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Factors influencing the adoption of emerging technologies by Micro Small and Medium agribusiness organizations in Kenya.

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FACTORS INFLUENCING THE ADOPTION OF EMERGING TECHNOLOGIES BY MICRO SMALL AND MEDIUM AGRIBUSINESS ORGANIZATIONS IN KENYA

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DECLARATION

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

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ABSTRACT

In developing countries such as Kenya, the slow adoption of emerging technologies by micro small and medium agribusiness organizations has been a subject of concern. No wonder, the Kenyan Government is putting emphasis on this sector. The available literature reveal that most micro small and medium agribusiness organizations are lagging behind the larger agribusiness firms in adoption of emerging technologies. This study sought to examine the factors that influence the adoption of Emerging Technologies by micro small and medium agribusiness organizations in Kenya with a focus on agribusiness organizations under two agribusiness value chain projects in Kenya. These projects are, Towards Sustainable Clusters in Agribusiness through Learning in Entrepreneurship and the Kenya Crop and Dairy Marketing System. The factors analyzed included, ICT Infrastructure, Cost of Technology, Top management Support and Government policies/regulations. The study employed a descriptive research design. The target population and sample were two senior managers from the thirty-seven micro small and medium agribusiness organizations targeted by the two projects to make up seventy-four respondents who were surveyed and included in the study. Structured questionnaires were administered to the seventy-four managers to obtain data and data obtained and recorded in the google forms. Statistical Package for Social Scientists (SPSS) and python were used for data management, data entry, cleaning and analysis. These software's, were used to conduct descriptive and inferential statistics including logistic regression. Tables, Graphs, Bar-Charts were used to present the study results. The findings reveal the level of ICT Infrastructure was found to have a significant positive influence ($p=0.006$) on adopting emerging technology, indicating that organizations or individuals with better ICT Infrastructure are more likely to adopt such technologies. However, the cost of emerging technology ($p=0.065$) and management support ($p=0.479$) was not found to have a statistically significant impact on adoption. Government policy and regulation were marginally significant at $p=0.05$, suggesting a moderate effect on technology adoption.

Key words: *Information Communication and Technology, Micro Small and Medium Sized Enterprises, Agribusiness Organizations, Emerging Technologies, Adoption.*

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LIST OF ACRONYMS AND ABBREVIATIONS

CRM Customer Relationship Management

ERP Enterprise Resource Planning

GDP Gross Domestic Product

ICT Information Communication Technology

IFDC International Fertilizer Development Center

KCDMS Kenya Crops and Dairy Market Systems

MSME - Micro Small and Medium Enterprises

SMS Short Messaging Service

TAM Technology Acceptance Model

TOE Technology Organization Environment Model

USAID United States Agency for International Development

2SCALE Towards Sustainable Clusters in Agribusiness through Learning in Entrepreneurship

DEFINITION OF KEY TERMS

Agribusiness Organizations: The agribusiness sector of the economy includes all profit-seeking and non-profit organizations that engage in the production, distribution, marketing, or utilization of food, fiber, forest products, or biofuel, as well as those that supply water to and collect waste from those organizations (Fleet, 2016).

Emerging Technologies: A technology is considered emerging in a particular context (domain, place, or application) but can be established elsewhere. Also, technology is considered emerging when its not widespread in a particular context and causes radical changes to business, industry or society (Halaweh, 2013).

Information Communication and Technology (ICT) Refers to computer and communications equipment and software that are used to share and exchange information. (Owusu-Ansah, 2014).

Micro Small and Medium Sized Enterprises (MSMEs): In Kenya, MSMEs are defined as any enterprise that have between 1-99 employees with an annual turnover of less than 50 million Kenyan shillings. (Cheruiyot, 2023).

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DEDICATION

To my Husband Reginald and children Virginia, Victoria and Lawrence.

CHAPTER ONE

INTRODUCTION TO THE STUDY

1.0 Background Information

Agriculture industry contributes to the economic growth in many developing nations. According to the World Bank (2021), agriculture alone employs 26.5% of the world's workforce. In addition, according to the Food and Agriculture Organization (FAO) of the UN, agribusiness is crucial since it is the primary source of off-farm employment in rural regions and agro-industrial firms, has a good impact on eradicating poverty and empowering women (Rusha et al., 2017), most of African's new millionaires are young entrepreneurs who have invested in African fast growing economies sectors among them solar power, agribusiness, smartphones, internet access, education, African art, retail (E-commerce), Apps and Online Services, Payment solutions, Real Estate and Start up financing. Thus the importance of agribusiness organizations becoming evident.

The agribusiness sector is fragmented and informal. The industry is mostly made up of small agricultural businesses that are dispersed and lack coordination. (Adenle et al., 2017) . The big challenge is how to make these agro enterprises competitive. Adenle et al., (2022) posits that one such way is through digital innovations and technologies. A statement supported by Kumar et al., (2022), who argues that ICT is an emergent business strategy. Accordingly, digitalization of agro-food SMEs in Kenya has increased since the beginning of the pandemic (Global Alliance for Improved Nutrition, 2021). However, micro small and medium agribusiness organizations in Kenya have not yet captured this opportunity (Mokaya, 2012). Perhaps, the Government policies can enhance adoption (kayumova, 2017) to ensure that agribusiness organizations are able to effectively adopt ICT and compete globally. In Kenya, a hustlers fund was created to enable SMEs access cheaper credit (Owoko, 2022).

In Kenya, the agriculture sector is important to the economy, contributes 21.9% of GDP and according to the world bank (2019), it is also a source of employment for at least 56 percent of total labor force in 2017. The agro-food sector account for 65 percent of exports revenues (Bolwig, Haselip , Strange, Toft, & Perdersen, 2021). Agriculture sector in Kenya is large and complex,

there are many players, farmers, private agribusiness organizations and public sector organizations. Agribusiness organizations are those businesses that cares most or all of its revenues from agriculture. This could be in farming, processing, manufacturing, packaging, and distribution of products. Micro small and medium Agribusiness organizations can also be referred to as agro-micro small and medium enterprises (Agri-MSMEs). In Kenya, Micro Small and Medium Enterprises are defined by the number of employees or annual turnover. Micro enterprises have between 0 and 10 employees; small enterprises have 10-49 employees while medium sized enterprises have between 50-99 employees. For this study, this definition of MSME will be applied to the agribusiness organizations and this study will focus on the Micro Small and Medium based agribusiness organizations in Kenya.

Worldwide, ICT and SMEs have been recognized to be important. Although it has been estimated that 48% of SMEs in industrialized nations have adopted ICT, just 15% of SMEs in developing countries have done so (Kanyaru, 2015). In Kenya, the government has created conditions for private sector growth and has articulated a digitization vision. Several initiatives and programs to support SME growth and pathway towards digitization have been launched (Wanjohi, 2010). Some of these initiatives include a dedicated minister of ICT, dedicated minister for cooperatives and MSMEs, an ICT policy, training programs, access to funds among others. In addition, there are other programs being implemented in Kenya with a view to support the growth of the private enterprises. International Fertilizer Development Center (IFDC) and United States Agency for International Development (USAID) through their projects, Towards Accelerating Agribusiness clusters (2SCALE) and Kenya Crop and Dairy Market Systems (KCDMS) respectively have had the opportunity to work with select Micro small and medium Agribusiness organizations in Kenya. These projects work in different value chains with a goal of improving the productivity of agribusiness organizations and eventually livelihood of the farmers https://www.2scale.org/en/about. As a result, some of the micro small and medium agribusiness organizations were introduced and exposed to different types of emerging technologies. Some of the organizations received subsidized license fees, free trial period for use of emerging technology and training opportunities. The aim of the support was to hasten appreciation of emerging technologies and eventually acquire and adopt emerging technologies. Despite these attempts by the government and NGOs and private sector, there has been little research to examine the extent of adoption and usage of emerging technologies. This study sought to examine the factors

influencing the ability of these micro small and medium agribusiness organizations to adopt Emerging Technologies. The factors investigated included ICT infrastructure, cost of the emerging technology, senior management support and government policy and regulation.

1.1.1 Emerging Technologies and Micro Small and Medium Agribusiness Organization

According to Chavula (2014), access to the most recent ICT advancements gives small-scale agriculture businesses a competitive edge. No wonder, most developed countries are deliberate on ICT and allocate budgets as much as thirty percent for its research and development (Tarute & Gatautis, 2014). In this study, Emerging Technologies will be viewed within the domain of advanced Information Communication and Technology (ICT).

Emerging Technologies can increase efficiency and improve competitive dynamics in agriculture, (United States Agency for International Development , 2013) and their importance cannot be ignored. The adaptation to emerging Technologies is not optional but a necessity in all business organizations including micro-enterprises (Gnana, 2017). This is true as witnessed during the Covid-19 pandemic when some organizations, agribusiness included, tried to adopt emerging technologies in order to continue to provide service, those who did not adopt, merely survived if lucky or went into extinction. Actually, Information Communication Technology (ICT) can transform the agriculture sector (Husein et al., 2021) and potentially improve business outcomes (Kyakulumbye, 2021), because of ICT agribusinesses can fully manage their operations, thereby improving efficiency, increase precision and reduce hired labor costs (Mulunga, 2021), and even improve the agriculture value chain efficiency and productivity (Ayim et al., 2022).

The use of Emerging Technologies can dramatically impact the success of a business. The areas impacted most by technologies are sourcing, marketing, packaging, networking and resource planning (Tarute & Gatautis, 2014). Other areas include, managing productivity, communication (Sewe, 2022), inventory, financial accounting and customer relationship management, thereby contributing to optimizing a business' operations. The Emerging Technologies can digitize processes from paper, thereby reducing errors, inefficiencies and increasing profitability. An example is the CRM and ERP which are used to digitize every unit of the business operation from customer care, to production units, to processing and packaging units and the warehouse for both raw materials and finished goods.

Emerging Technologies can also be used to respond to the current global consumer trends in agribusiness such as demand for transparency, demand for consistency and Convenience, demand for healthy foods, demand for direct sourcing and supply, and demand for traceability in supply chains. According to Sewe (2022), Emerging Technologies are used to send advisory messages, track supply chains, manage supplies from large out grower base, track and make payments to farmers, advance credit to farmers and to ensure transparency for consumers. For the informal value chains like that of cereals, Emerging Technologies have been used to enable access to markets (Phatty-Jobe, 2020). Examples include digital marketing, digital procurement among others.

Micro small and medium agribusiness organizations can use E-prod to manage large out grower base, track and manage payments to farmers. This system, collects digital records of the farmers including inputs advanced, produce delivered, quality of the produce making it easy for the agribusiness to know exact amounts to pay the farmer. The agribusiness organization may also use Block Chain to improve food traceability. The system collects data and is able to track food from harvest all the way through the processing and transport to the final market. Since in block chain, data cannot be deleted once entered, it will help to keep digital records which can be used to prevent food fraud, enhance safety measurements, supply chain efficiency, and compliance with standards, policies, regulations thereby improving food traceability. Digital procurement system can be used to enable access to markets. The system collects digital data of the interactions between the agribusiness and the farmer including produce, prices, quality. This data may also be used to create a credit rating for the farmers enhancing access to credit. The system may also be integrated with payment and traceability platforms. The MFarms platform can be used to monitor and track field agents, it has modules for linking buyers and sellers. It can also be integrated with payment platforms.

1.1.2. Factors Influencing Adoption of Emerging Technologies

The competitiveness and success of agribusiness organizations can be attributed to the advancement in latest technologies. Many African agribusiness organizations have very limited access to advanced technology, no wonder the adoption of many seemingly beneficial technologies remains low ((Khudzari et al., 2021); (Ruzzante et al., 2021)) and uptake in sub-Saharan Africa sluggish start Ayim et al., 2022. It is important to note that companies that adopt new technology

will acquire significant benefits over those who practice old styles (Khudzari et al., 2021).The type of technologies adopted by agribusiness firms in Kenya are virtual market innovations, virtual pricing innovations and mobile money innovations (Mukundi, 2019).

Agribusiness organizations have been slow to adopt technologies. Various factors have been cited to hinder the success of adopting emerging technologies. (Kabongo & Okpara, 2014) , (Khudzari et al., 2021) argued that companies with well-equipped employees, skilled in ICT were more likely to adopt and integrate newest ICTs. However, skill must be accompanied with right attitude. If the employee has the technology skills but do not have a positive attitude, the emerging technology will not be successfully implemented and utilized and if the employee has the right attitude and skill, they are likely to adopt technology.

The services and functions of the technology affects decision to adopt ((Achieng, 2014); (Otieno, 2015); (Machii & Kyalo, 2016)), knowing the functionality of the technology will affect the decision to adopt a technology. Micro small and medium agribusinesses are very rational in that they will not adopt a technology if it doesn't offer the services they require or even if the technology is too complex. A technology may be good but if it contains too many functionalities, the agribusiness maybe not be quick to adopt.

Another study by Hoque et al., (2016), also discussed the application, effect, and use of ICT in small and medium-sized companies. The following were considered the main factors in adoption, senior management support, government support, financial support, and recognition of benefits.

Agribusiness organizations also face several challenges, if these challenges can be solved, it will be easier for the agribusinesses to adopt emerging technology some of the challenges mentioned include, high Infrastructure cost, system incompatibility, internet access and connectivity, owners and employees skills and knowledge, government support, internet security, no clear legal and regulatory rules and currency instability (Rusha et al., 2017). Meanwhile Mugo (2018) undertook a study to find out the extent of ICT adoption among SMEs and identified the following barriers; high internet cost, high power costs, high hardware and software cost, lack of government support. Again Mukundi (2019), revealed that agribusiness firms main challenge in adopting innovations include cost of technology (by sixty eight percent of firms) and changes in Government regulations and standards (sixteen percent of firms). In addition, during Covid-19 pandemic, some

agribusiness organizations mentioned low literacy levels, inadequate infrastructure, poor internet connectivity as challenges (Sewe, 2022).

1.1.2.1 ICT Infrastructure

The presence of IT Infrastructure in the organization is very key. Does the agribusiness organization have the basic resources that favor integration with new technology? The presence or lack of ICT infrastructure affects adoption of technology, (Machii & Kyalo, 2016) conducted a study to assess ICT adoption for performance of SMEs in Nairobi county. The results showed that ICT infrastructure, ICT user skills, ICT services and Government policies (licenses) showed significant relation to ICT adoption. Another study to investigate the factors that affect adoption of Information and Communication Technology among small and medium sized enterprises in Tharaka Nithi County, Kenya concluded that there was a significant effect of ICT security, ICT infrastructure, management support and employee ICT skills on ICT adoption by SMEs (Kanyaru, 2015). In order to deploy a new technology, the company needs to have the required hardware and software upon which the technology will be based. The infrastructure includes computers, internet and mobile connectivity, electricity and website among others. The presence of these resources will make it easier for the agribusiness to adopt new technology while the absence may hamper adoption. This variable thus is important for this study as it helps to explain the availability of the necessary infrastructure that enables adoption of emerging technology.

1.1.2.2 Cost of Emerging Technologies

The cost of these new technologies include the acquisition cost/ the initial set up, the regular maintenance, subscriptions, trainings among others. The cost of technology implementation is argued to affect adoption (Ngongo, 2019) . In the study, he aimed to identify and evaluate the factors that affect the adoption of ICT solutions in cooperative dairy society. The study therefore concluded that cost of ICT adoption, perceived usefulness, staff competency, and top management are factors that influence the adoption of ICT solutions in dairy cooperative societies. The results of another study done in Ethiopia indicated that relative advantage, complexity, top management support, and competitive pressure factors are significant contributors to ICT adoption in Somalian agribusiness enterprises, while ICT costs are not significantly related to the adoption of (Husein et al., 2021). These authors posit that the initial set up cost is usually high and can be seen as a

challenge for many organizations, who are ordinarily trying to cut operational costs. As a result, many get into a dilemma of balancing the high implementation cost and reducing operations costs. Many agribusiness organizations may end up not adopting new technologies if it will compete for the limited finance available. This measure thus is important to this study as it will reveal availability of resources by the agribusiness organization to support adoption.

1.1.2.3 Support from Senior Management

Management support is another key factor to be considered when it comes to technology adoption (Ogundipe & Hassan, 2017), (Haderi et al., 2018), (Adamkolo et al., 2018), (Estébanez et al., 2022). Due to the nature of the structure of these organizations, most decisions are made by senior management on behalf of the company, therefore if they are supportive towards IT and emerging technologies, it is likely that the agribusiness organization will adopt. Example of this support include having a keen interest, rewarding innovativeness, budget allocation for technologies among others. Consequently, it is assumed that if management supports IT related innovations, then it is likely that the organization will adopt new technologies faster. This measure is important and this study will determine if indeed, the management influences adoption of new technologies.

1.1.2.4 Government policies and regulations

Governments are supposed to provide an enabling environment for businesses. Thus, a favorable Government policy and rules and regulations will influence decision to adopt technology (Hassa & Ogundipe, 2017), investigated the ICT adoption by Micro and Small Scale Enterprises in Abuja Nigeria using the Technology Acceptance Model (TAM) and Technological Organizational Environment (TOE) framework. The results established that competitive pressure, government support, employer's skill and knowledge has an influence on the adoption of ICT by MSEs in the Nigeria. If the Government is not perceived to be supportive then it may not be easy for an agribusiness organization to adopt a technology. The industry laws and regulations must be seen to support and encourage agribusiness organizations to adopt new technologies. This variable is very important for this study, as it will reveal how policies influence agribusinesses organization decision to adopt new technology.

1.2 Problem Statement

Adoption of technology introduces many benefits to the organization among them improved performance of companies (Barrios et al., 2020) ; (Shaikh, 2021)) , increased productivity, incomes and food security, (Ajayi & Olayungbo, 2014) and access to markets (Machii & Kyalo, 2016) . In addition, emerging technologies enable agribusiness to offer product transparency and supply chain traceability. Micro small and medium agribusiness organizations are seen to lag behind the larger firms in adoption of emerging technology (Hoque et al., 2016). Large agribusiness firms are focused; they continue to exploit the potentials of the emerging technologies. Most are using one or two of the emerging technologies such as big data, AI, IoT, Block Chain, ERP, CRM and many others. According to Kanyaru (2015), 48 percent of SMEs in developed countries have adopted ICT compared to 15 percent in developing countries. The reality is that only a few companies will adopt and use effectively information technology (Haderi et al., 2018). This is due to the fact that most micro small and medium agribusiness organizations are very traditional, using paper to record transactions, which could lead to slow processes and expensive products. Moreover, Mokaya (2012), also asserts that in Kenya , most agribusiness organizations have not yet embraced ICT, and the uptake of technology is low (Ndemo & Weiss, 2017). Because of the manual nature of doing business, the micro small and medium agribusiness organizations struggle to survive to remain competitive.

Several studies have been done to understand factors affecting ICT adoption by various groups, farmers (Awuor & Dorothy , 2022), Public Institutions (Nyonje et al., 2018);, (Ndichu et al ., 2019), SMEs (Kanyaru, 2015); (Hassa & Ogundipe, 2017) and (Wessels & Jokonya, 2022)), yet none has delved into micro small and medium agribusiness organizations. These studies succeeded but the results cannot be generalized for micro small and medium agribusiness organizations. This study sought to fill the gap, to analyze how ICT Infrastructure, cost of IT implementation, management support, favorable policy regulations will influence the adoption of Emerging Technologies by micro small and medium agribusiness organizations in Kenya with a focus on those organizations under the IFDC and USAID projects.

1.3 Objectives

The general objective of this study was to determine the factors influencing adoption of Emerging Technologies by micro small and medium agribusiness organizations in Kenya.

The specific objectives were;

i) To determine how ICT Infrastructure influences the adoption of Emerging Technologies by micro small and medium agribusiness organizations in Kenya.

ii) To determine how the cost of emerging technology influences the adoption of Emerging Technologies by micro small and medium agribusiness organizations in Kenya.

iii) To establish how management support influences the adoption of Emerging Technologies by Micro small and Medium Agribusiness Organizations in Kenya.

iv) To examine how Government Policies influences the adoption of Emerging Technologies by Micro Small and Medium Agribusiness Organizations in Kenya.

1.4 Research Questions

The study was guided by the following questions.

i) Does ICT Infrastructure influence the adoption of Emerging Technologies by micro small and medium agribusiness organizations in Kenya.

ii) Does Cost of Emerging Technology influence the adoption of Emerging Technologies by micro small and medium agribusiness organizations in Kenya.

iii) Does Management Support influence the adoption of Emerging Technologies by micro small and medium agribusiness organizations in Kenya.

iv) Does Government Policies influence the adoption of Emerging Technologies by micro small and medium agribusiness organizations in Kenya.

1.5 Significance of Study

The results of the study can be useful to the government and policy makers since it reveals pertinent information regarding adoption of Emerging Technologies among micro small and medium agribusiness organizations in Kenya. The results can form the basis for the review of IT/ ICT policies and the accompanying rules and regulations. Focusing on the findings of the factors that adversely influence the adoption and development of ICT/IT industry in the country.

This study brings knowledge in the field of ICT/ IT /emerging technologies and agribusiness sector in Kenya. The study provides more information to the literature on adoption of ICT/IT particularly, Emerging Technologies among micro small and medium agribusiness organizations operating in developing countries. Researchers and others in academia will greatly benefit from the study findings.

Another group of beneficiary is the developers of software's, ICT solutions and technology. This new information can be factored in to improve the next generation of designs and delivery of these Emerging Technologies and ICT solutions even digital solutions.

For the development organizations in the agriculture value chain. The study results will reveal new knowledge which can be factored in the design of projects that support the strengthening of agribusiness organizations.

1.6 Scope

The study was about determining the factors influencing adoption of emerging technologies by micro small and medium agribusiness organizations in Kenya with a special focus on thirty-seven organizations under two agribusiness value chain projects, Kenya Crops and Dairy Market Systems (KCDMS) and Towards Sustainable Clusters in Agribusiness through Learning in Entrepreneurship (2SCALE). This study was guided by the theory of Technology, Organization and Environment (TOE). The target population were seventy-four senior managers of the thirty-seven micro small and medium agribusiness organizations who have been introduced to the emerging technologies. These agribusiness organizations targeted, either sell agricultural inputs, provide agricultural technologies, consolidate markets, process and package farm produce,

aggregate, distribute and sell farm produce, marketing, transporting or provide services along the agriculture value chain.

1.7 Chapter Summary

This chapter discussed the introduction of the study, giving information on the background including some literature. It further stated the problem of the study, objectives and research questions including the significance and scope of the study.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter, presents relevant information and studies on adoption of Emerging Technologies by agribusiness organizations. In addition, the chapter will also discuss some theories that researchers have used while conducting studies on adoption of ICT or Emerging Technologies. This will be superseded by a detailed review of studies on adoption of ICT and Emerging Technologies by agribusiness organizations. The last section to be discussed in this chapter is the conceptual framework and operationalization of the study variables.

2.1 Theoretical Review

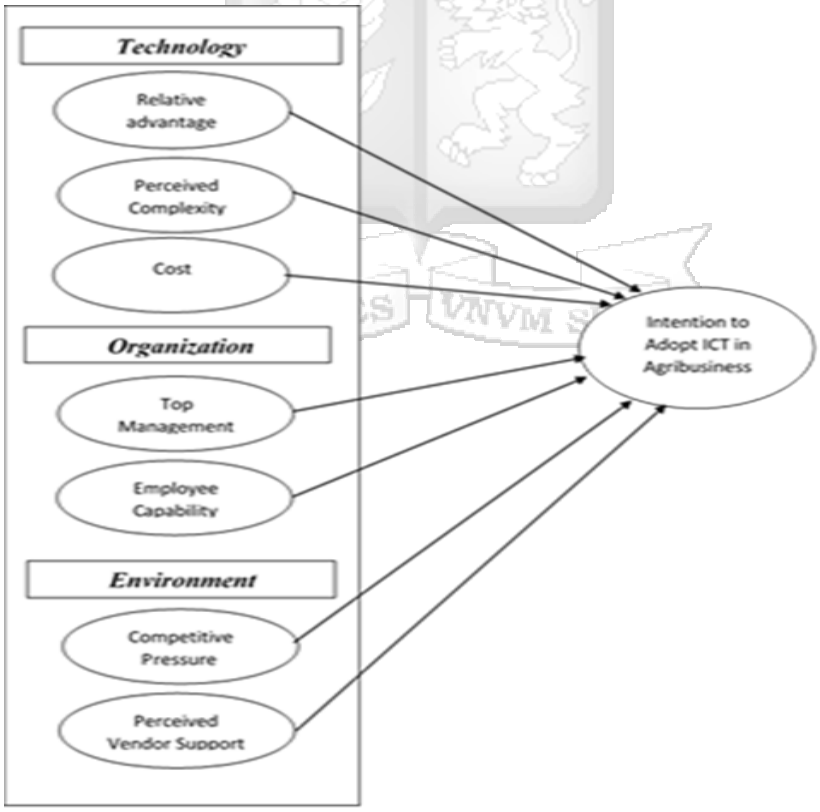
There are many theories which have been used to understand adoption behavior of individuals and organizations. They include Technology Acceptance Model (TAM), Innovation Diffusion Theory (IDT), Theory of Reasonable Action, Technology- Organization –Environment (TOE) among others.

2.1.1 Technology Acceptance Model (TAM)

Technology Acceptance Model (TAM) was introduced by Fred Davis in 1986. The logic under this theory is that technology utilization is guided by some beliefs related to technology (Marikyan & Papagiannidis, 2022) . These beliefs are; perceived usefulness and perceived ease of use. TAM is one of the commonly used theories in ICT adoption studies (Ngongo, 2019). This theory therefore is good to use if one is interested to know the measures to take prior to implementation. Moreover, Ngongo (2019) argues that the TAM model presents a theoretical contribution towards understanding ICT use and uptake. He considered the following factors, perceived cost, perceived usefulness, staff competencies and top management support. Nurqamaran A et al (2021), posits that perceived usefulness and perceived ease of use were the most common factors in TAM.

2.1.2 Technology Organization, Environment (TOE)

The technology-organization-environment framework, also known as the TOE framework was developed by Tornatzky, Fleischer and Chakrabarti in 1990. This theoretical framework illustrates how technological context, organizational context, and environmental context all have an impact on how technological innovations are adopted and implemented in companies. Internal and External innovations represent the technological context. These include both innovations currently being utilized as well as other available ones whose potential has not been exploited. The sector features and resources, products, services and employees represent the organizational dimensions while the environment relates to the climate of organizational operations. If these contexts are good, an organization may choose to adopt or not adopt new technologies. According to Trawnih A. et al., (2021), many researchers have used this model to assess how businesses adopt technology.



Source: (Husein et al., 2021)

Figure 2. 1: Technology, Organization and Environment (TOE)

Alshamaileh et al., (2013), in their study to evaluate Cloud computing adoption by SMEs in the Norh East of England, used this TOE model. These researchers posit that this theory is enhanced and could include other factors while explaining adoption. The findings show that the three contexts of the model, (technological, organizational, and environmental) are connected to each other. Similarly, Hussein, (2020) was guided by the framework of TOE in his study to understand the determinants of digital technologies adoption among small scale farmers in Embu and Kirinyaga Counties. Elsewhere, in Somalia, Husein et al., (2021) in their study of the determinants of ICT adoption among small scale agribusiness enterprises also used this theory. This study concluded that adoption is inspired by insight and motivation rather than financial and external support. Elsewhere, Wessels and Jokonya (2022), used the theory to study the factors affecting adoption of Big data as a service. The study results indicate that small micro and medium enterprises need to consider technological, organizational, and environmental factors when adopting Big data as a service. The study results revealed the most of the technological factors (security/privacy concerns, complexities, costs, and resources) and the organizational factors (organizational readiness, employee knowledge, financial costs, and infrastructure) and that three environmental factors (legislation, vendor capabilities, and competition) affect BDaaS adoption in SMMEs.

The Technology Organization Environment framework guided this study. Under Technology context, cost of the technology was investigated while under Organization context, the senior management support and infrastructure were analyzed. In the third sector, Environment context, the effect of government policies/rules/regulations was investigated.

2.2 Empirical Review

This section presents a review of all the relevant researches related to the adoption of Emerging Technologies by agribusiness organizations. All the relevant variables were considered, Adoption of emerging technologies, cost of emerging technologies, ICT infrastructure, Support from Management, Government regulations & policy.

2.2.1 Factors Influencing Adoption of Emerging Technology

Several studies have been conducted with the aim to bring an understanding on adoption of Emerging Technologies. These studies will be reviewed here. However, for a common understanding, a micro small and medium agribusiness will be said to have adopted a technology if they own and utilize a technology.

Research conducted by Hussein, (2020) to understand the determinants of digital technologies adoption among small scale farmers in Embu and Kirinyaga Counties, concluded that resource capacity, managerial capacity and access to extension services determined the capacity of the farms to adopt agricultural technologies. Elsewhere in Siaya, one hundred small holder farmers were surveyed. The findings revealed that the factors affecting ICT adoption by farmers to include, indicative cost, illiteracy, ICT skills, quality of the information and gender (Awuor & Dorothy , 2022). Three studies conducted to understand factors affecting ICT adoption by small scale agribusiness enterprises in Malaysia (Adamkolo et al., 2018) , Kenya (Ngongo, 2019) and Somalia (Husein et al., 2021), revealed the following factors relative advantage, cost of technology, complexity, perceived usefulness, staff competency, top management support, and competitive pressure factors, managerial and organizational characteristics. In Somalia the study was conducted among agricultural companies while in Kenya and Malaysia it was conducted among dairy cooperatives and agro based SMEs respectively.

Several studies on the factors affecting ICT adoption by SMEs have been conducted, Alshamaileh et al., (2013), in their study to evaluate Cloud computing adoption by SMEs in the Norh East of England, found out several factors to be significant in regard to cloud computing adoption, among them include, size, top management support, prior experience, compatibility and innovativeness. Ogundipe & Hassan (2017), investigated the ICT adoption by Micro and Small Scale Enterprises in Abuja Nigeria using the Technology Acceptance Model (TAM) and Technological Organizational Environment (TOE) framework. The results established that competitive pressure, government support, employer's skill and knowledge influence the adoption of ICT by MSEs in the Nigeria. Other studies in Kenya on SMEs concluded the following, ICT adoption, perceived usefulness, perceived ease of use, staff competency, and top management support and ICT security, ICT services, ICT infrastructure, management support, Government Policy and employee ICT skills on ICT adoption by SMEs ((Kanyaru, 2015); (Otieno, 2015); (Machii & Kyalo, 2016);

(Mugo, 2018)). These studies were done in Kenya through surveys and questionnaire administration. Similarly, in South Africa, Wessels and Jokonya (2022), sought out to explore the factors that affect the adoption of Big data as a service (BDaaS) in SMMEs. The study results indicate that small micro and medium enterprises need to consider technological, organizational, and environmental factors when adopting Big data as a service.

There was also another study done in order to understand factors affecting ICT technologies in the public sector. This was the case of Kenya Power (Ndichu et al ., 2019) and Yemen Public Sector ((Haderi et al., 2018). To investigate the relationships between the dependent variable (adoption of developing ICT technologies) and dependent variables, these research performed a multiple regression analysis (cost of implementation; top management support; organizational culture, and government regulations). According to the studies, the main determinants are the implementation cost, senior management support, organizational culture, and laws and regulations.

The construction Industry too was studied (Khudzari et al., 2021), the study concluded that adoption is very much affected by managers internal and external factors. The internal factors are those factors that manager can control while external factors are those factors that manager has no control of. These internal factors are related to labor (worker's skill), cost (implementation and infrastructure cost), time, and technology (adaptability, quality, ease of use) while the external factors consist of variables associated with the government and other third parties. The Study adopted qualitative analysis of the information obtained from interviewing construction managers. Another study was done in the Iranian Distribution sector (Zahiri et al ., 2018).

This study was different, it was specific to the micro small and medium agribusiness organizations. Logistic regression analysis was used to model or predict the factors influencing adoption of ICT.

2.2.2 The ICT Infrastructure and Adoption of Emerging Technology

Developing countries are characterized by poor ICT infrastructure and slow prioritization of it as well (Dona, 2020). Kenya has experienced growth in internet (more for urban compared to rural areas) however, majority of the population sixty four percent do not have an electricity connection (Dona, 2020). ICT Infrastructure refers to the set of IT resources that ensures the technology can function. To enable the generation, collection, storage, distribution, retrieval, modification, and transfer of information, tangible hardware and intangible software must be used. (Nyonje et al.,

2018). Availability of good infrastructure is known to greatly affect adoption of technology. An agribusiness organization with mobile phones, computers, laptops, operating systems, internet, mobile phone coverage and connectivity, software and electricity may decide to adopt faster than another organization with no such facilities. Therefore, if the agribusiness organization does not have a suitable infrastructure, it will be forced to organize one and hence potential of becoming a barrier. Several researchers agree with this, ICT adaption is related to existing IT infrastructure (Sechadrinathan & Chandra, 2021). According to Kanyaru (2015), ICT infrastructure is a significant determinant of ICT adoption. This study was carried out in Tharaka Nithi in Kenya with the aim to conduct an assessment of Adoption of ICT among SMEs. It utilized inferential and descriptive statistics. Another study conducted by Nyonje et al., (2018), concluded that ICT infrastructure has a significant influence on the adoption of E-government. This study was done in Kajiado county, Kenya. It interviewed employees using questionnaires and performed regression analysis and inferential data to make conclusion. The aim of the study was to understand the effect of ICT infrastructure on the adoption of e-government services for the improved service delivery in Kajiado Kenya. There is ambivalence in the acquisition and use of ICT infrastructure in Kenyan high schools (Nchunge D. M. et al., 2013).

2.2.3 The Cost of Technology and Adoption of Emerging Technology

The cost of Emerging technology in this study refers to the cost of acquiring the technology hardware and software and implementation. The cost of implementation would include license fees, maintenance cost, staff training fees. The initial set up cost and maintenance must be properly determined by the agribusiness at the beginning in order to avoid problems later on. Some technologies have higher set up costs when compared to others. According to (Awuor & Dorothy , 2022), the cost of development of the information platforms, the cost of training of staff and management and the cost of maintenance are significant for adoption. This is more so, because micro small and medium agribusiness organizations always strive to reduce costs. The higher the cost of implementation the likely an agribusiness firm not to adopt the technology, moreover, the costs of ICT adoption are commonly regarded as being very high by SMEs (Mokaya, 2012). This view of high cost affecting adoption was shared by Nchunge D.M et al., (2013), when they argued that the School ICT infrastructure be tax waived or zero rated to address costs of ICT facilities and connectivity to enhance the ICT adoption. Another study on ICT adoption by dairy cooperatives

conducted in Meru concluded that cost of implementation affects adoption decision (Ngongo, 2019). Forty general managers and IT managers drawn from twenty cooperatives were interviewed using a structured questionnaire. SPSS was used for data analysis. These results were not consistent with another study conducted in Somalia which concluded that ICT costs did not significantly influence ICT adoption (Husein et al., 2021). This study was conducted among small scale agribusiness enterprise in Somalia. The study was done through online survey to one hundred and seven staff from agricultural companies. ICT Cost is definitely one of the factors which will be considered as a factor affecting adoption of emerging technology in the present study in order to compare the results with those from Somalia.

2.2.4 Management Support and Adoption of Emerging Technology

Most strategic decisions are made by top management (boards, CEO and senior staff) and this is even so for these small agribusiness organizations when faced with technology adoption dilemma. In fact, according to Sugandini (2020), if the leadership of the agribusiness organization does not see the usefulness of the technology or does not understand the potential of the technology, they will not be quick to adopt. The kind of support from management includes having an interest in IT innovations, availing budget to IT, experience and knowledge of Emerging Technologies, awarding and recognition for technological innovation. It can also be about the attitude and commitment of managers towards technology adoption (Achieng, 2014). The support of management is required since adoption of IT solution will bring changes in systems and procedures and the general organizational operations. Therefore, unless they support, utilization may not be realized. Studies have revealed that managerial support readiness is key in adopting computer integration model in financial forecasting (Achieng, 2014) and also that top management support are important determinants in influencing the adoption of technologies (Haderi et al., 2018). This study was conducted in Yemen with the aim to analyze the factors affecting acceptance of Technology in the Public Sector. Fifty-three government utilities and three hundred and fifty-seven cases were used in the Analysis-Structural Equition Modelling. Elsewhere, Matikiti et al., (2018), also found similar findings that support from management influences the adoption of technology. However, another study conducted revealed that SMEs managers have not supported the adoption of social media technology (Sugandini, 2020).

Another study aimed to analyze the socioeconomic factors determining IT adoption and use in microenterprises in order to improve its sustainability. Through a quantitative and a qualitative research, the results show that management and economic characteristics as well as the education level of the employees determine the level of IT adoption and use (Estébanez et al., 2022).

2.2.5 Government Regulations and Emerging Technologies Adoption

"Regulations can be understood as the set of policies that govern the use of sensitive business data" (Yimam & Fernandez, 2016). Favorable regulations is important for an enabling environment for technology adoption. The policies should support and encourage IT innovations and use by micro small and medium agribusiness organizations. This can be done through lowering taxes, wavering duties on electronics such as mobile phones, computers, laptops, printers, internet services, IT policies (tech skill development policy, policy on network and service convergence), tradeable permits among others. Government policy-taxes, licenses affect adoption (Machii & Kyalo, 2016). According to Nchunge et al., (2013), in their assessment of ICT infrastructure on ICT adoption in Educational Institutions, their study recommended that basic infrastructure acquisition support guidelines be availed to schools. Another study by Ali and Osmanaj (2020), conducted in Australia to assess the role of Government regulations in the adoption of cloud computing concluded that the decision to adopt any new technology such as cloud computing, government regulation is a significant aspect to be considered.

2.3 Research Gaps

The studies reviewed reveal that there is a research gap. Most of the studies were not done in the area of interest yet the findings cannot be generalized. For instance, most of the adoption studies reviewed were for either farmers, or SMEs or for the public sector. This study will fill the gap by analyzing the factors influencing adoption of emerging technologies for the micro small and medium agribusiness organizations. Table 2.1 shows the detailed analysis of the research gaps.

There is another gap in the factors being analyzed. Some of the studies by Adamkolo et al., (2018), Ngongo, (2019) and Husein et al., (2021), did not consider Government policies/ regulations when analyzing the relationship with adoption of emerging technology. Therefore, this study will bridge

the gap by incorporating the Government policies- factor as independent variables. Concerning the topic of study. Most of the studies have concentrated on just ICT tools without considering the current trends in IT, the emerging technologies. This study analyzed factors influencing adoption of emerging technology such as block chain, IoT, A.I, eProd, Agri-digital wallet, digital marketing tools among others.

This study responded to the call: Areas of further research as stated in one study by Ndichu et al., (2019) which was assessing the effect of ICT infrastructure on e-Government services. This study therefore was addressing this gap. Nyonje et al., (2019) in their study showed that, the independent variables, cost of ICT, management support, organization culture and government regulations explained only 47%. Concluding that there could be other factors explaining ICT adoption, hence the introduction of ICT infrastructure in this study. In addition, the study also suggested for the work to be replicated to private institutions to see if the results are the same and this study was done on the micro small and medium agribusiness organizations which are private institutions.

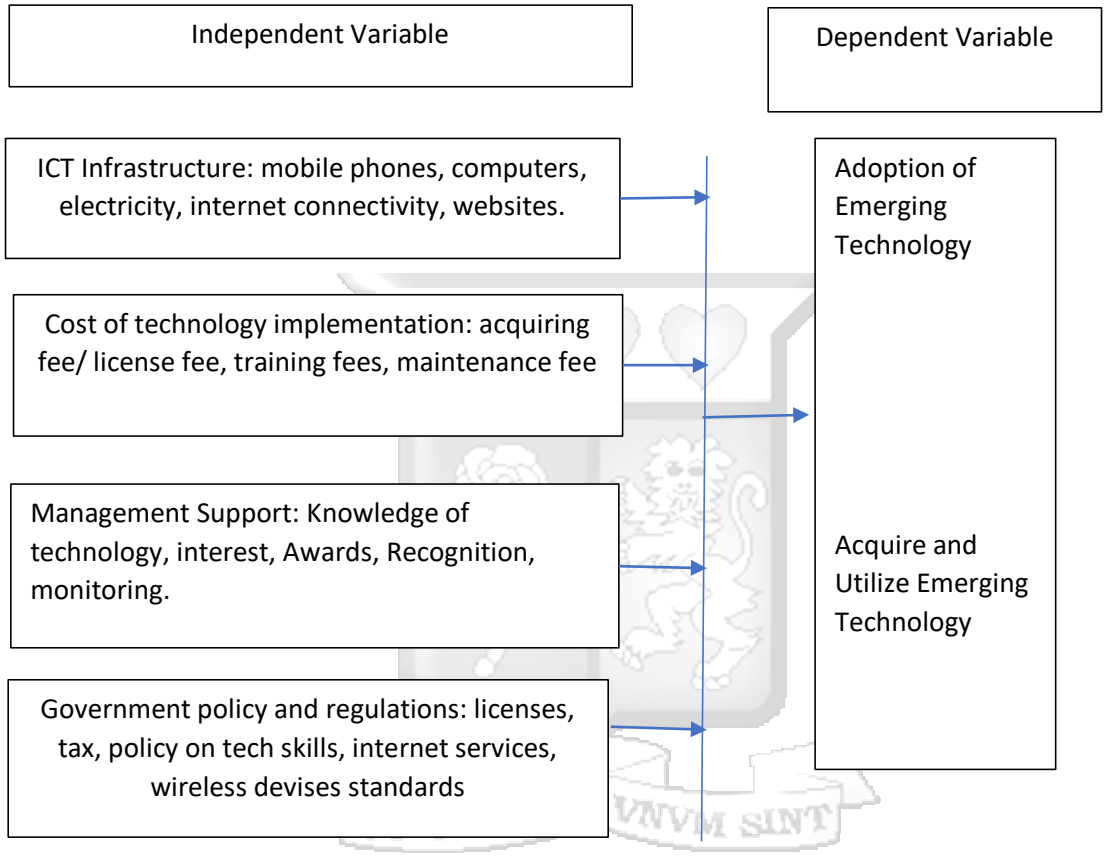
Table 2. 1: Summary of Research Gaps

Author	Title	Methodologies	Finding	Research Gap
General				Most of the studies reviewed were concerned with ICT only. The current trend in is Emerging Technologies
(Awuor & Dorothy , 2022), (Wessels & Jokonya, 2022)	ICT adoption by farmers	Descriptive and Regression Analysis	indicative cost, illiteracy, ICT skills, quality of the information and gender.	Mostly surveyed farmers, findings cannot be generalized for micro small and medium agribusiness organizations. Wessels used secondary data
(Adamkolo et al., 2018) , (Ngongo, 2019) and (Husein et al., 2021),	Agribusiness enterprise, Cooperative and Agri SME	TOE framework, Innovation Diffusion Theory Factor Analysis, Structural Equation Modelling	cost of technology, complexity, perceived usefulness, staff competency, top management support, and competitive pressure factors, managerial and organizational characteristics. In Somalia the study was conducted among agricultural companies while in Kenya and Malaysia it was conducted among dairy cooperatives and agro based SMEs respectively.	Failed to look at Technologies Infrastructure, Government policy/regulations.
ICT adoption by SMEs (Kanyaru, 2015), (Otieno, 2015), (Machii & Kyalo, 2016), (Mugo, 2018)	SME studies-ICT Adoption	Inferential Statistics and Regression Analysis	ICT adoption, perceived usefulness, perceived ease of use, staff competency, and top management support and ICT security, ICT services, ICT infrastructure, management support, Government Policy and employee ICT skills on	Failed to give detail for micro small and medium agribusiness organizations in Kenya. This study will bridge the gap
(Khudzari et al., 2021)	Construction Industry: ICT Adoption	TOE framework	labor, cost time, and technology, government	Failed to give detail for micro small and medium agribusiness organizations in Kenya. This study will bridge the gap
(Nyonje et al., 2018), (Haderi et al., 2018)	Public Sector: ICT Adoption	Technology Acceptance Model	ICT infrastructure has a significant influence on the adoption of E-government. Kajiado-Kenya. Regression analysis and inferential	The same study to be applied to private enterprises for comparison purposes(micro small and medium agri business organizations are private firms)

*Source: Researcher 2023

2.4 Conceptual Framework

Conceptual framework shows the relationship between dependent and independent variables. (Mugendi, 2017). In this study the independent variables are ICT Infrastructure, Cost of the Technology, Management Support and Government Policy and Regulations while the dependent variable is Adoption of Emerging Technologies.



Source: Researcher 2023.

Figure 2. 2: Conceptual Framework

2.5 Conceptualization

Availability of good ICT infrastructure is known to greatly affect adoption of technology. An agribusiness organization with mobile phones, computers, laptops, internet, mobile phone coverage /connectivity, software and electricity may decide to adopt faster than another organization with no such facilities. In addition, an organization with support from top management (board of directors, CEO, senior managers) is likely to adopt Emerging Technologies.

The kind of support needed is availing budget to IT, taking keen interest in IT innovations, experience/knowledge of IT technologies, proving awards and recognitions for technologies innovations. Another issue to factor in is the role played by Government in terms of ICT policies and regulations in the country. These include, policies that increase demand of Emerging Technologies by agribusiness organization's or policies lowering taxes /duties on electronics such as mobile phones, laptops, printers, air time, internet etc. The conceptual framework for this study therefore is that the more an agribusiness organization has the necessary ICT infrastructure, funds for technology implementation, good support from senior management and favorable ICT policies and regulations, the more it is likely to adopt an emerging technology.

2.6 Operationalization of Variables

In this section, we will operationalize the key variables of the study, independent and dependent variables. The operationalization is based on how the variable has been used in the current study.

Table 2. 2: Operationalization of Variables

Variable	Type of Variable	Indicators	Data Collection tool	Data Analysis
Adoption of Emerging Technology	Dependent	• Presence of emerging technology being used in the agribusiness organization • Name of technology being used by agribusiness	Questionnaire, question on if using emerging technology questions.	Descriptive analysis
ICT Infrastructure	Independent	• Number of laptops, desktops, mobile phones, electricity, mobile connectivity, internet	Questionnaire in form of open ended and 5-likert scale questions	Descriptive and inferential analysis
Cost of the Emerging Technology	Independent	• Cost of acquiring the technology • Initial Set up Cost • Cost of Maintenance • Cost of training and support	Questionnaire in form of open ended and 5-likert scale questions	Descriptive and inferential analysis
Management Support	Independent	• Budget allocation for IT • Recognition for IT innovativeness • Skills • Interest in IT stuff	Questionnaire in form of open ended and 5-likert scale questions	Descriptive and inferential analysis
Government policy and regulation	Independent	• Number of policies supporting IT sector • Tax /duty reduction for IT hardware and software, Licences	Questionnaire in form of open ended and 5-likert scale questions	Descriptive and inferential analysis

* Source: Author 2023

2.7 Summary

This chapter examined both theoretical and empirical literature. According to a review of the research literature, the adoption of new technologies is crucial for micro, small, and medium-sized agricultural organizations. According to the theoretical assessment of technology adoption, ICT infrastructure, cost of technology implementation, support from top management, and government regulations are crucial for the success of the agribusiness industry.

The study examined technology adoption across micro, small, and medium agribusiness organizations using the technology, organization, and environment theory. The study also analyzed multiple studies that assisted in identifying the different empirical and methodological gaps that were used to solve the research challenge. Based on the work of the literature reviewed, the conceptual framework, conceptualization and operationalization of the variables are also presented.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

Presented in this chapter is the method used in the study. This chapter discusses the research philosophy, research design, population and sampling, data collection methods, research quality, data analysis and ethical issues. Pillay (2016), states that the researcher's theoretical perspective and attitude toward how the data will be used have an impact on the study approach that is chosen. This understanding guided the choice of the research design.

3.2 Research Philosophy

Every researcher is usually guided by their own approach to the research itself. This study was not an exception. A research philosophy is a collection of fundamental principles that drive the planning and carrying out of a research investigation (Tamminen & Poucher , 2020). It is also a belief in the way data about phenomena should be collected, analyzed and used. There are many types of research philosophies, however, this study adopted a positivism philosophy. Under positivism method, quantifiable proofs that come from statistical analysis are used to verify hypotheses objectively. Thus positivists provide more accurate data. Generating explanatory linkages or causal relationships that eventually result in prediction and control of the phenomenon under investigation is one of positivist inquiry's main objectives (Konge et al ., 2020). The positivism philosophy, was thus appropriate in determining the factors influencing adoption of emerging technologies among micro small and medium agribusiness organizations.

3.3 Research Design

The study used a descriptive research design. It was also a cross sectional study. The utilization of the chosen design was justified since it allows the analysis of variables at a go. This method allows the researcher to be able to investigate different variables and how they influence adoption of emerging technology. Moreover, the researcher can make descriptions of contexts thereby allowing accurate description of a population. Muthomi et al., (2015) claims that descriptive

research establishes and documents how things are. It allows researcher to give a description of conditions without manipulation of the environment of the study.

3.4 Population and Sampling Procedure

In research, population means the group in which a researcher wants to find out something (Amitav Banerjee, 2010). In this study, the population was the entire group of agribusiness organizations who have been part of the 2SCALE project implemented by the International Fertilizer Development Center (IFDC) and the USAID Kenya Cereals and Dairy Market Systems projects in Kenya. The target population were two senior managers in each of the agribusiness organization. The senior manager, could be either board member or managing director or IT manager depending on the structure of the micro small and medium agribusiness organizations. Consequently, seventy-four managers from the thirty-seven organizations were targeted. Senior managers were selected because they occupy strategic positions according to O'Regan and Ghobadian as cited by (Majabi et al ., 2015). IFDC 2SCALE project had nine while USAID KCDMS project had twenty-eight micro small and medium agribusiness organizations.

Sampling procedure is the method used to come up with a sample, it is the method a researcher uses to gather people to study (Kombo & Tromp, 2011). For this study, purposive sampling was utilized. Purposive sampling is a nonprobability sampling that conforms to certain criteria. For the identification and choice of information-rich cases relating to phenomena of interest, purposive sampling is particularly useful (Palinkas, et al., 2015). The choice of purposive was guided by the fact that the study was interested only with the micro small and medium agribusiness organizations who have been exposed to Emerging Technologies by the IFDC 2SCALE project and the USAID KCDMS. The participating managers interviewed were from thirty-seven micro small and medium agribusiness organizations who were introduced to an emerging technology and either adopted or was in the process of adopting and or those who were introduced to an emerging technology and failed to adopt.

A sample is any part of the target population (Amitav Banerjee, 2010), it is a small group obtained from the target population (Mugenda & Mugenda, 2012). According to Mugenda & Mugenda

(2012), a sample size of between 10 and 30 percent is an effective representation of the target population. However, in this study, since the number of respondents was not large, the census approach was used, under this, the entire seventy-four managers from the thirty-seven agribusiness organizations were considered for the study. The main benefit of this approach is the increase in the confidence interval as stated by Cooper and Schindler (2014) (cited in (Ngongo, 2019). The agribusiness organizations studied were operating in the dairy, cereals, vegetables, fruits, technology and poultry and also engaged in various activities along the value chain such as input supply, production, marketing, processing, aggregating, consultation services. The table below shows the targeted population and sample.

Table 3. 1: Population and Sample

	Number of Agribusiness Organizations	No. of Respondents targeted (2 respondents per organization)	No. of respondents interviewed
	37	**74**	**47**

Source: Researcher (2023)

3.5 Data Collection, Methods and Instruments

Primary data was relied upon in this study. The researcher obtained data by conducting interviews using structured questionnaires. Blended methods of data collection was adopted, some data was collected via telephone while others were collected via goggle forms. For the goggle forms the link was sent to the managers via email and WhatsApp after detailed explanation via a telephone conversation. The link was accompanied by a covering letter and instructions on how to fill the questionnaire. The researcher was supported by two trained research assistants in the data collection exercise. Reminders via SMS, WhatsApp and email were sent to the respondents to ensure maximum response rate.

The questionnaire development was guided by the research questions and objectives of the study bearing in mind to follow keenly questionnaire developed by Ismail et al., (2011) (cited in (Pillay, 2016). The questionnaires were used to collect information on three important areas: participants' demographic information, Emerging Technologies used and factors influencing the adoption of Emerging Technologies. The questionnaire adopted the five-point Likert scale as developed by Wang and Amed (2004) (cited in Majabi et al., (2015). The adopted Likert Scale had the ratings

of “strongly disagree” (1) up to “strongly agree” (5) for use by participants in indicating their response to the questions.

Section one of the questionnaire, consisted of questions concerning the respondent’s business, level of education, core business of organization, type of business, years in operation, number of employees, and emerging technology being used by the organization. Section two included questions on the factors influencing adoption, ICT infrastructure, cost of technologies, support from the senior management and Government policy and regulation. The questionnaire used in this study is in appendices.

3.6 Research Quality

Throughout the study from questionnaire development to data collection and data entry, care was taken to ensure to maintain high quality. The research instrument, the questionnaire was tested before the actual field work started. It was subjected to a pretest stage. The pretesting stage helped to refine questions based on the feedback. In addition, the research assistants were trained on the data collection and each provided with a guideline on how to do introductions and how to ask the questions and record answers. The researcher was part of the team collecting data, and also checking the responses and the completeness of the questionnaires, including those which were going straight into the database vis goggle form.

3.6.1 Research Reliability

The consistency of a measure (whether the results can be replicated under the same conditions) that it aims to gather is referred to as its reliability (Bryman, 2012). How consistently a measurement produces results (cooper and schindler 2014) (cited in (Hussein, 2020). Using a test-retest reliability technique and the Cronbach Alpha measure of internal consistency, reliability is continuously assessed. The study questionnaire was also subjected to the Cronbach’s Alpha coefficient test to determine its reliability. The values of alpha are compared against the scale, 0 - 1. After the test was performed on all the variables together, the alpha was 0.80. However, further tests on individual variables revealed the following, ICT Infrastructure had an alpha estimation of 0.75, while cost of technology and management support has an alpha of 0.68 and 0.62 respectively.

On the other hand, Government policies and regulations has an alpha of 0.64. The alpha values were greater than 0.6 and therefore considered reliable. Moreover, Raharjanti et al., (2022) argue that the instrument is acceptable if the score is between 0.6 and 0.8. In conclusion, therefore, the responses in the questionnaires can be relied on.

3.6.2 Research Validity

The term "research validity" relates to determining whether a research instrument captures the data that it is designed to collect (Bryman, 2012). It is mostly concerned with whether a parameter adequately measure the concept. In this study, the researcher had to establish if the set of questions in the questionnaire will adequately address the objectives and answer the research questions. Therefore, different parameters were checked, including the manner in which the questions were set and the manner in which the answers will be recorded. The researcher subjected the questionnaire to peer review, checking among the expert researchers, consulting with the researcher's supervisor. After several consultations, the researcher made corrections, confirming presence of minimal errors before the final version was submitted. The feedback from pre-test stage was also very key in ensuring validity is checked. After several iterations, the researcher presented the final questionnaire for approval.

3.6.3 Pilot Test

The questionnaires were subjected to a pretest. This was done before the actual field work started and to organizations who were not part of the sample. Ten senior managers from three agribusiness organizations were selected for this exercise, accounting for fourteen percent of the sample. This is consistent with Mugenda and Mugenda (2012) who posits that for the pretest group, 10 percent of the sample size is adequate. The pretesting stage helped to refine questions based on the feedback. For example, some sensitive questions were removed, other questions modified while some responses were added to the answer options. This stage was very important to this study.

3.7 Data Analysis and Presentation

The study used structured questionnaires for data collection. Data management followed this procedure. Data collected via the phone was keyed into the google forms which then transmitted data directly to the data base. After completion of data collection, data was downloaded into micro

soft excel for cleaning and processing. At is at this stage that data was checked for completeness, this includes missing data, outliers and other inconsistent data being verified. Data analysis was done using the Statistical Package for Social Scientists (SPSS) and python. Python and SPSS were chosen for their robustness and easy to use and has good features of data presentation. Descriptive analysis including counts, mean, standard deviation, frequencies, percentages were obtained for the participant's responses of the general information such as age, level of education, core business of the organization and years of operation, number of employees, and whether emerging technology was adopted including their usage. The results presented in the form of tables, graphs, pie-charts, bar charts in chapter four of this report. Logistic regression and Correlation analysis was performed. The logistic regression was done to test the kind of influence generated by the independent variables on dependent ones. Logistic regression is a predictive analysis. It is a statistical method used to predict the probability of an outcome of a dependent variable based on previous observations. For this study, it will predict the probability of a micro small and medium agribusiness organization to adopt an emerging technology based on the factors identified. The logistic regression model was as follows

$$= \log\left(\frac{p(y=1)}{1-(p=1)}\right) = \beta_0 + \beta_1 x_{i2} + \beta_2 \cdot x_{i2} + \_ + \beta_p \cdot x_{in}$$

.

In this logistic regression equation, logit(pi) is the dependent variable and x is the independent variables. P is the probability of characteristics of interest to adopt, X are the predetermined factors; x1-IT Infrastructure, x2-cost of technology, x3-Management support and x4-Government rules/policy.

3.8 Ethical Considerations

This study will follow due process of protecting all the responses. A research license from the National Commission of Science and Technology. Before conducting interviews in the agribusiness organizations, permission will be sought from the relevant office within the organization. The confidentiality of the responses will be maintained. Moreover, once the research is completed, the final copy of the thesis will be made available at the Strathmore University Library for the public to read and understand the findings of the research.

CHAPTER FOUR

PRESENTATION OF RESEARCH FINDINGS

4.1 Introduction

This chapter presents an analysis of the four objectives of the study. First, to determine how ICT Infrastructure influences the adoption of Emerging Technologies by micro, small, and medium agribusiness organizations in Kenya; To determine how the cost of emerging technology influences the adoption of Emerging Technologies by micro small and medium agribusiness organizations in Kenya; To establish how management support influences the adoption of Emerging Technologies by Micro Small and Medium Agribusiness Organizations in Kenya; To examine how Government Policies influences the adoption of Emerging Technologies by Micro Small and Medium Agribusiness Organizations in Kenya.

4.2 Questionnaires return rate

A total of 74 questionnaires were sent out via Google Forms. However, only a limited number of responses were received online. To increase the response rate and gather more data, phone calls were conducted to participants. During the phone calls, participants were contacted individually and guided through the questionnaire. The participants provided their responses verbally, and responses were captured in a Google form. This method aimed to overcome any barriers or difficulties participants may have encountered while completing the questionnaire online.

It is important to acknowledge that the switch to phone calls may have introduced certain limitations. For instance, the ability to document and capture responses accurately may have varied compared to the standardized format of an online form. Additionally, the sample size might have been affected by the limited number of participants who agreed to complete the questionnaire over the phone.

By employing phone calls to gather responses, the research aimed to enhance the overall response rate and ensure a more representative sample. This adjustment allowed for a more comprehensive data collection process, considering the challenges faced during the online distribution of questionnaires. From a target of 74 questionnaires, 48 were filled, which equates to 64.86 percent.

Table 4. 1: Distribution of Questionnaire Response Rate

Response Rate	Frequency	Percent (%)
Issued	74	100
Returned	48	64.86
Not Returned	26	35.14

Source researcher 2023

4.3 Socio-Demographic Characteristics of Respondents

This section examines the respondents' social and demographic traits according to age, gender, years worked at the organization and educational attainment.

4.3.1 Gender

The study sought to investigate the gender distribution among respondents. This examined whether gender played a role in the acceptance of emerging technology. The research results have been presented in detail in Table 4.2

Table 4. 2: Gender distribution of respondents

Gender	Frequency	Percent (%)
Male	31	64.58
Male	17	35.42
Total	**48**	**100**

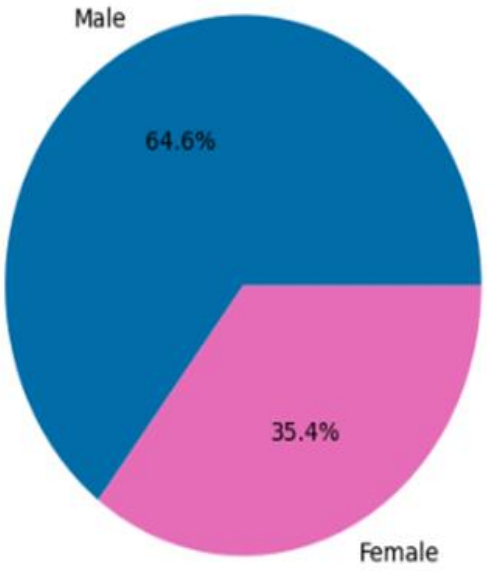
Source: Researcher 2023

Based on the findings presented in Table 4.2, the responses revealed that the gender distribution among the managers of small and micro agribusinesses in Kenya was unequal, specifically, the study found that a higher percentage of the respondents were male (64.58%) than their female

(35.42%) counterparts. This gender disparity may have implications for adopting emerging technology, as the study aimed to investigate. Further analysis and interpretation of the data may be necessary to determine if and how gender influences technology adoption in this context.

A significant variance (49) may be a symptom of a gender imbalance in the industry if there is a major underrepresentation of male or female managers in the management ranks of agribusinesses. This could impact the general effectiveness and competitiveness of agribusinesses since different leadership philosophies and decision-making processes can result in more innovative and successful decision-making.

A gender disparity may also reflect underlying social and cultural issues that limit access to opportunities, networks, and resources. To advance gender equality and provide both women and men the power to have a positive impact on the sector's expansion and development, it may be crucial to address gender gaps in agribusiness management.



Source: Researcher 2023.

Figure 4. 1: Gender Distribution of the Respondents in Percent

4.3.2 Respondent Age

The research tried to ascertain the respondent's age; the ages were classified in brackets, and the distributions are presented in Table 4.3.

Table 4. 3: Respondent age distribution

Age	Frequency	Percent (%)
25-34 years	11	21.7
35-44 years	14	30.4
45-54 years	9	19.6
55-64 years	9	19.6
Over 65 years	4	8.7
Total	**48**	**100**

Source researcher 2023

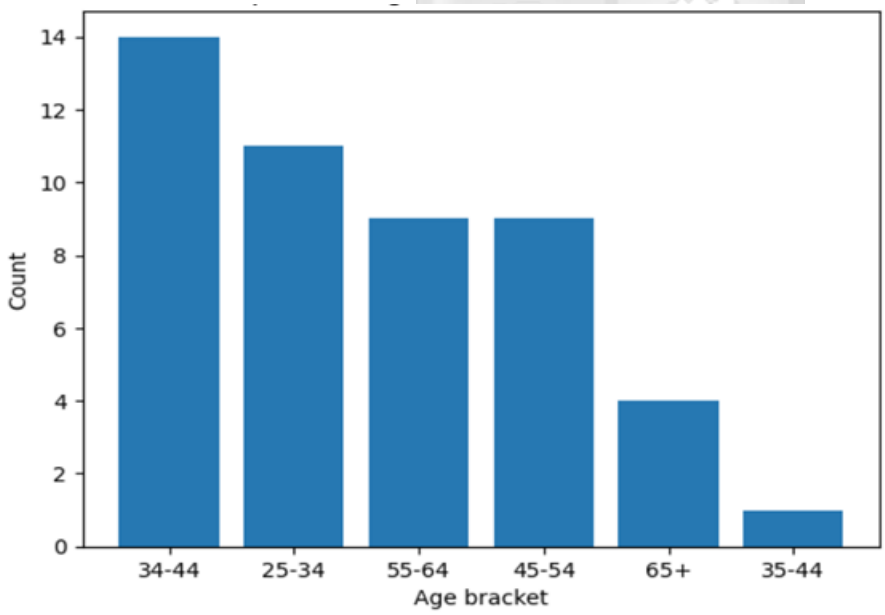
The age range of 35-44 years has the highest number of respondents (14) and the highest percentage (30.4%). This suggests that managers in small agribusiness companies are most found in this age group. The age distribution of managers in small agribusiness companies is relatively balanced across different age ranges. Apart from the 35-44 years' group, the remaining age ranges have similar frequencies and percentages, ranging from 9 to 11 respondents and 19.6% to 21.7%, respectively.

According to the statistics, managers over the age of 55 (55–64 years old and over 65 years old) make up a lesser percentage of the sample. The lowest number of respondents (4) and lowest percentage (8.7%) were managers over 65, demonstrating a lesser prevalence of elderly managers in small and micro agribusinesses. The comparatively smaller presence of senior managers shows that these micro small and medium agribusiness organizations may have room for succession planning. Accordingly, younger managers in the age categories of 25–34 and 35–44 might be

prepared for leadership positions to enable a seamless management transfer when older managers depart.

Between older and younger managers, there is a chance for knowledge transfer when there is a balanced distribution across the various age groups. While younger managers may have a better grasp of emerging technology, older managers may have important industry experience and knowledge. Utilizing the multiple skill sets and experiences prevalent across different age groups, encouraging information exchange, and offering training programs may ease the adoption of developing technologies. Utilizing the chi-square test of independence, the relationship between respondent age and use of emerging technology was examined. The test produced a 16.4037 chi-square value and a 0.0886 p-value.

According to this, there may not be a statistically meaningful relationship between respondents' ages and their use of developing technologies since the p-value is greater than 0.05.



Source researcher 2023

Figure 4. 2: Respondent age distribution in count and percentage

4.3.3 Educational Level of the Respondents

Most senior managers (91.7%) have a diploma or degree, indicating a high prevalence of formal higher education among this group. This suggests that having a higher education qualification is a preference for managerial positions in the micro small and medium agribusiness organizations. According to the research findings, only a tiny percentage of managers have education levels below that of a certificate or degree. Only 4.2% and 2.1%, of managers have completed primary and secondary school respectively. This suggests that managers with less formal education are less prevalent in micro small and medium agribusinesses. The greater percentage of managers with a diploma or degree implies that small agricultural enterprises prioritize employing people with specific knowledge and abilities. This can highlight the significance of agribusiness management skill sets frequently learned through higher education.

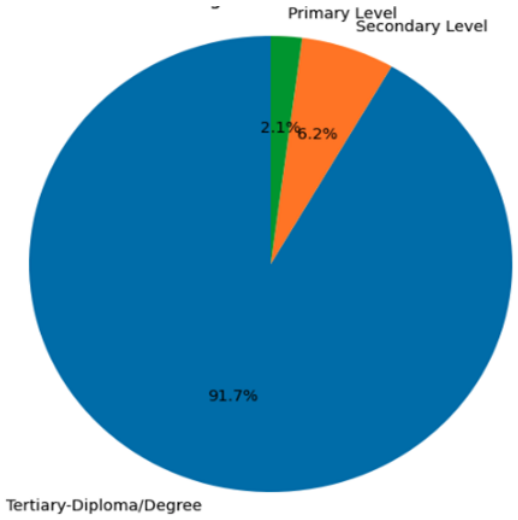
A greater level of education may be necessary for some jobs and responsibilities to manage complicated operations and decision-making processes, which is consistent with industry norms and the high number of managers with diplomas or degree credentials.

Table 4. 4: Education level of the respondent distribution

Education Level	**Frequency**	**Percent (%)**
Diploma/Degree	44	91.7
Secondary Level	3	4.2
Primary Level	1	2.1
Total	**48**	**100**

Source researcher 2023

The relationship between the use of emerging tech and education level was evaluated using the chi-square test of independence. A chi-square value of 2.3303 and a p-value of 0.6753 were obtained from the test. This is more than the usual significance level of 0.05, according to the calculated p-value (0.6753). According to the findings, there are no appreciable differences in the distribution of respondents across the categories of the use of emerging technology depending on their level of education.



Source: Researcher 2023

Figure 4. 3: Level of education and distribution in count and percentage

4.3.4 Designation of the Respondents

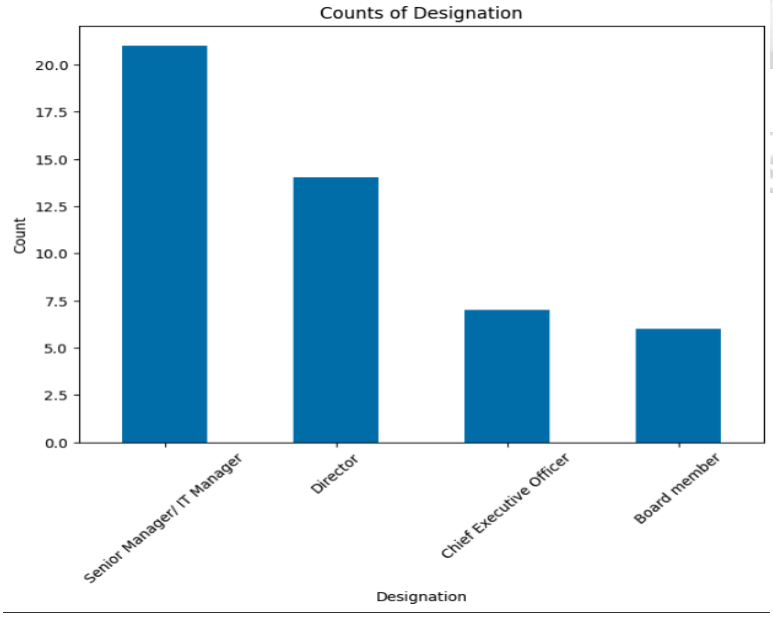
The study intended to ascertain the respondents' designations in the micro small and medium agribusiness organizations. The respondents were questioned about the positions they hold in the company.

Table 4. 5: Designation of respondents

Designation	Frequency	Percent (%)
Manager	21	43.75
Director /CEO	21	43.75
Board member	6	12.5
Total	**48**	**100**

Source: Researcher 2023

The results recorded in table 4.5, confirm the seniority of the respondents. A total of 21 respondents were Managers, accounting for 41.7% of the total while 14 respondents were Director, accounting for 29.2% of the total. There were 7 respondents who were Chief Executive Officer (CEO), representing 14.6% of the total. The remaining, six respondents were board members making up around 8.3% of the total.



Source: Researcher 2023

Figure 4. 4: Designation of respondents and distribution in count and percentage

The connection between the use emerging technology and designation was evaluated using the chi-square test of independence. The test produced chi-square values of 6.9976 and 0.3211, respectively. The results indicate that there is no significant difference in the distribution of respondents across the categories of use of emerging technology based on their designation, according to the derived p-value (0.3211), which is higher than the typical significance level of 0.05.

4.4.4 Tenure Years of Service by Respondent Distribution

In a population of 48 respondents, the average of number of years worked in the organization was 8. The maximum number of years reported is 39, while the minimum is 1. The mode representing the most frequent occurring is 3 years.

4.4 The Nature of Small and micro agribusiness companies

This section analyses the structure of the companies.

4.4.1 Type of Company

The table 4.6 shows the business entity types. Among them, Limited liability stands out as the most common, accounting for 25 entities or 52.08%. Cooperative Societies follow closely behind, with 13 entities or 27.08%. Family Businesses and NGOs have a relatively lower representation, with 3 entities each making up 6.25%. Partnerships are even less common, comprising 2 entities or 4.17%. Sole Proprietorships and Federations have the lowest representation, with only 1 entity each making up 2.08%. This data provides insight into the distribution and prevalence of different business entity types, highlighting the dominance of Limited Liability and Cooperative Societies among the respondents.

Table 4. 6: Distribution by type of company

Type of company	Frequency	Percent (%)
Limited Liability	25	52.08
Cooperative Society	13	27.08
Family Business	3	6.25
NGO	3	6.25
Partnership	2	4.17
Sole Proprietorship	1	2.08
Federation	1	2.08
Total	**48**	**100**

Source: Researcher 2023

4.4.2 Agribusiness Core Business.

Source: Researcher 2023

Figure 4. 5: Word Plot of Key Activities Done by Agribusiness Organizations.

Processing emerges as the most prevalent activity, accounting for 39.58% of the respondents. Marketing follows with 16.67%, while Production has 14.58%. There are entities that engage in a combination of activities, for example, Processing and Marketing accounting for 8.33% and Services 6.25%. Technologies and Aggregation are each present in 4.17% of the dataset. Export has a smaller representation of 2.08%. Additionally, there are entities that combine Processing, Marketing, and Technology, as well as entities involving Production, Processing, and Marketing, each accounting for 2.08%. This data provides insights into the relative distribution of different key activities, indicating the prominence of Processing, Marketing, and Production within the given dataset.

4.4.3 Emerging Technology used in the Micro Small and Medium Agribusinesses

The most common technology is ERP (Enterprise Resource Planning). The following most prevalent is digital marketing. Small and micro agribusinesses utilize a variety of technology combinations, including ERP, CRM (Customer Relationship Management), and Digital Marketing; two organizations use an amalgamation of the three. Two organizations employ dairy management systems, DigiFarm, and ERP. Digital Scale, FeeMSoft, Inhouse pig management system, E-prod, M-farms with Big data, IoT (Internet of Things), and Microsoft Dynamics are among the other technologies used.

4.4.4 Workforce Size Distribution of the Company

Most small and micro agribusinesses have a workforce size of 1 or 2. The number of agribusinesses gradually decreases as the workforce size increases. There are a few agribusinesses with larger workforce sizes, such as 50 and 40, but they are relatively rare compared to the smaller ones.

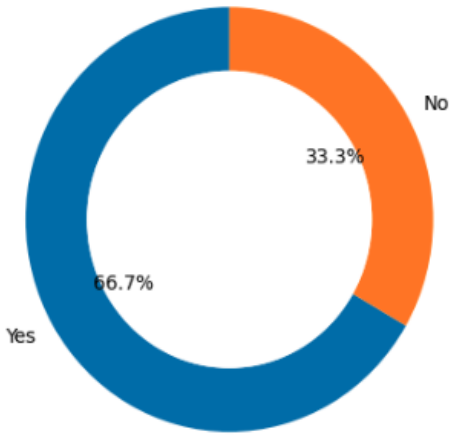
The distribution of workforce sizes in small and micro agribusinesses provides valuable insights into this sector. This suggests that these agribusinesses face limitations in scaling up their operations and expanding their workforce.

4.4.5 Year of Operation of Agribusiness

In a research study conducted on a population of 48 agribusinesses, the mean, representing the average years of operation, was 11.09 years. This suggests that the agribusinesses have been in operation for approximately 11 years. The maximum reported value was 56 years, indicating the presence of businesses with extensive longevity. On the other hand, the minimum reported value was 1 year, suggesting the inclusion of newly established ventures. The mode, representing the most frequently occurring value, was 5 years, indicating a substantial number of small and micro agribusinesses operating within this time frame. These findings provide valuable insights into the distribution and range of years of operation within the agribusiness sector, highlighting the longevity of established businesses and the presence of newer enterprises.

4.5 Adoption of Emerging Technologies

The study sought to find out if the small and micro agribusinesses have adopted emerging technologies. The responses can be seen in Fig 4.6:



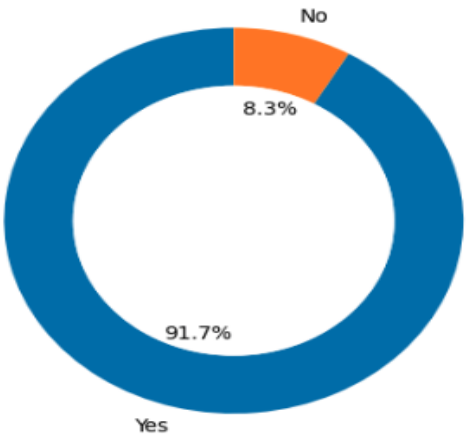
Source researcher 2023

Figure 4. 6: Adoption of Emerging Technologies

From Figure 4.6, we can see that 66.7% of the respondents agreed that they are using emerging technologies in their organizations. However, 33.3% of the respondents were not using emerging technology.

4.6 Influence of ICT Infrastructure on the Adoption of Emerging Technology

The impact of ICT infrastructure on the adoption of developing technologies is the focus of this section. The study sought to find out how infrastructure influences the adoption of emerging technology in micro small and medium agribusiness organization. Figure 4.7 show that 91.7% agree that infrastructure has a great impact on the adoption of emerging technologies in the small agribusinesses.



Source: Researcher 2023

Figure 4. 7: Influence of ICT Infrastructure on the Adoption of Emerging Technology

The study sought to determine the degree of agreement with the following claims about the Influence of ICT Infrastructure on the Adoption of Emerging Technology in Small and Micro Agribusinesses. On a five-point Likert scale, the items were scored as Strongly Disagree (SD), Disagree (D), Neutral (N), Agree (A), and Strongly Agree (SA). Table 4.7 summarizes the findings.

Table 4. 7: ICT Infrastructure on the Adoption of Emerging Technology

Variables	(n)SA %	(n)A%	(n)N%	(n)D%	(n)SD%	Mean
Organization has adequate hardware	(14)29.17	(16)33.33	(4)8.33	(11)22.92	(3)6.25	3.56
Organization has good network and internet connectivity	(12)25	(20)41.67	(7)14.58	(9)18.75	6.25	3.75
Organization has the right software and applications that easily integrate.	(4)8.33	(19)39.58	(9)18.75	(13)27.08	-	3

n = 48; Key: SA = strongly agree, A = agree, N = neutral, D = disagree, SD = strongly

Source: Researcher 2023

The results indicate that there are considerable differences between respondents' perceptions of the suitability of the hardware in their companies. A favorable attitude was shown by the respondents, who, at 29.17%, strongly agreed (SA) that the hardware in their organization is sufficient. An additional 25% of respondents agree (A) with the statement, supporting the idea of enough hardware. On the other side, 8.33% of respondents take a neutral posture (N), suggesting a lack of strongly held beliefs about the suitability of the technology. The fact that 33.33% of respondents disagree (D) with the statement suggests that they do not think the hardware used by their company is adequate. Indicating a substantial level of discontent with the hardware available in their organization, the biggest percentage of respondents, 41.67%, strongly disagree (SD) with the statement.

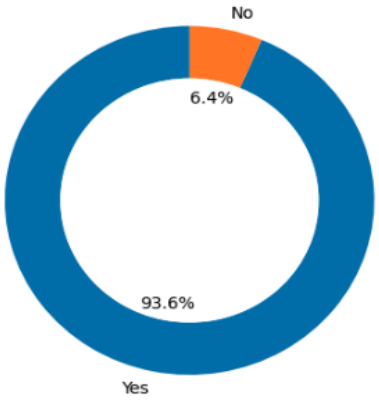
As per the mean Likert scale values of 3.56 and 3.75, the organization typically has appropriate hardware and strong network and internet access. These findings indicate that small and micro agribusinesses have invested in and maintained the essential hardware and network infrastructure to support their operations successfully.

However, the criteria "right software and applications that are easy to use" received a score of 3, indicating that there may be potential for growth in this area. While the firm possesses the required software and apps, the average rating suggests that there may be some usability issues or user

unhappiness. This suggests that the software and apps may require more review, training, or upgrades to improve user experience.

4.7 Influence of Cost of Emerging Technology on the Adoption of Emerging Technologies

This section focuses on the cost of emerging technology in the adoption of emerging technology.



Source researcher 2023

Figure 4. 8: Influence of Cost of Emerging Technology on the Adoption of Emerging Technology

From Fig 4.8, 93.6% agree that cost has a great impact on small and micro agribusinesses' adoption of emerging technology. The study sought to determine how cost influences the adoption of emerging technology on small agribusinesses. On a five-point Likert scale, the items were scored as Strongly Disagree (SD), Disagree (D), Neutral (N), Agree (A), and Strongly Agree (SA). Table 4.8 summarizes the findings. The responses are shown in Table 4.8.

Table 4. 8: Cost of Emerging Technology on the Adoption of Emerging Technology

Variables	SA %	A%	N%	D%	SD%	Mean
Organization has adequate finances for the license fee and subscription	(2)4.2	(18)37.5	(9)18.8	(16)33.3	(6)6.23	3.71
Organization has set aside funds for initial set up and training	(1)2.1	(16)33.3	(7)14.6	(17)35.4	(6)12.5	2.77
Organization has enough funding for implementing operating cost	(2)4.2	(10)33.3	(11)22.9	(22)45.8	(1)6.3	2.71

n = 48; Key: SA = strongly agree, A = agree, N = neutral, D = disagree, SD = strongly:

Source: Researcher 2023

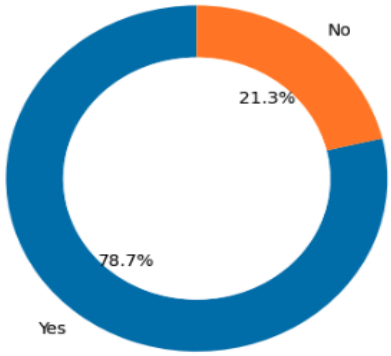
This section focuses on responses regarding how cost influences the adoption of developing technologies. The results are tabulated in Table 4.8. Most respondents (SA: 4.17%, A: 37.50%) agreed or strongly agreed that their organization has enough money to pay for licensing fees and subscriptions as well as for carrying out running expenditures (SA: 4.17%, A: 33.33%). The amount of agreement on allocating cash for early setup and training was less clear, with a sizeable majority (D: 35.42%) opposing. Additionally, across the three claims, neutral replies were noted, indicating some skepticism or a lack of a strong stance. These results imply that even if companies believe they have enough money to cover continuing expenditures, resolving concerns about setup and training costs (D: 35.42%) may be essential to encouraging the adoption of new technologies in the company.

Based on the mean scores of Likert Scale, it is possible to that the organizations have sufficient funds for the licensing price and subscription, as evidenced by the considerably higher score of 3.71. This indicates that the organizations have made adequate financial arrangements to pay the costs associated with the project or initiative's licensing and subscriptions. However, the lower

mean scores of 2.77 and 2.71 for money given for initial setup and training, respectively, and funding available for implementing operating expenditures, suggest possible financial constraints in these areas. These results indicate that the organizations may not have allocated adequate cash for the project's initial setup and training, and there may also be limits in terms of available resources for covering continuing costs.

4.8 Influence of Management Support on the Adoption of Emerging Technologies

This section focuses on management support in the adoption of emerging technology. The response in Fig 4.9 indicated out of the total respondents, 21.3% answered "yes" indicating that they believe management support plays a significant role in the adoption of emerging technologies, while the majority of respondents, 78.7%, answered "no," suggesting they do not perceive management support as influential in the use of emerging technology.



Source researcher 2023

Figure 4. 9: Influence of Management Support on the Adoption of Emerging Technology

The study sought to determine the degree of agreement with the following claims about the Influence of management support on the Adoption of Emerging Technology in Small and Micro Agribusinesses. On a five-point Likert scale, the items were scored as Strongly Disagree (SD), Disagree (D), Neutral (N), Agree (A), and Strongly Agree (SA). Table 4.9 summarizes the findings.

Table 4. 9: Management Support on the Adoption of Emerging Technology

Variables	SA %	A%	N%	D%	SD%	Mean
Senior management have a positive attitude toward emerging technology	(19)39.6	(20)41.7	(4)8.3	(3)6.3	(2)4.2	4.06
Senior management rewards and encourages employees to be ICT savvy	(10)20.8	(23)47.9	(7)14.5	(4)8.3	(4)8.3	3.65
Senior management is passionate and has experience of ICT solutions	(7)14.6	(22)45.8	(5)10.4	(11)22.9	(3)6.3	3.40
Organization has enough ICT resources for learning, training, and cap building, upgrading	(3)6.3	(12)25	(12)25	(12)39.6	(19)4.	2.96

n = 48; Key: SA = strongly agree, A = agree, N = neutral, D = disagree, SD = strongly:

Source: Researcher 2023

A large percentage of respondents (SA: 39.58%, A: 41.67%) agreed or strongly agreed or agreed that senior management had a good attitude toward new technologies. There was also strong agreement (A: 47.92%) that senior management rewards and promotes employees' ICT proficiency. Regarding senior management's enthusiasm for and experience with ICT solutions (A: 45.83%) and the accessibility of ICT resources for education, training, and capacity development (D: 39.58%), varied degrees of agreement were found. There were also replies that were neutral or disagreeable, demonstrating that respondents had a variety of viewpoints and experiences. These findings indicate that although there is a generally positive attitude toward new technology and initiatives to promote ICT savvy, there may be space for growth in terms of senior management's enthusiasm and familiarity with ICT solutions.

According to the Likert Scale data, senior management within typically have a favorable attitude toward developing technology, as seen by the considerably higher mean score of 4.06. This

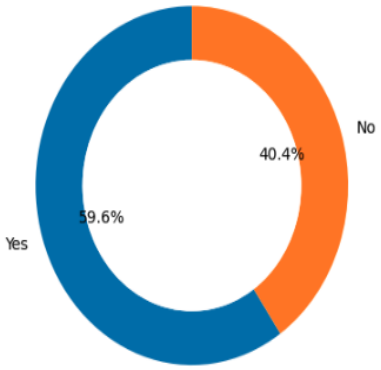
indicates that top management recognizes the significance and promise of emerging technology and is willing to assist its adoption and deployment inside the company. Furthermore, the mean score of 3.65 for senior management's support and awards for ICT-savvy staff reflects a somewhat favorable position. This shows that, while senior management provides some assistance and encouragement to increase workers' ICT abilities, there may be space for improvement in terms of actively motivating and recognizing employees' efforts in this area.

The mean score for senior management's enthusiasm and experience with ICT solutions is 3.40, indicating a modest level of interest and experience in this area. This suggests that senior management is familiar with and understands ICT solutions, but there may be possibilities to improve their skills and knowledge to advise and support technology-related activities successfully. The lower mean score of 2.96 for the availability of ICT resources for learning, training, capacity building, and upgrading, on the other hand, suggests a possible limitation in this area. This shows that the organization may have low resources for ICT-related learning and development, which might impede efficient technology deployment and usage inside the business.

4.9 Influence of Government Policy and Regulation on the Adoption of Emerging Technology.

This section focuses on government policies and regulations in the adoption of emerging technology.

From Fig 4.10, Out of the total respondents, 59.6% answered "yes," indicating that they believe government policy and regulation have a significant influence on the adoption of emerging technology. On the other hand, 40.4% of respondents answered "no," suggesting they do not perceive government policy and regulation as influential in this context. These results imply that a majority of the participants acknowledge the impact that government policy and regulation can have on the adoption of emerging technology within their respective domains. This finding suggests that participants recognize the role of government in shaping the environment for technology adoption, addressing potential risks, and providing guidance or incentives for organizations to embrace emerging technologies.



Source researcher 2023

Figure 4. 10: Influence of Government Policy and Regulation on the Adoption of Emerging Technology

The study sought to determine the degree of agreement with the following claims about the Influence of government policies and regulations on the Adoption of Emerging Technology in Small and Micro Agribusinesses. On a five-point Likert scale, the items were scored as Strongly Disagree (SD), Disagree (D), Neutral (N), Agree (A), and Strongly Agree (SA). Table 4.10 summarizes the findings.

Table 4. 10: Government Policies and Regulation on the Adoption of Emerging Technology

Variables	SA %	A%	N%	D%	SD%	Mean
The government of Kenya has a good ICT policy	(1)2.1	(17)35.4	(15)31.3	(13)27.1	(2)4.2	3.04
There are supportive rules and regulations regarding the development and deployment of emerging technologies	(2)4.2	(21)43.8	(15)31.3	(9)18.8	(1)2.1	2.54
The duties and taxes for importation and development of ICT materials are good	(1)12.5	(12)25.0	(16)33.3	(13)27.1	(6)2.1	2.77
Policies towards the cost of internet is favorable to agribusiness and general public	(1)2.1	(17)33.3	(11)22.9	(16)33.3	(3)6.3	2.83

n = 48; Key: SA = strongly agree, A = agree, N = neutral, D = disagree, SD = strongly

Source researcher 2023

Following is a summary of the replies addressing government policies and rules for the adoption of developing technologies. Only a tiny minority of respondents strongly agreed with the ICT policy of the Government of Kenya (SA: 2.08%), while a sizable portion expressed neutral or disagreement (N: 31.25%, D: 27.08%). A larger number of respondents agreed (A: 43.75%), and a lower percentage disagreed (D: 18.75%) about the existence of supporting laws and regulations for the development and implementation of new technologies respectively. The majority of respondents (33.33%) indicated neutrality about tariffs and levies imposed on the importing and creation of ICT materials. Regarding whether regulations governing the pricing of the internet are advantageous, there was no clear winner, with respondents equally split between the agree, neutral, and disagree groups. These results point to the need for additional research and possible improvements in areas like the government's ICT policy, duties and taxes, and the price of the

Internet in order to create an environment that is more favorable for the adoption and development of emerging technologies in agribusiness and the general public.

The mean score of 3.04 for the variable "The government of Kenya has a good ICT policy" indicates a moderate opinion of the ICT policy's quality. While this suggests that there may be some beneficial features of the policy, it also suggests that there may be opportunity for development or problems that must be addressed. Lower mean scores of 2.54, 2.77, and 2.83 for factors linked to supporting laws and regulations, tariffs and taxes on ICT materials, and internet cost policies, respectively, indicating a less positive assessment of these features. These results indicate that there may be problems or restrictions in these areas, which might impede the development, implementation, and accessibility of new technologies in Kenya.

5.0 Inferential Analysis

Table 4. 11: Inferential Analysis

Variable	Coefficient	Standard Error	z	P>|z|	[0.025	0.975]	Pearson correlation
Intercept	**-4.4703**	**2.190**	**-2.041**	**0.041**	**-8.763**	**-0.178**	**1**
Influence of ICT Infrastructure on the Adoption of Emerging Technology	**1.6365**	**0.598**	**2.738**	**0.006**	**0.465**	**2.808**	**0.540**
Influence of Cost of emerging technology on the Adoption of Emerging technologies	**1.0056**	**0.546**	**1.843**	**0.065**	**-0.064**	**2.075**	**0.368**
Influence of Management Support on the Adoption of emerging technologies	**0.3600**	**0.508**	**0.709**	**0.479**	**-0.636**	**1.356**	**0.337**
Influence of government policy and Regulation on the Adoption of Emerging Technology.	**-1.2891**	**0.659**	**-1.956**	**0.050**	**-2.581**	**0.003**	**-0.021**

Source: Researcher 2023

R = 0.601

R-squared = 0.3612

Y = -4.4703 + 1.6365 X1 + 1.0056 X2 + 0.3600 X3 + -1.2891 X4

Where:

Y – Adoption of emerging technology

X1 - ICT Infrastructure on the Adoption of Emerging Technology

X2 - Cost of emerging technology on the Adoption of Emerging technologies

X3 - Management Support on the Adoption of emerging technologies

X4 - Government policy and Regulation on the Adoption of Emerging Technology

The intercept coefficient (-4.4703) represents the expected value of the dependent variable (adoption of emerging technology) when all independent variables are zero. The intercept is statistically significant ($p = 0.041$), indicating that it has a significant impact on the adoption of emerging technology.

The coefficient (1.6365) suggests that a one-unit increase in ICT infrastructure is associated with a 1.6365-unit increase in the adoption of emerging technology. This variable is statistically significant ($p = 0.006$), indicating that ICT infrastructure has a significant positive influence on the adoption of emerging technology. The Pearson correlation of 0.540 suggests a moderate positive correlation between ICT infrastructure and adoption.

The coefficient (1.0056) indicates that a one-unit increase in the cost of emerging technology is associated with a 1.0056-unit increase in the adoption of emerging technology. Although the p-value (0.065) is slightly above the conventional significance level of 0.05, it suggests a marginally significant positive relationship. The Pearson correlation of 0.368 indicates a moderate positive correlation between the cost of emerging technology and adoption.

The coefficient (0.3600) suggests that a one-unit increase in management support is associated with a 0.3600-unit increase in the adoption of emerging technology. However, this variable is not statistically significant ($p = 0.479$), indicating that management support may not have a significant impact on the adoption of emerging technology. The Pearson correlation of 0.337 indicates a moderate positive correlation with adoption.

According to the coefficient (-1.2891), a one-unit increase in government policy and regulation is related to a -1.2891-unit decline in emerging technology uptake. This variable is marginally significant (p = 0.050), suggesting a potential negative relationship. The Pearson correlation of -0.021 indicates a weak negative correlation with adoption.

An R square of **0.3612** means approximately 36.12% of the variance in the dependent variable (Adoption of emerging technology) can be explained by the independent variables included in the model.

CHAPTER FIVE

SUMMARY, DISCUSSIONS, CONCLUSIONS, AND RECOMMENDATIONS

5.1 Introduction

This provides a comprehensive overview of the study's findings, draws insightful conclusions based on those findings, offers recommendations derived from the conclusions, and proposes suggestions for future research. This summary encapsulates the key outcomes of the study, highlights the implications of the findings, and provides valuable guidance for practical applications. Furthermore, it identifies areas where additional research can contribute to expanding knowledge and addressing any remaining gaps in the field. This chapter serves as a culmination of the study, providing a concise and informative overview of the entire research endeavor.

5.2 Summary of the Findings

This study sought to investigate the factors influencing adoption of Emerging Technologies by micro small and medium agribusiness organizations in Kenya. The specific tasks were to determine how ICT Infrastructure, ICT Cost of implementation, Support from Management and Government Rules and Policies influence the adoption of emerging technologies by micro small and medium agribusiness organizations in Kenya.

The study adopted a descriptive research design and was guided by the Technology Organization and Environment framework model. It used questionnaires to collect primary data. Data was collected via google forms and telephone calls. The study was conducted on senior managers of the thirty-seven agribusiness organizations under USAID KCDMS and IFDC 2SCALE projects in Kenya. Using a Python program, descriptive and inferential analysis was performed to obtain pearson, correlation and regression outputs. This study obtained a sixty-five percent response rate.

According to the study, most of the respondents were male and the majority of the managers are between the ages of 35 and 44 years. Furthermore, the vast majority of managers have a degree or diploma and have been in the business for about ten years.

According to the study, the majority of these agribusinesses operate as limited liability entities engaging in processing, marketing, and production as their core businesses. The study findings show that the majority of the respondents, sixty-seven percent, have adopted emerging technologies in their agribusinesses. The most prominent technologies are Enterprise Resource Planning (ERP), Digital Marketing tools, and Customer Relationship Management (CRM) systems which the agribusinesses are using to track business operations, manage and track out grower farmers, make payments and improve client relations.

The findings reveal the level of ICT Infrastructure was found to have a significant positive influence on adopting emerging technology. However, the cost of emerging technology and management support was not found to have a statistically significant impact on adoption. Government policy and regulation were marginally significant.

5.3 Discussions

The discussions on the findings are presented here in the order of the variables in the objective.

5.3.1 Influence of ICT Infrastructure on the Adoption of Emerging Technology

The findings from the analysis indicate that adequate hardware and good network and internet connectivity are significantly and positively associated with adopting emerging technologies. Moreover, most respondents agreed on having adequate hardware, good network and the right software to integrate new technologies, resonating well with the majority who had adopted emerging technologies. These findings support the notion that having the necessary hardware and reliable internet access plays a crucial role in facilitating technology adoption as stated by Nyonje et al., (2018) and Kanyaru (2015), ICT infrastructure is a significant determinant of ICT adoption. Therefore, these findings contribute to the understanding of the influence of ICT infrastructure on the adoption of emerging technology, highlighting the significance of hardware and internet connectivity in driving technology adoption in the context of the study. From the regression model, the coefficient for ICT Infrastructure was found to be statistically significant, indicating that it has a significant positive influence on adopting emerging technology. This means that as the level of ICT Infrastructure increases, the log odds of adopting emerging technology also increase by approximately. Therefore, organizations or individuals with better ICT Infrastructure are more likely to adopt emerging technology.

5.3.2 Influence of Cost of Emerging Technology on the Adoption of Emerging Technology

The study revealed a positive correlation between the cost of emerging technology and the adoption of emerging technologies. However, the p-value indicates that this correlation is not statistically significant. These findings agree with Husein et al., (2021) findings conducted in Somalia on small scale enterprises where cost of technology was not found to significantly influence ICT adoption. However, this study disagrees with that of Ngongo (2019) conducted on dairy cooperatives in Meru which concluded that the cost of implementation had a significant impact on adoption decision. Based on the findings, the study cannot confidently conclude that there is a reliable relationship between the cost of emerging technology and adoption of emerging technology.

5.3.3 Influence of Management Support on the Adoption of Emerging Technology

The third objective was to establish how support from management influences adoption of emerging technologies by micro small and medium agribusiness organizations in Kenya. The findings show that support from senior management influences adoption of emerging technologies. The respondents agreed that senior management is very supportive, moreover, the respondents agreed that the senior management are also positive and passionate towards IT innovations to the point of rewarding those employees who are IT innovative, many however, disagreed having put aside a budget for training, learning and capacity building. These findings point to the fact that senior managers of these micro small and medium agribusiness organizations understand the importance of emerging technologies, however because of limited financial capacity they are unable to commit budgets for new technologies. This limited financial capacity is supported by the respondents' claim that the cost of technology is high.

The correlation coefficient suggests a weak positive correlation between management support and the adoption of emerging technologies, this positive correlation aligns with studies that highlighted the role of management support in the adoption of IT Solutions and emerging technologies in various contexts, such as financial forecasting Achieng, (2014), the public sector Haderi et al., (2018) and dairy cooperatives Ngongo (2019). These studies emphasize the need for managerial interest, knowledge, experience, budget allocation and supportive strategies for successful technology adoption. However, the p-value indicates that this correlation is not statistically

significant, this contrasts with some of the prior studies that have found managerial support to be a significant determinant of technology adoption, such as the study conducted in Yemen (Ogundipe & Hassan, 2017) and that conducted in Kenya by Ngongo (2019) which stated that change in top management support is associated with a change in adoption and also another study by Alshamaila et al., (2013) and Matikiti et al. , (2018) in which the author's found that senior management support significantly influence and adoption of technology by SMEs. Based on this finding, the study cannot confidently conclude on the relationship between management support and adoption of emerging technologies.

5.3.4 Influence of Government Policy and Regulation on the Adoption of Emerging Technology.

The government policies, rules and regulations influence adoption of emerging technologies. The findings indicate that the government policies, rules and regulations are favorable. Many agreed that there are good policies in place and the accompanying rules and regulations are also good. However, many disagreed that the duties and taxes are favorable including the cost of the internet. The respondents reported that most of these services are only good in the urban areas when compared to the rural areas.

This suggests the correlation between government policy and regulation and technology adoption may be marginally significant based on the available data. In other words, there is a possibility that the observed relationship is not due to chance. Given the negative correlation and the marginally significant p-value, it implies that more stringent or restrictive government policies (taxes and licenses) and regulations may hinder the adoption of emerging technologies. This could be due to factors such as compliance burdens, bureaucratic processes, or limited flexibility in implementing innovative solutions. The finding from this study is supported by the studies done by Machii & Kyalo, (2016), and those done by Osmanaj (2016) and Hassa & Ogundipe (2017) who stated that government regulation is a significant aspect to be considered while deciding on adoption of technology.

The study findings indicate that the correlation coefficient is a negative correlation between government policy and regulation and the adoption of emerging technology. This suggests that

there is an inverse relationship between the government policies and regulations and the ability to adopt emerging technologies.

5.4 Conclusions

The main aim of the study was to analyze the factors influencing adoption of emerging technologies by micro small and medium agribusiness organizations in Kenya. Below are the conclusions of the study.

The study observed that most respondents have adopted emerging technologies. The most prevalent type of emerging technologies being used by micro small and medium agribusiness organizations include ERP (Enterprise Resource Planning), digital marketing, CRM (Customer Relationship Management), Dairy Management System, Big data and IoT.

The study observed that most organizations have adequate hardware, good network and the right software to integrate new technologies. The study further revealed that ICT infrastructure has a positive coefficient and a p value of less than 0.005, meaning that ICT infrastructure significantly influences adoption of emerging technology. Therefore, organizations with better ICT Infrastructure are more likely to adopt emerging technology.

The study found that the cost of technology is high for most organizations, however most of the organizations can pay for licenses and subscriptions but not implementation costs (maintenance and upgrades). The study further revealed that the Cost of Technology has a positive coefficient and a p value of more than 0.005, meaning that the cost of technology does not significantly influence adoption of emerging technology.

The study found that support from senior management is good among the agribusiness organizations surveyed. The senior management are very positive and passionate towards IT innovations and reward employees who are IT innovative however, there is reluctance to put aside budget for trainings, learning and capacity building. Further results indicate that there is a management support has a positive coefficient and a p value of more than 0.005, meaning that management support does not significantly influence the adoption of emerging technology.

The study found that government policies, rules and regulations are favorable. Good policies are in place and accompanying rules and regulations. However, the duties and taxes are not favorable including the cost of internet. Further analysis revealed that the government has a negative coefficient and a p value of 0.005, meaning that Government policies, rules and regulations marginally significantly influence adoption of emerging technology.

The research findings highlight the significant influence of ICT infrastructure and the cost of emerging technology on the adoption of emerging technology. However, the role of management support and government policy/regulation appears to be less pronounced. These results suggest that organizations should prioritize investments in ICT infrastructure and consider the cost implications of emerging technologies to promote their adoption. While management support and government policies may have some influence, their impact on adoption may be less straightforward and require further investigation. Further research is needed to explore additional factors that may influence the adoption of emerging technology and to provide a more comprehensive understanding of the topic.

5.4 Recommendations

5.4.1 Policy Recommendation

Government Policy and Regulation suggest a negative correlation with the adoption of emerging technology. While the correlation may be marginally significant, it implies that stringent or restrictive government policies and regulations may hinder technology adoption. Policymakers should strive to strike a balance between promoting innovation and ensuring appropriate regulatory frameworks. Encouraging flexible, supportive, and agile policies can facilitate technology adoption while still addressing potential risks or concerns. Based on the above findings, the government should provide a good business environment. The government can review the policies, rules and regulations to favor the micro small and medium agribusiness organization so that they can easily adopt emerging technologies. Governments may offer targeted incentives, this can be in the form of reduced subscription fees, in order to motivate micro small and medium agribusiness

organizations. Again, these policies should be seen to promote use of IT materials. For example, government can make her services can be electronic /digital, this way agribusinesses will see the need to try and fit in the economy by adopting new technologies. The cost of infrastructure such as cost of hardware, software etc be made affordable. Lastly there should be more private –public sector partnerships. Enhancing ICT infrastructure can provide a strong foundation for technology adoption and enable organizations to leverage the benefits of emerging technologies more effectively. These factors have been found to influence the adoption of emerging technologies significantly and positively.

5.4.2 Organization Recommendation

While the correlation suggests a positive relationship between the cost of emerging technology and its adoption. Therefore, further research is needed better to understand the impact of cost on technology adoption. Organizations should carefully evaluate the cost-benefit ratio of adopting emerging technologies and consider factors beyond just the initial financial investment, such as long-term value, potential efficiency gains, and competitive advantages.

Although the correlation coefficient indicates a weak positive relationship between management support and technology adoption, the non-significant p-value suggests that this relationship may not be significant based on the available data. Organizations should still prioritize providing management support for technology adoption, recognizing the potential benefits it can bring in terms of innovation, productivity, and competitiveness. However, it is important to acknowledge that other factors may play a more substantial role in influencing technology adoption.

5.4.3 Further Research

It is important to note that these recommendations are based on the specific findings and limitations of the study. Further research and analysis are necessary to establish more robust conclusions and determine the broader implications for technology adoption in different contexts. For example, do a similar study for a larger sample and compare results. Again conduct research with more independent variables.

For the technologies being used by agribusiness organizations, conduct a further research on the use of ERP and impact for the agribusiness organizations.

5.5 Limitation of the Study

The issue of limited respondents and a few of them declined interview, leaving a small number for the study. As a result, this may affect the findings' generalizability and statistical power of findings.

The use of goggle form and telephone calls may have introduced biasness, especially because there was no eye contact between interviewer and interviewee. Some of the respondents may have been tempted to give incorrect answers.

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APPENDICES

Appendix I: Ethics Clearance Approval

Strathmore UNIVERSITY

2nd May 2023

Mrs Okumu Bridget Auma,
bridget.okumu@strathmore.edu

Dear Mrs Okumu,

RE: Factors Influencing Adoption of Emerging Technologies by Micro Small and Medium Agribusiness Organisations in Kenya

This is to inform you that SU-ISERC has reviewed and **approved** your above **SU-masters** research proposal. Your application reference number is **SU-ISERC1657/23.** The approval period is from **2nd May 2023 to 1st May 2024.**

This approval is subject to compliance with the following requirements:

i. Only approved documents including (informed consents, study instruments, MTA) will be used.
ii. All changes including (amendments, deviations, and violations) are submitted for review and approval by SU-ISERC.
iii. Death and life-threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to SU-ISERC within 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 SU-ISERC within 72 hours.
v. Clearance for the 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 the expiry of the approval period. Attach a comprehensive progress report to support the renewal.
vii. Submission of an executive summary report within 90 days of completion of the study to SU-ISERC.

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

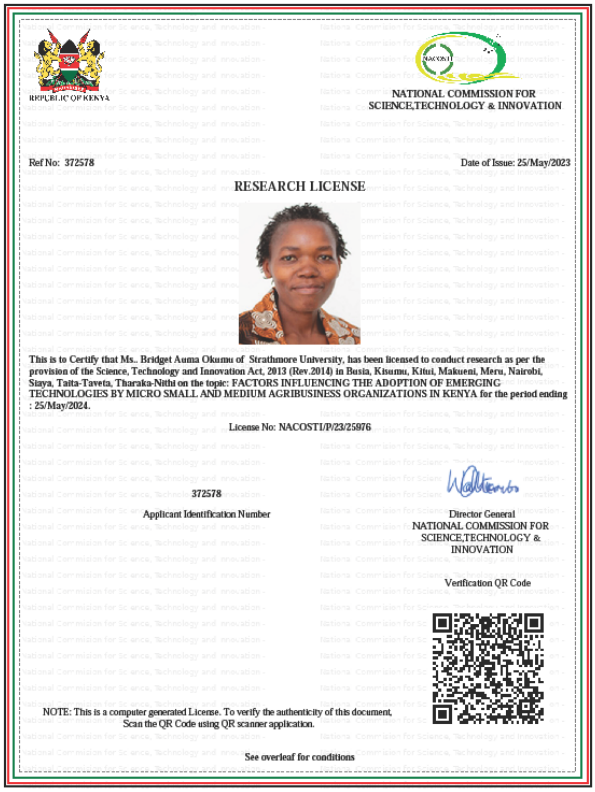
Yours sincerely,

for: **Mr Ambrose Rachier,**
Chairperson; SU-ISERC

STRATHMORE UNIVERSITY INSTITUTIONAL SCIENTIFIC AND ETHICAL REVIEW COMMITTEE
(SU-ISERC)
02-May-2023
Email:ethicsreview@strathmore.edu
P.O BOX 59857-00200
NAIROBI-KENYA

Ole Sangale Rd, Madaraka Estate. PO Box 59857-00200, Nairobi, Kenya. Tel +254 (0)703 034000

Appendix II: National Commission of Science and Technology (NACOSTI) Permit



REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: 372578

Date of Issue: 25/May/2023

RESEARCH LICENSE

This is to Certify that Ms.. Bridget Auma Okumu of Strathmore University, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Busia, Kisumu, Kitui, Makueni, Meru, Nairobi, Siaya, Taita-Taveta, Tharaka-Nithi on the topic: FACTORS INFLUENCING THE ADOPTION OF EMERGING TECHNOLOGIES BY MICRO SMALL AND MEDIUM AGRIBUSINESS ORGANIZATIONS IN KENYA for the period ending : 25/May/2024.

License No: NACOSTI/P/23/25976

372578

Applicant Identification Number

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NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

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See overleaf for conditions

Appendix III: Letter to the Participants

FACTORS INFLUENCING ADOPTION OF EMERGING TECHNOLOGIES BY MICRO SMALL AND MEDIUM AGRIBUSINESS ORGANISATIONS IN KENYA

SECTION 1: INFORMATION SHEET

Investigator: Bridget Okumu

Institutional affiliation: Strathmore Business School (SBS)

SECTION 2: INFORMATION SHEET–THE STUDY

2.1: Why is this study being carried out?

This is for academic purpose. The objective is to analyze the factors influencing adoption of emerging technologies among micro small and medium agribusiness organizations in Kenya.

2.2: Do I have to take part?

No. Taking part in this study is entirely optional and the decision rests only with you. If you decide to take part, you will be asked to complete a questionnaire to get information on the factors influencing adoption of emerging technologies in your organisation. If you are not able to answer all the questions successfully the first time, you may be asked to sit through another informational session after which you may be asked to answer the questions a second time. You are free to decline to take part in the study from at any time without giving any reasons.

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

- Two senior members of the organization. It can be a board member or the CEO or a senior manager or IT manager

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

- Your partners, technology providers

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

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

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

There are no risks in taking part in this study. All the information you provide will be treated as confidential and will not be used in any way without your express permission.

2.7: Are there any benefits of taking part in this study?

The information will be used to improve the environment so as to promote adoption of emerging technologies which may result in the agribusinesses being competitive and successful.

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

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

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

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

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

You can contact me, [BRIDGET OKUMU], at SBS, or by e-mail (bridget.okumu@strathmore.edu), or by phone (+254728561710). You can also contact my supervisor, Dr. [JOHN OLUKURU], at the Strathmore Business School, Nairobi, or by e-mail (jolukuru@strathmore.edu) or by phone (+254788356663)

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

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

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

Please tick the boxes that apply to you;

Participation in the research study

☐ I AGREE to take part in this research

☐ I DO NDON'T AGREE to take part in this research

Storage of information on the completed questionnaire

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

☐

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

Participant's Signature:

Date: _____/_____/_____

_____

DD / MM / YEAR

Participant's Name:

Time: _____ /_____

_____

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

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

Investigator's Signature:

Date:

_____ _____/_____/_____

DD / MM / YEAR

Investigator's Name:

Time: _____ /_____

_____ _____

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

Appendix IV: Questionnaire

Brief Introduction of self and the study.

Thank you for accepting to participate in this survey. All responses will be treated with confidentiality and used for the purposes of this academic study only. Your identity will not be revealed.

FACTORS INFLUENCING ADOPTION OF EMERGING TECHNOLOGIES BY MICRO SMALL AND MEDIUM AGRIBUSINESS ORGANISATIONS IN KENYA

SECTION A: GENERAL INFORMATION:

1. Name of Agribusiness Organization: _____
2. Name of Respondent_____
3. Gender of Respondent_____1-Female 2-Male
4. Designation: _____(1-Board member, 2-Chief Executive Officer, 3-Senior Manager/ Manager, 4-other specify……)
5. Years of business operation_____(yrs)
6. Age of Respondent_____1-(25-34yrs) 2-(35-44yrs) 3-(45-54yrs) 4-(55-64yrs) 5-(65yrs and above)
7. Education Level of Respondent_____1-no education 2-Primary level 3-Secondary level 4-Tertiary –Diploma/Degree 5- Other specify_____
8. Number of years worked in this Organization; _____
9. Core business of the organization: _____(1-Inputs 2.Production, 3-Processing, 4-Marketing, 5-Transport, 6-Storage 7-Other specify_____)
10. Type of Agribusiness Organization_____(1-Family business, 2-Sole Proprietorship, 3 –Partnership 4-Cooperative Society, 5-Limited Liability, 6-NGO , 7-Others specify _____)
11. Number of Employees_____
12. What is the annual turnover of the organization_____1- less than Ksh500,000, 2-Ksh 0.5m-5million 3-Ksh 5 -800million 4-Ksh 800m and above

13. Does the organization have and use an emerging technology? _____(1-yes , 2 –no)
14. If yes to 13: Which emerging technology does the organization have _____

    Payment platforms, eProd, mfarms, dairy management systems, drones, tractor tracking-hellow tractor, digifarm, e-voucher system, digital marketing platform, big data,

Later to be grouped as Enterprise Resource Planning (ERP), Customer Relationship Management (CRM), Artificial intelligence (A.I), Internet of Things(IoT), Block Chain Technology, Big data.

15. What is the purpose of the Emerging Technology_____ 1- Monitoring and Tracking Payments 2- Tracking business processes 3- Customer Relationship 4- Monitoring and tracking farmer out grower base 5-Marketing 6- Others – specify…….)

SECTION B: FACTORS INFLUENCING ADOPTION OF EMERGING TECHNOLOGIES

1) ICT INFRASTRUCTURE AND ADOPTION OF EMERGING TECHNOLOGIES

The following statements reflect your opinions regarding the status of ICT infrastructure in your organization. Using a scale with five scores, namely, strongly disagree (1), disagree (2), Neutral (3), agree (4), and (5) strongly agree, please tick an appropriate response.

Statements	**1**	**2**	**3**	**4**	**5**
My organization has adequate hardware: computers, laptops, mobile phones,					
My organization has good network and internet connectivity					
My organization has the right softwares and applications that easily integrated with new technologies					

What is your general view of ICT infrastructure to support adoption of new technology

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2) COST OF TECHNOLOGIES AND ADOPTION

The following statements reflect your opinions regarding the cost of emerging technologies in your organization. Using a scale with five scores, namely, strongly disagree (1), disagree (2), Neutral (3), agree (4), and (5) strongly agree, please tick an appropriate response.

Statements	**1**	**2**	**3**	**4**	**5**
My organization has adequate finances for license fee, subscriptions					
My organization has set aside funds for initial set up, training and maintenance fees, upgrades					
My organization has enough funding for implementation-operating costs, legal issues, security costs					

What is your general view of the cost of emerging technologies for agribusiness to support adoption?

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3) MANAGEMENT SUPPORT AND ADOPTION

The following statements reflect your opinions regarding the management support in your organization. Using a scale with five scores, namely, strongly disagree (1), disagree (2),

Neutral (3), agree (4), and strongly agree (5), please tick an appropriate response

Statements	**1**	**2**	**3**	**4**	**5**
My organization has enough ICT resources for learning, training and capacity building including upgrading					
My senior management are passionate and have experience of IT solutions					
My senior management rewards and encourages employees to be ICT savvy and innovative					
My senior management have a positive attitude on emerging technologies					

In your opinion, is there enough support by management to adopt emerging technologies----------
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4) GOVERNMENT POLICY AND REGULATIONS AND ADOPTION

The following statements reflect your opinions regarding the government of Kenya ICT policies, rules. Using a scale with five scores, namely, strongly disagree (1), disagree (2),

Neutral (3), agree (4), and strongly agree (5), please tick an appropriate response

Statements	**1**	**2**	**3**	**4**	**5**
The Government of Kenya has a good ICT policy					
There are supportive rules and regulations regarding development and deployment of emerging technologies					

The duties and taxes for importation and development of ICT materials are good					
The policies towards the cost of internet is favorable to agribusiness and general public.					

In your opinion, are the government policies/ regulations favorable for the adoption of emerging technologies by agribusiness organizations ----------

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Thank you for your time. As mentioned earlier, this data is strictly for academic purposes only.