

**THE IMPACT OF MOBILE PHONE USAGE TO ACCESSING MARKET
INFORMATION BY SMALLHOLDER FARMERS, IN LARI CONSTITUENCY,
KENYA**

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Award of the Post Graduate Diploma in Project Planning and Management, the
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DECLARATION

This research project is my original work and has not been submitted for an award of a degree or any other academic purpose in this or any other University.

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This research project has been submitted for examination purposes with my approval as the university supervisor.

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DEDICATION

I dedicate this research project to my brother Gilbert, my sister Joan and my parents Mr. and Mrs. Maina, who gave me both mental and resource support to pursue this program. I appreciate you all.

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In undertaking this study, I have received vital cooperation, guidance, and help from many individuals. First, I want to thank God for his grace of life and sustenance. I also want to thank my parents for their support and guidance most sincerely, my siblings, my college students, and most importantly, my supervisor, Dr. Angeline M. Ayuya, for her advice and often challenging me to be better. I owe this achievement to you.

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OPERATIONAL DEFINITIONS, ABBREVIATION, AND ACRONYMS

FAO	Food and Agricultural organization
US - \$	United States dollar.
USAID	United States Agency for International Development
SHFs	Small Holder Farmers
SSA	Sub Saharan Africa
US	United States
USDA	United States Department of Agriculture
UK	United Kingdom
WFP	World Food Program
AMIS	Agricultural market information system
GSMA	Global Services for Mobile Association
PLC	Public Limited Company
SMS	Short messaging service
CAK	Communication Authority of Kenya
KIHBS	Kenya Integrated Household Budget Survey
KNBS	Kenya National Bureau of Statistics
FTs	Farmer trainers
M-farm	Mobile Farm
IoT	Internet of Things
KPHC	Kenya Population and Housing Census

Web 2.0	They are World Wide Web technologies that allow users to interact and create content for discussion.
NCPB	National Cereal and Produce Board
CIARD	Coherence in Information for Agricultural Research for Development
MoA	Ministry of Agriculture
KARLO	Kenya Agricultural & Livestock Research Organization

ABSTRACT

Mobile phones are increasingly becoming one of the primary sources of agricultural market information. Farmers, agricultural programs, agricultural institutions, and non-governmental institutions utilize mobile phones and internet platforms to disseminate agricultural market information. The study's main objective was to investigate the impact of mobile phone usage on accessing market information by smallholder farmers regarding farmers in Lari constituency, Kenya. The specific objectives were to find out how phone calls influences access to market information by smallholder farmers in Lari Constituency Kenya, determine how text messaging influences access to market information by smallholder farmers in Lari Constituency Kenya, investigate how the internet influences access to market information by smallholder farmers in Lari Constituency Kenya, and to determine how social media influences access to market information by smallholder farmers in Lari constituency Kenya. The research design used was a descriptive survey to understand more about the phenomena. The qualitative method used was interviews with key informants. Purposive sampling was used to arrive at a sample of farmers in the study area. Descriptive statistics were employed in data analysis. From the research, it can be deduced that mobile phones are highly used among most farmers in the study area to fulfill their needs for accessing market information. The study established that farmers in the study area source for market information from various avenues, including phone calls, text messaging, and the internet. This study recommends that marketing centers can be established in Lari constituency, along with infrastructure for farmers to understand the risks associated with market dynamics and mobile phone service providers also to develop more affordable yet practical and easy to use handsets along with easy to use internet platforms which is cheap and has effective data plans for social media access.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Information is necessary for educating the masses on various issues, and people will look for news to meet their needs. Different mediums relay information that helps audiences to solve their problems and also influence their decisions. Mobile phones are essential tools of communication in this age where information sharing is advanced. However, the use and impact of these devices are often underrated as well as overrated as technology keeps advancing. Information is critical in agricultural development because it is a tool for communication between stakeholders and serves as a channel for assessing trends and shaping decisions (Kalusopa, 2005). Farming requires information and technical expertise hence the need for extension services; however, extension services are not readily available to all farmers due to various factors. This chapter looks at how farming and mobile technologies integrate to enhance the economic development of countries. It also looks at how information communication technologies are changing the agricultural landscape of countries. It further isolates the importance and challenges of agricultural market information in the agriculture value chain and the experiences that smallholder farmers in Lari constituency in Kenya have with farming.

After years of neglect, agriculture is once again seizing the attention of African governments, business leaders, communities, and development donors, as a powerful driver of the continent's relentless growth. This is according to the World Bank report (2013) on Growing Africa. The Food and Agricultural Organization (FAO, 2019) underscores the sector's significance in developing the rural economy and the Kenyan economy, with the sector being the first to devolve its functions to the county governments. Agriculture and agribusiness together are projected to be a US\$ 1 trillion industry in Sub-Saharan Africa (SSA) by 2030 (compared to US\$ 313 billion in 2010), and they should be at the top of the agenda for economic transformation and development, as put forth by World Bank report (2013) on Growing Africa. According to United States Agency for International Development, USAID (2018), Kenya has the largest, most diversified economy in East Africa, with agriculture being the economy's

backbone and central to its development strategy. However, Kenya is classified as a food deficit country. (Laibuni, Nyangena, Laichena, 2018). USAID is implementing activities focused on increasing agricultural productivity and incomes for smallholder farmers, building more resilient communities, improving access to clean water and energy, and increasing access to affordable financing for farmers, entrepreneurs, and businesses. The majority of farmers work without basic agricultural inputs or updated technology and lack adequate financial or extension services. The World Bank report (2013) on Growing Africa, affirmed that agribusiness plays a critical role in economic transformation and successful agribusiness investments; therefore, it can stimulate agricultural growth by providing new markets and the development of a vibrant input supply sector.

In China, agricultural resources are in plenty, and the country has a long history and tradition of intensive cultivation and an enormous rural population (FAO 2019). The agricultural sector in China has dramatically transformed since the late 1970s (Jikun Huang, Xiaobing Wang, and Huanguang Qiu 2012). China's agriculture is characterized by a large number of smallholder farmers (SHFs). These are farmers with limited land and animals, and since they are basically only using their land resources, they are strictly restricted by local constraints. Hence, throughout the world, SHFs are often closely accompanied by poverty, low income, and social vulnerability (von Braun, 2005). The market-oriented agricultural reform and globalization have transformed the traditionally closed peasant economy into a modern agricultural economy. During this process, SHFs have increasingly been involved in large open markets and non-farm employment. However, many of them hardly benefit from economic development due to the small-scale of their production, limited capital and information obtained, and lack of new technologies. (Dr. Xu Zhigang). In the United States (US), according to the United States Department of Agriculture (USDA) Economic Research Service (2010), small farms are those farms with gross sales of less than \$250,000.

According to Newton and Hope (2005), small farms in the US account for 91 percent of the farm count and 71 percent of farm assets, but only 27 percent of agricultural production. Small-scale farmers are faced with limited resources, which needs to be met

to help reduce some of their challenges. (Joy n. Goodwin and Jessica, I. Gouldthorpe, 2013). In the United Kingdom (UK), for SHFs, the prospect of using agriculture to escape poverty relies to a large extent on their ability to improve productivity and access markets. However, there are emerging global issues, some favorable, and some posing a challenge that affects their chances of success. (Maria Fay Rola-Rubzen and J. Brian Hardaker, 2006).

In South Africa, agricultural and food systems are characterized by increasing concentration over the past decades, with farms becoming smaller and more extensive (Heijden & Vink, 2013) and retailers attaining market dominance and achieving increased bargaining power (Andersson et al., 2013). Some of the most vulnerable in this system are SHFs with poor access to infrastructure, inputs, and markets and often have access to less than two hectares. A significant reason why SHFs with surplus production remain trapped in poverty is the lack of access to markets (Magingxa, Alemu & Van Schalkwyk, 2009). Almond and Hainsworth (2005) argue that field extension agents are ill-informed about local markets and often do not provide the necessary training and assistance so that SHFs can gain access information about markets. Based on two cases, Ortmann and King (2007) illustrate that access to high-value markets poses considerable challenges for rural farmers and that infrastructure investment is critical in reducing these types of transactional costs.

In Zimbabwe, agriculture plays a pivotal role in the country's socio-economic development and food security. It has the potential to significantly reduce poverty, enhance economic growth, and consolidate financial stability. It is the country's major backbone, contributing close to 16% towards the GDP in 2010 (FAO, 2010). Seventy-eight percent of the population living in rural areas is involved in smallholder farming for food security and livelihood (FAO, 2015). Farmers must access advisory services and market information for both inputs and produce to make informed decisions. (Masuka, Matenda, Chipomho, Mapope, Mupeti, Tatsvarei, Ngezimana, 2016). Mobile phones enable farmers to get such information and make informed decisions (Tadesse & Bahiigwa, 2015). It is essential to raise awareness and promote this ICT platform among

smallholder farmers to keep them up to date on weather, farming advice, and markets for an informed decision, better planning, and improved production. (Masuka, Matenda, Chipomho, Mapope, Mupeti, Tatsvarei, Ngezimana, 2016).

In Nigeria, agriculture remains the Nigerian economy base, providing the primary livelihood source for most Nigerians. (FAO 2019) The sector faces many challenges. Notably, an outdated land tenure system that constrains access to land, a shallow level of irrigation development, limited adoption of research findings and technologies, high cost of farm inputs, poor access to credit, inefficient fertilizer procurement and distribution, inadequate storage facilities, and poor access to markets have all combined to keep agricultural productivity low with high postharvest losses and waste. (FAO 2019) According to WFP 2018, smallholders continue to face severe constraints. Some are unable to produce enough to last through the lean season. Food production in Nigeria has not kept pace with population growth, and Nigeria continues to be a food deficient nation. (FAO 2019).

In Tanzania, Agriculture plays an essential role in the overall development of the economy and its people's livelihood. (Phillip, 2012). It provides a livelihood to more than 80 percent of the population, most of them living in rural areas. (, 2012). Many smallholder farmers in Tanzania adhere to traditional farming practices deemed unsuitable and unproductive. (Mattee, 1994). The main challenges facing the agriculture sector in the country include; Inability of smallholder farmers to access and use inputs such as seeds and fertilizers, Use of obsolete technologies such as the hand-hoe, Inadequate investment in irrigation, which makes farmers very vulnerable to droughts, Poor infrastructure, especially roads, High post-harvest crop losses caused by poor storage structures and inadequate access to pesticides, Inadequate market access for both crops and livestock products, Problems in accessing credit for Agricultural production and marketing among others (Phillip 2012).

Food is vital for society. It plays a pivotal role in enhancing humans' well-being and the economic development of a country. Recent research clearly shows that malnutrition,

especially undernutrition, is a consequence of poverty, food insecurity, and disease and one of the reasons for the lack of progress in economic development throughout the developing world (IFPRI 2014). Locally based agribusiness enterprises in developing countries are typically small to medium-scale operations in rural areas that either process raw agricultural materials or provide marketing, transport, and other services (Kinsey, 1987). Evidence shows that agriculture-led growth in Kenya is more effective in reducing poverty than the industry's growth, thus the need to boost small scale farmers' productivity and enable the growth of small enterprises to stimulate the rural economy. (Mokeira, 2014). Therefore, industrial development is unlikely to be sustainable unless there is sufficient domestic demand, which essentially calls for raising the incomes of rural people. (Nyoro, 2002). The growth strategy for most developing countries should focus on agricultural revitalization for several reasons (Todaro and Smith, 2011). Agriculture will provide the largest employment source in many countries and will remain the lead economic sector of comparative advantage.

Moreover, agricultural productivity growth is the primary driver of global poverty reduction by directly raising farmers' incomes and indirectly leading to decreased food prices. The potential of agricultural development to reduce poverty is four times greater than the growth potential from other economic sectors (Cline, 2007). Small-scale farmers continue to be the most important producers of most agricultural commodities. In 1990, for example, it was estimated that there were about 3.5 million smallholdings with a national average farm size of about 2.5 hectares. Smallholders' role in Kenya's agriculture has increased to the extent that they account for approximately 60 percent of the marketed products. In both the cash and food crop production, the small-scale production systems pre-dominate. (Nyoro, 2002).

1.1.1 Agricultural Market Information System in Kenya

Agricultural marketing information systems play a crucial role in farmers' decision-making process on-farm produce production and marketing. Farmers require easy access to relevant, up to date, and adequate agricultural marketing information. (Amer, Odero, and Kwake, 2018). Kenya's agricultural sector has just gone through a period of market

liberalization. The government has moved out of setting prices, imposing controls, and subsidizing parastatals. The trade and exchange rate regimes also have been liberalized. Market liberalization is not yet complete, but many sectors are already finding the new regime not to their liking. This is evidenced by sometimes violent farmers reacting to what they see as a reduction in their incomes, loss of control of their organizations, and political interference in the running of their affairs. (Argwings-Kodhek, 2015). Increased productivity of the millions of people engaged in agriculture is required for living standards to rise. But since Kenya's arable landmass is mostly fixed and already under cultivation, expansion of cropped area is not a realistic option to increase the livelihoods of Kenya's rural population, growing at 3.34% per year. (Mose, Lawrence, 2015). Unfortunately, there is limited household-level information available in Kenya to allow planners, policymakers, and donors to make a comprehensive assessment of the factors that determine agricultural productivity in Kenya. Such information would be extremely valuable in identifying major constraints on productivity growth and in formulating strategies to overcome them. (Owuor, Joseph, 2015). This information may help identify the constraints that need to be addressed to realize the predicted benefits of market liberalization on agricultural productivity in Kenya. (Mose, Lawrence, 2015).

The extent of access to market information in Kenya has not been sufficiently effective. Often information platforms exist but they are not accessible to the farmers, extension workers and policymakers for the decision making process. (Amer, et al 2018). Having up-to-date market information on commodity and input prices, as well as demand trends, boosts farmers' negotiating positions and informs decisions about when and where to buy and sell, what to produce, and the quantity and quality of future production (Stienen, et al., 2007). Farmers usually lack information about current market prices because of villages' remoteness and poor communications with marketplaces. Access to agricultural marketing information by farmers and other agricultural stakeholders can be enhanced through the availability of easy to use, accessible agricultural marketing information systems (Amer, et al 2018)

FAO, (1997) defines agricultural market information system, AMIS as “a service, usually operated by the public sector, which involves the collection on a regular basis of information on prices and, in some cases, quantities of widely traded agricultural products, from rural assembly markets, wholesale and retail markets as appropriate and dissemination of this information on a timely and regular basis through various media to farmers, traders, government officials, policymakers and others, including consumers”. Agricultural Market Information Systems are designed to collect, analyze and disseminate data on the status and the dynamics of agricultural market prices. CTA, (2015) further describes marketing information systems as systems that collect, analyze, package, store and disseminate prices and other information relevant to farmers, traders, processors, and others interested in agricultural commodities. Marketing information is a wide concept that includes details on potential market channels, payment requirements, packaging, quality and a whole lot of information required by a producer to make a successful sale, including market information. (Amer, et al 2018)

1.1.2 The Role of Mobile phone in Agricultural Market Information by smallholder farmers in Lari Constituency

Agricultural market information in Kenya has been inaccessible to rural farmers. The rural farmers have been left to depend on traders who dictate prices of their products leading to low prices that are unfavorable to farmers. Most of the existing solutions that provide market information use SMS technology which is widely available and cost-effective in Kenya, however, requirement to adhere to strict syntax, registration via the web and the fact that most of these systems are offered in English making most rural farmers who cannot effectively communicate in English unable to use the system (Chemweno 2012).

In spite of the growing demand for agricultural products, and some improved market conditions, smallholder farmers may be excluded from opportunities for a number of reasons. Relatively low population densities and poor infrastructure in and across many SSA countries isolate smallholder farmers from markets and increase transaction costs

for input and output markets, especially for those within landlocked countries (Sachs & Warner, 1997).

Lack of information has been worsened by a combination of factors that include; low levels of literacy, limited connection to the internet and high cost of broadband internet when available and weak purchasing power among rural farmers. There have been attempts to make market information more readily available. However, most of these solutions have been geared towards providing information to donors, or government departments. This information does not become of much use to farmers and traders because they do not access it in the shortest time possible. Timely information is important because agricultural produce is perishable and therefore market conditions fluctuate. For market information to be reliable, it ought to be as up to date as possible. Another reason that has made most of the solutions advanced for market information availing to have little impact on farmers and traders has to do with the media used in those solutions. (Chemweno 2012)

Comparing mobile phones and the internet, not only do mobile phones come at more affordable prices but already the majority of the Kenyan population own mobile phones, 72 per 100 Kenyans (CAK, 2012). The explosion of mobile phones in Kenya is phenomenal; this means it is easier to get in touch with people using mobile phones than using any other media in Kenya. Aker and Mbiti (2010) observe that mobile phones can have a great impact on people's livelihoods by connecting the population to markets.

1.2 Statement of the Problem

Research done in Ethiopia, Uganda, Tanzania and China has shown that mobile phones can be used to provide information to the farmers and rural residents through SMS and multimedia-supported systems (Martin and Abbott, 2008; Wei and Zhang, 2008; Nyamba and Mlozi, 2012; Chhachhar, Qureshi, Khushk, and Maher, 2014; Tadesse and Bahiigwa, 2015). According to Martin and Abbott, (2008) and Wei and Zhang (2008), mobile phone use offers real benefits to rural residents in the area of connectivity to the outside world as well as reduced unnecessary commuting to urban centers. With information on the

supplies markets and prices, markets for products and product prices, weather data and advice farmers are able to make informed decisions (Nyamba & Mlozi, 2012; Tadesse & Bahiigwa, 2015). Elsewhere including Zimbabwe, farmers make and receive payments as well as insure crops using mobile services (Econet, 2015). By consulting remotely on mobile phones for supplies and product markets, prices, for advice as well as by using mobile financial transactions, farmers save time and finances that would have been used on traveling (Deloitte, 2012; Nyamba & Mlozi, 2012).

In the Kenyan case, the lack of information has been worsened by a combination of factors that include; low levels of literacy, limited connection to the internet and high cost of broadband internet when available, and weak purchasing power among rural farmers. (Chemweno 2012). Gakuru et al., (2009) observed that market-related information like the weather forecast, transport facilities, and information storage facilities are vital, but they have a tendency to quickly either get out-dated or change frequently. Farmers who produce agricultural commodities and traders who deal in agricultural produce lack a platform for exchanging information. (Chemweno 2012).

Information such as availability of supply or demand is useful to both parties. Currently, such information does not find its way easily from one party to another especially where the parties are far apart. (Chemweno 2012). According to a GSMA report, 2014 mobile phones have become the most popular and widespread form of personal technology on the planet, with 3.6 billion unique mobile subscribers and 7.2 billion connections globally. For many consumers across Sub-Saharan Africa, the mobile phone is not just a communication device but also the primary channel to get online, as well as a vital tool to access various life-enhancing services. Mobile adoption in the region has grown rapidly in recent years: overall subscriber penetration reached 44% in 2017, up from just 25% at the start of this decade. (GSMA 2018). Therefore, this potential that mobile phone devices present can be adopted by small scale farmers to improve their access to market information.

1.3 Purpose of the Study

The purpose of this study is to investigate the impact of mobile phone usage on accessing market information by smallholder farmers in Lari constituency, Kenya.

1.4 Objectives of the Study

The following objectives guide the study:

1. To establish how phone calls influences access to market information by smallholder farmers in Lari constituency, Kenya.
2. To determine how text messaging influences access to market information by smallholder farmers in Lari constituency, Kenya.
3. To investigate how the internet influences access to market information by smallholder farmers in Lari constituency, Kenya.
4. To determine how social media influences access to market information by smallholder farmers in Lari constituency, Kenya.

1.5 Research Questions

1. How do phone calls influence access to market information by smallholder farmers, in Lari Constituency, Kenya?
2. To what extent does text messaging influence access to market information by smallholder farmers, in Lari Constituency, Kenya?
3. Does the availability of internet influence access to market information by smallholder farmers, in Lari Constituency, Kenya?
4. To what extent do social media influence access to market information by smallholder farmers, in Lari Constituency, Kenya?

1.6 Research hypothesis

Phone calls, text messaging, internet and social media have no influence on access to market information by smallholder farmers in Lari constituency.

1.7 Significance of the Study

First, the study may be significant to planners and policymakers as it will enhance their understanding of problems affecting access to markets by the smallholder farmers in Kenya and aid in taking the appropriate measures in improving some of these problems while lobbying relevant authorities to address the problems that are beyond their control. The study may also be of importance to farmers as they can use the study findings to address those problems that negatively contribute to the inability of accessing markets. Using study findings, farmers may be able to gain knowledge of markets and methods of accessing available markets, consumer needs, consumer trends, market prices, and market challenges and also establish reliable communication channels with consumers.

1.8 Assumptions of the Study

It is assumed that the researcher will be accorded with all the necessary assistance from the farmers where the research is conducted; all respondents will be truthful in their answers, cooperative and knowledgeable enough to provide complete, reliable and authentic information. They will fill all the questions in the questionnaires and return them within a reasonable time for data analysis, and the respondents have knowledge of mobile phone use.

1.9 Scope of the Study

Although there are other studies focusing generally on how the usage of mobile phone influence access to agricultural information, this study focuses on how mobile phone use influences access to market information in Lari constituency.

1.10 Limitation of the Study

This study faces the following limitation. The farmers are always busy in their farms, especially since they are working throughout the day. This is a challenge during data collection since there is limited time to interview the farmers to fill the questionnaires. I will employ a drop-and-pick-later method for some of the questionnaires to allow the farmers to complete the questionnaires during their free time.

1.11 Definitions of Significant terms

Mobile phone: In the study, it is a tool used for communication that allows its users to make calls, send text messages, among other many features like using the internet and social media applications like Whatsapp messenger, Twitter, Facebook, Instagram, among others.

Market: In this study, it refers to a place which commercial farmer meets and exchange agricultural goods and services either directly or through integrative channels like institutions, agents or tools.

Small Holder Farmer: In this study, it refers to a farmer who cultivates less than ten acres of land mostly for subsistence and a few cash crops.

Phone call: In this study, it refers to an attempt to contact someone by a mobile phone or actually speaking to someone on the mobile phone.

Text message: In this study, it refers to a short electronic communication sent and received via a mobile phone.

Internet: In this study, it refers to a platform that provides a variety of information that is readily available through a networked system.

Social media: In this study, it refers to a channel of communication that uses Web 2.0, where information is shared quickly, efficiently, and in real-time. It includes various platforms like Facebook, Twitter, Whatsapp, YouTube, and blogs.

1.12 Organization of the Study

The study is organized into five chapters. Chapter one comprises a background of the study, problem statement, purpose, and objectives of the study, research questions, research hypothesis, significance, basic assumptions, scope, and definition of important terms. Chapter two deals with a literature review on the impact that mobile phone calls, text messaging, the internet, and social media has on market access by smallholder farmers. Chapter three comprises of research methodology focusing on research design, target sample and sampling procedures, research instruments, validity and reliability of the research instruments, data collection procedures and data analysis techniques. Chapter four constitutes data analysis and discussion of findings, while chapter five deals with the summary, conclusion, and recommendations for further research.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This section explores the existing literature on the current mobile phone usage in Kenya and the impact of activities like phone calls, text messaging, using the internet and social media on accessing market information by smallholder farmers in Kenya. The chapter is based on studies on mobile phone usage, which were found useful to the present study. Furthermore, the studies reviewed the “Uses and Gratification theory and the transactional model of communication,” which helped develop a conceptual framework.

2.1.1 Phone calls and access to market information.

A phone call is an activity of communicating with another person using a mobile phone. A mobile phone is a communication device with various multifunctional features that aides communication through; besides making a phone call, sends text messages, uses the internet and other system enabled programs. Mobile phones are largely being adopted around the world as the most preferable communication tool, challenging convectional mass communication tools like television, radio, and newspapers. According to Grameen foundation 2018, as mobile phone use increases, the paradigm is also shifting for how smallholder farmers are profiled, how their needs are understood and met, how the impact of agricultural services is measured, how farmer data is shared, and how a global body of knowledge can be built by drawing on typically siloed expertise and data. In their research, most of the data already exists to solve many constraints that farmers face, but the solutions are fragmented and not all service providers or farmers have equal opportunities to access them. The information thus is barely enough for these farmers who want to take their produce to the market.

Safaricom PLC, the largest communication company in Kenya has a market share of 67 % according to its sustainability report 2018. Apart from the 29.6 million customers who make phone calls and use other services, the company launched DigiFarm, a platform that offers smallholder farmers access to a suite of information and financial services, including discounted products, customized information, and tutorials on farming best

practices, and access to credit and other financial facilities. The service, however, has had limited influence on providing information on market access for smallholder farmers due to the nature of its customers in relation to its products and services. This poses a challenge in the quest to provide market among the large group of smallholder farmers in the country.

According to the Kenya population and housing census of 2013, Lari constituency has a population of 123,895 people. The land is purely an agriculture zone and the agricultural practices are rain-dependent (Mwangi J.N. and Mutua J.M, 2014). The landscape has nearly 90% of the population engaged in cultivation. The majority of these people depend on small scale farming with the average size of the land being 0.8hectares where they grow various types of cash and subsistence crops and keep livestock in their smallholdings. Tea and horticultural products are the main income earners. (Mwangi 2014). Agribusiness is thus the heart of the constituency economic development. While the tea is the main cash crop in the Landscape, there has been some major shift to livestock and high-value horticultural enterprises in recent years due to a ready urban market like Kiambu, Nakuru, Nairobi as well as Mombasa. However, this sub-sector is yet to achieve its full potential owing to constraints such as the use of uncertified seeds, shortage and high costs of farm inputs, lack of appropriate storage facilities, poor farming skills, and harsh climatic conditions like frost and flooding in some parts of the landscape. (Mwangi 2014). Although there is a ready urban market, the market information is constantly changing and farmers need to always research information on the markets.

2.1.2 Text messaging and access to market information.

A text message often referred to as a short messaging service (SMS) is a predominant feature in the use of mobile phones for communication. SMS is widely used because it offers an easy to use and cost-friendly rate for communication.

According to the CAK quarter 1 report of the financial year 2018-2019, as at 30th September 2018, the number of active mobile subscriptions in the country stood at 46.6

million. Subsequently, mobile penetration rose by 2.3 percentage points to stand at 100.1 percent from 97.8 percent reported last quarter. During the period under review, mobile penetration surpassed the 100 percent mark mainly attributed to the fact that most users own more than one SIM card either from the same or different service providers. This fact is also supported by the Kenya Integrated Household Budget Survey (KIHBS) report released by Kenya National Bureau of Statistics (KNBS) in April 2018 which indicated that at least 30% of mobile users in Kenya own more than one SIM card, which translates to an average of 1.3 SIM cards per subscriber. During the quarter under review, the total number of outgoing short messages stood to 15.4 billion up from 14.8 billion messages registered in the preceding quarter according to the CAK quarter 1 report of the financial year 2018-2019.

A study conducted by ICRAF in 2015 with 28 farmer trainers (FTs) in Kaptumo and Olkalou in Kenya to assess the use of (SMS) in accessing agricultural information showed that all FTs owned mobile phones and were able to read and write text messages and that English was the popular language among FTs in SMS usage (90% preference over other languages). The results further showed that FTs received agricultural text messages from fellow FTs (100% in Olkalou and 71.4% in Kaptumo), service providers (50% in Kaptumo), extension workers (71.4% in Kaptumo), and local administration (78.6% in Kaptumo). The study further revealed that FTs occasionally share the text message information that they receive with other farmers. These findings point to the fact that the use of mobile phone technology is widely used by farmers to access and share agricultural information. However, smallholder farmers in Kenya have been known to have limited access to reliable and affordable infrastructure and services for them to access market information. According to Chemweno 2012, timely information is important because agricultural produce is perishable and market conditions fluctuate thus for market information to be reliable, it ought to be as up to date as possible.

Explanations as to why SMS is often not relied on by farmers have been highlighted by Wayan Vota, 2016. In his publication, mFarm, like many SMS-based services, requires the farmer to start and modify the service using text messages. While texting can be

difficult in English, it's much harder still in local languages like Swahili, Bukusu, and Luo, which have long words that can be spelled multiple ways. Farmers would need to understand how to input letters, spaces, and symbols, and switch between upper and lower case letters, all on a tiny keyboard and they also have to do it correctly. When farmers send a text message, they never know if the intended recipient got the text until they respond. This makes text messaging an unreliable communications channel. Farmers don't know if their text went through or not, or if it was read or not, or if the recipient just didn't know how to use a text message, or felt it was too difficult to respond. With all that uncertainty, farmers are left unsatisfied. The study further revealed that when farmers are making a few hundred Kenyan shillings a day, every shilling counts. Kenya's M-Farm, for instance, charges farmers 10 Kenyan shillings to simply check local market prices by SMS, according to a publication by the guardian, 2012 but it also has a feature that enables them to band together to buy and sell collectively, empowering them within the supply chain. In this context, sending a text message feels expensive, especially when they don't know if the person received the text. Farmers typically also have poor eyesight, which is a consequence of age, health, and using fuel-based lighting vs. electrical lighting in the home. With this reduced vision, farmers found the small screen of their feature phone handsets too inadequate to read even short SMS text announcements. Farmers furthermore received their handset from a friend, or it was bought many years ago and is now a relic of the past. Either way, phones are held together with rubber bands or string, making it very difficult for farmers to use their phones. The study further found that many handsets were turned off to preserve their charge, as access to electricity is still very low in rural Kenya. Some participants even talked about charging their phones up to 10Km away in a charging kiosk. These power issues make it extremely difficult to send farmers real-time price information and along with the other issues above, serve as a disincentive to using SMS text messages to find market prices for agricultural products.

2.1.3 Internet and access to market information.

There is a growing interest in how the internet is changing businesses globally. For farmers in Kenya, innovations on how farming can benefit is a growing discussion. The

Internet of Things (IoT) is expected to ramp up in everyday business, with more than three quarters (76 percent) of businesses saying IoT will drive future success. Moreover, 63 percent of businesses plan to launch IoT technologies over the next year according to a standard newspaper published in July 2016. In agriculture, IoT applications include farm vehicle tracking, livestock monitoring, storage monitoring, and other farm operations. In this IoT model, sensors can be deployed on the farm; to the ground, in water, in vehicles, etc. to collect data. The collected data is stored in the cloud system or server and accessed by the farmer via the internet or their mobile phones. (FAO 2017). IoT has been applied in agriculture in general, in arable farming, in fisheries and aquaculture, in animal food consumption, in the agri-food supply chain, in greenhouse horticulture and livestock farming.

Liquid Telecom Kenya, part of the leading pan-African telecoms group Liquid Telecom has partnered with Sigfox, the world's leading IoT services provider, to build and deploy a nationwide IoT network which is set to enable farmers run their activities from wherever they are at any time. With the new network, farmers will also be able to detect adverse weather conditions, pest and disease in their farms and put necessary measures to avoid any losses. Furthermore, it will enable the farmers to avoid middlemen who may deny them enjoying their full profits as the network will enable them identify markets for their produce. (Oyugi 2018). The network which is expected to cover up to 85 percent of the Kenyan population will be connected to Liquid Telecom's fiber network, to deliver guaranteed reliability and speed. The launch of the IoT network in Kenya will support the Big Four agenda and will be used to connect sensors in agriculture among other sectors. The sensors gather farm conditions and relay real-time information to farmers through SMS for necessary actions. (Oyugi 2018). In Lari Constituency, out of 123,895 people who live in the constituency, only 5,195 accesses and use the internet while 107,339 people never use the internet, 1,748 don't know the internet and 9,613 gave no reply on their internet use. (KPHC 2009) Currently, small scale farmers in Kenya have challenges in accessing the internet due to unavailable internet infrastructure, high internet costs, and poor connectivity.

2.1.4 Social media and access to market information.

Social media is a collection of online technologies that allow users to share awareness, experiences, and opinions. The sharing can be in the form of text, audio, video, or multimedia (Safko & Brake, 2009). Tang, Gu & Whinston (2012) state that the benefits of participating in social media have gone beyond social sharing to building reputations and bringing in career opportunities and monetary income. According to Kietzman, Hermkens, McCarthy, and Silvestre (2011), social media platforms focus on some or all seven building blocks: identity, sharing, conversations, relationships, presence, groups, and reputation. According to Kietzman et al. (2011), social media creates highly interactive platforms through which individuals and groups share, generate, debate, and modify content due to mobile and web-based technologies.

Social media is all-inclusive for information whereby the users can read and come up with the content (Wangu, 2014). The introduction of social media and web 2.0 applications has opened up a platform that agricultural extension officers, farmers, agricultural institutions and non-governmental institutions utilize to disseminate and exchange agricultural information (Thomas Kipkurgat, Michael Onyiego, and Silahs Chemwaina, 2016). Inappropriate or poor-quality information could be a hindrance to farmers' use of information sources. The major constraints to information access are poor availability, poor reliability, and a lack of awareness of information sources available and untimely provision of information (Wangu, 2014). The number of extension workers in Kenya has been decreasing drastically while the number of small scale farmers has been increasing, therefore, creating the need for innovative services to address this gap (Gakuru et al., 2009). Compared with the agriculture sector in developing countries, agriculture is becoming increasingly knowledge-intensive. As agriculture systems become more complex, farmers' access to reliable, timely and relevant information sources becomes more critical to their competitiveness (Thomas Kipkurgat, Michael Onyiego, and Silahs Chemwaina, 2016). The information must be relevant and meaningful to farmers, in addition to being packaged and delivered in a way preferred by them (Diekmann, Loibl & Batte, 2009).

Social media is increasingly being used as a medium for sharing information and creating awareness. Platforms such as Facebook, Twitter, Whatsapp, YouTube, and blogs have been used to engage with various audiences. The users generate and shape the content. Social media strengths are complementing traditional media in facilitating the shaping of content. Farmers and the users interested in farming get information from these social media sites (Thomas Kipkurgat, Michael Onyiego, and Silahs Chemwaina, 2016).

The clients trade data and talk about issues concerning agribusiness dependent on experience and information. They likewise purchase and sell farming produce and inputs and use pictures, connections, and recordings to encourage this. This sharing of data encourages the promotion of the farmers' produce and the arrangement of organizations. The online media platforms are additionally used to share connections, news stories, data, feedback, and inquiries. Agricultural institutions in Kenya have likewise fused online media in their data frameworks. For example, the Agricultural Information Resource Center has Facebook and YouTube pages and a blog. Notwithstanding, not all establishments have entirely held onto Web 2.0 as an instrument for spreading data. (Thomas Kipkurgat, Michael Onyiego, and Silahs Chemwaina, 2016).

A 2012 report by CIARD states that the use of Web 2.0 to enhance visibility and exchange of research outputs, including metadata, has not been widely embraced for sharing research outputs. The MoA, KARLO use YouTube to spread recordings about functions at their organizations. At the individual level, there were secluded instances of the utilization of instruments, for example, Facebook, online journals, and Skype by analysts. Be that as it may, it couldn't be set up if such apparatuses were being utilized to share research data. It is likewise clear that there is a combination of conventional media and web-based media to give and shape content. (Thomas Kipkurgat, Michael Onyiego, and Silahs Chemwaina, 2016). Agricultural programs are using social media to engage audiences and obtain feedback. For example programs like Shamba Shape Up on Citizen Television and the pull out seeds of gold, in the Saturday Nation have social media platforms. Mkulima Young a radio program on Coro Fm also obtains its feedback on the Mkulima Young social media platforms. Social media overcomes geographical

boundaries and creates communities that share common interests. The users also seek out information from traditional media social media platforms. (Thomas Kipkurgat, Michael Onyiego, and Silahs Chemwaina, 2016). Rhoades and Hall (2007) noticed an enormous presence of sites covering points on agriculture. A large number of the sites were officially composed. A greater part was not media related. Farming media is starting to comprehend this marvel and use Web 2.0 advancements for their crowds.

Among the most common challenges faced by small scale farmers in Kenya include poor network access, power outages, and costly charges when accessing the internet. Similarly, Babu et al. (2012) point out that the major constraints to information access are poor availability, poor reliability, lack of awareness of information sources available and untimely provision of information. Van and Fortier (2000) add that smallholder farmers usually experience challenges in obtaining agricultural information due to lack of infrastructure.

2.2 Theoretical Framework

This segment reviews the theory applicable to the study, the impact of mobile phone usage on market access by smallholder farmers. Ideas organize knowledge and disconnected findings from various research studies into a strong logical system and models from writing or an expert hunch that supports the reasonable structure and therefore advises the problem statement (Mugenda, 2003).

The investigation was guided by “The uses and gratifications theory (U&G) and the transactional model of communication.”

2.2.1 “Uses and Gratifications Theory.”

Early in the history of communications research, an approach was developed to study the gratifications that attract and hold audiences to the kinds of media and the types of content that satisfy their social and psychological needs (Cantril, 1942). Wimmer and Dominick (1994) proposed that U&G began in the 1940s when researchers became interested in why audiences engaged in various forms of media behavior, such as listening to the radio or reading the newspaper. Still, others credit the U&G perspective

with Schramm's (1949) immediate reward and delayed reward model of media gratifications (Dozier & Rice, 1984). Regardless, early U&G studies were primarily descriptive, seeking to classify the responses of audience members into meaningful categories (Berelson, Lazarsfeld, & McPhee, 1954; Katz & Lazarsfeld, 1955; Lazarsfeld, Berelson, & Gaudet, 1948; Merton, 1949). U&G.

Despite disagreement by communication scholars as to the precise roots of the approach, in the next phase of U&G research, during the 1950s and 1960s, researchers identified and operationalized many social and psychological variables that were presumed to be the precursors of different patterns of consumption of gratifications (Wimmer & Dominick, 1994). Accordingly, Schramm, Lyle, and Parker (1961) concluded that children's use of television was influenced by individual mental ability and relationships with parents and peers. Katz and Foulkes (1962) conceptualized mass media use as an escape. Klapper (1963) stressed the importance of analyzing the consequences of use rather than simply labeling the use as earlier researchers had done. Mendelsohn (1964) identified several generalized functions of radio listening: companionship, bracketing the day, changing the mood, counteracting loneliness or boredom, providing useful news and information, allowing vicarious participation in events, and aiding social interaction. Gerson (1966) introduced the variable of race and suggested that race was important in predicting how adolescents used the media. Greenberg and Dominick (1969) concluded that race and social class predicted how teenagers used television as an informal source of learning.

The "uses and gratifications theory" was progressed by theorists Elihu Katz, Jay G. Blumler and Michael Gureitch in 1974. The theory holds that individuals effectively search out explicit media and explicit content to create explicit delights (Turner & West, 2010).

Tan (1984) states that media use is objective directed. The mass media is utilized to fulfill specific necessities. These needs emerge out of the social environment. He further expresses that recipients select the sorts of media and media substance to satisfy their

needs. Consequently, the crowd starts the mass correspondence measure and can 'twist the media' to their necessities more promptly than the media can overwhelm them.

2.2.2 Transactional Model of Communication

Brazilian adult teacher Paulo Freire's unique proficiency work during the 1950s, engaged peasant farmers. Integral to this line of speculation, there was an emphasis on letting the partners engage in the improvement cycle and decide the result instead of outside actors forcing the outcome (Wangu 2014). From the start, the focal point of participatory correspondence was on dialogical correspondence instead of direct correspondence. The emphasis was on participatory and aggregate cycles in research, problem identification, decision making, execution, and progress (Tufte and Mefalopulos, 2009).

Participatory correspondence is value-based; the clients of online media are partners in the molding of data messages. Today, farmers share their insights with different farmers dependent on experience by the person to person correspondence and online discussions (Wangu 2014). Mobile phones are increasingly being used by the farmers in Kenya as a tool for communication and seeking information.

Gilder (1994) anticipated future innovation, a hybrid of the TV and the PC.

'As opposed to commending mass culture, the teleputer will improve independence. Instead of developing detachment, the teleputer will advance inventiveness. Rather than ace slave design, the teleputer will have intuitive engineering in which each receiver can work as a processor and transmitter of video pictures and other data. The teleputer will introduce a culture viable with the monstrous forces of the present ascendant innovation. Maybe generally significant, the teleputer will enhance and fortify majority rule government and private enterprise worldwide' (p46) Web 2.0 applications and platforms depend on the value-based model of correspondence whereby networks for example, farmers, make and shape their substance that is helpful to them. (Wangu 2014).

Correspondence is a powerful process. 'Correspondence resembles a movie, not a solitary preview. A word or activity doesn't remain solidified when you impart; it is quickly supplanted with one more word or activity' (Samovar, Portier & Mc Daniel, 2006).

The reason of the conditional model of correspondence is that the sender and the recipient are engaged with the way toward encoding and translating messages and connect henceforth the component of input, in this manner, the sender likewise turns into the beneficiary. As per Tan (1984), a conditional model of correspondence has components of Shannon and Weaver's numerical model, Newcomb's social-mental model and Westley and Maclean's overall model. Correspondence is started purposely by a source to accomplish some impact (reaction) in the beneficiary. Perception of various types of mass correspondence can show that mass correspondence is positively purposive.

As per Turner and West (2010) correspondence as value-based implies that the cycle is agreeable; the sender and the recipient are commonly liable for the impact and the adequacy of correspondence. They further express that in the conditional model, individuals construct shared significance. Also, what individuals state during an exchange is significantly impacted by their past encounters. The differentiation among source and recipient is discretionary since both are effectively engaged with the exchange. The first source may influence the recipient, yet beneficiaries likewise regularly influence sources (Tan, 1984). Value-based correspondence expects us to perceive the impact of one message on another. One message expands on the past message; in this way, there is interdependency between and among the segments of correspondence. An adjustment in one causes an adjustment in another (Turner & West, 2010). The sharing of a typical reality gives individuals inside a specific culture a typical asset of information (Samovar, Portier and Mc Daniel, 2010). Mutual information offers ascend to shared implications that are conveyed in the common physical climate, social establishments, social practices, the language, discussion contents and other media (Chiu and Hong, 2006).

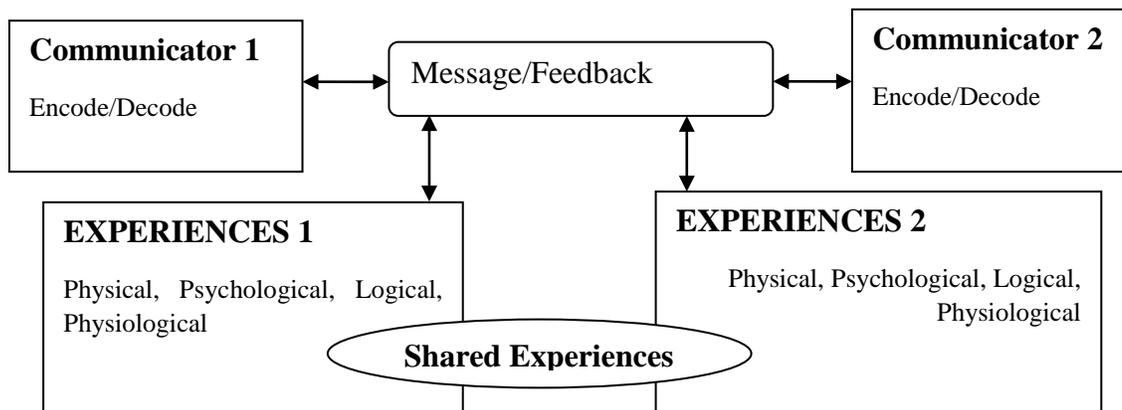


Figure 2.1: The transactional model of communication (Turner & West, 2010)

2.3 Conceptual framework

The conceptual framework for the study is presented in the figure below.

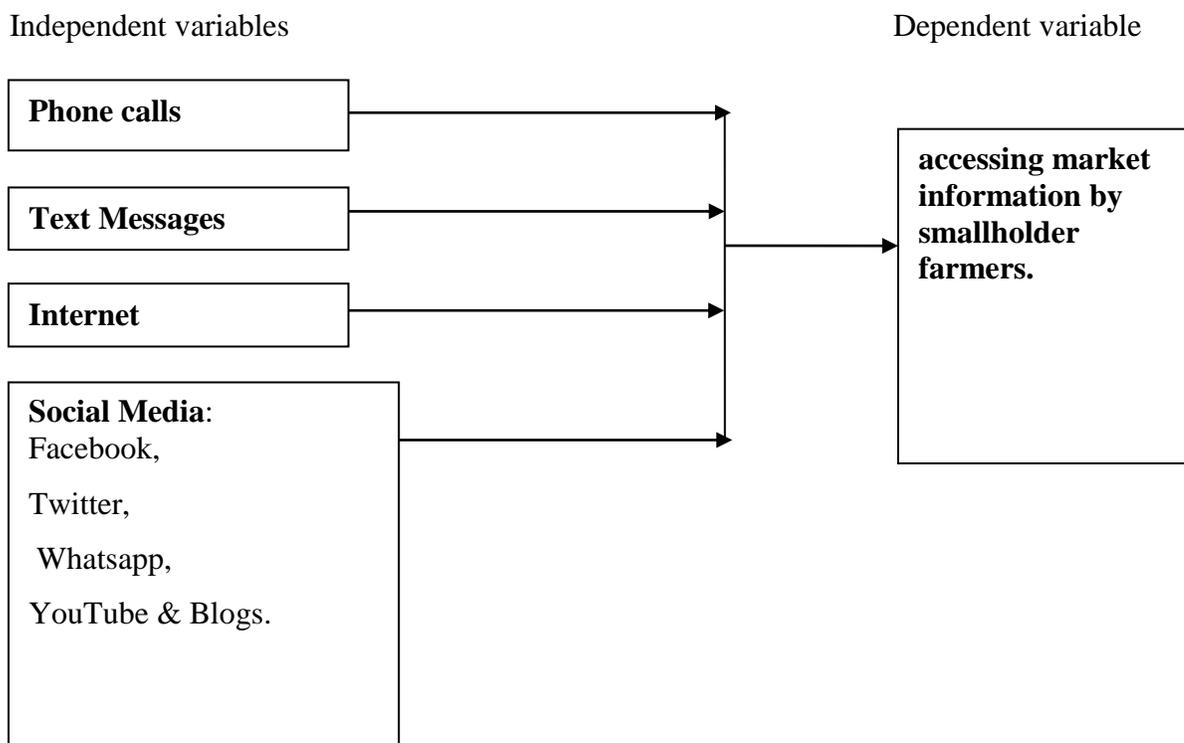


Figure 2.2: Conceptual framework

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter provides an explanation of the research design and the methodology that was applied in carrying out the research study and justification for using the particular research design. It also describes the characteristic of the population which was used in the study, detailed description of sampling methods used and procedures, data collection instruments and the procedure of data collection, validity, reliability, data analysis, and ethical issues.

3.2 Research design

Orodho (2003) defines research design as the scheme, outline or plan that is used to generate answers to research problems. The study adopted a descriptive survey research design since would describe the state of affairs as it would be.

3.3 Target population

According to Mbwesa (2006), the population is the entire group of people, events or things of interest that the researcher wishes to investigate. The target population in this research was 200 farmers.

3.4 Sample size

The sample size is a subset of the absolute populace that is utilized to give the overall perspectives on the objective populace (Kothari 2004). The sample size for this investigation was 20 Farmer respondents drawn from the objective populace. Assurance of test size was critical to the researcher since it was helpful in drawing out a valid portrayal of the populace.

3.5 Sampling Procedure

This study used census, which enabled the researcher to gather more information to assist in analysis and arriving at accurate results. The 20 respondents were more than the

threshold of 10 percent in a descriptive study (Kombo & Tromp, 2006) and so the entire target population participated in the investigation.

3.6 Data collection instruments

This investigation utilized a survey as an essential tool for information collection. The survey was organized with both open-ended inquiries and closed-ended inquiries in three areas. The questions were systematic and were presented with exactly the same wording and in the same order to all respondents. Section one had inquiries on respondents' demographic attributes. Section two involved inquiries on the independent variables (Phone calls, Text messaging, Internet, Social Media), and on the dependent variable (Access to market information).

3.7 Validity of research instruments

Legitimacy encourages the researcher to be certain that survey items measure the ideal constructs. Donald and Delno (2006) define the instrument's legitimacy as the appropriateness, significance, and handiness of surmisings an analyst makes dependent on information gathered. Mugenda (2003) concurs with this statement that legitimacy has to do with how precisely the information acquired in the investigation speak to the factors. This examination utilized content and construct legitimacy. Construct legitimacy was suitable to the examination since it tried to uncover the better subtleties in the exploration through stating and building clear inquiries that were unmistakably perceived by respondents and keep away from vagueness subsequently upgrading the finishing pace of polls. Content legitimacy was used by guaranteeing that the poll had the inquiries that empowered the research targets and exploration inquiries to be replied. This was accomplished by giving the poll to my supervisor, Dr. Angeline M. Ayuya for scrutiny.

3.8 Reliability of research instruments

The questionnaire was piloted in Limuru constituency in Kiambu County. The constituency was selected due to its high usage of internet and high agricultural activity and also because it is located where the researcher can easily access. Two questionnaires for two farmer respondents were administered and re-administered to the same samples

after 1 week. The coefficient of reliability was then calculated to measure the reliability of the questionnaires.

3.9 Data collection procedure

The investigation utilized essential information. The utilization of primary data is supported by (Saunders et al, 2007). After successfully defending the proposal, the researcher sought to obtain a letter of authority to collect data from the University of Nairobi Department of extramural studies. The researcher undertook data collection by using two fronts. In the main case, the researcher visited the research site and hand-conveyed surveys. This methodology concurred the researcher an occasion to meet the respondents. At that point, the researcher gathered the poll for investigation following seven days to permit the respondents to answer the survey in their available time.

3.10 Data Analysis Techniques

The information analysis included: editing, coding, arrangement, and classification of the information gathered. The information gathered from the respondents were later summarized and displayed in tabular form for further analysis. Data were further analyzed using descriptive analysis procedures. The descriptive analysis procedures included mean, standard deviation, frequencies, and percentages. Computer-based packages for quantitative data (SPSS Version 20) was used to analyze the data and where possible presented the data in tables and charts.

3.11 Ethical consideration

In this study, ethical considerations were made on the basis of the basic concepts and aspects identified as important components of social considerations in social science research (Oliver, 2008). First, the researcher obtained a letter of authority to collect data from the University of Nairobi. Secondly, the researcher informed respondents in the research process that the research was purely treated with confidentiality.

The respondents were additionally guaranteed that the data accumulated through this exploration was not imparted to their partners. Respondents were further requested not to indicate their contacts anywhere on the questionnaire and were also be implored to provide the requested information truthfully and honestly.

CHAPTER FOUR
DATA ANALYSIS AND INTERPRETATION

4.1. Introduction

This section presents the discoveries of the study “Impact of mobile phone usage on accessing market information by smallholder farmers, in Lari Constituency, Kenya”. The mean, standard deviation, frequencies, and percentage rates are presented, deciphered, and discussed.

4.2. Response Rate

The survey was administered to the respondents straightforwardly. A rundown of the reaction rate is presented in table 4.1 below.

Table 4.1: Respondents rate

Questionnaire	Frequency	Percentage (%)
Distributed	20	100
Returned	20	100
Unreturned	0	0

Source: Fieldwork 2019

The study accomplished a reaction rate of 100%, with 20 respondents reached out of the 200 targets. According to (Kombo & Tromp, 2006), the 20 respondents are more than the threshold of 10 percent in a descriptive study, and so the entire target population participated in the study. The incredible reaction rate was because of administering the survey straightforwardly to the respondents and making subsequent meet-ups on the respondent's fulfillment with calls.

4.3. Respondents' profile

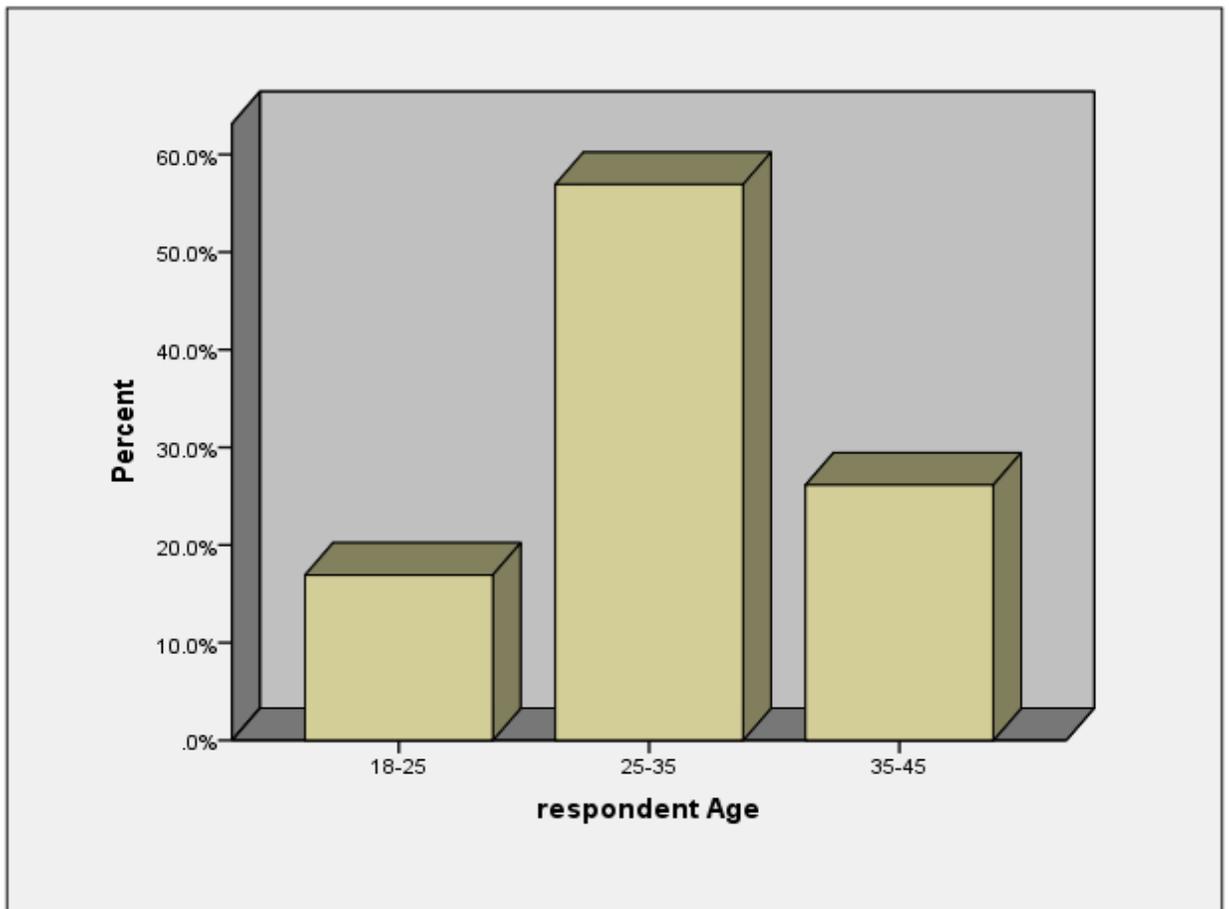
The survey captured the respondents' age and gender described and presented in figure and table below.

4.3.1 Age

The study further thought it was important to build up the respondents' age section to learn variety in viewpoints and for portrayal purposes for information dependability.

The figure underneath presents the discoveries.

Figure 4.1: Respondents' distribution by age



Source: Fieldwork 2019

Figure 4.1 shows that most of the respondents, 60%, fall inside the 25 and 35 age classification. This is firmly trailed by those inside the 35-45 years and those inside 18-25 years old classifications, recording rates of 30% and 10% individually. Thus, it would be

derived from examining that age among farmers in the investigation region is commonly circulated, a greater part of who has a place with between 25-35 years.

4.3.2 Gender

Table 4.2: Respondents' distribution by gender

Gender	Frequency	Percentage (%)
Male	10	50
Female	10	50
Total	20	100

Source: Fieldwork 2019

As shown in Table 4.2, male respondents, 10 (50%) male respondents, and their female counterparts, 10 (50%), were equally represented. It follows then, from the findings, that there is no dominant gender among the respondents.

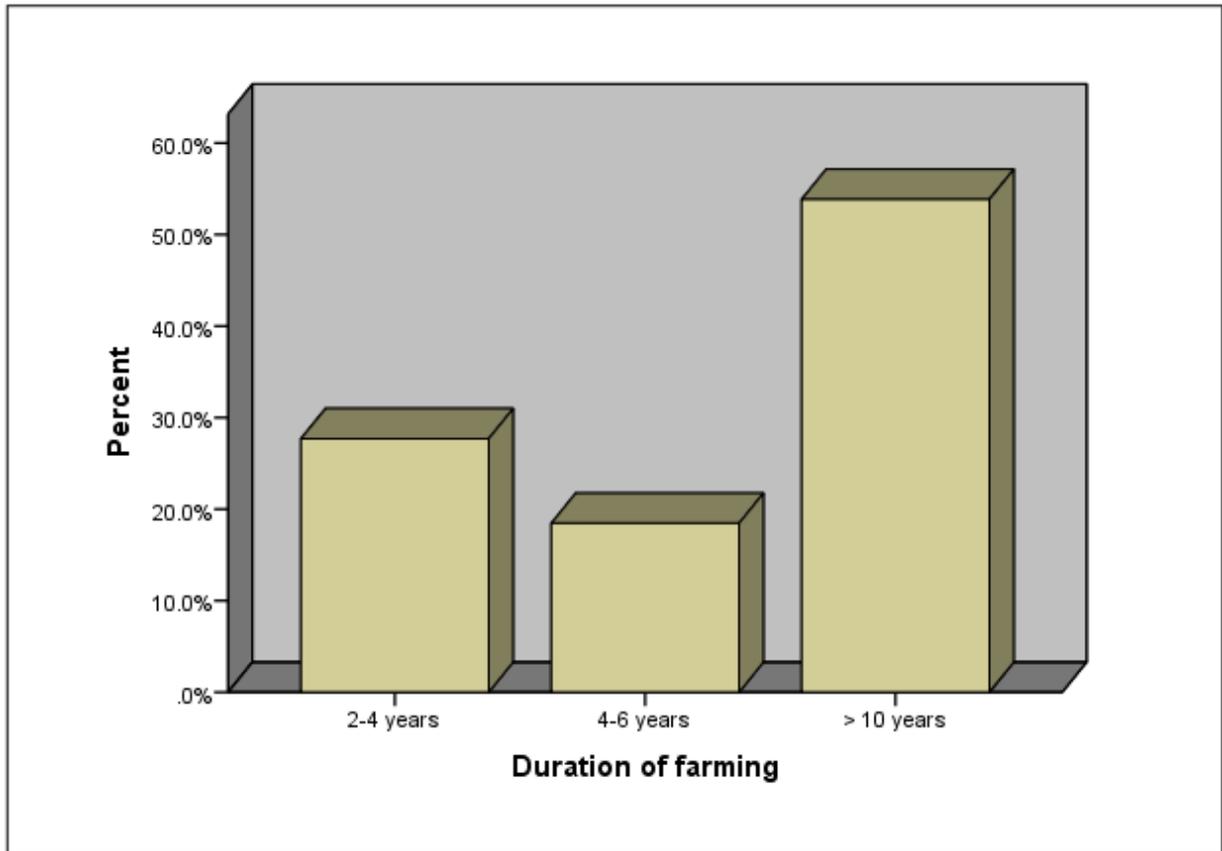
4.4. Farmer mobile phone usage

This segment presents discoveries to questions asked to discover farmers' market information needs through utilizing cell phones.

4.4.1 Duration of farming

The study first sought to establish whether or not the farmers were engaged in farming and the number of years in farming. This formed a premise to expand on the utilization of a cell phone as a device to gain market data.

Figure 4.2: Duration farmers have engaged in farming



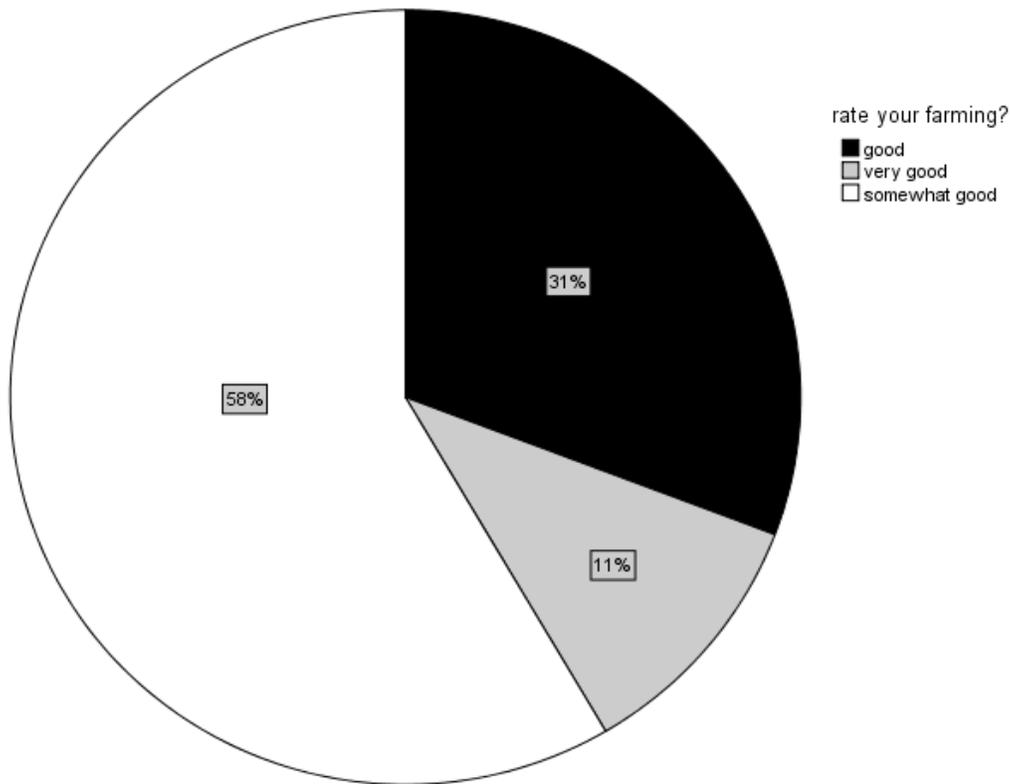
Source: Fieldwork 2019

It was uncovered that a larger part, 27.7% of respondents have engaged in farming for 2 to four years. Further, 18.5% have been in farming for 4 to 6 years while a majority, 53.8% have been in farming for more than 10 years. None of the respondents has been in farming for less than a year. Most of the discoveries of the findings from the research area can be supposed to be from active farmers. This is supported by the findings of (Mwangi J.N. and Mutua J.M, 2014) that the land is purely an agriculture zone.

4.4.2 Rating farming activities

The study first sought to establish how the farmers view their farming activities. This would form a premise upon which to enhance mobile phones as a source of acquiring market information. Figure 4.3 below presents the discoveries.

Figure 4.3: How farmers rate their farming activities



Source: Fieldwork 2019

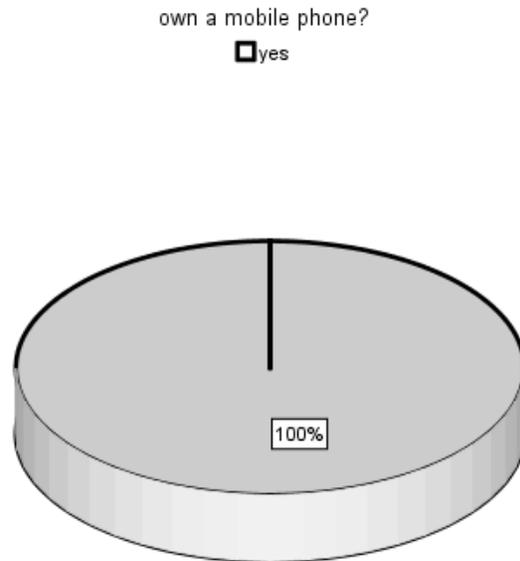
As shown in figure 4.3, the majority, 58% of respondents, felt their farming activities are somewhat good. 31% of farmers are quite satisfied with their farming activities, while 11% are very satisfied with their farming activities. This was confirmed with interviews with Lari farmers SACCO leader, responding to whether farmers feel satisfied with their farming activities.

“Farmers have different views about their farming, and the view differences are often due to the unpredictable market prices and inputs. Furthermore, the size of farmland also influences the level of satisfaction by the farmer as this determines the margins from produce” (Interview with a Farmers SACCO leader)

4.4.3 Owning a mobile phone

Respondents were then asked whether or not they owned a mobile phone. This would expand on the utilization of calls, text messaging, web and web-based media as one of the sources from which they get market data. Figure 4.4 underneath presents the discoveries.

Figure 4.4: Whether or not farmers own a mobile phone.



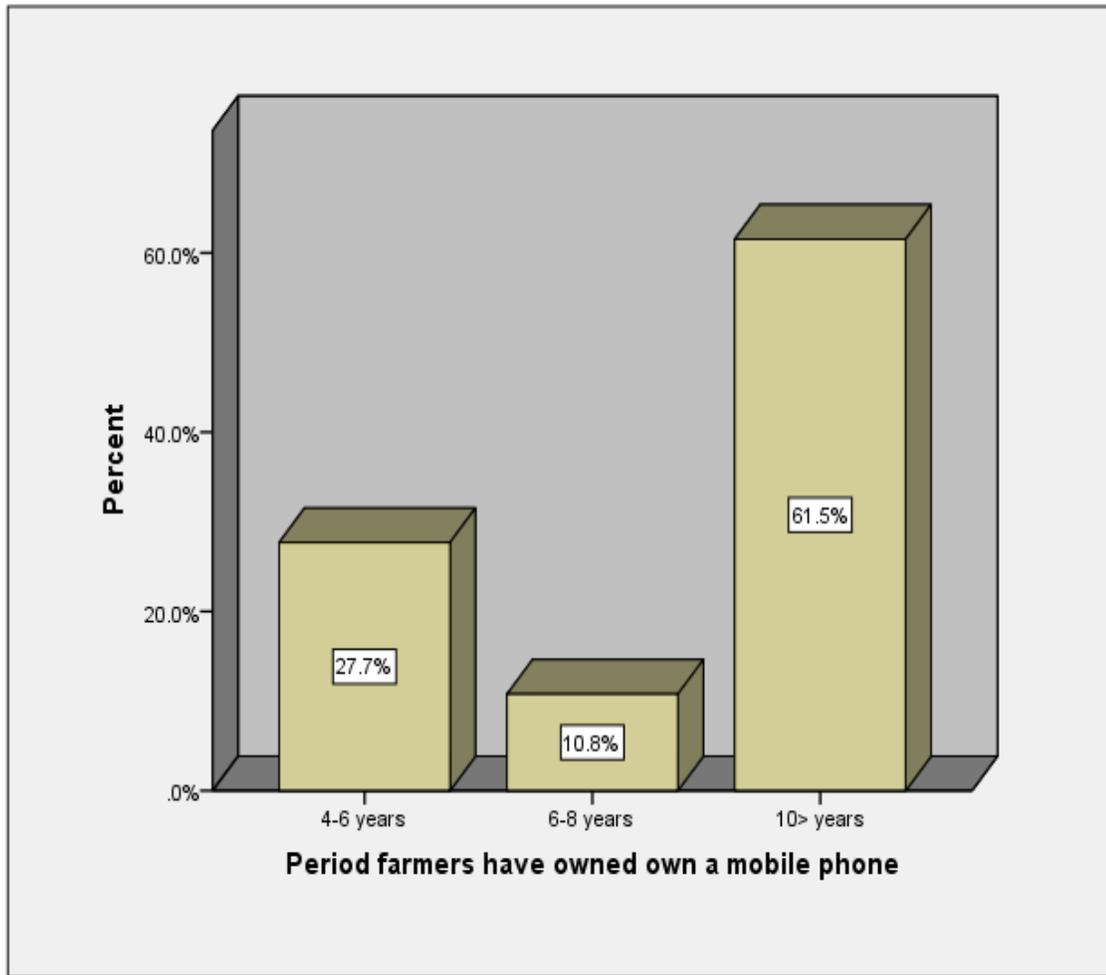
Source: Fieldwork 2019

As presented in figure 4.4, it was revealed that a majority, 100% of respondents, own a mobile phone. It can thus be deduced that mobile phones are very important devices to the farmers.

4.4.4 Duration farmers have owned a mobile phone.

The study further found it paramount to establish the period in which these farmers have owned a mobile phone. This would indicate other possible formal sources of market information, complementing phone calls, text messaging, the internet, and social media. Figure 4.5 below presents the discoveries

Figure 4.5: Period farmers have owned a mobile phone



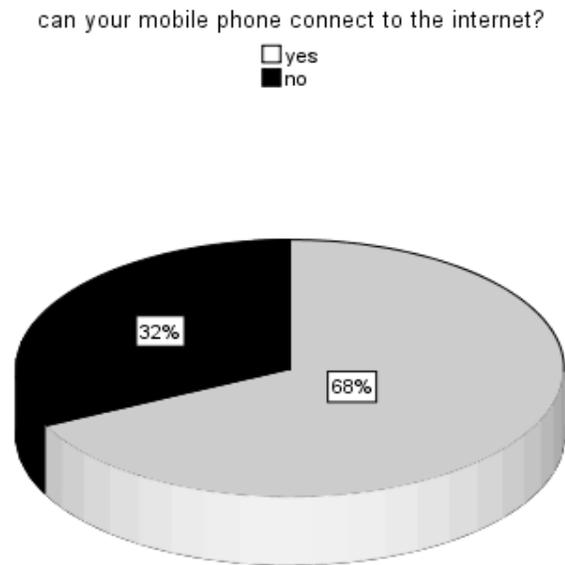
Source: Fieldwork 2019

The study revealed that most of the farmers, 61.5%, have owned mobile phones for more than 10 years, followed by 27.7% (4-6 years) and 10.8% (6-8years).

4.4.5 Internet connectivity

Respondents in the study were then asked whether or not their phones can connect to the internet. This was to indicate how the internet and internet-related services contribute to accessing market information in comparison to phone calls and text messaging.

Figure 4.6: Whether or not farmers' mobile phones can connect to the internet.



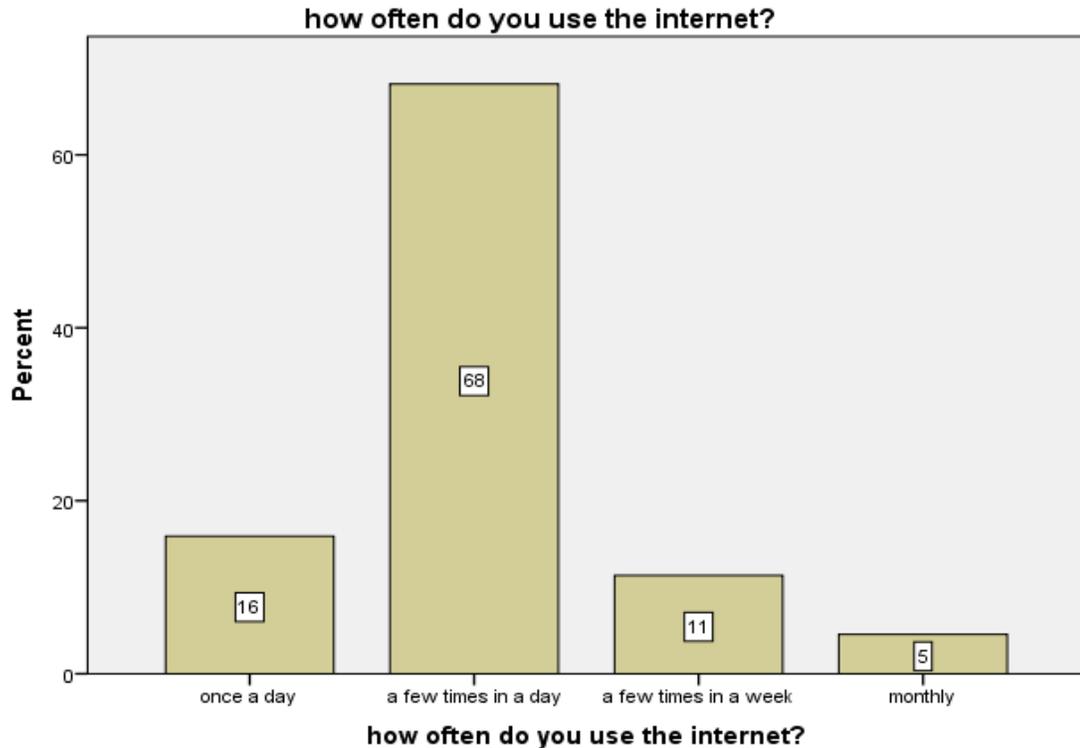
Source: Fieldwork 2019

It was established that 68% of farmers can connect to the internet while 32% cannot access the internet using their mobile phones.

4.4.6 Frequency of internet usage

The study tried to set up the recurrence with which different kinds of market data were looked for by farmers on the web. This was on a five-point scale, where 1= Once a day, 2= A few times in a day, 3= once a week, 4= A few times in a week and 5= Monthly. The findings are presented in the table below.

Figure 4.7: Frequency of internet usage



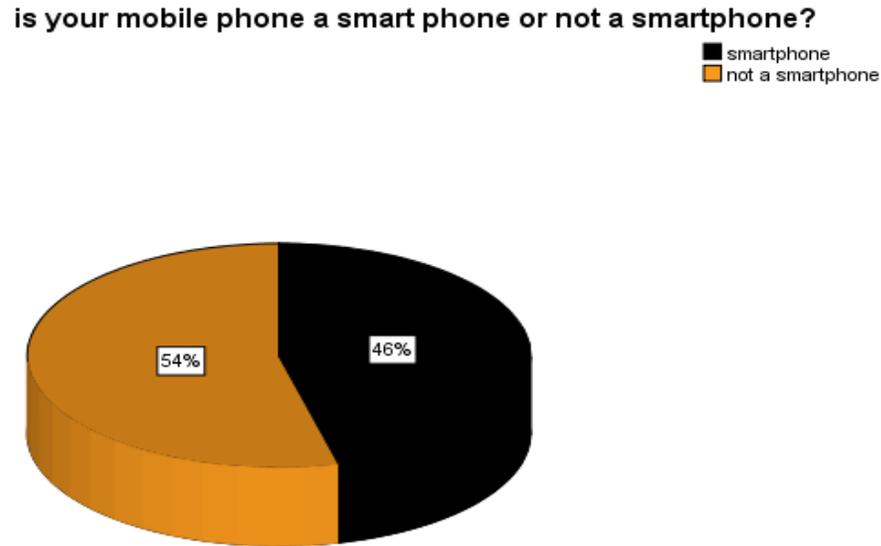
Source: Fieldwork 2019

As shown from the study findings, 68% of farmers use the internet a few times a day while 16% use it once a day. The lower number of internet users among the farmers use it a few times in a week and monthly, where they recorded 11% and 5% respectively.

4.4.7 Type of phone

It was also necessary for the study to find out the type of phones that the farmers use to measure the extent to which mobile devices can be used for accessing market information. This is because mobile phones have different built-in capacities. The results are presented in the figure below.

Figure 4.8 Type of phones used by farmers



Source: Fieldwork 2019

The study revealed that 54% of the farmers do not own a smartphone while 46% own smartphones. It, therefore, suggests that the majority of the farmers have limited access to market information because of the limited capabilities in their mobile phone devices. This is in support of the findings of (Amer, et al 2018) that the extent of access to market information in Kenya has not been sufficiently effective. Often information platforms exist but they are not accessible to the farmers, extension workers and policymakers for the decision making process.

4.4.8 Mobile phone usage

The study further sought to determine how the farmers use their mobile phones. This would establish the platforms through which farmers use to access market information. The outcomes are shown in Table 4.3 and 4.4 below, and the finding discussed.

Table 4.3: How farmers use mobile phones

Statement: ‘Do you currently use a mobile phone to;’	Mean	Standard deviation
Make phone calls	1.00	.000
Send text messages	1.06	.242
Internet browsing	1.38	.490

Source: Fieldwork 2019

Table 4.4: How farmers use mobile phones

Statement: ‘Do you currently use a mobile phone to;’	YES	NO
Make phone calls	100 %	0
Send text messages	94 %	6 %
Internet browsing	62 %	38 %

Source: Fieldwork 2019

As presented in table 4.3 and table 4.4 above, on average, a majority of respondents use their mobile phone as a tool to browse the internet ($\bar{X} = 1.38$, S.D = 0.49) representing 62% against 38% who said No; followed closely by sending text messages ($\bar{X}=1.06$; S.D=0.242) at 94% against 6% who said No and finally for making phone calls ($\bar{X}= 1.00$; S.D= 0) representing the whole group of respondents.

4.4.9 Social media use

Respondents were further subjected to questions related to their social media use. This would form a basis for which social media can be used as a tool for accessing market information.

Table 4.5: Whether or not farmers use Social media platforms

	Facebook		Whatsapp		Twitter		You tube		Blogs	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Percentage (%)	55	45	49	51	15	85	25	75	12	88
Mean	1.19	1.62	1.00	1.76	1.00	1.45	1.00	1.51	1.00	1.44

Source: Fieldwork 2019

As presented above, a larger number of respondents who use social media platforms use Facebook, representing 55% followed by Whatsapp at 49%; Youtube at 25%; Twitter at 15% and blogs at 12%. Those that do not use social media registered 45 % for Facebook; 51% for Whatsapp, 75; percent for YouTube; 85 percent for Twitter and 88% for blogs. On average, most of the respondents don't use social media platforms as recorded above i.e. Facebook (\bar{X} =1.62 against \bar{X} =1.19); Whatsapp (\bar{X} =1.76 against \bar{X} =1.00); Youtube (\bar{X} =1.51 against \bar{X} = 1.00); Twitter (\bar{X} =1.45 against \bar{X} =1.00); Blogs (\bar{X} =1.44 against \bar{X} = 1.00).

It can be reasoned that web-based media is not a well-known wellspring of agriculture market data. On the side of (Wangu, 2014), the facts demonstrate that the significant imperatives to data access are helpless accessibility, quality, an absence of attention to data sources and untimely provision of data. This was affirmed by one of the respondents who was inquired as to why they don't consider web-based media as a wellspring of market data and reacted that; "To get data via online media requires some investment since it's hard to get to the data particularly when network inclusion is poor".

4.4.10 Mobile phone usage for accessing market information

The examination further looked to discover the level of mobile phone usage by respondents in the investigation region concerning their market information needs. The following are the discoveries.

Table 4.6 Accessing information about the market location

Do you access information and news about the market location using;	YES		NO	
	F	%	F	%
1. Phone calls	58	89.2	7	10.8
2. Text messages	23	35.4	42	64.6
3. Internet browsing	22	33.8	43	66.2
4. Facebook	12	18.5	53	81.5
5. Whatsapp	12	18.5	53	81.5
6. Twitter			65	100
7. You tube	2	3.1	63	96.9
8. Blogs			65	100

Source: Fieldwork 2019

From the findings, farmers obtain market information mostly from making phone calls (F=58; 89.2%) followed by text messages (F=23; 35.4%) and Internet browsing (F=22; 33.8%). However, text messages and internet browsing is not very popular. Obtaining market information from Facebook and Whatsapp are the least used channels by farmers both representing (F=53; 81.5 %). Further none of the farmers obtain market information through twitter (F=65; 100%) and blogs (F=65; 100%)

Table 4.7 Accessing information about consumer needs

Do you access information and news about consumer needs using;	YES		NO	
	F	%	F	%
1. Phone calls	61	93.8	4	6.2
2. Text messages	23	35.4	42	64.6
3. Internet browsing	27	41.5	38	58.5
4. Facebook	9	13.8	56	86.2
5. Whatsapp	17	26.2	48	73.8
6. Twitter			65	100
7. You tube	4	6.2	61	93.8
8. Blogs			65	100

Source: Fieldwork 2019

It was revealed that farmers access information about consumer needs mostly through making phone calls (F=61; 93.8%). None of the farmers use Twitter (F=65; 100%) and blogs (F=65; 100%) to obtain information about consumer needs. Text messaging (F=42; 64.6%), Internet browsing (F=38; 58.5%), Facebook (F=56; 86.2%), Whatsapp (F=48; 73.8%) and youtube (F=61; 93.8%) are not actively used for accessing information about consumer needs.

Table 4.8 Accessing information about consumer trends.

Do you access information and news about consumer trends using;	YES		NO	
	F	%	F	%
1. Phone calls	56	86.2	9	13.8
2. Text messages	18	27.7	47	72.3
3. Internet browsing	22	33.8	43	66.2
4. Facebook	9	13.8	56	86.2
5. Whatsapp	17	26.2	48	73.8
6. Twitter			65	100
7. You tube	2	3.1	63	93.1
8. Blogs			65	100

Source: Fieldwork 2019

The findings revealed that farmers ought information about consumer needs mostly through making phone calls, (F=56; 86.2%). None of the farmers use Twitter (F=65; 100%) and blogs (F=65; 100%) to obtain information about consumer trends.

Table 4.9 Accessing information about market prices.

Do you access information and news about market prices using;	YES		NO	
	F	%	F	%
1. Phone calls	63	96.9	2	3.1
2. Text messages	33	50.8	32	49.2
3. Internet browsing	20	30.8	45	69.2
4. Facebook	12	18.5	53	81.5
5. Whatsapp	20	30.8	45	62.9
6. Twitter			65	100
7. You tube	2	3.1	63	96.9
8. Blogs			65	100

Source: Fieldwork 2019

Furthermore, it was revealed from the findings that a large number of farmers prefer to make phone calls (F=63; 96.9%) to inquire about information about market prices as compared to using text messages, (F=33; 50.8%). Youtube (F=2; 3.1%) is least used while none of the farmers use Twitter (F=65; 100%) and blogs (F=65; 100%) to obtain information about market prices.

Table 4.10 Accessing information about market challenges.

Do you access information and news about market challenges using;	YES		NO	
	F	%	F	%
1. Phone calls	65	100		
2. Text messages	26	40	39	60
3. Internet browsing	22	33.8	43	66.2
4. Facebook	12	18.5	53	81.5
5. Whatsapp	20	30.8	45	69.2
6. Twitter			65	100
7. You tube	4	6.2	61	93.8
8. Blogs			65	100

Source: Fieldwork 2019

It was established that all farmers use phone calls (F=65; 100%) to access information about market-related challenges. None of the farmers use twitter (F=65; 100%) and blogs (F=65; 100%) for obtaining information about market challenges.

Table 4.11 Staying in touch with consumers who live far away.

Do you stay in touch with consumers who live far away by using;	YES		NO	
	F	%	F	%
1. Phone calls	63	96.9	2	3.1
2. Text messages	23	35.4	42	64.6
3. Internet browsing	9	13.8	56	86.2
4. Facebook	10	15.4	55	84.6
5. Whatsapp	20	30.8	45	69.2
6. Twitter			65	100
7. You tube	2	3.1	63	96.9
8. Blogs			65	100

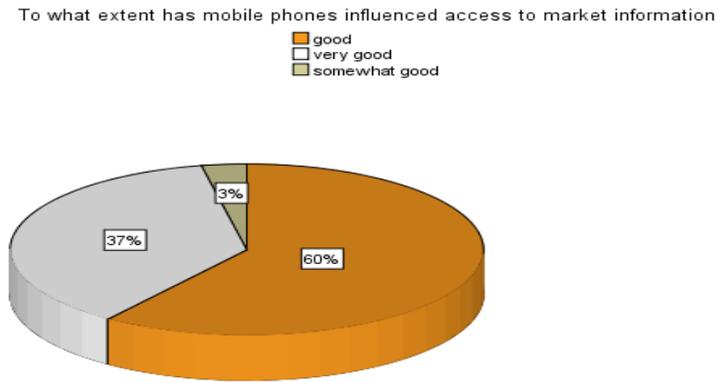
Source: Fieldwork 2019

A majority of farmers use phone calls (F=63; 96.9%) to stay in touch with consumers who live far away. There is a close divide between those who use text messages (F=23; 35.4%) and those who use Whatsapp (F=20; 30.8%) for staying in touch with consumers.

4.5: Impact of mobile phone usage in accessing market data

The examination likewise tried to discover the general feeling from the respondents of the influence of mobile phones, the internet, and social media have towards accessing market information. The results were summarized in the figures below.

Figure 4.9: How mobile phones influence access to market information



Source: Fieldwork 2019

Figure 4.10: How internet influence access to market information

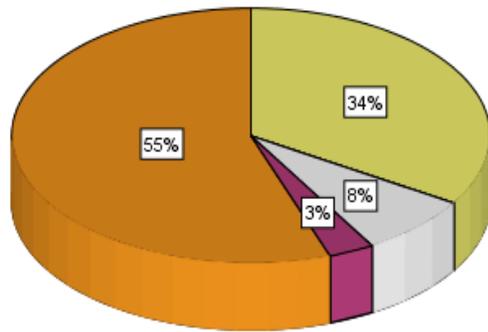


Source: Fieldwork 2019

Figure 4.11: How social media influence access to market information

To what extent has social media influenced access to market information?

- good
- very good
- somewhat good
- very bad



Source: Fieldwork 2019

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This section presents the outline of the examination discoveries, the suggestions from the discoveries and proposals of areas for additional exploration.

5.2 Summary of Key Findings

The study provided the descriptive type of data analysis, in which the mean, standard deviation, frequencies, and percentage values were determined.

The study first sought to find out the years in which farmers have been farming to which a majority, 53.8% have been in farming for more than 10 years while none of the farmers have been in farming for less than a year. Further, to establish the mobile phone usage of farmers in Lari constituency, the study sought to determine whether or not farmers owned a mobile phone for accessing market information to which, 100% of respondents affirmed that they have mobile phones. Respondents were then asked whether or not their mobile phones can connect to the internet. It was uncovered, that, 68% of respondents can connect to the internet. It was further established that these respondents use the internet a few times a day. The study also sought to establish the dynamics of mobile phone devices in order to understand usage capabilities. It was reported that a large number; 54%, don't use smartphones. In such manner, respondents were then approached to demonstrate the different ways they use mobile phones. All the respondents, 100% use their mobile phones for calling, followed by a majority, 94% who use text messaging service. Out of the 62% of respondents' who use the internet, a majority, 55% use Facebook, 49% use Whatsapp messenger. Among the least used mobile phone applications is you-tube, 25%; Twitter, 15% and blogs 12%.

This study then tried to unearth how respondents access various types of market information using their mobile phones. A majority of respondents, 89.2% use phone calls to obtain information about market location, and then followed by text messaging, 35.4%

and internet browsing, 33.8%. Among the least, utilized sources incorporate Facebook, and Whatsapp, both recording 18.5 % and youtube, recording 3.9%.

It was further noted that a most respondents 93.8% access information about consumer needs using phone calls, followed by internet browsing, 41.5% then text messaging, 35.4%. Facebook, Whatsapp, and youtube are the least preferred options recording percentages of 13.8%, 26.2%, and 4% respectively.

The study further established that information about consumer trends are mostly accessed using phone calls and Internet browsing, recording percentages of 86.2% and 33.8% percent respectively. Among the least preferred sources include text messaging, Facebook, Whatsapp, and youtube recording percentages of 27.7%, 13.8%, 26.2%, and 3.1% respectively.

The study findings further revealed that information about market prices was sought from the four most preferred sources, the majority of respondents preferring to use phone calls, 96.9%, followed by text messaging, 50.8 %. An equivalent of 30.8 % prefers using the internet and Whatsapp to access information about market prices.

When it comes to accessing information about market challenges, 100% of respondents use phone calls, while 40% use text messaging; 33.8 % prefer using the internet and 30.8% use Whatsapp. Among the least preferred sources include Facebook and youtube.

The study then sought to understand how farmers stay in touch with consumers. It was revealed that a majority, 96.9 % use phone calls followed by text messaging 35.4% then Whatsapp 30.8%. Least preferred options are the internet, and youtube at 13.8% and 3.1% consequently.

None of the respondents use Twitter and blogs for accessing information about market location, consumer needs, consumer trends, market prices, market challenges or staying in touch with consumers.

At last, the examination looked to examine the extent to which mobile phones, the internet, and social media have helped with accessing market information. It was uncovered that 60% felt that mobile phones have been good when it comes to accessing market information. A majority, 40% felt that the internet has been very bad when it comes to accessing market information. A majority of respondents further felt that social media have been very bad when it comes to accessing market information.

5.3 Conclusion

From the investigation, it very well may be reasoned that a majority of farmers have practiced farming for long. A majority of those in farming also have mobile phones. To fulfill their needs for accessing market information, a majority of farmers use the internet as a source of market information, mostly using the internet a few times a day. A majority of farmers don't have a smartphone but they are able to use mostly Facebook and Whatsapp. All farmers use phone calls for accessing market information followed by text messaging. A large number of farmers, in this examination however, don't take a lot of intrigue in using Twitter, YouTube, and blogs for accessing market information.

The investigation further derived that farmers in the study area source for data about market location from a variety of methods, incorporating phone calls, text messaging and the internet. However, a majority of the farmers don't use Facebook, Whatsapp, Twitter, YouTube and Blogs as sources of information about the market location

Similarly, with regards to information about consumer needs, a majority of farmers use phone calls, text messaging and the internet while a majority of the farmers don't use Facebook, Whatsapp, Twitter, YouTube, and blogs. Furthermore, farmers mainly seek information about consumer trends using phone calls and the internet. A majority, however, don't use text messages, Facebook, Whatsapp, Twitter, YouTube, and blogs.

In relation to market prices, a majority of farmers use various sources to obtain this market information which, in relation to preference, include; phone calls, text messages, internet, and Whatsapp.

The study also revealed that all farmers use phone calls to obtain information about market challenges. Other sources include text messaging, internet and Whatsapp. Furthermore, a majority of the farmers also stay in touch with consumers mostly through phone calls, including text messaging and Whatsapp, whereas among the sources not preferred at all for obtaining market information includes twitter and blogs.

5.4 Recommendations

1. Lari constituency can set up marketing centers for farmers to search for market information.
2. Market centers can also provide infrastructure for farmers to understand the risks associated with market dynamics for them to have the independence of market information.
3. Mobile phones have a huge capacity to provide fast and easy access to market information. Mobile phone service providers can, therefore, develop more affordable, yet effective and easy to use handsets to disseminate market information reliably.
4. Social media also has a huge potential to provide both local and international market information and thus content developers can develop easy to use social platforms to relay market information.
5. Internet service providers can also improve connectivity and provide affordable, yet effective data plans for farmers in need of market information

5.5 Suggestions for further studies

1. Further investigation could be attempted on mobile phone development techniques that can be utilized to viably give market data.
2. A study can be done on the effectiveness of social media content in providing market information.
3. The present study focused on the impact of mobile phone usage on accessing market information by small scale farmers in Lari constituency, Kenya. A comparative report can be directed in an alternate study territory.

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APPENDICES

Appendix I: Letter of Authority to Collect Data


UNIVERSITY OF NAIROBI
OPEN, DISTANCE AND e-LEARNING CAMPUS
SCHOOL OF OPEN AND DISTANCE LEARNING
DEPARTMENT OF OPEN LEARNING
NAIROBI LEARNING CAMPUS

Your Ref: _____
Our Ref: _____
Telephone: 318262 Ext. 120

Main Campus
Gandhi Wing, Ground Floor
P.O. Box 30197
N A I R O B I

REF: UON/ODeL/NLC/30/236 5th November, 2019

TO WHOM IT MAY CONCERN

RE: GIBSON KIPLIMO SANG - REG NO: L42/10202/2018

This is to confirm that the above named is a student at the University of Nairobi, Open Distance and e-Learning Campus, School of Open and Distance Learning, Department of Open Learning pursuing Postgraduate Diploma in Project Planning and Management.

He is proceeding for research entitled "the impact of mobile phone usage to accessing market information by small holder farmers, in Lari Constituency, Kenya".

Any assistance given to him will be highly appreciated.


CAREN AWILLY
CENTRE ORGANIZER
NAIROBI LEARNING CENTRE



Appendix II: Questionnaire

This questionnaire will only be used for research purposes. All information will be treated with confidentiality. Please. Tick ONLY ONE ANSWER per question.

SECTION 1: Demographic characteristics of the respondent.

Respondent: _____

- Age:** 18-25 []
25-35 []
35-45 []
45-55 []
55 and above []

SECTION 2: FARMER MOBILE PHONE USAGE

1. How long have you been farming?
1. 1-2 years []
2. 2-4 years []
3. 4-6 years []
4. 6-8 years []
5. More than 10 years []
2. How do you rate your farming activities?
1. Good []
2. Very good []
3. Somewhat good []
4. Somewhat bad []
5. Very bad []

3. Do you own a mobile phone?

1. Yes []

2. No []

4. If Q3=yes. How long?

1. 1-2 years []

2. 2-4 years []

3. 4-6 years []

4. 6-8 years []

5. More than 10 years []

5. Do you regularly use someone else's mobile phone?

1. Yes []

2. No []

6. If Q5= yes. How long?

1. Less than a year []

2. 1-2 years []

3. 2-4 years []

4. 4-6 years []

5. More than 6 years []

7. Can you mobile phone connect to the internet?

1. Yes []

2. No []

8. If Q7= yes. How often do you connect to the internet?

- 1. Once a day []
- 2. A few times a day []
- 3. Once a week []
- 4. A few times a week []
- 5. Monthly []

9. Is your mobile phone a smartphone or not a smartphone?

- 1. Smartphone []
- 2. Not a smart phone []

10. Do you currently use a mobile phone to (ITEM)

- 1. Make phone calls []
- 2. Send text messages []
- 3. Internet browsing []

11. Do you currently use;

- 1. Facebook []
- 2. Whatsapp []
- 3. Twitter []
- 4. You tube []
- 5. Blogs []

12. Have you been able to

a. Access information and news about **market location** by using;

1. Phone calls []
2. Text messaging []
3. Internet browsing []
4. Facebook []
5. Whatsapp []
6. Twitter []
7. You tube []
8. Blogs []

b. Access information and news about **consumer needs** by using;

9. Phone calls []
10. Text messaging []
11. Internet browsing []
12. Facebook []
13. Whatsapp []
14. Twitter []
15. You tube []
16. Blogs []

c. Access information and news about **consumer trends** by using;

17. Phone calls []

18. Text messaging []

19. Internet browsing []

20. Facebook []

21. Whatsapp []

22. Twitter []

23. You tube []

24. Blogs []

d. Access information and news about **market prices** by using;

25. Phone calls []

26. Text messaging []

27. Internet browsing []

28. Facebook []

29. Whatsapp []

30. Twitter []

31. You tube []

32. Blogs []

e. Access information and news about **market challenges** by using;

33. Phone calls []

34. Text messaging []

35. Internet browsing []

36. Facebook []

37. Whatsapp []

38. Twitter []

39. You tube []

40. Blogs []

f. **Stay in touch with consumers who live far away** by using;

41. Phone calls []

42. Text messaging []

43. Internet browsing []

44. Facebook []

45. Whatsapp []

46. Twitter []

47. You tube []

48. Blogs []

13. To what extent have **mobile phones** been when it comes to accessing market information?

- 1. Good []
- 2. Very good []
- 3. Somewhat good []
- 4. Somewhat bad []
- 5. Very bad []

14. To what extent has **the internet** been when it comes to accessing market information?

- 1. Good []
- 2. Very good []
- 3. Somewhat good []
- 4. Somewhat bad []
- 5. Very bad []

15. To what extent has **social media** been when it comes to accessing market information?

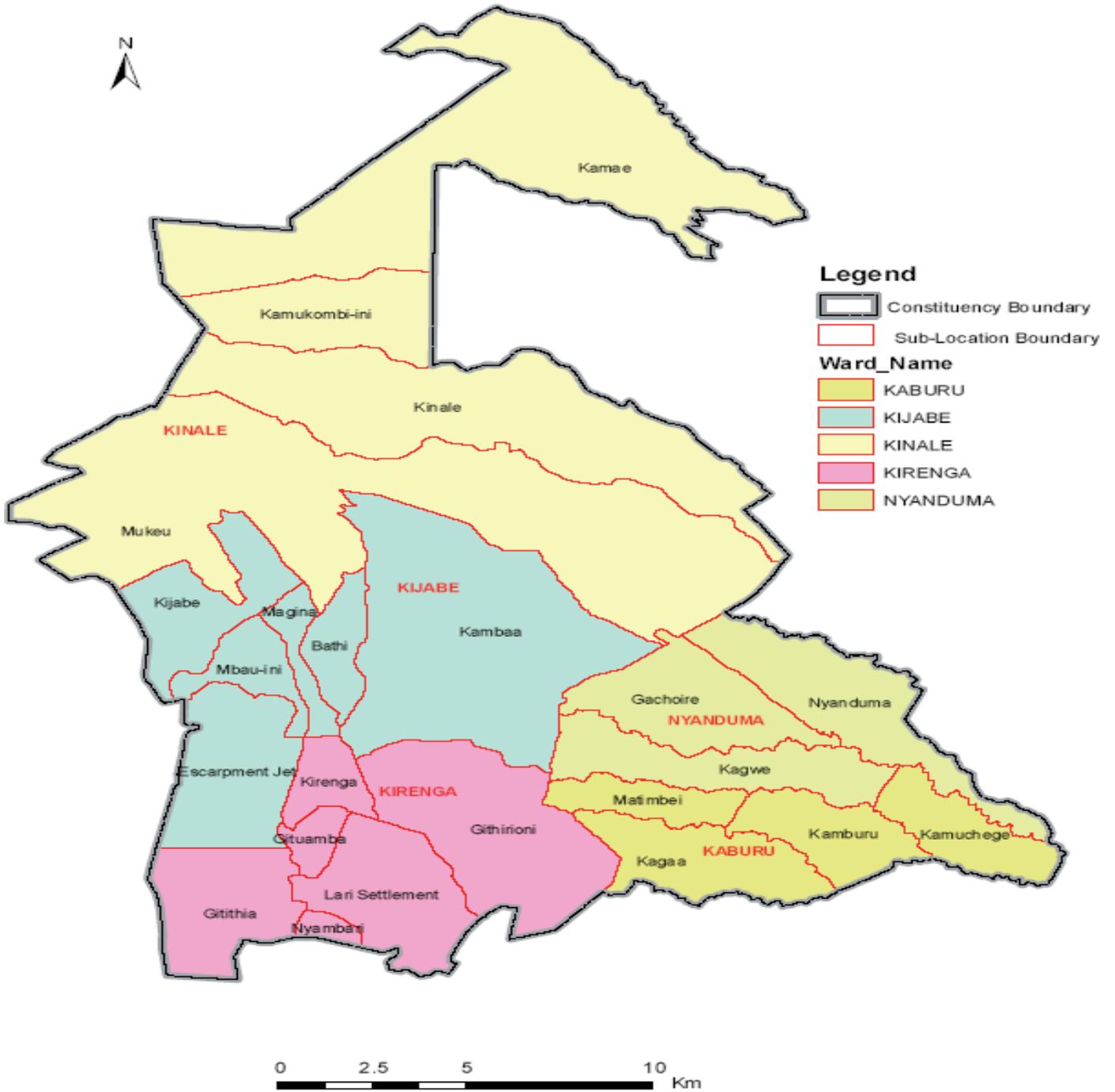
- 1. Good []
- 2. Very good []
- 3. Somewhat good []
- 4. Somewhat bad []
- 5. Very bad []

Appendix III: Interview Schedule

1. How long have you been farming?
2. Do you own a mobile phone?
3. Can your mobile phone connect to the internet?
4. How often do you use the internet?
5. Is your mobile phone a smartphone or not a smartphone?
6. Do you use your mobile phone for making calls?
7. Do you use your mobile phone for sending text messages?
8. Do you use your mobile phone for internet browsing?
9. Do you use Facebook?
10. Do you use Whatsapp?
11. Do you use Twitter?
12. Do you use YouTube?
13. Do you use Blogs?
14. Have you:
 - a. accessed Market location, using items (1-8)
 - b. accessed Consumer needs, using items (1-8)
 - c. accessed Consumer trends, using items (1-8)
 - d. accessed Market prices, using items (1-8)
 - e. accessed Market challenges, using items (1-8)
 - f. stayed in touch with people who live far away, using items (1-8)
 1. phone calls
 2. text messages
 3. Internet browsing
 4. Facebook
 5. Whatsapp
 6. Twitter
 7. You tube
 8. Blogs

Appendix IV: Map of Lari Constituency.

IEBC REVISED LARI CONSTITUENCY COUNTY WARDS ASSEMBLY



Thank you