UNIVERSITY OF NAIROBI

FACULTY OF ARTS

DEPARTMENT OF SOCIOLOGY & SOCIAL WORK

Impact of Mobile Phones on Household Income. A Case Study of M-pesa in Kiagu location, Meru County

BY Mwabu Sylvanah Karimi
REG: C 50/61667/2011

CSO 698: PROJECT PAPER

Research Project submitted to the faculty of Arts, University of Nairobi, in Fulfillment of the Requirements for the Award of the Degree of Master of Arts in Rural Sociology and Community Development.

November 2012

DECLARATION

I declare this project proposal is my original work and has not been presented for a degree award in any other university.

Signature .....Date 21/11/2012.....

Mwabu Sylvanah Karimi

This project proposal has been submitted with my approval as the project supervisor.

Signature .....Date 22/11/2012.....

Professor Edward Mburugu

DEDICATION

I dedicate this work to my Uncle Germano and Aunt Racheal, my family Mike and Ryan and my parents whose prayers and moral support has made this long journey a success. God bless you all and keep you strong. Amen.

ACKNOWLEDGEMENTS

This work would not have been complete without the support and encouragement from many people, to whom I am highly indebted. I wish to sincerely express my utmost gratitude to my supervisor professor Mburugu for his interest in my work and his tireless and meticulous guidance that shaped this work. Prof, I can't thank you enough. I owe you a lot.

I would not have attained the heights of education this far without the support of my uncle Germano Mwabu and Mrs Mwabu. You tenderly held my hands and lifted me up from the bottom to the top spheres of knowledge seeking. Thank you many times for your love and May God bless you bountifully.

Special appreciation is to my family; Mike and Ryan for being patience with me even when I had to work on this project till late. Thanks are due to Chris who helped me all the way with his criticisms and also to my parents, brothers and sisters; your moral support was great.

TABLE OF CONTENTS

LIST OF TABLES

ACRONYMS

CCK	Communications Commission of Kenya
OECD	Organization for Economic Cooperation and Development
SMS	Short Messages Services
MDG	Millennium development Goal
PRSP	Poverty Reduction Strategy Papers
R$D	Research and Development
KCA	Kenya Communications Act
ICT	Information Communication Technology
ITU	International telecommunication Union
SPSS	Statistical Package for Social Sciences.

ABSTRACT

Globally, Information and communication Technologies (ICT) have proved to be a key driver of economic progress and development, enhancing productivity and therefore economic growth, reducing poverty and improving living standard in many ways. The mobile phone specifically, has emerged as one of the most dynamics forms of ICTs in the 21st century. The diffusion and adoption of mobile phone technology and its application has not only become a conduit for economic development in various sectors of the world's economy but also in the personal lives of its users.

The main objective of this study was to assess the impact of mobile phone technology and specifically M-pesa on household income. The study used primary data from Meru County to investigate the impact of M-pesa to the household income. The general focus in the formulation of economic policies in Kenya has failed to take into account all the technologies, particularly M-pesa. The main focus has been on the development of other types of technologies with the view to enhancing economic growth while ignoring the various uses of M-pesa and how it impact on household income

Descriptive methods were used to achieve the objectives of the study. Results from the descriptive analysis show that the m-pesa is very significant in the household income

There is evidence in the study area that m-pesa has facilitated economic growth of the residents more particularly through sending and receiving money. The findings further show that people can bank money in their m-pesa accounts.

The findings of the study suggest recommendations that are expected to yield increased use of M-pesa in the country particularly in the rural areas.

CHAPTER ONE: INTRODUCTION

1.1 Background

Mobile and wireless markets have both recorded exponential rise emerging as the fastest growing markets in the world. The rate of mobile subscription in Kenya according to Communications Commission of Kenya (CCK) is currently estimated to be slightly above 60 per cent (http://mobilemonday.co.ke/2011/). This is slightly more above half of the Kenyan population. It further indicates that mobile usage among the Kenyan population is huge. Tandon (2002) argues that most households in the rural area have no option but to remain in the informal sector and this influence the kind of telecommunication they are willing to invest in and this investment usually begins and ends with a mobile phone.

The huge usage of mobile telephony has consequently been accompanied by an incremental growth in mobile commerce. This is the use of mobile phones in the market economy where actors are able to effectively carry out financial transactions across time and space. Mobile commerce falls within the broader category of e-commerce which often refers to the gamut of activities facilitated through the use of information technology and network such as internet and M-pesa (money pesa). Organization for Economic Cooperation and Development (OECD, 1997) defines e-commerce as all forms of electronic transactions relating to commercial activities by organizations and individuals that are based upon the processing and transmission of digitized data, including text, sound and visual images. It also includes sale of goods and services over computer networks, mobile phones by businesses, individuals, governments or other organizations.

Mobile phone commerce, a sub set of e-commerce refers to the buying and selling of goods and services through cellular phones. It also includes the storage, payment, receiving and sending of electronic money by mobile phones (Mendes et Al 2007). An example of electronic money transfer in Kenya is M- Pesa.Ilever and Mas (2009) observe

that M-Pesa allows users to hold money in virtual stored value account maintained in a server by a service provider and operated by users through their mobile phones. It should therefore be noted that if the owner of the account losses the handset the money is still safe on the account.

According to William et al (2009) M-Pesa is the most popular money transfer in Kenya, and its growth is stronger than that for financial institutions such as banks and postal services Heyer and Mas (2009) assert that the success of M-Pesa mobile money has revolutionalized the access to financial services in Kenya. Users of these services can withdraw or deposit money with an M-Pesa agent and use the available balance to, for example buy airtime, debt payments, pay for goods, pay bills, send airtime to other mobile users, and pay salaries and store money for every day use.

M-Pesa transactions feature prominently in the Kenya economy today This is perhaps because the majority of Kenyan population does not have banking accounts and therefore the introduction of mobile phone banking such as m-pesa provide an e-commerce whereby mobile phone assists the operator to complete simple financial transactions (Mwaura, 2009). Mobile phone banking in Kenya has demonstrated that where the formal sector fails the poor and the marginalized, technological innovations can come to their rescue in successful ways (Warah, 2009). The poor are able to cut costs on transportation by using short messages services (SMS), and even for banking transactions.

Usage of mobile phones for e-commerce has enhanced innovations and technical changes in the informal sector particularly in the rural areas They have evolved within a few years to become economic empowerment for the rural poor. They compensate for in adequate infrastructure, such as bad roads and slow postal services by allowing resources and information to move more freely including making money transactions more efficient. This has a direct impact on economic growth According to Diga (2008) mobile phones are not identified by most international agencies as tools for development, while they have become long term economic investment for the disadvantaged. She further

states that many people across Africa are investing in mobile telephony before meeting the needs of improved sanitation, water, health, housing and education Mobile phones are regarded as catalysts for productivity, networking and information gathering; and this minimizes the need to travel or to have a face-to face meeting to complete business deals (Melchioly and Saebo, 2010)

In most developing countries, Kenya not an exception, governments are struggling with the need to improve the living conditions of their people. Among the strategies adopted include the formulation of pro-poor policies and heavy investments in Research and Development (R&D). The latter has encouraged and supported technological innovations taking place in developing countries. In Kenya, the M-pesa innovation has not only been recognized locally, but has also attracted global attention because of its perceived potential in promoting economic growth. Consequently, a large proportion of the Kenyan population has subscribed to the M-pesa services.

1.2 Problem Statement

Reducing poverty and increasing per capita incomes are primary focus of public policies in most countries in sub-Saharan Africa. Many countries in the region, including Kenya have formulated Poverty Reduction Strategy Papers (PRSP) and are determined to achieve the Millennium Development Goal (MDG) number one of reducing poverty by half and hunger by 2015. High poverty and low per capita incomes coupled with increasing vulnerability to various shocks has motivated poverty and vulnerability research in sub-Saharan Africa.

The Kenya government recognizes that information and communication technologies are an engine of development and economic growth. It's therefore, increasingly making investments in poverty monitoring through welfare monitoring surveys with support from World Bank to inform policy decisions and poverty reduction interventions. One of such an investment is the innovation of mobile phone for e-commerce. Once a toy for the rich,

mobile phones have evolved in the recent times as tools of economic empowerment for the world's poorest people. It is perceived that if this innovation is taken up by individuals can help to fight poverty as well as provide a material basis for implementing strategies for addressing other social ills. However evidence of this role of mobile phones among households has been lacking. The basic question underlying the formulation of this study is whether or not the use of mobile phone as a tool aiding market transaction has an effect on income outcomes at the household level This study will seek to specifically assesses the extent of mobile phone adoption among households in rural areas in Kenya, identify factors influencing adoption of mobile phones among households in rural areas, and their impact on households' income.

1.3 Research Questions

i) What factors influence the adoption of mobile phones among households in Kiagu location?

ii) Do mobile phones influence income of households in Kiagu location?

1.4 Objectives of the study

1.4.1 Broad Objective

The main objective of this research is to establish the contribution of mobile phones to households' income in the rural areas of Kiagu Location.

1.4.2 Specific objectives

i) To identify factors influencing the adoption of mobile phone technology in Kiagu location.

ii) To assess the extent to which mobile phone communication is being used to generate household income

1.5 Study justification

The diffusion of M-PESA in the Kenyan economy has been rapid and deep. While M-PESA was seen early on as a hi-tech product aimed at the unbanked, it was initially

adopted more widely by the better off. However, over a short period of time the service has spread to households who are poorer, less well connected to the financial system, and located in more remote areas. This pattern of technology adoption mirrors that of other product and service innovations, which are often first used by the better off. But the speed, at which the service has reached less well-off Kenyans, and their apparently high valuation of it, is unprecedented.

The fact that people are willing to pay the not-insignificant fees to use M-PESA is evidence that it is valuable. Two features of M-PESA which make it valuable is that first, the technology reduces the costs of sending money over long distances, so it could have a positive impact on the ability of households to send and receive remittances a potentially important source of regular or incidental income in a country with a large number of (internal) migrant workers. Second, in a country with high levels of violent robbery and police extortion and corruption, the safety, confidentiality, and convenience that M-PESA offers allow individuals to better manage their day-to-day finances, including their ability and incentive to save. Evidence is therefore required of such impacts on the household income especially in the rural areas which are reached by such innovations last.

1.6 Scope and Limitations of the Study

This study will cover only selected households in the rural area of Kiagu location of Meru County. The target households will be those that one or more members is in possession of a mobile phone. The study will only examine the commercial usage of mobile phones and their relationship with income of the selected households. Since the study will be conducted in an area that is rural, the results may not be applicable to urban areas. However, they may be true for other parts of Kenya that bear similar characteristics with the area of study.

CHATPER TWO: LITERATURE REVIEW

2.1 Empirical Review

Although the growth of mobile phone use has been tremendous over the last years not much empirical research has been done on the impact it has on the households' income in Kenya. However, Gyimah-Brempong et al (2007) are implying that Africa might be the region of the world where the mobile phone could make the biggest economical difference considering the poor infrastructure making other technologies e.g. personal computers, difficult or even impossible to access. Arunga & Kahora (2006) also agree that the telecom industry is doing very well as mobile phone users are rapidly increasing.

On a more economic level, Jacobson (2006) points out that the mobile phone is playing a significant role in the growth of businesses in the rural and small towns. Shopkeepers, auto mechanics, electricians, farmers, open-air market business people have realized the value of having a mobile phone as it makes it possible to strike deals with customers, place orders, contacting business associates and so on. Although Jacobson's study does show the usefulness of the mobile phone in promoting growth of enterprises, the study does not show how mobile phones impacts on the households' income in the same areas.

Despite the fact that in the countryside the income growth might be on a very small range, it is important to note that there are observable facts. People do not need to take a trip to places to check prices on different products or asking for appointments or even search for a job, all these tasks can be done via the mobile phone. In a study by Arunga & Kahora (2006), women entrepreneurs almost cut the expenditures in half on travels. Before, they spent equivalent to Ksh 750 a week on meeting business associates and agents to ensure that their supplies would arrive to the preferred destination with no problem. They now spend only ksh 400 a week to do the same thing and they say it has become easier to perform and complete a business transaction through the mobile phone.

According to Fahamu (2007), the economic impacts of mobile phones use are felt on individual levels, in businesses and on overall activities that are undertaken by different people

The M-Pesa function is booming because many people in Kenya need to send money to their families who usually live upcountry to help them out. According to AFP (2007) the M-Pesa function is making bank institutions re-think on how to handle those who live in rural areas, as they often do not have bank accounts. Nonetheless more than half the population in Kenya now owns or has access to a mobile phone providing a great potential for banks and other financial institutions to utilize the prospect to attract new kind of customers (AFP 2007).

Another financial transformation mentioned by Dholakia & Kshetri (2005) is about how mobile phones have started to be utilized in buying and selling stocks online and tracking agricultural prices, both nationally and internationally. It is realized that mobile phone has enabled small business owners in rural Kenya to promote or advertise their products and communicate with their customers and business associates efficiently. It is because of the mobile phone that small-scale farmers can choose when to sell their goods when demand is high and in that way the mobile phone is contributing to economic development. Furthermore the mobile phone is helping farmers, fishermen, small scale business owners and other common people to initiate activities and several business models that are evolving. According to Dholakia & Kshetri (2005), mobile phone is helping in running the business effectively and efficiently, which is an important aspect in all businesses. In the business world there is usually a middleman who does surveillance on product prices in the world market and report back to sellers and buyers making a profit in providing this service. This role has been reduced because via the mobile phone you can obtain the same information. It is known fact that larger farms in developed countries squeezes profit margins from the farmers in developing countries and that is why the mobile phone plays an important role so the information is accessible

for everybody. Dholakia & Kshetri (2005) state that the mobile phone has now made it possible for small farmers to sell crops while world prices are in their favor.

The growth of mobile phone use in Kenya has caused a fast increase in business possibilities Gyimah-Brempong et al (2007) argue that personal computers transformed the economy in the industrial world and Asian countries and that the same is happening in Third World countries especially Africa and this is because of the mobile phone. According to Wachira (2003) the proliferation of mobile phones in Africa is partly attributed to the privatization of telecommunications services across Africa.

2.2 The adoption and Diffusion of Mobile Phone Technology in Kenya

The mobile phone specifically has emerged as one of the most dynamics forms of ICTs in the twenty first century. The rapid global spread and mobility of cellular telephony have challenged the growth rate of prior communications devices to become the technology of choice for people in most countries of the world (Ahonen, 2007).

As an affordable and accessible means of communication, rural communities are realizing the potential of mobile telephony to create economic opportunities and strengthen social networks. Mobile telephony effectively reduces the "distance" between individuals and institutions, making the sharing of information and knowledge easier and more effective (http://ict.ez-blogs.de).

The number of mobile telephone subscribers has grown steadily (CCK, 2010) over the years since the liberalization of the Kenyan telecommunications sub-sector through the 1998 Communications Act (KCA, 1998). The act facilitated the creation of Communications Commission of Kenya (CCK) as the primary regulator of the telecommunications industry to formulate regulations, monitor, solve disputes and above all protect the interests of all users of telecommunication services in Kenya with respect to the prices charged for and the quality and variety of such services. Statistics given by

International Telecommunication Union (ITU, 2010) regarding access to Information and Communications Technologies (ICT s) indicated that Africa had the least broadband subscriber base with only one million broadband subscribers. This was a meager 0.4 percent of the 281 million subscribers in the world by the end of 2006. But the figures have increased to about 12 million subscribers (ITU, 2010) as more people access mobile broadband. By the end of the third quarter of 2010, Africa had more than 500 million mobile telephone users and more than 110 million Internet users (ITU, 2010) which is more than double the 2007 figures when Africa had about 265 million mobile telephone users and 50 million Internet users (ITU, 2007).

Mobile cellular technology has a higher coverage rate in Africa than any other telecommunication technology. Cheaper infrastructure and larger regional penetration, cheaper handsets, competitive markets and business models oriented to the needs of the poorer segments of the population, such as affordable prepaid cards, have resulted in a mobile boom in Africa during the last decade (ITU, 2007). Data released by Communications Commission of Kenya (CCK, 2010) in March 2010 indicates that mobile telephone networks have a national coverage of about 84.5% of the Kenyan population and 34% geographic coverage. This 34%geographic coverage implies that large portions of Kenyan land mass are not covered by mobile telephone networks especially in the arid and semi-arid areas. On mobile technologies and financial transactions, Buncombe's (2009) analysis on mobile device-based payments in Africa indicated that use of mobile payments is conditioned by non-market factors related to financial and technical literacy. William Jack of Georgetown University and Tavneet Suri(Suri et al., 2010) of MIT surveyed Kenyan households in December 2009 and found that Mobile phone Banking (in particular M-PESA) was reaching a majority of Kenya's poor, un banked, and rural populations. This implies that the use of Mobile phone Banking in Kenya defies the Duncombe (2009), and Boateng (2009) arguments that the overall level and pace of adoption of m-finance services in developing countries is relatively low and confined to more affluent users. Most Kenyan poor and unbanked fully

embraced the use of this technology to store money and make payments. This is mainly because it offers cheaper and secure alternatives to the existing informal money transfer channels. Most Kenyans also find it appropriate to use it for their everyday transactions. Most Kenyan rural source of income is managed by their owners and hence most technology adoption decisions are based on individuals and not organizations.

The importance of mobile telephones to African countries is enormous and has been summarized as: an infrastructure service to improve efficiency of markets, promote investment, reduce risk of disasters and contribute to empowerment (Scott et al, 2004).According to Eagle (2005) the boom of mobile phones in Kenya has been credited for much of the activity in its small business sector which is mostly dominant in the rural areas. He claims that adding an additional ten mobile phones per 100 people boosts a typical developing country's GDP growth by 0.6 percent. This boost comes from the innovative use of mobile phone technology by local people. Kenyan businessmen, farmers, and laborers of all sorts are finding new uses for a tool thought of as two-way voice communication devices in the traditional western paradigm and coming up with original methods for solving their own problems. One such problem is the problem of e-commerce. Initially this form of business was transacted via computers using the internet and by land line telephones locking out the rural people as these are urban technologies. Mobile commerce a sub set of e-commerce was revolutionalised by the innovation of mobile phones. It refers to the buying and selling of goods and services through a hand held device. It also includes the storage, payment, receiving and sending of electronic money by mobile phones (Mendes et al 2007). An example of electronic money transfer in Kenya is M-Pesa. According to William et al (2009) M-Pesa is the most popular money transfer in Kenya, and its growth is stronger than for previous financial options such as banks and postal services.

According to the report by United Nations Economic and Social Council (2009), M-pesa is an important tool for development in poor countries because of its ability to by

pass the infrastructure barriers in remote rural areas in Kenya. McCoy and Smith (2007 argue that people in the rural areas are welcoming M-pesa service as a life changing innovations.

M-PESA empowers rural people by making it easier for them to solicit funds from their relatives and friends and other contacts in the city. The mobile phone, in conjunction with M-PESA, is a powerful tool for mobilizing remittances. Before these technologies were introduced, rural people had to travel to the city or post office by bus to get money. They then had to travel back to the village. This process could take over a week. Now they can use a mobile phone to request a remittance and receive it at a nearby agent, making it easier for them to solicit funds from their people in the city (http://www.cgap.org).

M-PESA (mobile money in Swahili) has taken off as a mobile branchless banking service that opens up basic banking facilities such as transfer of cash to low-income people who would ordinarily not have access to such services. Difficulties and the expense in transferring money has been a longstanding problem in East Africa, especially given the reliance on urban to rural remittances that sustain many rural households. Using mobile phones to effectively 'text' financial transactions that can be cashed in via a network of thousands of M-PESA agents has become an increasingly popular way to share resources, smooth household income and solidify financial arrangements.

The technology has huge potential; facilitating micro credit for small scale entrepreneurs, acting as a place to virtually store money and most importantly as a means to transfer resources internationally – particularly important given that remittances into Africa are currently worth double the total amount aid that flows into the continent.

2.3 Brief History of M-PESA

Safaricom and Vodafone launched M-PESA, a mobile-based payment service targeting the un-banked, pre-pay mobile subscribers in Kenya on a pilot basis in October 2005. M-PESA started as a public/private sector initiative. Vodafone was successful in winning funds from the Financial Deepening Challenge Fund competition established by the UK Government's Department for International Development to encourage private sector companies to engage in innovative projects to deepen the provision of financial services in emerging economies. The full commercial launch was initiated in March 2007. The service comprises a simple registration process to set-up a customer's new M-PESA account into which they can upload (deposit) and download (withdraw) cash at a large number of Safaricom's re-seller airtime distribution agents. Making a deposit is a similar process to topping up their airtime pre-pay balance: the account identifier is the mobile phone number and the customer goes to the very same place that they would go to buy airtime.

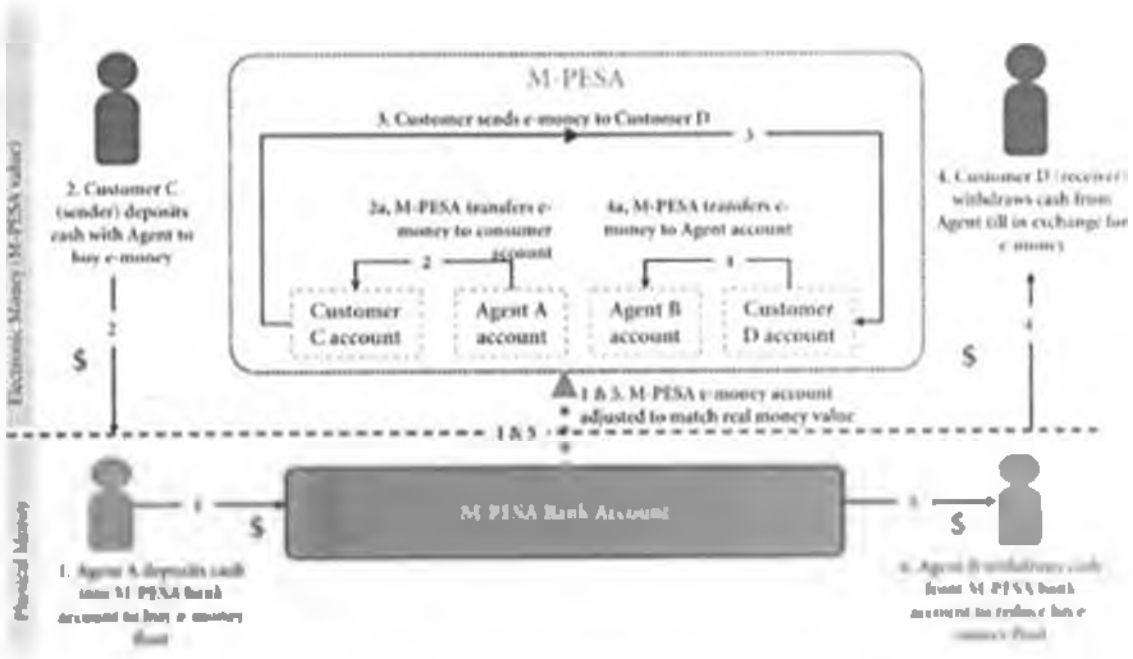
There the similarity ends; the M-PESA account is entirely separate to the pre-pay airtime credit. Once registered, the customer can send funds to any other phone number, on any network. The receiver gets a text message that can be taken to a re-seller agent and „cashed in", enabling person-to-person money transfer instantly over large distances. A customer can also use their M-PESA account balance to buy goods and services (including airtime credit for any other Safaricom pre-payphone (http://www-cs-faculty.stanford.edu).

2.4 How M-PESA Works

In order to start using M-PESA, all a client needs is a mobile phone and a national ID card. As M-PESA is much more informal than traditional banking services, a client does not need to go through tedious registration process as he/she would in a bank. Once

registered for the service, the client can visit local M-PESA agents. And once he she deposit cash, he'll get cyber money called "e-float" in exchange. Then using SMS technology, he can exchange that "e-float" with another M-PESA subscriber. Or he can retrieve cash from the agent in exchange of "e-float" he has in his M-PESA account (http://www-cs-faculty.stanford.edu).

Figure 1: Conceptual Model of M-pesa Banking



Source. (http://www-cs-faculty.stanford.edu).

2.5 Summary of the Literature review

While the M-pesa service is receiving a great deal of journalistic and industry attention, little is known about how it is being used on a daily basis in any given village, how widespread it is, how it is being used and what it means to people who live in the rural setting. It was therefore important to establish the impact of M-pesa on the house hold income outcome of the rural areas.

2.6 Theoretical Framework

This study adopts the modernization theory and Diffusion of innovation theory. These perspectives will play a fundamental role in guiding the entire study including interpretation of research findings.

Kerlinger (1964) defines a theory as a subset of interrelated concepts, definitions and propositions that present a systematic view of phenomena by specifying relations among variables, with the purpose of explaining and predicting phenomena. Nachmias and Nachmias (1996) concur with the same by noting that theories help us explain and predict phenomena of interest and in consequence, to make intelligent and practical decisions. Credible theory, they say is the conceptual foundation for reliable knowledge The diffusion of innovation theory and modernization theory provide a suitable framework to help examine and explain the impact of mobile phones on household income outcomes in rural areas.

2.6.1 Diffusion of Innovation Theory

The diffusion of innovations theory is heavily influenced by the work of Everett Rogers (1995). This theory seeks to explain how, why, and at what rate new ideas and technology spread through cultures. This theory stemmed from his research on how farmers adopted agricultural innovations in Iowa Sate, USA. Rogers (1995) proposed four main elements that influence the spread of a new idea; they include the innovation, communication channels, time and a social system. Consequently he defines diffusion as the process by which an innovation is communicated through certain channels, over time, among the members of a social system. He theorizes that when individuals are in decision making process of whether or not to adopt an innovation, they generally progress through five stages: knowledge, persuasion, decision, implementation, and confirmation. If the innovation is adopted it spreads through various communication channels. During communication, the idea is rarely evaluated from a scientific perspective but rather, subjective perceptions of the innovation, influence diffusion This

process occurs over time. Finally, social systems determine diffusion, norms on diffusion, roles of opinion leaders and change agents, types of innovation decisions, and innovation consequences.

Rogers (1995) defines several fundamental characteristics of innovations that influence an individual's decision to adopt or reject an innovation. First, how improved an innovation is over the previous generations. For instance, the mobile phone is seen to be a great improvement from its predecessor, the fixed telephone line. Secondly, the innovations level of compatibility to integrate into an individual's life. Thirdly, if the innovation is too difficult to use, an individual will not likely adopt it. Fourthly, the ease of an innovation to be experienced with as it is being adopted. If a user has difficulty in using and trying out an innovation, this individual will be less likely to adopt it. Lastly is the extent to which an innovation is visible to others. An innovation that is more visible will drive communication among the individual's peers and personal networks and will in turn create more positive or negative reactions. It is inevitable that the adoption of an innovation has both negative and positive consequences. Wejnert (2002) details two categories of consequences: public vs. Private and benefits vs. costs. Public consequences refer to the impact of an innovation on those other than the actor, while private consequences refer to the impact on an individual actor. Public consequences usually involve collective actors, such as countries, states, organizations or social movements and the results are usually concerned with issues of societal well being. On the other hand, private consequences involve individuals or small collective entities, such as the community and are concerned with the improvement of quality of life or the reform of organization or social structures.

The current wave of scam of Kenya's being registered as members of certain political parties without their knowledge via social media such as face book, twitter and my space, is a good example of public consequences of technological innovation. Private impact can be illustrated where a person working and living in a city, hundreds of kilometers

from the rural home where the family resides, can via mobile phone constantly keep in touch and send them money through M-pesa without necessarily having to incur costs and time traveling from time to time.

The benefits of an innovation refer to the positive consequences, while the costs refer to the negative. Costs may be monetary or non-monetary, direct or indirect. Direct costs are usually related to financial uncertainty and the economic state of the actor. Indirect costs are more difficult to identify, a suitable example is where one has to purchase and install a mobile tracking device in their mobile handset, due to the increased cases of cell phone theft. Indirect costs may also be social, such as social conflict caused by innovation.
Therefore, this theory is the most appropriate for investigating the impact of technology (M-pesa) on the income outcome of the rural households.

2.6.2 Modernization Theory

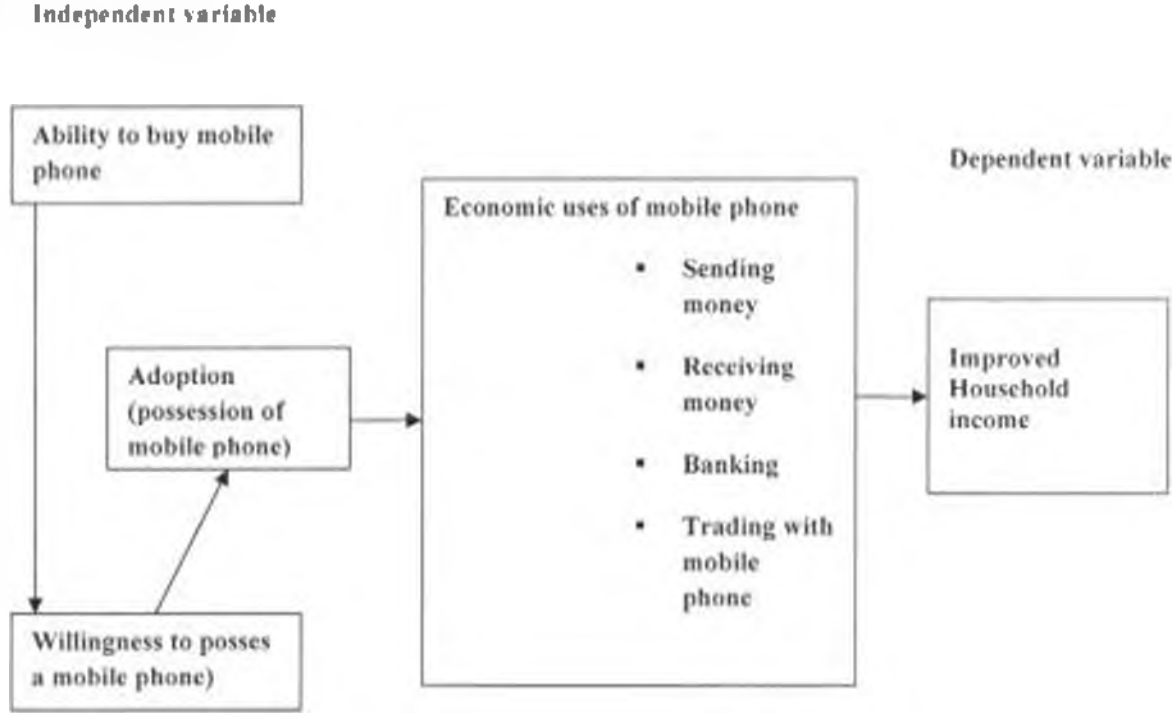
Modernization is a theory used to describe the transition from traditional society of the past to modern society as it is found today in the West. Modernization theory presents the idea that introduction of modern methods in technology enhances economic production.
An important proposition of modernization theory according to Inkeles (1974) is that various process of modernization i.e. economic development, urbanization, structural differentiation and increased contact and communication would lead to changes in society.

Modernization theory further posits that the forces of modernization have a converging effect in shaping individuals within a society. The sociological perspective of modernization emphasizes on how the universalistic character of industrialization affects individuals' beliefs, value and behaviors and mainly deals with the convergence across societies. This viewpoint argues that industrialization produces common forms of social structure and those structures in turn produce a similar pattern of values, beliefs and thoughts. This facilitates the adoption of new innovations and patterns of behavior.

According to Inkeles (1974) modernity has the following traits: openness to new experience and knowledge (such as the adoption of mobile phone technology and innovations), orientation to the present and the future rather than the past. Members of modern societies lack such traits as passive acceptance of fate. People in society are thus coming up with new ideas and adopting better ways of making life easier and more enjoyable. Technological innovations are strong predators of modernization and play a central role to the process of social change in the society.

Mobile phones technology, as an element of modernity has been embraced by millions of people in many parts of the world including Africa of which Kenya is no exception. Modernization theory therefore qualifies as a relevant theory in the analysis of the impacts of mobile phones on households' income in the rural areas.

2.7 Conceptual Framework



2.8 Operational definition of variables

Variable type	Measured through	Indicators
Independent variable		
Adoption of mobile phone	**Individual level characteristics**	• **Ability to purchase** • **Knowledge of operating the phone** • **Willingness to adopt the technology**
Mobile phone use	**Economic uses of mobile phone** • **Trading with mobile phone** • **Sending money** • **Receiving money** • **Banking**	**Frequency of sending money, receiving, banking money and trading with mobile phone**
Dependent variable		
Household income	**Average monthly income**	• **Amount of money in Ksh. Generated for the household through mobile phone transactions**

CHAPTER THREE: METHODOLOGY

3.1 Introduction

This chapter presents a brief description of the methods which were adopted in this study It also includes information about the site of study, the sampling procedure which was used, methods of data collection, data presentation and data analysis.

3.2 Site Description

Data on impact of mobile phones on household income was collected from Central Imenti constituency of Meru County in Eastern province of Kenya. Central Imenti administratively is divided into eight locations namely Gatimbi, Kariene, Katheri, Kiagu, Kiharanyai, Kibirichia, Kithirune, and Mwangathia. Kiagu location was purposively chosen for the study because it is poorer than the rest locations.

Kiagu location is a low potential agricultural zone characterized by poor climate in terms of temperatures and rainfall which combined with unfertile land influences agricultural activities. Much of agriculture is carried out on smallholder farms with or without rainfall sometimes. It is for this reasons that most of the people in this region combine agricultural activities with on farm activities to offset poor harvest. Therefore, the introduction of M-pesa service by safaricom was embraced with a lot of fervor in this area. It is for these reasons that this area was chosen as the actual site of data collection to find out the impact that this innovation has on their household income.

3.3 Unit of Analysis

The unit of analysis in this study was the role of M-pesa innovation on household income among households that were in possession of mobile phones with M-pesa facility in Kiagu location. Use of mobile phone has the potential for reducing both poverty and promoting economic growth. Before the invention and adoption of mobile phone technology and the concomitant M-pesa technology, people in rural areas were dependent on the traditional methods of generating livelihood such as physical exchange of goods

and services in physical markets. However, the increased diffusion of M-pesa has revolutionalized the market operations and created new opportunities for income generation. Hence the need to focus the analysis on the role of M-pesa on households income in the rural areas.

3.4 Unit of observation

The main units of study were the households in Kiagu locations of Abothuguchi division in Meru County. One member of every household who owned a mobile phone and used the M-pesa money transfer service was interviewed.

A total of 50 households were interviewed including 4 key informants. The latter were interviewed to help provide deeper insight into the relationship between the adoption of mobile phone technology and household income outcome

3.5 Sampling procedure and sample size

The study employed simple random sampling to enhance the representativeness of its findings. This method ensured that the whole population was adequately represented in the sample so as to increase their level of accuracy when estimating parameters. This method was preferred due to its unbiasness; that is each unit had the same chance of being selected and also the selection of each unit was not affected by the selection of other units and therefore was regarded as independent. . This sampling procedure was used because of the immenseness of the study area Furthermore Simple random sampling was considered suitable because it eases the process of data collection thus saving time and other resources.

Kiagu location is sub-divided into ten villages and five of them namely Mpau, Rikana, Kiamuri, Gacibi and Kanywee were selected for study. A total of 50 households were interviewed, 10 from each village. The sample size was arrived at after reaching the saturation point where getting more samples was not any more necessary since it could not give new data-value. To corroborate the data and fill the gaps that respondents had

left, four key informants were purposively selected and interviewed using key informant guide. This was to help provide deeper insights into the relationship between the adoption of mobile phone technology and the effect on house hold income outcome.

3.6 Methods of data collection

The study was based on primary data collected from the site. The main tool of data collection was structured questionnaires where respondents were subjected to face to face interviews. This was done by the researcher, with the help of carefully selected and trained research assistants, who were guided by a structured questionnaire The questions comprised of both open and closed-ended questions. Closed ended questions were to help provide structured responses for the rating of various attributes, while open-ended questions were to help provide additional information that was relevant, but would not have been captured by the closed-ended questions. Questionnaires help conserve time and money as well as facilitating easier data analysis. Yin (1989) says that interviews are an essential source of evidence because in most case studies are about human affairs. Human affairs should be reported through the eyes of specific interviewees and well informed respondents who can provide insight into a situation. Survey research usually involves acquiring information about a group of people by asking them questions, tabulating and statistically analyzing the responses and the drawing inferences about a particular population from the responses of the sample (Leedy and Ormrod, 2005).

3.7 Data Analysis

This entailed the process of interpreting the collected information in order to establish relationships between variables or obtain other messages. The data collected for this study was checked for completeness and consistency before processing. Checking was done with the view of detecting errors and omissions and other discrepancies in the filled questionnaires. This was to guarantee that quality data and reliable results were obtained. The data was then coded and entered into an SPSS programme to run frequencies.

Descriptive statistics such as frequency distribution tables and percentages were used to summarize and present the data. The findings were then presented in form of frequency distribution tables. The qualitative data which was generated from the key informants was analyzed by noting the emerging themes.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND INTERPRETATION

4.1 Introduction

This chapter presents a detailed description and analysis of field data focusing on the demographic characteristics of the respondents, factors influencing the adoption of mobile phone technology in rural areas, level of mobile phone possession among households in the rural areas, and the extent to which mobile phone communication is being used to generate household income

4.2 Data Presentation

Data collected from the survey was presented using descriptive statistics inform of frequency distribution tables and percentages.

4.2.1 Response rate

The study targeted 50 respondents who possessed a mobile phone and were using it for income generating purposes. As a result of devoted efforts of the researcher and data collection team, there was a 100% response rate from the respondents. A total of 4 key informants were also interviewed, specifically to help provide deeper insight into the relationship between mobile phone adoption and household income outcomes. The response rate for the key informants was also 100%.Those interviewed were mobile money transfer agent, the local chamber of commerce representative, co-operative society officer and a local leader (chief).

4.2.2 Social and Demographic information

This section highlights the demographic characteristics of the respondents as retrieved from the questionnaires. These characteristics are gender, age, and marital status, level of

education completed, occupation, monthly income and period of residency in Kiagu location.

4.2.2.1 Gender distribution

Table 4.1 shows the distribution of mobile phone possession on gender basis. The majority, 62 percent of the respondents owning a mobile phone are men compared to 38 percent women. This skewed distribution shows that in the study area, there exists inequalities in property ownership between men and women with the latter being disadvantaged.

Table 4.1: Gender Distribution according to possession of mobile phone

Gender	Frequency	Percent
Male	31	62.0
Female	19	38.0
Total	50	100.0

4.2.2.2 Marital status

The study found out that 54% of the respondents were married, 36% of the respondents were single, 6% of the respondents were widowed and 4% of the respondents were divorced as shown in the table below.

Table 4.2: Marital Status according to possession of mobile phone

Marital status	Frequency	Percent
Married	27	54.0
Single	18	36.0
Divorced	2	4.0
Widowed	3	6.0
Total	50	100.0

4.2.2.3: Age distribution

Majority of the respondents (34%) were aged between 21-40 years and 31-40 years respectively, followed by those aged below 21 years. Respondents aged 41-50 years and those over 50 years comprised 8% and 4% respectively. Majority of the residents aged between 21-30 years and 31-40 years can be attributed to the fact that these years are the most productive in one's life, and therefore this age group is interested in commercial usage of the mobile phone.

Table 4.3: Age Distribution in accordance to possession of mobile phone

Age categories	Frequency	Percent
under 21	10	20.0
21-30	17	34.0
31-40	17	34.0
41-50	4	8.0
over 50	2	4.0
Total	50	100.0

4.2.2.4: Level of education

With regard to the level of education, the study found out that majority of the respondents (42%) had attained secondary school education. 30% had completed primary school education, 24% had completed college education and a mere 4% had university level education as shown in the table below. These figures indicate that there are very few university graduates within the area of study. This may be attributed to rural-urban migration of graduates in search of white collar jobs.

Table 4.4: Level of Formal Education Completed

Level of education	Frequency	Percent
Primary	15	30.0
Secondary	21	42.0
College	12	24.0
University	2	4.0
Total	50	100.0

4.2.2.5: Type of occupation

In response to the question on occupation, the respondents indicated their various income earning activities as follows; businessmen/women, farmers, teacher and accountant. As per the findings majority of Kiagu residents are farmers comprising of 50% followed closely by traders with 46%. Only one (2%) of the respondents and another 2% identified themselves as a teacher and an accountant respectively.

Table 4.5: Occupation of the respondents

Occupation	Frequency	Percent
Accountant	1	2.0
Business	23	46.0
Farmer	25	50.0
Teacher	1	2.0
Total	50	100.0

4.2.2.6: monthly income

Majority of the respondents had a monthly income of between Kshs 0-10,000 which comprises of 48% of the respondents. 32% of the respondents earned between kshs 10,001-20,000.Those respondents whose income was between Kshs 20,001-30,000 comprised of 14% and those respondents who categorized themselves as earning between Kshs 30,001-40,000 were 4% while only 2% earned above Kshs 40,000 It was interesting to find out that all the respondents had some sought of income because Kiagu is thought to be an area where there is a high rate of poverty. Nevertheless, most of the residents earn a relatively low income.

Table4.6: Average monthly income

Income	Frequency	Percent
0-10,000	24	48.0
10,001-20,000	16	32.0
20,001-30,000	7	14.0
30,001-40,000	2	4.0
Above 40,000	1	2.0
Total	50	100.0

4.2.2.7: Duration of residence

In line with my methodology, I had purposefully sampled respondents who had resided in Kiagu for as long as they can remember. According to the findings, 54% of the respondents had been residents of Kiagu for 21-40 years, 30% for 41-60 years and 16% for 0-20 years.

Table 4.7: Period of residing in Kiagu Location

Length of residence	Frequency	Percent
0-20 years	8	16.0
21-40 years	27	54.0
41-60 years	15	30.0
Total	50	100.0

4.3 Data Analysis and Interpretation

4.3.1 Factors Influencing the Adoption of Mobile phones in Kiagu location

The first objective of the study was to find out what factors influenced the adoption of mobile phone technology among residents of Kiagu location. Table 4.8 shows the reasons given by the respondents to adopt mobile phones. In response to the question on the factors they deemed most important when making a purchase decision, 64% of the total respondents rated commercial needs as one of the main factor which influenced them. The respondents further rated price and additional features such as radio, internet or camera on the handset as factors that influenced when making a purchase decision. Opinion of relatives and friends, ease of use and special offers from dealers influenced 6% of the respondents while only 2% were influenced by physical appearance of the mobile handset. It was interesting and surprising to find that price did not greatly influence the purchase decision, yet the residents of Kiagu location are low-income earners as shown in table 4.6.

Table 4.8: Factors influencing decision to A acquire a Mobile Phone

Reasons for acquiring a mobile phone	Frequency	Percent
Price	4	8.0
Physical appearance	1	2.0
Additional features such as radio, internet or camera	4	8.0
Opinion of relatives and/or friends	3	6.0
Ease of use	3	6.0
Special offers from dealers and mobile phone service providers	3	6.0
Commercial needs	32	64.0
Total	50	100.0

4.3.1.1: Mode of acquisition

The study found out that 80% of the respondents had purchased their mobile phone from a mobile shop/dealer .16% of the respondents were given a mobile phones by their relative/friend at no cost and a mere 4% of the respondents received their handsets from their employers with monthly deductions from their salaries. Ability to purchase a mobile handset is therefore a major determinant of mobile handset ownership as the most respondents purchased their mobile phones.

Table 4.9: Mode of Acquiring Mobile Handsets

Mode of acquisition	Frequency	Percent
Bought from a mobile shop	40	80.0
Given at no cost by a friend/relative	8	16.0
From employer with deduction from my salary	2	4.0
Total	50	100.0

This is explained further by the fact that all the respondents in the sample were found to have some sought of income as shown earlier in table 4.6. The fact that these people are willing to buy mobile phone using their low incomes shows that this technology is valuable. Further, as implied by the literature review, the availability of low cost handsets is also a key factor in influencing the adoption of mobile phone technology within the rural areas such as Kiagu, owing to the fact that majority of the respondents 48% comprise of low income earners as indicated in table 4.6.

4.3.1.2: Mobile phone ownership

With regard to mobile phone ownership and use, the study found out that 68% of the respondents were the sole users of their mobile phones while 32% shared with other members of their household.

Table4.10: Mobile Phone Ownership and Daily use

Ownership and use of mobile phone	Frequency	Percent
I am the sole/only user	34	68.0
It is shared with other members of my household	16	32.0
Total	60	100.0

These further support the notion that mobile phone technology has been adopted to a great extent in Kiagu location. Most of the respondents did not have to share their mobile handsets because other members had their own. In addition, the privacy that mobile phone technology provides when one is communicating is another factor that seems to have aided its adoption in Kiagu. The mobile phone provided the privacy and freedom to call or text their contacts without intrusion, from any place and at any time. These findings are also indicative of the fact that low cost handsets have enabled several members of the same household to each own a mobile phone, rather than having only one handset which is to be shared among the family members

4.3.2 Uses of Mobile Phone Technology to generate Income

The third objective of the study was to assess the extent to which mobile phone technology is used to generate household income. All the respondents indicated that they use their mobile phone in income generating activities. This corresponds with the earlier analysis that the primary motivation for acquiring a mobile phone was largely for commercial purposes. The study further sought to know the various ways in which the study participants used their phones for income activities

4.3.2.1: Mobile phone and household income

Table 4.11 shows that nearly 44% of the respondents indicated that they use their mobile phone handset to send and receive money to and from other people. Also, another nearly 40% of the respondents indicated that they receive calls and short message services for income generating purposes (e.g. a *bodaboda* (motorcycle) operator may receive a short message or a call from a customer in need of transport). Only 17% of the respondents indicated that they use their mobile phones for income generating ways by calling and sending short messages. The response rate for this particular question was not 100% because 4% of the respondents did not answer this question. However, this did not affect the findings.

Table4.11: How Mobile Phone is used to generate Household Income

Economic uses of mobile phone		Frequency	Percent
Valid	Calling/sms for income generating purposes	8	16.0
	Receiving calls/sms for income generating purposes	19	38.0
	Sending' receiving money to/from other people	21	42.0
	Total	48	96.0
Total		50	100.0

4.3.2.2: Use of M-pesa

In regard to the use of the mobile phone for the M-pesa services, which include depositing cash, withdrawing, sending money, paying bills, and shopping among others all the respondents indicated that they use their mobile phones for all the listed M-pesa services. To establish whether the use of mobile phone had influence in their income outcomes, all the respondents acknowledged that since they adopted mobile phone technology, there has been improvement in their household incomes a change they overwhelmingly attributed to mobile phone technology.

Table 4.12: Uses and influence of mobile phones on household income outcomes

Do you use your mobile phone for all M-pesa services	Frequency	Percent
yes	50	100.0
Total	**50**	**100.0**
Has adoption of mobile phone influenced your household income outcomes		
yes	50	100.0
Total	**50**	**100.0**

4.3.2.3: Influence on income outcomes before

To examine the validity of the response on the influence of mobile phone technology on household income outcomes, the respondents were asked to state their average monthly income before and after the acquisition of a mobile phone. The data in table 4.13 shows the distribution of respondents' average monthly income prior to acquisition of a mobile phone. The data in the table shows that before acquiring a mobile phone, 48% of the respondents had an average monthly income of below Kshs 10,000; 32% of the respondents had an average monthly income of between Kshs 10,001-20,000 followed by 14% of the respondents whose average monthly income was kshs 20,001-30,000 while 4% indicated that their monthly income was Kshs 30,001-40,000 and a mere 2% said their monthly income was above kshs 40,000

Table 4.13: Distribution of Respondents Average monthly income before acquisition of Mobile Phone

Average monthly income prior to mobile phone acquisition	Frequency	Percent
Below 10,000	24	48.0
10,001-20,000	16	32.0
20,001-30,000	7	14.0
30,001-40,000	2	4.0
Above 40,000	1	2.0
Total	50	100.0

4.3.2.4: Influence on income outcomes after

The data on the respondents' average monthly income after acquiring a mobile phone gives credence to the earlier finding that indeed adoption of mobile phone has had a positive influence on the household income outcomes. A comparison of data in Table 4.13 and that in the preceding Table 4.14 shows that the average monthly income of the category of respondents whose monthly income before obtaining a mobile phone was below Kshs 10,000 reduced remarkably from 48% to 16 % indicating a difference of 32% of respondents whose average monthly income increased from their previous average monthly earnings. Those whose monthly income was Kshs 10,001-20,000 increased from 32% to 38 % while the category of Kshs 20,001-30,000 increased from 14% to 16%.Consequently those respondents whose monthly income was Kshs 30,001-40,000 increased from 4% to 22%. The monthly category of above Kshs 40,000 increased from 2% to 8%.

Table 4.14: Distribution of respondents' Average monthly income after acquisition of Mobile Phone

Average monthly income prior to mobile phone acquisition	Frequency	Percent
10,001-20,00	19	38.0
20,001-30,00	8	16.0
30,001-40,00	11	22.0
above 40,000	4	8.0
below 10,000	8	16.0
Total	50	100.0

4.3.2.5: Views on impact

As shown by the findings in table 4.15, majority of the respondents consisting 92% agreed that the adoption and use of mobile phone had a huge impact on their household income.

Table4.15: Respondents views on the impact of mobile phone on household income in the last one year

Perceived level of impact		Frequency	Percent
	Very much	44	88 0
	Neither very much nor not much	2	4 0
	Not much	2	4 0
	Total	48	96 0
Total		50	100 0

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This Chapter summarizes the study's findings and draws conclusions and recommendations based on the research objectives. This study aimed to investigate the impact of mobile phones on Household income on the residents of Kiagu location.

5.2 Summary of Findings and Conclusions

This study concludes that the introduction and adoption of mobile phone technology within Kiagu location has had a significant impact on the household income. The fact that the researcher was able to find 50 respondents, who owned mobile phones, goes to show that Kiagu residents have indeed adopted mobile phone technology. This is also an indicator of mobile phone technology being of benefit to them. If it was not so, they would not have purchased the device in relatively large numbers, as is the case currently This was supported by one of the Key informants who said that "*siku hizi tunauza simu mingi sana kwa siku*"meaning that these days we are selling many phones in a day. This shows that mobile phone adoption increased with the introduction of m-pesa

Regarding the factors that influence the adoption of mobile technology within Kiagu location, it was established from the findings that Most of respondents had purchased their mobile phones from mobile shops/dealers as shown in table 4.9. The fact that these people are willing to buy mobile phone using their low incomes shows that this technology is valuable. Further, as implied by the literature review, the availability of low cost handsets is also a key factor in influencing the adoption of mobile phone technology within the rural areas such as Kiagu, owing to the fact that majority of the respondents 48% comprise of low income earners as indicated in table 4.6.

In addition to the foregoing, the privacy that mobile phone technology provides when one is communicating is another factor that seems to have aided its adoption in Kiagu. The findings showed that 68% of the respondents were the sole users of their handsets. This

provided the privacy and freedom to call or text their contacts without intrusion, from any place and at any time. These findings are also indicative of the fact that low cost handsets have enabled several members of the same household to each own a mobile phone, rather than having only one handset which is to be shared among the family members. The findings summarized in table 4.3 shows that 34% of the respondents were aged between 21-30years and 31-40 years of age respectively. This is an age group which the society refers to as the youth. This age group usually tends to be more aggressive when it comes to income generation opportunities. It therefore was not surprising to find that even in Kiagu, the commercial usage of the mobile phone was the attribute that was rated the highest when respondents were asked what influenced their purchase decision vis –a vis their mobile phones. This age group is also conscious with fashion and class. Since brands are symbols of the same, it then expected that the brand of a phone was considered an important factor in making purchase decision and that's why 4% of the respondents considered physical appearance and additional features when purchasing their phones. An additional explanation would be that, certain brands are known to be more reliable than others and have a greater utilitarian value to the user.

It was interesting to note that the findings showed only two main uses of mobile phones among the respondents. These were communication and mobile money transfer with the latter being given the highest weight at 43% as shown in table 4.11 This supports the notion that with the introduction of mobile money transfer services (M-pesa), mobile phones have become agents of economic development in the lives of those who use them. As pointed out in the literature review, users can deposit, withdraw and send money within and across borders, using this wireless technology.

The study has shown that mobile phone adoption has brought economic development to the residents of Kiagu by improving their household income. This is evidenced by the findings in table 4.12 where 100% of the residents said that they have benefited financially from the adoption of the mobile phone technology. The respondents credited

this financial development to the mobile money transfer (M-pesa) innovation, which has enabled them manage their personal and business finances in a more formal and secure manner. The respondents who did not own bank accounts in commercial banks indicated that the mobile money transfer innovation served as their bank account and enabled them transact similar to those who owned commercial bank accounts. This was supported by the chief who said that "*Siku hizi watu wana Bank pesa kwa simu*" Meaning that these days' people are banking money in their phones He explained that when need be money is deposited and sent to those who need it, for example children who are in schools far from home are sent fare and pocket money via m-pesa service from the money banked in the m-pesa account while the remaining is retained in the mobile phone account. It is only withdrawn when need arises. This shows that mobile phone innovations which aim the unbanked in low in come communities have aided the adoption of mobile phones within Kiagu location.

From the foregoing, it can be deduced that the adoption of mobile technology and in particular M-pesa has encouraged savings. This is by way of informal saving groups such as merry-go-rounds ("chamas") and self help groups. The respondents explained that collection and safe storage of funds had become easier to co-ordinate with introduction of M-pesa. Those who were self employed indicated also that mobile phones have enhanced the timeliness of their business transactions; thereby helping them ran more efficient and effective businesses.

The findings from the key informants evidenced that mobile phone adoption has significantly impacted on the household income. The proliferation of mobile phone technology within Kiagu especially with the innovation of M –pesa service created a 'need gap' for mobile phone adoption and possession by the residents. The findings showed that majority of respondents didn't possess mobile phone handsets prior to the innovation of M-pesa. These findings support the claim that the introduction of M-pesa catalyzed the diffusion of mobile phone technology in low income communities.

The information from key informant showed that the standard of living of the residents had significantly improved. They explained that they can now save for a rainy day in their M-pesa accounts and also can solicit money from their relatives and friends in urban settings when need arises. They explained that income received through their mobile phones courtesy of m-pesa service has enabled them provide for their families basic needs with much more ease.

In light of the above, we can conclude that the introduction of mobile phone technology especially with the innovation of m-pesa service has impacted positively on the household income of the rural areas. It is clear from the findings that the income and economic development in Kiagu location has improved, with the adoption of mobile phone technology.

5.3 Recommendations

The study has clearly revealed that mobile phone technology has an impact on household income. This means that mobile phone technology like other forms of technology is an asset that can be used to improve economic welfare of the households and the state in general However, the stakeholders in the telecommunication sector should reduce the M-pesa withdraw charges especially when withdrawing money amounting to Kshs 20,000 and above. Employers should also partner with mobile phone handset manufacturers or dealers to enable them offer credit facilities to the customers who would wish to own mobile handsets, but can only do so on credit basis.

5.4 Suggestions for further Studies

This study sought to investigate the economic impact of mobile phone on house hold income in rural area of Kiagu location, Meru County. Additional research can therefore be carried out to assess the impact that mobile phone technology has on other aspects of society such as social, culture, religion or marriage. Comparative studies can also be carried out to assess the impact of mobile phone technology between rural areas and

urban areas. Research could also be carried out on the impact of other forms of technology in different starata's of society.

REFERENCES

African Centre for Economic Growth. (2005). Development of micro and small enterprises in Kenya: renewed policy and strategy framework. ACEG, Nairobi, Kenya.2.

Akoten, J. E. (2007). Breaking the Vicious Cycle of Poor Access to Credit by Micro and Small Enterprises in Kenya. Nairobi: Institute of Policy Analysis and Research (IPAR). Discussion Paper No. 095/2007.3.

Developing Countries: A Review of Concepts, Methods, Issues, Evidence and Future Research Directions, Development Informatics Working Papers, 37, 1-33. Institute for Development Policy and Management, University of Manchester.24.

Diga, K (2008). "Mobile Cell Phones and Poverty Reduction: Technology Spending Patterns and Poverty Level Change among Households in Uganda". A paper presented at a workshop on the Role of Mobile Technologies in Fostering Social Development, June 2-3, 2008, Sao Paulo, Brazil. Retrieved April 10, 2012 from www.w3.org/2008/02/MS4D_WS/...'position_paper-diga-2008pdf.pdf

Falk, R.F., and Miller, N.B. (1992). A Primer for Soft Modeling. Akron, Ohio: University of Akron Press.25.

Fornell, C. and Larcker, V. F.(1981). Evaluating Structural Equation Models with Unobservable Variables and Measurement Error. Journal of Marketing Research, Vol. 18(1), pp. 39-50.26.

Gagnon, E., McCarthy, R. V. (2004), "User acceptance of tactical technology: An evaluation of administrative support systems within higher education". Issues in Information Systems, Volume V, No. 1.28.

Goodhue, D. L., and Thompson, R. L. (1995).Task-Technology Fit and Individual Performance. MIS Quarterly, 19(2), 213-236.29.

Government of Kenya, (2004) "National Information and communications Technology Policy". Nairobi: Ministry of Information and Communications.

Grewal, D., Gotlieb, J. and Marmorstein, H. (1994). The Moderating effects of Message Framing and Source Credibility on the Price-Perceived Risk Relationship.

Hair J. Black W, Babin B, Anderson R and Tatham R. (2006). Multivariate Data Analysis (6th ed.). Upper Saddle River, New Jersey: Prentice Hall.31.

Heidi, T. and Mathiassen, L. (2010). Early Adoption of Mobile Devices: A Social Network Perspective.

Heyer, A. and Mas. I (2009) "Seeking Fertile Grounds for Mobile Money." Retrieved From http://www/docstoc.com/docs/12613377/ on May 2 2012.

Horton, R. L. (1976). The structure of perceived risk. Journal of the Academy of Marketing Science, 4, 694-706.33.

http://afiinnovator.com/blog/2012/02/17/from-mobile-money-to-mobile-finance-effects-of-mobile-money-on-household-community-and-national-economies

http://ict.ez-blogs.de/rural-development-with-mobiles-impact-for-individuals-1/
http://www-cfaculty.stanford.edu/~eroberts/cs181/projects/2010/SmartPhones.pt4.html

International Centre for Economic Growth (1999). National Micro and Small Enterprise Baseline Survey. Nairobi: CBS, K-Rep, ICEG.34.

International Telecommunication Union (2010): Measuring the Information Society, the ICT Development Index. Geneva, Switzerland: ITU.37.

International Telecommunication Union (2009). Measuring the Information Society, the ICT Development Index. Geneva, Switzerland: ITU.

International Telecommunication Union,(2007).Telecommunication/ICT Markets and Trends in Africa 2007. Africa, ICT Indicators, 2007, International Telecommunication Union, Place des Nations, CH-1211 Geneva Switzerland..

Journal of Information Technology Theory and Application (JITTA): Journal of Consumer Research

Kenya National Bureau of Statistics (2010): Kenya 2009 Population and housing census highlights Brochure: Summary of Census Results. http://www.knbs.or.ke (Accessed 4thjune 2012)

Melchioly S. and Saebo O. (2010) "ICTs and Development: Nature of mobile phones Usage for SMEs for Economic Development,"AnExploratory study in Morogo, Tanzania

Mendes S.; Alampay, E., Soriano E. and Sariano, C. (2007) *The Innovative use of mobile Applications in the Phillipines. Lessons for Africa* SIDA.

Morawczynski, O. (2009) Exploring the usage and impact of 'transformational' mobile financial services: the case of M-PESA in Kenya. Journal of Eastern African Studies, 3(3), 509-529

Mwaura, P.W.(2009).*Mobile Banking in Developing Countries: A case study of Kenya.* VASAAN Ammattikorkeakoulu University.

OECD.(2002) *OECD Information Technology Outlook* OECD Publications Service.

Smith, J. (2009) Science and Technology for Development. Zed Books. London.

Smith, J. (2010)new institutional arrangements for development, science and technology. Development, 53(1), 48-53.

The African Journal of Information Systems, Volume 3, Issue 2, 2011
Vol. 11: Issue 1, Article 3.32.

Warah, R. (2009) "Mobile Telephony: Kenya No- So Silent revolution" *Daily Nation*, pp 12

William j. pulver,C. and Suri T. (2009). "The Performance and Impact of M-PESA: Preliminary

Matthew Clark. *Unserved By Banks, Poor Kenyans Now Just Use a Cell phone*. The Christian Science Monitor - - October 12, 2007.

(http://www.csmonitor.com/2007/1012/p01s03-woaf.html)
Communication Commission of Kenya – *Annual Report 2006/2007*.

(http://www.cck.go.ke/html/annual_reports.asp)

Vanessa Gray. *The un-wired continent: Africa's mobile success story*. International Telecommunication Union (ITU) document.

(http://www.itu.int/ITU-D/ict/statistics/at_glance/Africa_EE2006_e.pdf)

Cell phones reshaping Africa. Associated Press, October 2005

Safaricom Kenya official web site: (www.safaricom.co.ke)

Kiwanja Gallery, *Mobiles in Africa* (http://www.kiwanja.net/mobilegallery.htm)

Nick Hughes and Susie Lonie. *M-PESA: Mobile Money for the "Unbanked". Turning Cell phones into 24-Hour Tellers in Kenya* Winter & Spring 2007 issue of Innovations

M-PESA Web pages on the Safaricom Web site.
(http://www.safaricom.co.ke/index.php?id=228)

Kyle Valenti. *Reach Out and enrich someone - Microfinance goes mobile as cell Phone banking revolutionizes financial services for the poor* Policy Innovation. July 2007. (http://www.policyinnovations.org/ideas/briefings/data/phone_bank)

APPENDICES

APPENDIX 1: STRUCTURED QUESTIONNAIRE

I am a student in the University of Nairobi Pursuing Masters in Rural Sociology and Community development. I am carrying out a study on the **"Impact of Mobile Phones on Household Income Outcomes: A case study of Kiagu location Meru County".** You have been selected for this study as a respondent. The information you provide with combination of other key informants and respondents is vital for this study. However, none of the information you give will be used for purposes other than for making analytical conclusions.

SECTION A: PERSONAL CHARACTERISTICS OF THE RESPONDENTS

1. What is your Sex?

(a) Male (b) Female

2 What is your age in years?

Age group: (a) Under 21 (b) 21-30 (c) 31-40 (d) 41-50 (e) over 50

3 What is your marital status?

(a) Married (b) Single (c) Divorced (d) Widowed (e) Separated

(f) Other specify.....

4 What is your highest level of education?

(a)None (b) Primary (c) Secondary (d) College (e) University

(f)Other specify.....

5 What is your occupation.....

6 Approximately, what is your average monthly income in Ksh?

(a) 0- 10,000 [ ] (b) 10, 001-20,000 [ ]

(c) 20,001 -30,000 [ ] (d) 30,001- 40,000 [ ] [ ] (e) Above 40,000[ ]

7 For how long have you been a resident of Kiagu location?

.... Years

SECTION B: FACTORS INFLUENCING ADOPTION OF MOBILE PHONES

8. For how long have you owned a mobile phone?.....years.

9. How did you acquire your mobile phone?(Tick appropriately)

(a) Bought it from a mobile phone shop

(b) Given, at no cost by a relative or friend

(c) From employer as a tool of trade which is to be surrendered if employment ceases.

(d) From employer with monthly deductions of its cost from my salary

(e) Other (specify).....

10. In the table below, what factors influenced you to acquire a mobile phone? Tick all that apply

Factors	
Price	
Brand/model	
Physical appearance (its look)	
Additional features such as radio, internet or camera	
Opinion of relatives and /or friends	
Quality	
Ease of use	
After sale service/guarantee	
Advertisements in the media	
Special offers on handsets from mobile phone service providers and dealers	
Commercial needs	

11. With regard to ownership and daily use of my mobile phone

(a) I am the sole/only user

(b) It is shared with other members of my household

SECTION C: USES OF MOBILE PHONE TECHNOLOGY TO GENERATE INCOME.

1. When did you acquire a mobile phone?

2. Do you use your mobile phone in any income generating activity?
   Yes No
3. If no Why? _____

4. If no, move to question number 7.

5. If yes, when did you begin? _____

6. If yes, how do you use it for income generating activity? Use the table provided below and you may tick all that apply.

Uses	YES	NO
Calling/SMS for income generating purposes		
Receiving calls/SMS for income generating purposes		
Sending/receiving money to/from other people		
Calling/SMS for income generating purposes		
Other income generating purposes(specify)		

7. Do you use your mobile phone for the M-pesa services i.e. Depositing cash, withdrawing, sending money, paying bills, shopping, etc?
   Yes No

8. Do you think the use of mobile phone has influenced your income outcomes?
   Yes No

9. If yes, what was your average household income before the possession of mobile phone and after?

	Before	After
Average household income in (Ksh.)		

10. Using a scale of 1 to 3, where 1 means very much and 3 not much, rate the impact of mobile phone on your income in the last one year.

1. Very much 2. Neither very much nor not much 3. Not much

APPENDIX 2: KEY INFORMANTS INTERVIEW GUIDE

I am a student in the University of Nairobi Pursuing Masters in Rural Sociology and Community development. I am carrying out a study on the **"Impact of Mobile Phones on Household Income Outcomes: A case study of Kiagu location Meru County".** You have been selected for this study as a key informant The information you provide with combination of other key informants and respondents is vital for this study However, none of the information you give will be used for purposes other than for making analytical conclusions.

1. I would like to start by asking you whether you consider the introduction of mobile phones in the last couple of years to have influenced the residents of this area to start income generating activities.

2. What are the common income generating activities do the residents of this area engage into and what is the role of mobile phones inn these activities?

3. Do you think the introduction of mobile phone and in particular M-pesa has created opportunities for income generation for the people of this area?

4. Describe the mobile phone related income generating activities that people of this area are currently participating in.

5. Do you think that the introduction of mobile phones has improved the income of residents of this area compared to the period prior to the introduction of mobile phones?

6. What challenges do you think users of mobile phones encounter in their daily operations?

7. In what other ways has mobile phones impacted on the economic life of people in this area.