences. It was structured into different sections, covering key variables such as access to credit facilities, mobile banking adoption, financial literacy, savings platform utilization, and cultural attitudes as a moderating factor. The questionnaire followed a Likert scale format, where respondents rated their agreement with statements on a five-point scale that ranged from “Strongly Disagree (1) “to” Strongly Agree (5)." This format ensured standardized responses, making data quantification and statistical analysis more efficient, particularly for regression models assessing the relationships between financial access and livestock investment decisions (Creswell, 2014). Structured questionnaires were widely recognized for their effectiveness in large-scale data collection, ensuring consistency while capturing relevant insights into financial access and investment behavior among pastoralist households (Saunders et al., 2019).

3.6 Data Collection Procedure

The data collection procedure involved a systematic approach to gather information to address the research objectives and test the hypotheses effectively (Creswell, 2014). For this study, data was collected using structured questionnaires administered to a randomly selected sample of 400 respondents from pastoralist households across various counties in Kenya. The procedure began with the preparation phase, where the questionnaire was refined to ensure clarity, reliability,

and validity. This step ensured that the questions were unambiguous and capture relevant data aligned with the study's focus on financial services and livestock investment decisions. During the data collection phase, trained enumerators visited selected pastoralist households in different counties to administer the questionnaires. Given the geographical spread of the respondents, data collection was conducted through both face-to-face interactions and digital survey platforms, allowing for broad accessibility and increased response rates. Ethical considerations, such as obtaining informed consent, maintaining confidentiality, and ensuring respect for respondents' time, was strictly observed throughout the process.

3.7 Diagnostic Tests

3.7.1 Multicollinearity

Multicollinearity occurs when two or more independent variables are highly correlated, which can distort the estimation of regression coefficients and inflate standard errors. To test for multicollinearity, the study calculated the Variance Inflation Factor (VIF) for each independent variable. A VIF value greater than 10 will indicate problematic multicollinearity (Kothari, 2004; Saunders et al., 2019). All the variables that were correlated were refined others excluded to improve model precision.

3.7.2 Heteroscedasticity

To assess the assumption of homoscedasticity, the study employed both graphical and statistical diagnostic procedures. A scatterplot of the regression standardized residuals against the regression standardized predicted values was generated to visually examine the distribution of residuals across the range of predicted values. This plot was inspected for any discernible patterns, funnel shapes, or curvature that could indicate non-constant variance.

3.7.3 Normality Test

The normality of residuals was evaluated to confirm the assumption that error terms were normally distributed, which supports the reliability of hypothesis testing. This was assessed using graphical methods such as histograms and Q-Q plots, alongside formal statistical tests including the Shapiro-Wilk and Kolmogorov-Smirnov tests. A non-significant result ($p > 0.05$) was interpreted as evidence of normally distributed residuals (Saunders et al., 2019). In instances where deviations from normality were observed, appropriate data transformation techniques were considered to achieve distributional conformity.

3.8 Pilot Testing

Pilot testing involves conducting a small-scale study using a subset of the target population to evaluate the effectiveness and reliability of the data collection instruments (Creswell, 2014). For this study, the questionnaire was pre-tested on a sample of 40 respondents randomly selected from pastoralist households across various counties in Kenya, representing approximately 10 percent of the final sample size. This process was designed to identify and resolve ambiguities in the questionnaire items, enhance clarity, and ensure that the instruments were contextually relevant to the research objectives. Feedback obtained from the pilot study was used to refine the Likert-scale items and confirm their alignment with the study's key variables, which included access to credit facilities, mobile banking adoption, financial literacy, savings platform utilization, and cultural attitudes as a moderating factor. Pilot testing played a critical role in ensuring that the instruments captured accurate and consistent data, thereby strengthening the reliability and validity of the subsequent research findings (Saunders et al., 2019).

3.8.1 Validity of the Research Instruments

Validity refers to the extent to which an instrument accurately measures what it is intended to measure (Kothari, 2004). In this study, the validity of the questionnaire was established through both content validity and face validity. Content validity was assessed by consulting financial inclusion experts and academic professionals to confirm that the questionnaire adequately captured the key variables, namely credit facilities, mobile banking, financial literacy, savings platforms, and livestock investments.

Face validity was evaluated during the pilot testing phase, where the questionnaire was pre-tested with selected respondents to determine whether the items were clear, interpretable, and contextually appropriate. Based on expert feedback and pilot results, necessary adjustments were made to eliminate ambiguous or irrelevant items. This process ensured that the questionnaire generated accurate and meaningful data aligned with the research objectives (Creswell, 2014).

3.8.2 Reliability of the Research Instruments

Reliability refers to the consistency and stability of the research instruments in measuring the intended variables over repeated trials (Kothari, 2004). In this study, the reliability of the Likert-scaled questionnaire was assessed using Cronbach's alpha, which measures internal consistency. A threshold of 0.7 or higher was considered acceptable, in line with the recommendation by Saunders et al. (2019). This test determined whether the questionnaire items were coherently aligned and consistently captured the dimensions of financial inclusion and livestock investments.

To further reinforce the reliability of the research instruments, the study also conducted regression assumption tests, including assessments for normality, linearity, multicollinearity, and homoscedasticity. These diagnostic procedures were essential for confirming the appropriateness

of the regression model and the accuracy of the results derived from the data. By implementing these tests, the study ensured that the data collected was suitable for statistical analysis and interpretation, thereby enhancing the robustness and credibility of the research findings.

3.9 Data Analysis and Presentation

The data analysis process involved both descriptive and inferential statistical methods to ensure comprehensive insights into the research objectives. Descriptive statistics summarized demographic characteristics and key variables, such as credit facilities, mobile banking adoption, financial literacy, and savings platform usage. This included measures of central tendency (mean, median) and variability (standard deviation), providing an overview of the data distribution. Inferential statistics were applied to explore the relationships between financial inclusion tools (independent variables) and livestock investments (dependent variable). The study employed a multiple linear regression model, expressed as:

$$Y=\beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 (X_5 * X_1) + \mathcal{E}$$

Where:

- Y: Livestock investments (dependent variable)
- β_0: Intercept (constant term)
- X_1: Availability of credit facilities
- X_2: Mobile banking adoption
- X_3: Financial literacy
- X_4: Access to savings platforms

- X_5: Cultural attitude (moderating variable)
- $X_5 * X_1$: Interaction term to assess the moderating effect of cultural attitude on financial access variables
- $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6$: Coefficients indicating the effect of each independent variable on Y
- ϵ\epsilon: Error term accounting for unexplained variation

The results of both descriptive and inferential analyses were presented using tables, graphs, and charts to provide a clear and systematic interpretation. This analytical approach aligned with the study's objective to evaluate the impact of financial inclusion on livestock investments among pastoral households in Kenya.

3.10 Ethical Research Considerations

Ethical integrity was central to the credibility and legitimacy of the research involving human subjects. The study strictly adhered to ethical standards governing the collection, handling, and reporting of data from pastoralist households in Kenya. Prior to data collection, informed consent was obtained from all participants, ensuring that they voluntarily agreed to participate after being briefed on the purpose, procedures, risks, and benefits of the study. Participants were assured that their responses would remain confidential and anonymized, and that their identities would not be disclosed in any publication or presentation arising from the study.

The researcher upheld principles of respect, autonomy, and cultural sensitivity, particularly in recognition of the unique traditional values among pastoralist communities. Efforts were made to ensure that the language used in the questionnaires was clear and appropriate, avoiding any coercive or misleading content. The research instruments were reviewed to minimize

psychological discomfort, and participants retained the right to withdraw from the study at any point without consequence.

Moreover, data collected were securely stored in password-protected digital formats, accessible only to the principal researcher and approved supervisors. The study obtained formal ethical clearance from the relevant institutional ethics review board prior to the commencement of fieldwork. All procedures conformed to national and institutional ethical guidelines for academic research, and any deviations or unforeseen risks were documented and addressed transparently.

CHAPTER FOUR

DATA ANALYSIS, FINDINGS AND DISCUSSIONS

4.1 Introduction

This chapter presents the results of the empirical analysis, beginning with the demographic characteristics of the respondents, followed by statistical findings and interpretive discussions aligned with the study's objectives. Out of the 400 questionnaires distributed, 303 were returned with valid responses, yielding a response rate of 75.8%. This response rate is considered highly satisfactory for survey-based research. According to Fincham (2008), response rates above 60% are generally acceptable and enhance the credibility of survey findings. Similarly, Baruch and Holtom (2008) report that the average response rate for organizational research surveys is approximately 52.7%, with rates above 70% regarded as excellent. Therefore, the 75.8% response rate achieved in this study exceeds conventional thresholds and supports the reliability and generalizability of the subsequent analyses. The high response rate minimizes the risk of non-response bias and strengthens the representativeness of the sample, particularly in studies involving geographically dispersed populations. The chapter proceeds with a breakdown of demographic variables, followed by regression diagnostics, model estimations, and interpretation of key relationships.

4.2 Demographics

4.2.1 Gender

Table 4.1
Gender

	Frequency	Percent
Male	200	50.0
Female	103	25.8
Total	**303**	**75.8**
Missing System	97	24.3
Total	**400**	**100.0**

Out of the 400 questionnaires distributed, 303 were returned with valid gender responses. Male respondents accounted for 50.0 percent, while female respondents made up 25.8 percent. The remaining 97 entries were system-missing. The predominance of male respondents may be attributed to the socio-cultural structure of pastoralist communities, where men typically assume public-facing roles and are more likely to engage in external activities such as community meetings, livestock trade, and interactions with researchers. Women, while central to household and livestock care, often have limited mobility and may be less accessible during survey administration. Cultural norms and gendered expectations around decision-making and representation further contribute to this imbalance, making male participation more visible in formal data collection exercises.

4.2.2 Age

Table 4.2
Age

	Frequency	Percent
Below 20 years	40	10.0
21–30 years	74	18.5
31–40 years	81	20.3
41–50 years	77	19.3
Above 50 years	31	7.8
Total	**303**	**75.8**
Missing System	97	24.3
Total	**400**	**100.0**

Table 4.2 presents the age distribution of the respondents. Out of the 400 questionnaires administered, 303 were returned with valid age responses, while 97 entries were system-missing. Among the valid responses, 40 respondents (10.0 percent) were below 20 years, 74 respondents (18.5 percent) were aged between 21 and 30 years, and 81 respondents (20.3 percent) fell within the 31 to 40 years category. Additionally, 77 respondents (19.3 percent) were aged between 41 and 50 years, while 31 respondents (7.8 percent) were above 50 years. The remaining 97 cases (24.3 percent) did not indicate their age.

The age distribution reflects a relatively balanced representation across adult age groups, with the highest concentration observed in the 31 to 40 years bracket. This pattern may be attributed to the active role individuals in this age range play in pastoralist livelihoods, including livestock management, mobility, and community decision-making. Younger respondents below 20 years may have limited involvement in such responsibilities, while older individuals above 50 years may be less accessible due to mobility constraints or reduced engagement in external

activities. The spread suggests that the survey captured a broad cross-section of the economically and socially active population within pastoralist settings.

4.2.3 Level of Education

Table 4.3
Level of Education

	Frequency	Percent
No formal education	190	47.5
Primary education	79	19.8
Secondary education	23	5.8
Tertiary education	11	2.8
Total	**303**	**75.8**
Missing System	97	24.3
Total	**400**	**100.0**

Table 4.3 presents the distribution of respondents by level of education. Out of the 400 questionnaires administered, 303 were returned with valid responses, while 97 entries were system-missing. Among the valid responses, 190 respondents (47.5 percent) reported having no formal education. Primary education was reported by 79 respondents (19.8 percent), secondary education by 23 respondents (5.8 percent), and tertiary education by 11 respondents (2.8 percent). The remaining 97 cases (24.3 percent) did not indicate their educational level.

The data reveal that nearly half of the respondents had no formal education, which is consistent with patterns observed in pastoralist communities where access to formal schooling remains limited. Factors such as mobility, distance to educational facilities, and prioritization of livestock-related responsibilities often hinder consistent school attendance. Primary education appears more accessible, but progression to secondary and tertiary levels remains low. This distribution reflects broader structural challenges in educational attainment within pastoralist settings and underscores

the need for context-sensitive interventions that accommodate the realities of nomadic and semi-nomadic lifestyles.

4.2.4 County of Residence

Table 4.4
County of Residence

	Frequency	Percent
Garissa	40	10.0
Wajir	39	9.8
Isiolo	36	9.0
Marsabit	37	9.3
Turkana	40	10.0
Samburu	33	8.3
Kajiado	51	12.8
Baringo	27	6.8
Total	**303**	**75.8**
Missing System	97	24.3
Total	**400**	**100.0**

Table 4.4 presents the distribution of respondents by county of residence. Out of the 400 questionnaires administered, 303 were returned with valid responses, while 97 entries were system-missing. Among the valid responses, Garissa and Turkana each contributed 40 respondents (10.0 percent), Wajir had 39 respondents (9.8 percent), Isiolo had 36 (9.0 percent), and Marsabit had 37 (9.3 percent). Samburu accounted for 33 respondents (8.3 percent), Kajiado had the highest representation with 51 respondents (12.8 percent), and Baringo contributed 27 respondents (6.8 percent). The remaining 97 cases (24.3 percent) did not indicate their county of residence.

The distribution reflects a relatively even spread across the selected counties, with slight variations likely influenced by population density, accessibility, and logistical factors during data collection. Kajiado's higher representation may be attributed to its proximity to major transport

corridors and administrative centers, which can facilitate easier engagement with respondents. Counties such as Garissa, Turkana, and Wajir also show strong participation, consistent with their large pastoralist populations and active involvement in livestock-based livelihoods. The variation across counties provides a geographically diverse sample, enhancing the representativeness of the study within pastoralist contexts.

4.2.5 Main Source of Income

Table 4.5 Main Source of Income

	Frequency	Percent
Livestock farming	196	49.0
Business	61	15.3
Employment	46	11.5
Total	**303**	**75.8**
Missing System	97	24.3
Total	**400**	**100.0**

Table 4.5 presents the distribution of respondents by their main source of income. Out of the 400 questionnaires administered, 303 were returned with valid responses, while 97 entries were system-missing. Among the valid responses, 196 respondents (49.0 percent) reported livestock farming as their primary source of income. Business activities were cited by 61 respondents (15.3 percent), while formal employment accounted for 46 respondents (11.5 percent). The remaining 97 cases (24.3 percent) did not indicate their income source.

The data clearly show that livestock farming is the dominant livelihood activity among respondents, which aligns with the economic structure of pastoralist communities. Livestock serves not only as a source of food and income but also as a cultural and social asset. Business activities, though less prevalent, may include small-scale trade in livestock products, household goods, or informal retail. Employment, being the least reported, likely reflects limited access to

formal job markets in remote pastoralist regions. These findings underscore the centrality of livestock in sustaining household economies and shaping livelihood strategies in the study areas.

4.3 Descriptive Statistics

Table 4.6
Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Livestock Investment	303	1	5	3.04	.819
Availability of Credit Facilities	303	1	5	2.92	.703
Mobile Banking Adoption	303	1	5	2.86	.717
Financial Literacy	303	1	5	2.72	.847
Access to Savings Platforms	303	1	5	3.15	.608
Cultural Attitude	303	2	5	3.21	.621
Valid N (listwise)	**303**				

Table 4.6 presents the descriptive statistics for the key variables used in the study. All variables were measured on a five-point Likert scale, and the analysis was based on 303 valid responses. The mean scores and standard deviations provide initial insights into the central tendencies and variability of each construct. Livestock investment recorded a mean of 3.04 with a standard deviation of 0.819, indicating moderate engagement levels with some variation across respondents. Availability of credit facilities had a slightly lower mean of 2.92 and a standard deviation of 0.703, suggesting limited access and relatively consistent perceptions among participants.

Mobile banking adoption and financial literacy recorded mean scores of 2.86 and 2.72 respectively, with standard deviations of 0.717 and 0.847. These figures point to relatively low adoption and understanding of financial tools, which may reflect infrastructural limitations, digital literacy gaps, or cultural preferences within pastoralist communities. Access to savings platforms showed a higher mean of 3.15 and a lower standard deviation of 0.608, suggesting more widespread use and less variability in responses. Cultural attitude registered the highest mean at

3.21 with a standard deviation of 0.621, indicating a generally positive orientation toward cultural norms and practices, with limited dispersion.

4.4 Diagnostic Tests Results

4.4.1 Tests for Normality

Table 4.7
Tests of Normality

	Kolmogorov-Smirnov[a]		
	Statistic	**df**	**Sig.**
Availability of Credit Facilities	.272	303	.500
Mobile Banking Adoption	.271	303	.201
Financial Literacy	.308	303	.470
Access to Savings Platforms	.337	303	.070
Cultural Attitude	.320	303	.090
Livestock Investment	.205	303	.061

a. Lilliefors Significance Correction

To evaluate the normality of the study variables, the Kolmogorov-Smirnov test with Lilliefors significance correction was applied, given the sample size of 303. The results showed that all variables including Availability of Credit Facilities, Mobile Banking Adoption, Financial Literacy, Access to Savings Platforms, Cultural Attitude, and Livestock Investment returned non-significant p-values, all above the 0.05 threshold. This indicates that the null hypothesis of normality could not be rejected for any of the constructs. The test statistics ranged from 0.205 to 0.337, with Access to Savings Platforms showing the highest deviation but still within acceptable limits at a significance level of 0.070. These findings confirm that the data distributions are sufficiently normal to justify the use of parametric techniques such as multiple regression, and no transformation or non-parametric adjustment was required.

4.4.2 Tests for Multicollinearity

Table 4.8
Multicollinearity

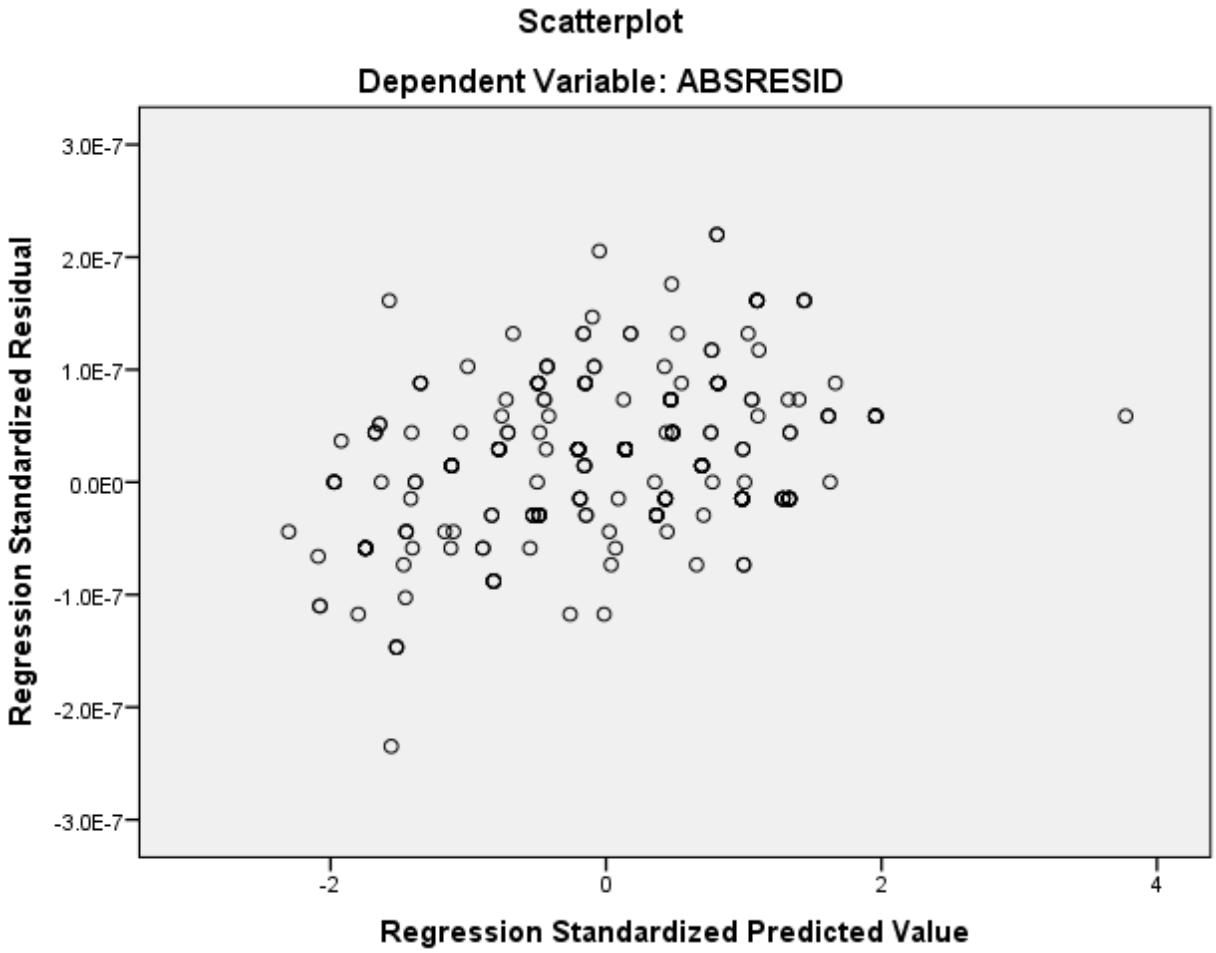
	Collinearity Statistics	
	Tolerance	**VIF**
(Constant)		
Availability of Credit Facilities	.569	1.757
Mobile Banking Adoption	.633	1.579
Financial Literacy	.596	1.679
Access to Savings Platforms	.711	1.406
Cultural Attitude	.837	1.195

a. Dependent Variable: Livestock Investment

To assess the presence of multicollinearity among the independent variables, tolerance values and Variance Inflation Factors (VIF) were examined. The results, as presented in Table 4.8, indicate that all tolerance values exceed the conventional threshold of 0.10, ranging from 0.569 to 0.837. Similarly, all VIF values fall well below the critical cut-off of 10, with the highest observed value being 1.757 for Availability of Credit Facilities. These results suggest that none of the predictor variables exhibit problematic levels of multicollinearity. The relatively low VIF values imply that the independent variables are not highly correlated with one another, and therefore, the regression estimates are unlikely to be distorted by redundancy or inflated standard errors. Consequently, the model satisfies the assumption of independence among predictors, allowing for reliable interpretation of regression coefficients in subsequent analysis.

4.4.3 Heteroscedastic Test

Figure 4.1
Heteroscedastic Test using scatterplot



To assess the assumption of homoscedasticity, a scatterplot of the regression standardized residuals against the regression standardized predicted values was examined. The visual inspection of the plot revealed that the residuals were randomly and evenly dispersed across the range of predicted values, without forming any discernible pattern, funnel shape, or curvature. This suggests that the variance of the residuals remains relatively constant across all levels of the dependent variable, Livestock Investment. The absence of systematic clustering or heterogeneity in the spread of residuals supports the conclusion that the model satisfies the assumption of homoscedasticity. Therefore, the regression estimates are unlikely to be biased due to non-constant

error variance, and no corrective measures such as weighted least squares or robust standard errors were deemed necessary.

4.4.4 Autocorrelation Test

Table 4.9
Durbin-Watson test output

Model	Durbin-Watson
1	1.538

a. Predictors: (Constant), Cultural Attitude, Financial Literacy, Access to Savings Platforms, Mobile Banking Adoption, Availability of Credit Facilities

To evaluate the presence of autocorrelation in the residuals of the regression model, the Durbin-Watson statistic was examined. The test yielded a value of 1.538, which falls within the acceptable range for independence of residuals. While the ideal value is approximately 2.000, indicating no autocorrelation, values between 1.500 and 2.500 are generally considered tolerable in social science research. The result suggests a slight positive autocorrelation, but not at a level that would compromise the validity of the regression estimates. Therefore, the assumption of independent errors is reasonably satisfied, and no corrective procedures such as generalized least squares or autoregressive modeling were deemed necessary.

4.5 Correlation Analysis

Table 4.10
Correlations

		Livestock Investment	Availability of Credit Facilities	Mobile Banking Adoption	Financial Literacy	Access to Savings Platforms	Cultural Attitude
Livestock Investment	Pearson Correlation	1	.586**	.583**	.692**	.468**	.421**

	Sig. (2-tailed)		.000	.000	.000	.000	.000
	N	303	303	303	303	303	303
Availability of Credit Facilities	Pearson Correlation	.586**	1	.498**	.559**	.483**	.287**
	Sig. (2-tailed)	.000		.000	.000	.000	.000
	N	303	303	303	303	303	303
Mobile Banking Adoption	Pearson Correlation	.583**	.498**	1	.526**	.372**	.332**
	Sig. (2-tailed)	.000	.000		.000	.000	.000
	N	303	303	303	303	303	303
Financial Literacy	Pearson Correlation	.692**	.559**	.526**	1	.387**	.282**
	Sig. (2-tailed)	.000	.000	.000		.000	.000
	N	303	303	303	303	303	303
Access to Savings Platforms	Pearson Correlation	.468**	.483**	.372**	.387**	1	.322**
	Sig. (2-tailed)	.000	.000	.000	.000		.000
	N	303	303	303	303	303	303
Cultural Attitude	Pearson Correlation	.421**	.287**	.332**	.282**	.322**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	
	N	303	303	303	303	303	303

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

Table 4.10 shows that Livestock Investment are positively and significantly associated with all five predictors. The strongest correlation was observed with Financial Literacy ($r = 0.692$, $p < 0.01$), followed by Availability of Credit Facilities ($r = 0.586$) and Mobile Banking Adoption ($r = 0.583$), indicating that financial knowledge, access to credit, and mobile banking usage are closely linked to investment behavior. Access to Savings Platforms ($r = 0.468$) and Cultural Attitude ($r = 0.421$) also showed moderate but statistically significant relationships, suggesting that these factors contribute meaningfully, though to a lesser extent. These results provide empirical support for the

conceptual framework and justify the inclusion of all five variables in the subsequent regression analysis.

4.6 Regression Analysis

4.6.1 Availability of Credit Facilities and Livestock Investment among Pastoralist

Table 4.11
Regression output for Availability of Credit Facilities

ANOVA[a]

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	69.481	1	69.481	157.106	.000[b]
Residual	133.119	301	.442		
Total	**202.601**	**302**			

a. Dependent Variable: Livestock Investment

b. Predictors: (Constant), Availability of Credit Facilities

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	1.041	.164		6.361	.000
Availability of Credit Facilities	.682	.054	.586	12.534	.000

a. Dependent Variable: Livestock Investment

Table 4.11 presents the regression results assessing the influence of credit facility availability on livestock investment among pastoralist households. The model is statistically significant ($F = 157.106$, $p < 0.001$), indicating that credit access explains a substantial portion of the variation in investment behavior. The standardized beta coefficient ($\beta = 0.586$) and corresponding t-value (12.534, $p < 0.001$) confirm a strong positive relationship. The unstandardized coefficient ($B = 0.682$) suggests that a one-unit increase in perceived credit availability leads to a 0.682 unit increase in livestock investment, holding other factors constant.

This implies that access to credit facilities plays a critical role in shaping pastoralists' willingness and ability to invest in livestock.

These findings are consistent with Carrer et al. (2020), who found that rural credit access significantly enhanced investment in productive agricultural assets in Brazil's crop-livestock systems. Although their study focused on smallholder farmers, the positive relationship aligns with the current results. Silong and Gadanakis (2020) similarly reported that credit availability positively influenced investment among Nigerian farmers, particularly when mediated by group membership and gender. The present findings corroborate their conclusion, affirming the predictive power of credit access in agricultural contexts. Wagacha and Odini (2020), in their study of Kenyan agricultural households, observed that access to credit information and financial services was positively associated with increased investment in farming activities. The current results agree with their findings, confirming that credit facility availability is a statistically significant driver of livestock investment among pastoralists.

4.6.2 Mobile Banking Adoption and Livestock Investment among Pastoralist

Table 4.12
Regression output for Mobile Banking Adoption

ANOVA[a]

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	68.895	1	68.895	155.097	.000[b]
Residual	133.706	301	.444		
Total	**202.601**	**302**			

a. Dependent Variable: Livestock Investment
b. Predictors: (Constant), Mobile Banking Adoption

Coefficients[a]

Model	Unstandardized Coefficients	Standardized Coefficients	t	Sig.

	B	Std. Error	Beta		
(Constant)	1.129	.158		7.154	.000
Mobile Banking Adoption	.666	.053	.583	12.454	.000

a. Dependent Variable: Livestock Investment

Table 4.12 presents the regression results assessing the effect of mobile banking adoption on livestock investment. The model was statistically significant ($F = 155.097$, $p < 0.001$), indicating that mobile banking adoption explains a substantial portion of the variance in investment behavior. The standardized beta coefficient ($\beta = 0.583$) and corresponding t-value (12.454, $p < 0.001$) confirm a strong positive relationship. The unstandardized coefficient ($B = 0.666$) suggests that a one-unit increase in mobile banking adoption leads to a 0.666 unit increase in livestock investment, holding other factors constant.

These findings are consistent with Kouandou and Laajimi (2025), who found that mobile banking significantly increased the adoption of modern agricultural inputs in Côte d'Ivoire. Although their study focused on inorganic fertilizers, the positive relationship aligns with the current results. Similarly, Emeana et al. (2020) highlighted that mobile-enabled agricultural services facilitated access to financial tools for smallholder farmers across Africa, supporting the notion that mobile platforms enhance investment capacity.

Chelang'a (2024) also reported that mobile phone access improved market integration and price transparency for livestock farmers in Kenya's pastoral drylands. While that study did not directly assess banking functionalities, the current findings complement its conclusions by demonstrating that mobile banking adoption contributes positively to actual investment behavior. Krell et al. (2021), however, found that only 25 percent of smallholder farmers in central Kenya used mobile phones for livestock-related information, suggesting low utilization despite widespread ownership. The present results contrast with that observation, indicating that where mobile banking is adopted, it has a significant and positive impact on investment decisions.

4.6.3 Financial Literacy and Livestock Investment among Pastoralist

Table 4.13
Regression output for Financial Literacy

ANOVA[a]

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	97.084	1	97.084	276.945	.000[b]
Residual	105.517	301	.351		
Total	**202.601**	**302**			

a. Dependent Variable: Livestock Investment
b. Predictors: (Constant), Financial Literacy

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	1.214	.115		10.586	.000
Financial Literacy	.669	.040	.692	16.642	.000

a. Dependent Variable: Livestock Investment

Table 4.13 presents the regression results examining the relationship between financial literacy and livestock investment. The model is statistically significant, with an F-value of 276.945 and a p-value less than 0.001. This confirms that financial literacy is a strong predictor of investment among pastoralist households. The standardized beta coefficient is 0.692, indicating a strong positive relationship. The unstandardized coefficient of 0.669 suggests that a one-unit increase in financial literacy leads to a 0.669 unit increase in livestock investment, holding other factors constant. The t-value of 16.642 further supports the reliability of this effect.

These findings align with Njogu and Olweny (2022), who found that financial literacy significantly improved access to formal credit among livestock farmers in Murang'a County. Although their study focused on credit access, the current results extend this relationship by

demonstrating a direct link between financial literacy and actual investment behavior. Ephrem and Wamatu (2021) also reported that financial literacy enhanced financial goal-setting and reduced vulnerability among sheep farmers in Ethiopia. While their study did not directly assess livestock investment, it supports the broader conclusion that financial knowledge contributes to improved financial outcomes in agropastoral contexts. Raza et al. (2023) found that financial literacy influenced credit accessibility among rice farmers in Pakistan, with education and income as key drivers. Although the study focused on crop farming, the observed relationship between literacy and financial behavior reinforces the relevance of financial literacy in guiding investment decisions.

However, Proscovia et al. (2021) noted that informal financial literacy training in Uganda did not yield significant differences in overall literacy scores between trained and untrained farmers. This suggests that the effectiveness of financial literacy programs may depend on delivery methods and contextual factors, which should be considered when designing interventions for pastoralist communities. Overall, the results highlight the importance of financial literacy in promoting livestock investment decisions. Strengthening financial knowledge among pastoralists can enhance their ability to allocate resources effectively and improve economic resilience.

4.6.4 Access to Savings Platforms and Livestock Investment among Pastoralist

Table 4.14
Regression output for Access to Savings Platforms

ANOVA[a]

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	44.409	1	44.409	84.500	.000[b]
Residual	158.191	301	.526		
Total	**202.601**	**302**			

a. Dependent Variable: Livestock Investment
b. Predictors: (Constant), Access to Savings Platforms

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	1.052	.220		4.788	.000
Access to Savings Platforms	.631	.069	.468	9.192	.000

a. Dependent Variable: Livestock Investment

Table 4.14 presents the regression results assessing the relationship between access to savings platforms and livestock investment. The model is statistically significant, with an F-value of 84.500 and a p-value less than 0.001. This indicates that access to savings platforms is a meaningful predictor of investment decisions among pastoralist households. The standardized beta coefficient is 0.468, showing a moderate positive relationship. The unstandardized coefficient of 0.631 suggests that a one-unit increase in access to savings platforms leads to a 0.631 unit increase in livestock investment decisions, holding other factors constant. The t-value of 9.192 confirms the reliability of this effect.

These findings are supported by Bostedt et al. (2021), who observed increased savings participation among agropastoralists in West Pokot County, Kenya, largely driven by informal group-based savings organizations. Although their study did not directly assess livestock investment outcomes, it highlighted the role of savings in enhancing financial inclusion, which aligns with the current results. Gikonyo et al. (2022) found that households with savings were more likely to adopt climate-smart agricultural technologies in Nyando Basin, Kenya. While their study focused on crop-related investments, the positive association between savings and investment behavior supports the conclusion that savings platforms contribute to productive decision-making.

Batista and Vicente (2020) demonstrated that access to mobile savings accounts increased agricultural investments in rural Mozambique. Although their study emphasized fertilizer use, the mechanism through which savings platforms facilitate investment is relevant to livestock contexts as well.

Ankrah Twumasi et al. (2020) reported that savings mobilization significantly improved credit access among smallholder farmers in Ghana. While the focus was on credit rather than direct investment, the findings suggest that savings behavior enhances financial capacity, which can translate into livestock investment. However, Kubinska et al. (2023) noted that digital savings platforms are influenced by psychological factors such as trust and risk tolerance. This implies that while access is important, behavioral dimensions must also be considered when designing savings interventions for pastoralist communities. Overall, the results underscore the importance of expanding access to savings platforms tailored to pastoralist needs. Strengthening these mechanisms can enhance investment in livestock and contribute to the financial resilience of rural households.

4.6.5 Joint effects of financial services accessibility, Financial Literacy on Investment in Livestock Farming

Table 4.15
Regression output for joint Effect of financial services accessibility, Financial Literacy on Investment in Livestock Farming

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.768[a]	.589	.584	.529

a. Predictors: (Constant), Access to Savings Platforms, Mobile Banking Adoption, Financial Literacy, Availability of Credit Facilities
b. Dependent Variable: Livestock Investment

ANOVA[a]

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	119.364	4	29.841	106.834	.000[b]
Residual	83.237	298	.279		
Total	**202.601**	**302**			

a. Dependent Variable: Livestock Investment

b. Predictors: (Constant), Access to Savings Platforms, Mobile Banking Adoption, Financial Literacy, Availability of Credit Facilities

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	.021	.177		.121	.904
Availability of Credit Facilities	.197	.057	.169	3.435	.001
Mobile Banking Adoption	.254	.053	.223	4.844	.000
Financial Literacy	.413	.046	.427	8.889	.000
Access to Savings Platforms	.187	.058	.139	3.200	.002

a. Dependent Variable: Livestock Investment

Table 4.15 presents the regression results assessing the combined influence of financial services accessibility and financial literacy on livestock investment decisions. The model is statistically significant, with an F-value of 106.834 and a p-value less than 0.001. The R-squared value of 0.589 indicates that approximately 58.9 percent of the variance in livestock investment decisions is explained by the joint predictors, confirming strong explanatory power. Among the predictors, financial literacy shows the highest standardized beta coefficient (0.427), followed by mobile banking adoption (0.223), availability of credit facilities (0.169), and access to savings platforms (0.139). All four predictors are statistically significant at the 0.05 level, indicating that each contributes meaningfully to investment decisions when considered jointly.

These findings are consistent with Njogu and Olweny (2022), who found that financial literacy enhanced access to formal credit among livestock farmers in Murang'a County. Kouandou and Laajimi (2025) reported that mobile banking adoption increased agricultural technology

uptake in Côte d'Ivoire, which aligns with the positive effect observed here. Carrer et al. (2020) and Tanti et al. (2022) emphasized the role of credit availability in promoting agricultural investment, and Batista and Vicente (2020) showed that mobile savings accounts facilitated investment in Mozambique. All these studies support the conclusion that financial literacy and financial services jointly influence livestock investment decisions.

4.6.6 Moderating Effect of Cultural Attitude on the relationship between Financial Services Accessibility, and investment in livestock farming

$$Y_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 Z_i + \beta_6 (X_1 \times Zi) + \beta_7 (X_2 \times Zi) + \beta_8 (X_3 \times Zi) + \beta_9 (X_4 \times Zi) + \varepsilon$$

Table 4.16
Regression output for Moderating Effect of Cultural Attitude

ANOVA[a]

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	125.723	9	13.969	53.240	.000[b]
Residual	76.878	293	.262		
Total	**202.601**	**302**			

a. Dependent Variable: Livestock Investment

b. Predictors: (Constant), X4Zi, Financial Literacy, Mobile Banking Adoption, Availability of Credit Facilities, Cultural Attitude, Access to Savings Platforms, X3xZi, X2xZi, X1xZi

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	1.065	.839		1.269	.205
Availability of Credit Facilities	.612	.321	.526	1.907	.057
Mobile Banking Adoption	-.250	.289	-.219	-.863	.389
Financial Literacy	.247	.248	.256	.996	.320
Access to Savings Platforms	-.150	.309	-.112	-.487	.626
Cultural Attitude	-.232	.251	-.176	-.925	.356
X1xZi	-.134	.097	-.557	-1.374	.170

X2xZi	.145	.089	.607	1.632	.104
X3xZi	.045	.076	.200	.591	.555
X4xZi	.094	.097	.376	.971	.333

a. Dependent Variable: Livestock Investment

Table 4.16 presents the regression results assessing whether cultural attitude moderates the relationship between financial services accessibility and livestock investment. The model is statistically significant, with an F-value of 53.240 and a p-value less than 0.001. This indicates that the combined predictors, including interaction terms, explain a substantial portion of the variance in livestock investment. However, the individual coefficients reveal that most predictors and interaction terms are not statistically significant at the 5 percent level. Availability of credit facilities shows a marginal effect ($p = 0.057$), while mobile banking adoption, financial literacy, access to savings platforms, and cultural attitude all exhibit non-significant effects. Similarly, the interaction terms (X1×Zi, X2×Zi, X3×Zi, X4×Zi) do not show statistically significant moderation effects, with p-values ranging from 0.104 to 0.555.

These results suggest that while the overall model is significant, cultural attitude does not significantly moderate the relationship between financial services accessibility and livestock investment decisions when examined through individual interaction effects. This finding contrasts with Lapinski et al. (2022), who emphasized the role of descriptive and injunctive norms in shaping conservation behaviors among Tibetan pastoralists. Although their study was qualitative and contextually distinct, it highlighted how cultural norms influence decision-making under environmental and policy pressures. The current results suggest that such cultural influences may not exert a measurable moderating effect on financial investment behavior in the Kenyan pastoralist context.

Kinati et al. (2022) identified gender-based differences in empowerment preferences among Ethiopian livestock keepers, with psychological well-being influencing decision-making. While their study did not directly test moderation effects, it supports the idea that cultural and psychological factors shape financial behavior. However, the present findings indicate that cultural attitude, as operationalized in this model, does not significantly alter the effect of financial services on investment decisions.

Ng'ang'a (2022) and Eshete and Molla (2021) both illustrated how cultural beliefs influence health-related decisions among pastoralists, but neither study addressed financial behavior. Their insights into cultural resistance and indigenous knowledge systems underscore the complexity of measuring cultural attitudes quantitatively, which may explain the lack of significant moderation effects in this model. Overall, while cultural attitude is conceptually relevant, the current results suggest that its moderating role in financial services accessibility and livestock investment decisions is limited. Future research may benefit from refining the measurement of cultural constructs or exploring alternative pathways through which culture influences financial behavior.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents a synthesis of the study's key findings, drawing together the empirical evidence and theoretical insights discussed in Chapter Four. It begins with a concise summary of the research objectives, methodology, and major results, followed by conclusions that respond directly to the study's hypotheses and conceptual framework. The final section offers actionable recommendations for policy, practice, and future research, grounded in the realities of pastoralist communities and the financial ecosystem in Kenya. The chapter aims to bridge the analytical outcomes with practical implications, ensuring that the study contributes not only to academic discourse but also to the design of inclusive financial strategies that enhance livestock investment. Each recommendation is informed by statistically significant relationships and contextual interpretations, reinforcing the study's relevance to stakeholders in financial services, agricultural development, and rural governance.

5.2 Summary of Findings

5.2.1 Availability of Credit Facilities and Livestock Investment among Pastoralist

The study found a statistically significant relationship between the availability of credit facilities and livestock investment among pastoralist communities. Regression analysis yielded a standardized beta coefficient of 0.169, indicating a positive and moderate effect. This suggests that access to credit, whether through formal banks, SACCOs, or mobile-based lending platforms, enhances pastoralists' ability to invest in livestock assets. The variable remained significant across both individual and joint regression models, with p-values below the 0.05 threshold. These

findings are consistent with Carrer et al. (2020) and Tanti et al. (2022), who emphasized credit access as a driver of agricultural investment. Contextually, the results reflect structural barriers such as collateral constraints and limited financial literacy. The positive association observed highlights the need for inclusive credit mechanisms tailored to pastoralist realities, particularly in arid and semi-arid regions where livestock remains a primary economic asset.

5.2.2 Mobile Banking Adoption and Livestock Investment among Pastoralist

The study found a statistically significant relationship between mobile banking adoption and livestock investment among pastoralist communities. Regression analysis yielded a standardized beta coefficient of 0.583, indicating a strong positive effect. This suggests that mobile financial services, including mobile money transfers and digital savings platforms, enhance pastoralists' ability to invest in livestock assets. The variable remained significant across both individual and joint regression models, with p-values below the 0.001 threshold. These findings are consistent with Kouandou and Laajimi (2025) and Emeana et al. (2020), who emphasized mobile banking as a catalyst for agricultural investment. In the Kenyan context, Chelang'a (2024) highlighted how mobile platforms improve liquidity and transactional efficiency for livestock farmers. The positive association observed reflects the growing role of mobile banking in bridging financial access gaps among pastoralist populations, particularly in remote and underserved regions.

5.2.3 Financial Literacy and Livestock Investment among Pastoralist

The study found a statistically significant relationship between financial literacy and livestock investment decisions among pastoralist communities. Regression analysis yielded a

standardized beta coefficient of 0.692, indicating a strong positive effect. This suggests that pastoralists with higher financial literacy, including budgeting skills, savings awareness, and understanding of investment risks, are more likely to make informed decisions regarding livestock acquisition and management. The variable remained significant across both individual and joint regression models, with p-values below the 0.001 threshold. These findings are consistent with Njogu and Olweny (2022) and Ephrem and Wamatu (2021), who emphasized financial literacy as a key driver of financial resilience and productive investment. The positive association observed highlights the importance of targeted financial education programs tailored to pastoralist contexts, where formal schooling is limited and livestock remains the primary economic asset.

5.2.4 Access to Savings Platforms and Livestock Investment among Pastoralist

The study found a statistically significant relationship between access to savings platforms and livestock investment decisions among pastoralist communities. Regression analysis yielded a standardized beta coefficient of 0.468, indicating a moderate positive effect. This suggests that access to savings mechanisms, including mobile savings accounts, informal savings groups, and SACCOs, enhances pastoralists' ability to allocate resources toward livestock investment. The variable remained significant across both individual and joint regression models, with p-values below the 0.001 threshold. These findings are consistent with Bostedt et al. (2021) and Batista and Vicente (2020), who emphasized savings access as a driver of agricultural investment. In the pastoralist context, savings platforms offer a buffer against income volatility and facilitate planned asset accumulation. The positive association observed highlights the importance of expanding savings infrastructure tailored to pastoralist needs, particularly in regions where formal banking services are limited and livestock remains the cornerstone of household wealth.

5.2.5 Moderating Effect of Cultural Attitude on the relationship between Financial Services Accessibility, and investment in livestock farming

The study examined whether cultural attitude moderates the relationship between financial services accessibility and livestock investment decisions among pastoralist communities. The overall model was statistically significant ($F = 53.240$, $p < 0.001$), indicating that the combined predictors and interaction terms explain a substantial portion of the variance in investment decisions. However, individual coefficients for the interaction terms were not statistically significant at the 0.05 level. Specifically, the interaction effects of cultural attitude with availability of credit facilities ($p = 0.170$), mobile banking adoption ($p = 0.104$), financial literacy ($p = 0.555$), and access to savings platforms ($p = 0.333$) did not yield significant moderation.

These findings suggest that while cultural attitude is conceptually relevant, it does not significantly alter the influence of financial services on livestock investment in this context. This contrasts with Lapinski et al. (2022), who found that cultural norms shaped conservation behavior among Tibetan pastoralists. Similarly, Kinati et al. (2022) highlighted psychological and cultural factors in livestock decision-making among Ethiopian farmers. However, the current results indicate that cultural attitude, as operationalized in this study, does not exert a measurable moderating effect. This may reflect limitations in how cultural constructs are captured quantitatively or the possibility that financial decisions among Kenyan pastoralists are driven more by economic necessity than cultural orientation. Future research may benefit from refining cultural measures or exploring indirect pathways through which culture influences financial behavior.

5.3 Conclusion

This study examined how access to financial services influences livestock investment among pastoralist communities in Kenya. Using data from 303 respondents across eight counties, the analysis confirmed that financial literacy, mobile banking adoption, access to savings platforms, and availability of credit facilities each had a statistically significant and positive effect on investment behavior. The results support the study's framework and show that financial inclusion plays an important role in shaping economic decisions in pastoralist settings. Among the variables tested, financial literacy had the strongest effect, suggesting that knowledge and understanding of financial concepts are central to how pastoralists manage and grow their livestock assets. The findings also show that mobile banking and savings platforms are becoming important tools for financial management in areas with limited access to formal banking services.

The positive relationship between mobile banking and livestock investment reflects the growing use of digital financial services among rural populations. Mobile platforms allow pastoralists to save, transfer money, and access financial products without relying on physical bank branches. This convenience helps them respond quickly to market opportunities and manage risks more effectively. Access to savings platforms also showed a meaningful effect, indicating that the ability to store money securely contributes to planned investment in livestock. These findings suggest that expanding digital financial services and informal savings mechanisms can support pastoralist households in building more stable and productive livelihoods. The results are consistent with other studies that highlight the role of financial tools in improving agricultural investment outcomes in rural areas.

Credit access was also found to influence livestock investment, although the effect was less pronounced compared to other variables. This may be due to challenges such as lack of collateral,

limited formal employment, and geographic isolation, which make it difficult for pastoralists to qualify for conventional loans. Despite these barriers, the positive association suggests that flexible and inclusive credit models, such as SACCOs and mobile-based lending, can help unlock investment potential. The findings point to the need for financial products that are designed to meet the specific needs of pastoralist communities. Combining credit access with financial education and digital tools may offer a more effective approach to supporting livestock investment and improving household income in arid and semi-arid regions.

The study also tested whether cultural attitude moderates the relationship between financial services and livestock investment. While the overall model was statistically significant, the interaction terms did not show meaningful effects. This means that cultural beliefs, as measured in this study, did not significantly change how financial services influenced investment decisions. It is possible that economic needs and practical concerns are more important than cultural preferences when pastoralists make financial choices. Alternatively, the way cultural attitude was measured may not have captured its full influence. Previous research has shown that cultural norms can affect behavior in areas such as health and agriculture, so future studies may need to use different methods to explore this relationship more deeply.

In conclusion, the study provides evidence that financial literacy, mobile banking, savings access, and credit availability are important factors in livestock investment among pastoralist communities. These findings offer practical guidance for policymakers, financial institutions, and development organizations working to improve rural livelihoods. By strengthening financial knowledge and expanding access to appropriate services, stakeholders can help pastoralists make better investment decisions and build more resilient economies. The study also highlights areas for further research, especially in understanding how cultural factors interact with financial behavior.

Overall, the results contribute to the broader discussion on financial inclusion and rural development, with specific relevance to livestock-based economies in Kenya.

5.4 Recommendations

Based on the study findings, policy makers should prioritize the development of inclusive financial frameworks that address the unique needs of pastoralist communities. The strong relationship between financial literacy and livestock investment decisions highlights the need for targeted financial education programs. These programs should be integrated into existing community structures and delivered in local languages to ensure accessibility. Government agencies and development partners should collaborate to design culturally sensitive training modules that focus on budgeting, savings, and investment planning. Such interventions can empower pastoralists to make informed financial decisions and reduce vulnerability to economic shocks. Additionally, policies should support the expansion of financial infrastructure in arid and semi-arid regions, including mobile banking networks and savings cooperatives.

Financial institutions should develop flexible credit products tailored to the realities of pastoralist households. The findings show that access to credit significantly influences livestock investment, yet many pastoralists face barriers such as lack of collateral and formal documentation. Institutions should consider alternative credit scoring models that incorporate livestock ownership, group guarantees, and transaction histories from mobile platforms. Partnerships with local SACCOs and community-based organizations can improve outreach and trust. Moreover, financial institutions should simplify loan application procedures and offer repayment schedules that align with livestock production cycles. These adjustments can enhance credit uptake and stimulate investment in livestock, which remains the backbone of pastoralist economies.

Mobile service providers have a critical role in expanding access to financial services through digital platforms. The study confirmed that mobile banking adoption has a strong positive effect on livestock investment decisions. Providers should invest in network coverage across remote pastoralist regions and ensure that mobile financial services are compatible with low-tech devices. User interfaces should be simplified to accommodate varying literacy levels, and customer support should be localized. In addition, mobile providers can collaborate with financial institutions to offer bundled services such as savings accounts, microloans, and insurance products. These integrated solutions can improve financial inclusion and enable pastoralists to manage their resources more effectively. Providers should also consider offering financial literacy content through SMS and voice-based formats to reinforce learning and encourage responsible financial behavior.

Development agencies and non-governmental organizations should support the establishment of informal savings groups and financial cooperatives within pastoralist communities. The study found that access to savings platforms contributes meaningfully to livestock investment decisions. Informal savings mechanisms, such as rotating savings and credit associations, have proven effective in building financial discipline and pooling resources for investment. Agencies should provide technical assistance to strengthen governance structures within these groups and link them to formal financial systems. Training in record-keeping, group management, and financial planning can enhance the sustainability of these platforms. Furthermore, development actors should advocate for policy reforms that recognize and support informal financial institutions as legitimate contributors to rural financial ecosystems.

Finally, future research and program design should consider the limited moderating effect of cultural attitude on financial behavior. While cultural norms are important, the findings suggest

that economic factors have a stronger influence on investment decisions among pastoralists. Researchers should explore alternative ways of capturing cultural dynamics, possibly through qualitative methods or participatory approaches. Program designers should focus on practical interventions that address immediate financial constraints while remaining sensitive to local customs. By aligning financial services with the lived realities of pastoralist households, stakeholders can promote inclusive growth and strengthen the resilience of livestock-based livelihoods across Kenya's arid and semi-arid regions.

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APPENDICIES

Appendix 1: QUESTIONNAIRE

Section A: Demographic Information

1. **Gender**
   - [ ] Male
   - [ ] Female
   - [ ] Other
2. **Age**
   - [ ] Below 20 years
   - [ ] 21–30 years
   - [ ] 31–40 years
   - [ ] 41–50 years
   - [ ] Above 50 years
3. **Level of Education**
   - [ ] No formal education
   - [ ] Primary education
   - [ ] Secondary education
   - [ ] Tertiary education
4. **County of Residence**
   - [ ] Garissa
   - [ ] Wajir
   - [ ] Isiolo
   - [ ] Marsabit
   - [ ] Turkana
   - [ ] Samburu
5. **Main Source of Income**
   - [ ] Livestock farming
   - [ ] Crop farming
   - [ ] Business
   - [ ] Employment

Section B: Availability of Credit Facilities

On a scale of 1 to 5, where 1 = Strongly Disagree and 5 = Strongly Agree, please indicate your level of agreement with the following statements:

Statement	1 (Strongly Disagree)	2 (Disagree)	3 (Neutral)	4 (Agree)	5 (Strongly Agree)
Credit facilities are easily accessible to pastoralist households in my area.	☐	☐	☐	☐	☐

The interest rates on credit facilities are affordable for livestock investment.	☐	☐	☐	☐	☐
Credit facilities have enabled me to expand my livestock herd.	☐	☐	☐	☐	☐
Lack of collateral is a major barrier to accessing credit facilities.	☐	☐	☐	☐	☐
Financial institutions provide adequate information about credit products for livestock investment.	☐	☐	☐	☐	☐

Section C: Mobile Banking Adoption

On a scale of 1 to 5, where 1 = Strongly Disagree and 5 = Strongly Agree, please indicate your level of agreement with the following statements:

Statement	1 (Strongly Disagree)	2 (Disagree)	3 (Neutral)	4 (Agree)	5 (Strongly Agree)
Mobile banking services are readily available in my area.	☐	☐	☐	☐	☐
I use mobile banking to save money for livestock investment.	☐	☐	☐	☐	☐
Mobile banking has reduced the cost of financial transactions for me.	☐	☐	☐	☐	☐
Mobile banking enables me to access credit for livestock investment.	☐	☐	☐	☐	☐
I trust mobile banking platforms for secure financial transactions.	☐	☐	☐	☐	☐

Section D: Financial Literacy

On a scale of 1 to 5, where 1 = Strongly Disagree and 5 = Strongly Agree, please indicate your level of agreement with the following statements:

Statement	1 (Strongly Disagree)	2 (Disagree)	3 (Neutral)	4 (Agree)	5 (Strongly Agree)
I understand how to budget and plan for livestock investment.	☐	☐	☐	☐	☐
I am aware of the financial services available for pastoralist households.	☐	☐	☐	☐	☐
I can calculate the costs and benefits of livestock investment.	☐	☐	☐	☐	☐
Financial literacy training has improved my ability to make investment decisions.	☐	☐	☐	☐	☐
Lack of financial literacy is a barrier to accessing financial services.	☐	☐	☐	☐	☐

Section E: Access to Savings Platforms

On a scale of 1 to 5, where 1 = Strongly Disagree and 5 = Strongly Agree, please indicate your level of agreement with the following statements:

Statement	1 (Strongly Disagree)	2 (Disagree)	3 (Neutral)	4 (Agree)	5 (Strongly Agree)
Savings platforms are accessible to pastoralist households in my area.	☐	☐	☐	☐	☐
I regularly save money for future livestock investments.	☐	☐	☐	☐	☐
Savings platforms provide secure storage for my money.	☐	☐	☐	☐	☐
Access to savings platforms has improved my financial stability.	☐	☐	☐	☐	☐
Lack of savings platforms limits my ability to invest in livestock.	☐	☐	☐	☐	☐

Section F: Cultural Attitude (Moderating Variable)

On a scale of 1 to 5, where 1 = Strongly Disagree and 5 = Strongly Agree, please indicate your level of agreement with the following statements:

Statement	1 (Strongly Disagree)	2 (Disagree)	3 (Neutral)	4 (Agree)	5 (Strongly Agree)
Cultural beliefs influence my decisions about livestock investment.	☐	☐	☐	☐	☐
Traditional norms affect my willingness to adopt financial services.	☐	☐	☐	☐	☐
My community values align with the use of modern financial tools.	☐	☐	☐	☐	☐
Cultural attitudes moderate the relationship between financial access and livestock investment.	☐	☐	☐	☐	☐
Resistance to change due to cultural beliefs limits financial service adoption.	☐	☐	☐	☐	☐

Section G: Livestock Investment Decisions

On a scale of 1 to 5, where 1 = Strongly Disagree and 5 = Strongly Agree, please indicate your level of agreement with the following statements:

Statement	1 (Strongly Disagree)	2 (Disagree)	3 (Neutral)	4 (Agree)	5 (Strongly Agree)
I have increased my livestock herd size in the past year.	☐	☐	☐	☐	☐
I invest in veterinary services to improve livestock health.	☐	☐	☐	☐	☐
Financial services have enabled me to diversify my livestock investments.	☐	☐	☐	☐	☐
I prioritize livestock investment over other forms of investment.	☐	☐	☐	☐	☐
My livestock investment decisions are influenced by financial access.	☐	☐	☐	☐	☐

Appendix II: ETHICS CLEARANCE CERTIFICATE

KCA UNIVERSITY

Thika Road, Ruaraka
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Pilot Line: +254 20 8070408/9

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KCA UNIVERSITY SCIENTIFIC & ETHICS REVIEW COMMITTEE

REF: KCAU/SERC/ SOB0179 Date: 21ST JULY 2025

TO: MOHAMED ABDIHASSAN (23/08319)

Dear Sir/Madam,

RE: ACCESS TO FINANCIAL SERVICES ON LIVESTOCK INVESTMENT DECISIONS AMONG PASTORALIST HOUSEHOLDS IN KENYA

This is to inform you that KCA University Scientific Ethics Review Committee (KCAUSERC) has reviewed and approved your above research proposal. Your application approval number is ***KCAUSERC/SOB0179***. The approval period is ***21st July 2025 – 21st July, 2026.***
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 ***KCAUSERC.***
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 **KCAU*SERC*** within 72 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 ***KCAUSERC*** within 72 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 ***KCAUSERC.***

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 also obtain other clearances needed.

Yours sincerely

Dr. Caroline Ntara
Chairperson
KCA University Scientific & Ethics Review Committee

Appendix III: Ethical Request Form

RESEARCH, INNOVATION, AND OUTREACH DIVISION

KCA UNIVERSITY SCIENTIFIC AND ETHICS REVIEW COMMITTEE

REQUEST FOR ETHICAL REVIEW FORM

The request must include the following information for the research to be considered for approval:

Name, institution, and contact details (email and phone number) of the principal/lead investigator/researcher:	**Name:** Mohamed Abdi Hassan **Institution:** KCA University **Registration Number:** 23/08319 **Phone Number:** +254 725 533731 **Email:** 2308319@students.kcau.ac.ke
If it is a thesis, include also the name(s), institution(s), and contact details (emails and phone numbers) of the supervisor(s):	**Supervisor's Name:** Dr. Peter Omae **Institution:** KCA University **Email:** pkabuka@kcau.ac.ke Phone Number:0727158927
Date of request:	04/06/2025
Title of the Research:	Access to Financial Services on Livestock Investment Decisions Among Pastoralist Households in Kenya
Planned or confirmed source of funding:	Self-funded
Members of the research group and their roles in the implementation of the study, as well as possible cooperation with other universities, research institutes, or similar organizations:	**4 people** (Helping distribute and collect questionnaires)
What is the level of risk presented by your research?	Please indicate whether the research risk assessment (Check risk document) stated on the application is: ☑ **Low risk** (*Research has no foreseeable risk of harm, discomfort, or inconvenience to respondents*) ☐ **Medium risk** (*Research has potential risk of unexpected negative consequences, harm or discomfort, but where appropriate steps can be taken to mitigate the risk*) ☐ **High risk** (*Research with real and foreseeable risk of harm and discomfort to participants and or the research team, and which may lead to serious adverse consequences if these risks are not managed*

1

	in a responsible manner. It involves highly sensitive topics and/or the participation of very vulnerable and marginalized individuals/groups)
Would you like to bring any aspects of the applications to the Ethics Review Committee's attention?	• Informed consent will be obtained from all participants • Data privacy and anonymity measures will be enforced • No potential harm to participants
What research data will be collected?	The study will collect quantitative data from pastoralist households across Kenya to analyze the impact of financial access on livestock investment decisions. Specifically, the data collection will cover: • Financial Access: Availability of credit facilities, mobile banking adoption, financial literacy, and access to savings platforms • Livestock Investment Decisions: Herd size, veterinary care, market participation, investment trends • Demographic Information: Age, gender, level of education, household income sources • Cultural Attitudes: How traditions influence financial decisions and livestock investment

What personal data and confidential information will be processed?	The study will process the following personal data:
	• Participant Identification: Name (if applicable), age, gender, and occupation
	• Contact Information: Phone number and email (if respondents opt to share)
	• Financial Records: Income range, savings habits, access to credit (handled securely)
	• Confidentiality Measures:
	  ○ Responses will be anonymized before analysis
	  ○ Data will be stored securely with limited access
	  ○ No confidential agreements required, but ethical privacy measures will be observed

Specify any special category or sensitive data that will be collected (tick all that apply)	☐ Ethnicity ☐ Mental Health (status, medical records conditions, to include disability) ☐ Physical Health (status, medical records conditions, to include disability) ☐ Sexual Orientation/Sexual life ☐ Genetic Data (to include DNA data) ☐ Biometric data (such as facial scan, iris scan, or fingerprint data used to identify a participant) ☐ Political opinions ☐ Trade Union membership

	☐ Religious or philosophical beliefs ☐ Criminal Convictions and offences (to include alleged offences and convictions) ☑ None ☐ Other – Please specify below
How will data be stored and transferred during the research?	• All data will be digitally stored in a secure, password-protected system. • Hard copies (questionnaires) will be temporarily stored in locked cabinets before being digitized. • During transfer, data will be encrypted to ensure privacy and protection from unauthorized access. • Research assistants will collect questionnaires and submit them securely to the researcher for processing.
Specify who will be able to access the identifying information and how you will ensure they process the information securely	• Only the researcher (Mohamed Abdihassan) and the four research assistants will have access to raw identifying information. • Supervisors may review anonymized datasets but will not access personal details. • Identifying information (names, phone numbers, etc.) will be removed before analysis to maintain confidentiality. • Data processing will follow strict security protocols, ensuring information is handled responsibly.
How will research data be preserved and shared on completion of the project? (NB: *Enter N/A in this section unless results will be published*)	N/A (Results will not be publicly shared or published outside academic review).
Describe the measures that will be taken to ensure data are suitable for sharing, e.g., securing consent, anonymizing data prior to deposit/sharing, and sharing confidential or high-risk information using a controlled access repository.	• Consent forms will clarify voluntary participation and data handling procedures. • Before depositing data into any repository (if applicable), identifying details will be removed or encrypted. • No confidential or high-risk data is expected, eliminating the need for controlled-access repositories.
State how long you plan to retain personal data and any confidential information after the end of the project. Indicate also how the data will be disposed	• Personal data and raw confidential information will be retained for six months post-study to allow for analysis and verification. • After six months, all personal data will be permanently deleted from digital storage and hard copies will be shredded.

As the Principal Investigator of this study, I declare that I take full responsibility for the proposed study and will conduct it according to the documented proposal and in line with KCAUSERC ethical guidelines.

By signing this document, I agree that:

a) All documents submitted with this application are true representations of the study and

have not been falsified.

b) This study will not commence in any way, and no participant will be recruited until final official approval is received from KCAUSERC
c) The study will be conducted according to the protocol submitted. All participants will be recruited and consented to according to the protocol.
d) Any protocol deviations or protocol violations to the submitted study must be reported to KCAU in writing by email to KCAUSERC immediately. Within five (5) business days of the deviation or violation, the Deviation/Violation Must be reported to the ISERC office.
e) Any study-related unexpected or serious adverse event must be reported to the ISERC Office by email within twenty-four (24) hours after the PI becomes aware of the event.

Principal Investigator's Signature **Date**

INFORMED CONSENT FOR RESEARCH PARTICIPATION

Introduction
You are invited to participate in a research study. This document provides information about the study so that you can make an informed decision about your participation. Please take the time to read the information below. If you have any questions, feel free to ask the researcher. **(PI to Fill in the sections italicized)**

Purpose of the Study
The purpose of this study is to *examine the impact of financial access on livestock investment decisions among pastoralist households in Kenya*. The research is being conducted to *understand how financial tools such as credit facilities, mobile banking, financial literacy, and savings platforms, affect investment behaviors and economic resilience within pastoral communities*.

Study Procedures
If you agree to participate, you will be asked to *complete a structured questionnaire that will collect information on your financial access, livestock investment decisions, and socio-economic factors. The questionnaire should take approximately 30 minutes to complete. Research assistants will distribute and collect the forms from participants across different counties in Kenya.*

Potential Risks and Discomforts
There may be some risks associated with participation in this study. These risks may include *N/A*. Every effort will be made to minimize these risks, and you can withdraw from the study at any time without penalty.

Potential Benefits
While participating may not directly benefit you, the results of this study may contribute to *policy recommendations and financial inclusion strategies aimed at improving access to financial services for pastoralist communities.*

Confidentiality
Your participation will be kept confidential. Any data collected will be stored securely and only accessible to the research team. Your identity will not be revealed in any publication or presentation resulting from this research.

Voluntary Participation
Participation in this study is completely voluntary. You have the right to withdraw from the study at any time without any negative consequences or loss of benefits to which you are otherwise entitled.

Questions
If you have any questions about this study, your participation, or your rights as a participant, please contact the principal investigator at *Mohamed Abdi Hassan, at +254 725 533731.*

Consent
By signing below, you indicate that you have read the information provided above, understand the purpose and procedures of the study, and voluntarily agree to participate. You can withdraw from the study at any time without penalty.

Participant Statement:

I, the undersigned, consent to participate in this study.
Name of Participant: _____
Signature of Participant: _____
Date: _____

Researcher (Principal Investigator –P1) Statement:

I, the undersigned, confirm that I have explained the nature of this study to the participants, answered all questions, and ensured that they understand the information provided.
Name of Researcher: _Mohamed Abdi Hassan_____
Signature of Researcher: _____
Date: 24/06/2025

Appendix IV: NACOSTI

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: 141868

Date of Issue: 02/September/2025

RESEARCH LICENSE

This is to Certify that Mr.. MOHAMED ABDI HASSAN of KCA University, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Garissa, Isiolo, Kajiado, Mandera, Marsabit, Samburu, Tanariver, Turkana, Wajir on the topic: FINANCIAL SERVICES ACCESSIBILITY, FINANCIAL LITERACY AND INVESTMENT IN LIVESTOCK FARMING AMONG PASTORALIST HOUSEHOLDS for the period ending : 02/September/2026.

License No: NACOSTI/P/25/4179081

141868

Applicant Identification Number

Ag. Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

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