

EFFECT OF INFORMATION AND COMMUNICATION TECHNOLOGY  
ADOPTION ON THE LIVELIHOODS OF RURAL CITIZENS OF KISII  
COUNTY, KENYA

BY

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### **ABSTRACT**

Information and Communication Technologies (ICTs) are considered as important tools in empowering rural citizens with the ability to communicate instantaneously thereby facilitating rural development process and information needs. ICTs are now recognized as one of the key sources of growth and competitiveness in the global economy. Despite all this, the livelihoods of many ICT users are still below the poverty line. To add, in developing countries, the potential of ICT adoption is still not understood. The purpose of this study was to determine the effect of ICTs on the livelihood of rural citizens in Kisii County, Kenya. Specifically, the study sought to determine the level of access to ICT by rural citizens; establish the major problems faced by rural citizens in Kisii County in accessing ICT facilities and determine the influence of access to ICTs on the livelihoods of rural citizens. The study was guided by a conceptual framework where ICT adoption was the independent variable and Livelihoods was the dependent variable. Both correlation and case study designs were used. The population of the study was 455 rural residents of Kisii County who have adopted ICT in the businesses. Purposive sampling of 137 respondents based on their ICT skills was applied. The main instrument for data collection was the questionnaire. Analysis revealed that the correlation between ICTs and livelihood assets; financial capital, human capital and social capital were found to be 0.719, 0.681 and 0.610 respectively with a significance of 0.000 (depicting a significant positive relationship). The coefficient of determination was found to be 0.517, 0.464 and 0.373 meaning that ICTs which is an independent variable influenced up to 51.7%, 46.4% and 37.3% of livelihood assets; financial, human and social capital respectively. It was concluded that increasing access to ICTs opens gates to information which further accelerates access of resources and opportunities that generate more resources hence improving livelihoods. The study recommends that Government should increase ICT awareness campaigns and participate in meeting up part of ICT costs to foster ICT growth in rural areas. The study may assist in policy formulation on issues related to ICTs and their effect on livelihoods of rural citizens. Further, the research may provide additional knowledge in the area of ICTs and its effect on the livelihoods of people.

## CHAPTER ONE: INTRODUCTION

This chapter provided an insight to readers to understand the research area. In the beginning, background of research area was presented followed by statement of the problem. Purpose of the study was extended with research questions explaining the objectives of research. Research topic was then justified with brief arguments. Scope and limitations of the study were also discussed.

### 1.1 Background to the study

Information and communication technologies (ICTs) involve improvement in microelectronics, hardware, software, and telecommunication which improves the processing and storage of large amount of information with rapid distribution of information through communication networks (UNDP 2001). Information and communication technology is built on empowering people with an ability to communicate immediately in right way facilitating development process by increasing efficiency and effectiveness (Yonah *et al*, 2002). Ubiquitous and pervasive nature of information and communications technologies (ICTs) can support global community interaction, commerce and learning, resulting in higher standards of living and improved social welfare (Dewan and Riggins, 2005). ICTs as a tool can bring direct benefit on life of rural citizens by reducing poverty, if relevant ICTs are incorporated in rural areas that are more relevant to socio-economic sustainability. In developing countries majority of people live in rural areas and have limited access to technology and information. ICTs helps people to communicate effectively, overcomes the limitations of time and space, empowers people by providing information and knowledge, provides income generating and learning opportunities, increases government transparency and efficiency and enables people to express their concerns and to actively participate in decision making processes at local level (Hosseini *et al*, 2009). Internet offers great opportunity for improving livelihoods of people with right access and utilization of information in rural areas characterized by poor ICTs infrastructure, illiteracy, ICTs illiteracy, low awareness of ICTs use and its benefit (Singh *et al*, 2008). In terms of Information and Communication Technologies (ICTs) and related services, rural communities face constraints such as (a) high cost of accessing ICT such as telecommunication prices (b) restricted access to education, training and user-supported services and (c) inadequate technical capability of the telecommunications infrastructure to access services and information that require high

bandwidth. The study therefore was design to determine the level of access to ICT by the rural citizen in Kisii County.

Information and Communication Technologies (ICTs) provide relevant information on health, education and secretarial services to improve livelihoods of rural people. The innovative use of relevant information provided by ICTs on health, education combining with traditional technologies helps to overcome possible constraints in rural areas (infoDev, 2008). Rural citizens need more technology infrastructure and information to fulfill their ease of use of market information, maintaining social network and accessing government services. The problems of rural people are very critical and have direct impact on survival (Singh, 2010). Theoretically, livelihood is means of gaining a living or a combination of the resources used in activities undertaken in order to live (Singh, 2010). Capability and equity are fundamental means and end of sustainable livelihoods where capability is ability to find and make use of livelihood opportunities, and equity is equal access and end to discrimination. These improve access to high quality education, information, training, social environment, and better access to basic services and infrastructure. In terms of rural development, ICT can play an important role in improving the quality of life for rural people, but this statement has not yet been realized due to lack of accessibility to universal service among rural citizens. So it is necessary to remove the obstacles faced by rural citizens and provide basic infrastructure to spread ICT use. This would enable ICT to be part of a comprehensive socio-economic development strategy for rural development as a means, not an end (Hosseini et al, 2009). The present study therefore sought to establish the problems faced by rural citizens in Kisii County in accessing ICTs.

Information and Communication Technology (ICTs) have importance in both potential value and potential risk of greater socio-economic exclusion faced by citizens of rural areas who cannot access or benefit from ICTs in context of emerging global knowledge and information society. In this context the flexibility of ICTs can make their uses a bit hard to predict but careful planning of expected outcomes could be counterproductive (Parkinson et al, 2006). At the same time, the desire for accountability and effective development requires serious efforts to understand what impact, or at least influence, ICT-related development efforts have had on people's lives.

In developing countries most of the population resides in rural areas where access to information and telecommunication is not possible thus development in such areas it is still inadequate (ITU,

1998). The intervention of ICTs has a positive impact on livelihoods to improve and enhance social networking at various levels and reducing cost and time. This study sought to determine the influence of ICT adoption on the livelihoods of rural citizens in Kisii County

## **1.2 Statement of the Problem**

Information Communication Technologies are regarded as tools for socio-economic development and the major issues for developing countries is not the matter of introducing ICTs for development, but to find the best strategy to implement ICTs for development, and facilitate developing countries to become information societies to improve peoples' lives. ICTs have the potential to improve the welfare of the poor through improved availability of market information, creation of economic opportunities and better access to health and education facilities. The ability to use and adapt ICTs is regarded as critical factor for accessing information and generating knowledge which can be used to achieve socio-economic development. To add the government of Kenya committed to provide free laptops to class one pupils in all public primary schools mostly attended by pupils considered to have backgrounds of moderately lower to medium livelihoods. This initiative is to introduce the younger generation with ICT skills believed to be the key to future positive influence to their livelihoods. The benefits of ICTs are however, yet to be recognized among rural citizens in Kisii County who are argued to be living below the poverty line. The question remains whether adoption of ICT is promoting these people's livelihoods. Despite all these efforts little studies have been conducted to link the effect of ICT adoption on the livelihoods of rural Kenya. Therefore this study was designed to determine the effects of ICT on the livelihoods of rural citizens.

## **1.3 Objectives of the study**

The broad objective was to determine the effect of Information and Communication Technology (ICT) adoption on the livelihood of rural citizens in Kisii County, Kenya.

The study aimed at achieving the following specific objectives:

1. To determine the level of access to ICT facilities by rural citizens of Kisii County.
2. To establish the major problems faced by rural citizens of Kisii County in accessing ICT facilities.

3. To determine the influence of access to ICTs on the livelihood of rural citizens of Kisii County.

#### **1.4 Research Questions**

The study was guided by the following research questions:

1. What is the extent of access to ICT by rural citizens of Kisii County?
2. What are the major problems faced by rural citizens of Kisii County in accessing ICT facilities?
3. What are the influences of access to ICTs on the livelihood of rural citizens of Kisii County?

### **1.5 Justification of the Study**

The study will be significant to the government and donor agencies to make appropriate plans regarding how to deploy ICT as tools for development goals in health, education, livelihoods and achievement of public development. It will help to better assess the connection (or lack of one) between the use of ICT and success in poverty alleviation activities to improve the quality of life of rural citizens in Kenya. Above all, the study will contribute for positive discussion on how far the ICTs intervention have reached to its desired people and to identify changes brought by use of ICTs by rural citizens in Kenya.

### **1.6 Scope of the Study**

This study sought to assess the extent to which ICTs facilities are being utilized by citizens living in rural areas of Kisii County. The study also aimed at improving an understanding of the effects of ICT as a variable on people's livelihood as well to assist the ICTs led development practices. Data was gathered from respondents in rural Kisii County.

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## 1.7 Conceptual Framework

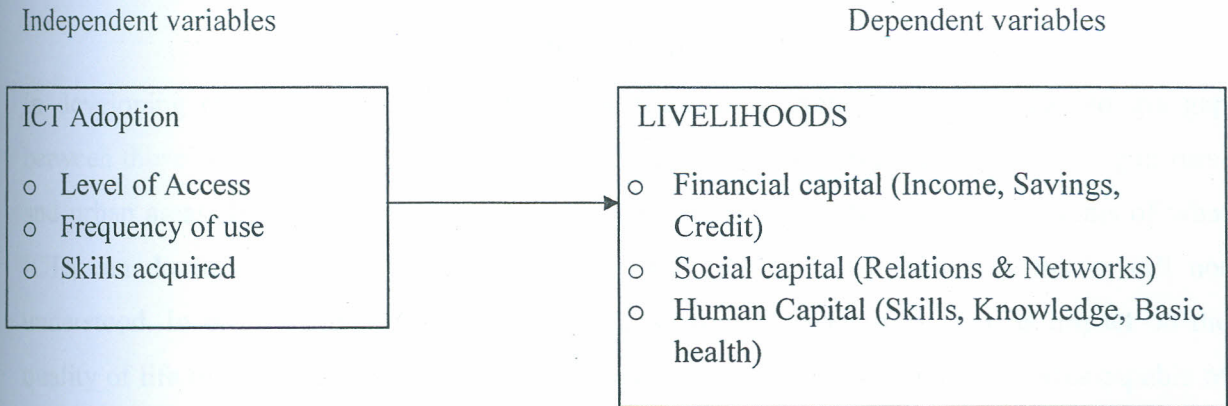


Figure 1.1: Relationship between ICTs and Livelihoods of rural citizens of Kisii County

Source: self-conceptualization 2013

The aim of this framework was to assess the relationship between ICT adoption and livelihoods of rural citizens of Kisii County. ICT adoption was the independent variable that affects livelihoods (dependent variable) of rural citizens of Kisii County over a given period of time. Livelihood was measured by improved financial, social and human capital. ICT adoption was measured by accessibility.



## CHAPTER TWO: LITERATURE REVIEW

This chapter reviewed both theoretical and empirical literature relevant to the study.

### 2.1 Theoretical Review

In developing countries technologies have not reached to groups of rural areas so the gap between those who “haves” and “have-nots” of ICTs use is large between people living in rural and urban areas. In rural areas of developing countries, the potential of ICTs in terms of what ICTs can do to rural citizens’ lives and how ICTs are used by rural citizens is still not understood. In order to fully understand the relationship between ICTs and its impact on the quality of life of rural citizens, it is necessary to articulate multi-disciplinary theories capable of thinking about the realities and subjectivities that are enabled by ICTs on livelihood of rural people. ICTs tools can assist in wealth creation for the rural poor, as in an information society, wealth comes from knowledge. Knowledge is created by accessing, assimilating, sharing and using information that can be accessed via ICTs tools like Computers, email, internet etc. Thus investment and assessment on ICTs tools for better access to information bridges the digital divide and create positive impact on livelihood of rural citizens which is vital. According to Pandit (2009), designed ICTs application for people of rural areas can makes life easy by mitigating livelihood vulnerabilities. Integration of ICTs with traditional knowledge systems at community level provide for rapid information exchange promoting development of the citizens of that community because ICTs enabled knowledge networks can help poor and marginalized people for their development in rural areas. ICTs have become increasing interest and development driving force to gear the livelihoods prosperity in developing countries. The interrelationship of ICTs & people to build livelihoods using ICTs resources strategically is lacking in case of rural areas of Kisii County, so methodological study to expose its uses and impacts that it brings in peoples’ lives was in need.

ICTs facilities should be improved to use the employment opportunities, physical assets and to meet the economic opportunities. All these figure the people centered achievement of ICTs. In order to understand all these context it was necessary to have fruitful study between the ICTs intervention and its touch with livelihood of citizens in rural areas of Kisii County (Colle, 2005).

### 2.1.1 Information Communication Technologies (ICTs)

Heeks (2002) defines ICTs as electronic means of capturing, processing, storing and communicating information. Information and communication technologies (ICTs) involve innovations in microelectronics, computing (hardware & software), telecommunications, micro-processor, semiconductors, and fiber optics. These innovations enable the processing and storage of enormous amounts of information, along with rapid distribution of information through communication networks. ICTs are those technologies that can be used to interlink information technology devices such as personal computers with communication technologies such as telephones and their telecommunication networks for example laptop with email and internet (Chapman et al, 2003). ICTs are a range of electronic technologies which when converged in new configurations are flexible, adaptable, enabling and capable of transforming organizations and redefining social relations which can now be linked to others to share and exchange information and allow it to be used in such a way that they can also be categorised as ICTs. ICTs can be categorized based on time, i.e. how long that it has been used.

New ICTs include computers, satellite, wireless one-on-one communication (including mobile phones), electronic mail and internet. Old ICTs include radio, television, land line telephones and telegraph. ICTs, therefore, are an expanding assembly of technologies that can be used to collect, store and share information between people using multiple devices and multiple media. The synergetic ICTs relationship is shown below.

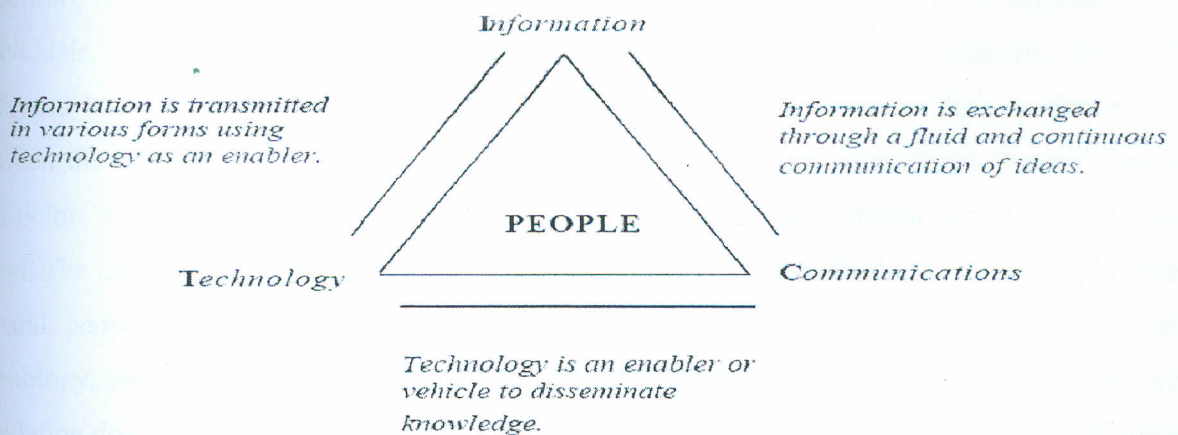


Figure 1.2: Dynamics of ICTs

(Source: Yusoff & Lim, 2003, p.2)

In order to understand what ICTs can represent, it is necessary to find broader definitions of people centric approach. Attention can now be given to some critical factors (i.e. local accessibility and human networks) for ICTs and development initiatives to co-exist. Accessibility can represent not only the obvious physical access to ICT infrastructure, but also context-sensitive access in terms of local language and relevant content for rural citizens (Yusoff & Lim, 2003). To understand ICTs it is necessary for one to understand the pre-existing role of information within development which includes process and outcomes. Process is changing data with potential value into information with actual value and move from source to recipient through communication network i.e. internet, where electronic handling of these processes is main contribution of ICTs. The outcome of ICTs in development is learning and decision making where information is transformed into knowledge as an input for decision making and action.

### **2.1.2 Digital Divide and Access to ICTs**

The intervention of ICTs led to technological revolution in the globe changing the global social and economic conditions making use of these technologies. In the globe, due to technology revolution, developed countries became societies of electronic information, and developing countries are involved in bridging the digital divide by making effective use of ICTs among rural and remote citizens. Rural citizens of developing countries still do not have access to ICTs due to lack of ICTs facilities and low income to afford the facilities (Oludolapo & Osunkunle, 2010). According to Lesame (2005), the term digital divide refers to the gap between the access of individuals, households, organizations, countries and regions at different socioeconomic levels of ICTs and Internet usage. This shows that digital divide not only refers to the gap that exists between the impoverished, poor, rural "have-nots" and the affluent, rich, urban "haves", but it also points to the divide that exists between the underdeveloped and developed nations of the world. The term 'digital divide' describes the fact that the world can be divided into people who do and people who don't have access to and the capability to use modern information technology, such as the telephone, television, or the Internet. In the world, one third of the population does not have phone calls and seventy percent of world population lives in rural areas where access to information and communication technologies is of scarce (Gurstein, 2007). Most of the information exchanged over global networks such as the Internet is in English, the language of less than ten percent of the world's population (Gurstein, 2007). Digital divide exists

due to socio-economic inequalities and can be characterized by insufficient infrastructure, high cost of access, inappropriate or weak policy regimes, inefficiencies in the provision of telecommunications networks and services, lack of locally created content, and uneven ability to derive economic and social benefits from information-intensive activities. In order to develop the concept of physical access to ICTs, the term real access is needed; access that goes beyond just physical access and makes it possible for people to use technology effectively to improve their lives closing the digital divide (Bridges.org, 2003).

### **2.1.3 Information Chain Model**

ICTs disseminate processed electronic information according to the user's request which contributes in socio-economic development, so in order to understand the necessary resources and activities needed for information to contribute to development, it is important to know the information chain. The chain presents interconnection between data and effective actions for development.

Therefore, access to data and access to ICTs might be necessary, but they are far from sufficient conditions to enable effective development because to make ICTs intermediaries truly effective, information chain resources i.e. social and economic resources must be provided. More generally, all those involved with ICTs must adopt an interconnected approach that ensures an information chain package, not just technology but also the data, economic, social and action resources that are required to turn data into learning, decisions and actions of value (Heeks, 2002). The study also finds to understand the information related divides, and information should be the result of process of accessing, assessing and applying data. Data remains as data unless people have skills to transfer it into useful information or knowledge. Data are used as the input which is then processed assessing its relevance and applying assessed data to specific information as the output. Information of one can be the data of others who have no valuable meaning. Finally, the information chain model also suggests ways in which ICTs may be a divergent rather than convergent technology. Today ICTs tools and techniques are introduced and those who have information chain resources are likely to benefit while those who do not may not benefit (Heeks, 2002).

Heek's information chain is a useful technique to understand ICTs led impact because it demonstrates how an individual processes data into information and act upon it to achieve

desired outcomes. According to Chapman & Slaymaker (2002) information chain should be understood in context of economic, social, data and action resources which assist human beings to transfer data to information to acquire better livelihoods. Access to information via internet is not very difficult task since greater challenge is the assessment and transformation of data to meaningful knowledge as well as the availability of social resources. Hence, people capabilities to access and assess data and acquire and share knowledge need to be considered in developing countries (Ashraf et. al, 2008). In poor communities of rural areas, telecentres provide information but rural citizens do not understand the content and relevancy of content they access. Also through telecentre services poor community identify new markets for local products but are unable to deliver goods to the market due to terrible roads and unaffordable transportation costs. All these lacking resources makes information chain un-functional and leads ICT4D projects to fail to produce significant impact in the community of rural areas (Heeks, 2005).

#### **2.1.4 Knowledge and Rural Development**

The power of knowledge for development can be greatly enhanced by ICTs if they are harnessed to improve access and break down barriers to knowledge because while education develops cognitive skills, information gives content to knowledge (Chapman & Slaymaker, 2002). World development report focuses on knowledge gaps which refer to unequal distribution of technical knowledge. Emergence of knowledge economy through technology revolution and unequal distribution of information results in information problems that contribute to underdevelopment. ICTs improve the access to knowledge and information exchange addressing both barriers to rural development through its potential. To achieve these needs, ICTs can be used strategically by understanding the potential of technologies in social, political and cultural context in which ICTs could be used (Chapman, 2002). The strategic use of ICTs for poverty reduction will depend on developing the appropriate infrastructure to enable economic development and appropriate information content for the necessary social and human development to occur (Skuse, 2001). Considering these infrastructure helps to inform future rural development strategies, assessing information, users and their knowledge need. In technological revolution of the world, ICTs come as an important driving force for people and world to knowledge economy but ICTs development to-date has not been geared towards addressing specific needs of rural and remote people.

### 2.1.5 Sustainable Livelihood Framework

In order to understand the role of ICTs use on livelihood of rural citizens in Kisii County, this research study set out the asset pentagon model which is core components of sustainable livelihood framework. Asset pentagon composed of five assets which show interrelationships of various capitals: social capital, human capital, financial capital, physical capital and natural capital. The implementation of ICTs for development generates multiple opportunities, so any single capital of asset can be necessary condition but not sufficient condition to achieve overall socio-economic development (Thapa & Saebq, 2011). The sustainable livelihood framework is a tool used for planning and assessing ICTs intervention in development. It focuses on how people strategically use the resources available to them to forge the livelihoods, and how ICTs interventions in development affect the available resources and the way people interact with them. The framework includes the following components: capital assets, vulnerabilities context, processes and livelihoods outcomes. All these components present factors that affect the rural citizen's livelihood and their relationships. The livelihood framework identifies five types of capital upon which livelihoods are built. Increasing ownership to use these capitals can provide support to rural people's livelihood and reduction of poverty.

Human capital represents the skills, knowledge, ability to labour and good health that together enable people to pursue different livelihood strategies and achieve their livelihood objectives (DFID, 1999). Many people regard ill-health or lack of education as core dimensions of poverty and thus overcoming these conditions may be one of their primary livelihood objectives.

Social capital in the context of the sustainable livelihoods framework is taken to mean the social resources upon which people draw in pursuit of their livelihood objectives that is developed through networks and connectedness that increase peoples' trust and ability to cooperate, membership of more formalized groups and their system of rules and sanctions, relationships of trust which facilitate cooperation reducing transaction cost for rural people (DFID, 1999).

Financial capital denotes the financial resources that people use to achieve their livelihood objectives (DFID, 1999) such as cash or equivalent i.e. available stock (cash, bank deposits, livestock and jewellery) and regular inflows of money (labour income, pensions, transfer from states and remittances) that enables people to adapt different livelihood strategies (ibid).

Natural capital is the term used for the natural resource stocks from which resource flows and services useful for livelihoods are derived (DFID, 1999) such as land and forest.

Physical capital include necessary commodities and infrastructure needed to support livelihoods such as affordable transport, secure shelter and buildings, adequate water supply and sanitation, clean affordable energy and access to information (DFID, 1999). The vulnerability context frames external environment in which people exist where the existence is affected by population trends, economic shocks, civil conflict, natural shocks, and seasonal changes of prices, production and employment. In the livelihood framework structure and processes are the institutions, organizations, policies and legislation that shape livelihoods of rural people. Strategies in livelihood denote combination of activities that rural people can adapt to achieve their livelihood goals. Through adjustment of these strategies livelihood outcome is achieved such as improved income source, reduced vulnerability, improved sense of well being and increased sustainability of natural resources (DFID, 1999). According to Silva (2008) ICTs always have key role to mitigate context of vulnerability in people's life and improve their assets which have direct relation with their livelihoods. ICTs always facilitate to select best strategies to have positive outcomes on rural people's livelihood. Sustainable livelihood framework provides best guidelines for researcher to study impact of ICTs on livelihood of people by linking between ICTs and assets, mitigating vulnerabilities faced by rural citizens to have better livelihoods. Bridging the digital divide is not merely increasing the number of telephone lines or providing improved Internet access, but is basically about impacting the lives of people and empowering them through ICT Singh (2006). So, in this study sustainable livelihood framework will be useful. The activities of ICTs are fundamental elements of rural development. According to Thapa & Saebq (2011) rural areas are characterized as information poor where poor people typically lack access to information that is vital to their livelihoods and need of information has always become component of rural development. The livelihood framework does not necessarily aim at addressing all aspects of the livelihoods of the rural citizens in a single intervention.

## **2.2 Empirical Review**

According to Chilimo (2008) who examined the relationship between ICTs and sustainable livelihoods in selected rural areas of Tanzania, a combination of the sustainable livelihoods framework and other ICTs for development models formed the theoretical foundation of the

study. The investigation was carried out using ICT services provided by the telecentres and mobile phone services in two rural districts in Tanzania. It used a multi-case study research design. A mixed paradigm methodology was adopted and the qualitative research was used as a dominant paradigm. Data was collected through structured interview protocols administered to 203 users and non-users of ICTs in communities surrounding the telecentres. The findings of the study indicated that, contrary to the use of mobile phones, which was characterized by greater uniformity across socio-economic groups and gender, telecentre users in the researched areas were generally young. The majority were males with higher levels of education. It was found that telecentres management have failed to take into consideration the appalling conditions of the extremely poor and disadvantaged individuals in their provision of ICT services to the community. The findings further show that while the necessary conditions for access exist in all the telecentres involved in the study, sufficient conditions for access are still lacking, especially with regard to skills, awareness and affordability. It was also found that use of ICTs in rural areas is still faced with many barriers ranging from affordability to language problems and the lack of basic infrastructure such as electricity. The study recommended that telecentre managers should re-design programmes with the aim of bringing the under-represented groups such as farmers back to the centre of their projects, rather than treating them as passive receivers of ICT services. On the issue of mobile phones, there was a need to develop services that are nuanced towards the real needs of the rural people and incorporate them into the mobile technology.

Though this study concentrated in determining the relationship between ICTs and livelihoods in rural areas of Tanzania, adopted a multi-case study design, the present study concentrated on the effect of ICT adoption on the livelihoods of rural residents in Kenya and applied both case study and correlation designs.

Suleiman (2010) explored on the role of information communication technology on poverty alleviation in Nigeria and found out that the impact and potential of ICTs have not been fully exploited in the Nigerian context. While the formal government sector continues to play an important role, it is the growth of private participation in providing affordable computer education, especially to the socially and economically under-privileged that appear to have provided the impetus for growth in qualified professionals. In his findings he observed that education and training in computer programmes and packages is likely to increase the



capabilities for job-seeking, which in turn would change the socio-economic structure of the households whose members have been the beneficiary of such programmes. Data for his research were drawn mainly from documentary sources. The results of this study points out that computer education appears to have tremendous scope and a major source of empowerment of people especially the socially and economically backward in Nigeria.

Though this study mainly used secondary data, the present study used both secondary and primary data.

According to Mago (2012) who analyzed the impact of Information and Communication Technologies (ICTs) on livelihoods of smallholder farmers in Zimbabwe, a sustainable livelihood approach was used with special attention to Chapman et al (2001)'s information wheel. The study followed a qualitative research methodology. Data were collected from published reports of government, reports from the Ministry of ICT, internet, journals, newspapers and periodicals. The study established that Information and Communication Technologies promote livelihoods of smallholder farmers through the dissemination of vital information for improvement of agricultural productivity. From the research findings, the study recommended Strengthening of ICT policy for effective smallholder farmers, enhancement of ICT awareness campaigns by the government directed towards rural people especially smallholder farmers, scaling ICT Infrastructural development and commissioning of livelihoods research in the country.

Though this study mainly used qualitative research approach to find answers to research questions, the present study utilized both case study and correlation to bring out the level of influence ICT adoption has on livelihoods.

Thapa *et al* (2011) studied the role of ICT for development in mountain regions of Nepal. A case study approach was adopted with the focus on those in the rural Nepal. Interviews, focus group discussions and observations were supplemented by completion of questionnaires by residents of rural Nepal. The research findings suggested that ICT can help build more efficient, complete products or services that have deeper impact in poverty alleviation. The use of ICT was found to increase the value proposition in various ways including accurate and fast needs recognition, adapting products and services to the needs of beneficiaries, opportunities creation, information

disclosure and fairer markets construction, new access channels to beneficiaries thus access to markets for people living in isolated areas and access to isolated communities for enterprises that provide goods and services. The researcher recommended strengthening of e-government and scaling up of ICT infrastructural development in rural Nepal.

Pandit (2009) carried out a study on Technology for development of livelihoods, reflections on case studies of India. The objectives for the study were to establish how ICT factor impact on social capital's constructing of rural female entrepreneurs, and to further find out how ICT impact the performance of entrepreneurship. Data of the research was collected by means of interviews, notes taking, observations, and questionnaire investigation based on social network analysis. The interviews were mainly semi-structured. The subjects of the research were rural entrepreneurs of Liaoning province. The purpose of using ICT by rural entrepreneurs was mainly found to be connecting with family, friends, and clients. The research findings indicate that usage of ICT helps rural female entrepreneurs to create and extend social capital though those who have access are few. The researcher recommended that local government should increase budgetary funds and loans for ICT infrastructure, provide more technological support to rural areas, and build a platform for e-commerce.

Sefika *et al* (2012) carried out an Investigation on the benefits of ICT in Lesotho rural communities of Mabote and Kubetsoana mainly to find the benefits that ICT contributed to the socio-economic development of Lesotho rural communities. The study used Activity Theory and investigated ICT diffusion and infusion in Lesotho's disadvantaged communities. The study also applied the cause and effect principle and questionnaires were distributed in the two villages of Lesotho that were investigated; Mabote and Khubetsoana. An investigation on the benefits of ICT in rural communities of Lesotho revealed that it will take addressing a number of issues before any benefits can be realized. Research results revealed that realizing the benefits of ICT in rural communities require adequate knowledge of the underlying causes of the digital divide. It was also found that while ICT had a number of potential benefits towards the socio-economic status of rural Lesotho, issues like cost, accessibility, lack of infrastructure and illiteracy among others remain a challenge to the full realization of this empowerment. The research recommended that awareness campaigns should take place at all levels, ICT education be

incorporated in the school curriculum at all levels and further research and analysis be done to determine the role of government as stakeholders especially in meeting up the costs as well as developing alternative solutions.

### **2.3 Summary of Literature Gaps**

The review depicts gaps in methodologies, context and objectives that this present study sought to address.

Methodologically, the studies by Mago (2012) applied qualitative research while the present study applied case study and correlation designs. Furthermore the study by Suleiman (2010) utilized multi-case study design while the present study utilized case study design.

By objective, the study by Pandit (2009) attempted to gauge the relationship while the present study sought to determine the effect of ICT on livelihoods.

Put together, the foregoing research gaps suggest the reasons for a study on the effect of ICT adoption on the livelihoods of rural citizens in Kisii County.

## **CHAPTER THREE: RESEARCH METHODOLOGY**

This chapter describes the methods, techniques and strategies that were used to address the research problem. It provides information on the study area, research design, target population, sample and sampling techniques, data and data collection techniques, reliability and validity tests for data collection instruments, data processing, analysis and presentation techniques as well as ethical considerations used in the study.

### **3.1 Study Area**

The study area was Kisii County and it targeted rural citizens who had adopted ICT in their business enterprises. Kisii County is located in Southwestern part of Kenya. Its capital and largest town is Kisii. The rural parts of the county are inhabited mostly by the Gusii people. Kisii County was preferred because of its uniqueness in business operations. The County is a haven of business enterprises with lately majority adopting ICT while at the same time the livelihoods of the rural folks indicate a mixture of comfort and desperation.

### **3.2 Research Design**

Both correlation and case study design were utilized to determine the effect of ICT adoption on livelihoods of rural citizens of Kisii County. According to Orlikowski and Baroudi (1991), case study is one of the primary research designs for Information Systems research, besides laboratory experiments and surveys. A case study is an empirical enquiry that looks into contemporary phenomenon within its real life situation. The focus of this study was on contemporary phenomenon with some real life content, thus the preference for case study.

### **3.3 Target Population**

The target population comprised of 455 rural residents of Kisii County who have adopted ICT in their businesses.

### **3.4 Sample and sampling techniques**

The sample size for the study was 137 which is 30% of the entire population. Mugenda & Mugenda (2003) argues that 30% of the entire population is a good sample to make a generalization in social science studies. Purposive sampling was employed to contact respondents based on their ICT skills.

### **3.5 Data and data collection techniques**

The study used two kinds of data; primary and secondary data. Primary data was collected using self-administered questionnaires delivered to respondents by the researcher. Secondary data was obtained from records, books and web information.

### **3.6 Reliability and validity tests for data collection instruments**

Primary data was collected using well-structured questionnaires designed based on the literature related to the study objectives. The questionnaire was subjected to expert review to attain its reliability.

### **3.7 Data Analysis and Presentation**

The data gathered was processed for analysis by editing, coding, categorizing and recording. These data was subjected to both qualitative and quantitative analysis. Qualitative methods of analysis such as simple descriptive statistics were used to present the descriptive information.

Quantitative methods of analysis such as Correlation and Regression analysis were used to determine the relationship between ICT and livelihood of citizens in rural Kisii County. Analysis of case study is qualitative and interpretive based on Klein and Myers (1999) principles for conducting and evaluating interpretive field studies (Singh et. al, 2008) on ICTs led development. The impact was discussed under social, human, and financial capital interpreted from the outcomes of the ICTs initiatives. It is important to note that many of the ICTs initiatives are connected to improve the livelihood of rural people (Singh et. al, 2008). Analyzed data was presented in the form of tables, charts and figures.

## CHAPTER FOUR: RESULTS AND DISCUSSIONS

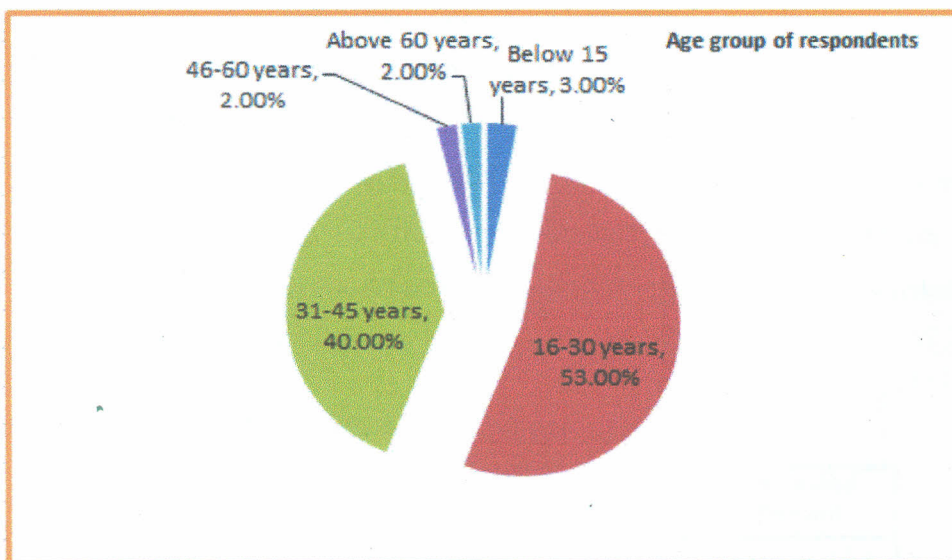
This chapter presents the results and findings of the study as captured from the analysis of the study objectives. The study had three objectives which were to: determine the level of access to ICT facilities by rural citizens of Kisii County, establish the major problems faced by rural citizens of Kisii County in accessing ICT facilities and to determine the influence of access to ICTs on the livelihood of rural citizens of Kisii County.

### 4.1 Level of access to ICTs by Rural citizens of Kisii County

#### 4.1.1 Percentage of responses according to age group

As indicated in figure 4.1, the majority of respondents, 53% were between the ages of 16-30 years followed by the 31-45 years age group that had 40%. In societies such as rural Kisii County, these age group categories are the most socially and economically active as well most literate age groups of the society.

**Figure 4.1: Percentage of Responses according to Age Group**



#### 4.1.2 Principal Source of Income for the sampled individuals

Table 4.1 indicates that most of the respondents, 28% of the respondents earn a living from full time employment and it is their principal source of income. Self-employment included small enterprises in carpentry, tailoring, cobblers and barber shops among others and this comprised of 26% of the respondents. 23% of the respondents engage in agriculture and livestock farming.

**Table 4.1: Principal Source of Income**

Source of Household Income	Responses	Percentage Responses
Full time Employment	39	28%
Business/ Self Employed	35	26%
Other	27	20%
Agriculture/Livestock	31	23%
Pension	5	4%
Total	137	100%

Source: Survey data 2013

#### 4.1.3 Level of access to Information Communication Technologies

Respondents were asked about frequency of use of different ICTs. Figures in the table below represent the result on a five point scale (where 1 = “lowest” and 5 = “highest”). Majority of the respondents represented by 36.5% indicated that they have medium access to ICTs as shown by table 4.2 below. Up to 40.9% of the respondents experience low to lowest level of access while 22.6% of the respondents have high to highest access level. The results indicate different priorities in using ICTs services and these were mostly dependent on education and literacy level. Most young people sampled preferred using mobile phones and computers to access internet, social networks and educational requirements. Older people preferred listening to the radio and watching TV as compared to using internet and e-mail.

**Table 4.2: Level of access to ICTs**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Lowest	20	14.6	14.6	14.6
Low	36	26.3	26.3	40.9
Average	50	36.5	36.5	77.4
High	20	14.6	14.6	92.0
Highest	11	8.0	8.0	100.0
Total	137	100.0	100.0	

Source: Survey data 2013

Using the Pearson correlation statistical analysis for a 0.01 two-tailed significance test, it is seen that level of access to ICTs by the local citizens of Kisii County is positively correlated to their education and literacy levels ( $r= 0.606$ ). This is shown in Table 4.3 below.

**Table 4.3: Pearson’s Correlation relating ICTs access with education**

		Level of Educ.	Level of Access
Level of Educ.	Pearson Correlation	1	.606**
	Sig. (2-tailed)		.000
	N	137	137
Level of Access	Pearson Correlation	.606**	1
	Sig. (2-tailed)	.000	
	N	137	137

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

Source: Survey data 2013

**Table 4.4: Respondents’ education level**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Primary	34	24.8	24.8	24.8
	O-Level	39	28.5	28.5	53.3
	College Certificate	29	21.2	21.2	74.5
	College Diploma	28	20.4	20.4	94.9
	University	7	5.1	5.1	100.0
	Total	137	100.0	100.0	

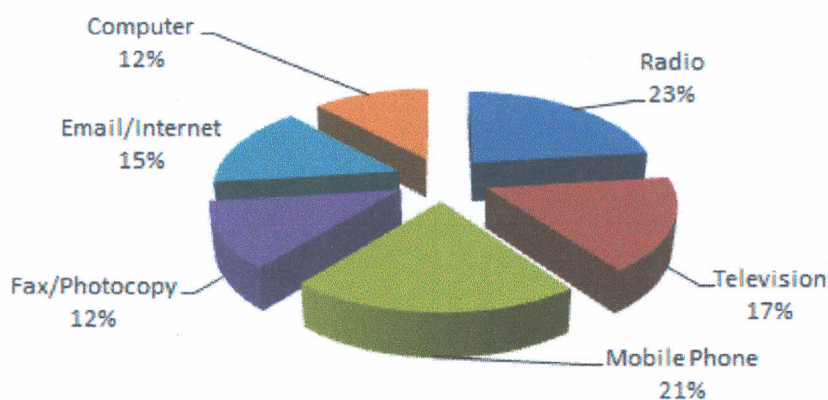
Source: Survey data 2013

The Study also found out that education to some extent determined the type of ICTs frequently accessed. Respondents who were university and college educated preferred accessing information through internet/Email while the less educated preferred old ICTs such as radio and Television for their information needs. A number of respondents indicated that they experience limited access to ICTs due to inadequacy and or lack of electricity supply to their homes. Only 30% of the respondents indicated to be having access to electricity as illustrated by figure 4.2 below. A whopping 70% do not have access to electricity, a factor which contributes greatly to their limited access to ICTs. Some of them however, make efforts to access ICTs at telecentres which they travel several kilometres to access. Respondents blamed poor road network and bad roads as hindrance towards their travelling efforts to visit telecentres.



The study further established that Modern ICT tools such as computers, e-mail, internet and faxes are the most underutilized ICTs in Kisii County. The most utilized ICT tool being the radio at 23% followed closely by mobile phone at 21%. Television comes third at 17%. Respondents representing 15% of the total majority of them being students and professionals indicated that they prefer Internet/E-mail which they mainly use for research/educational reasons, social and business dealings as well as searching for employment and business opportunities. This is shown in figure 4.2 below.

**Figure 4.2: Preference of ICTs usage**



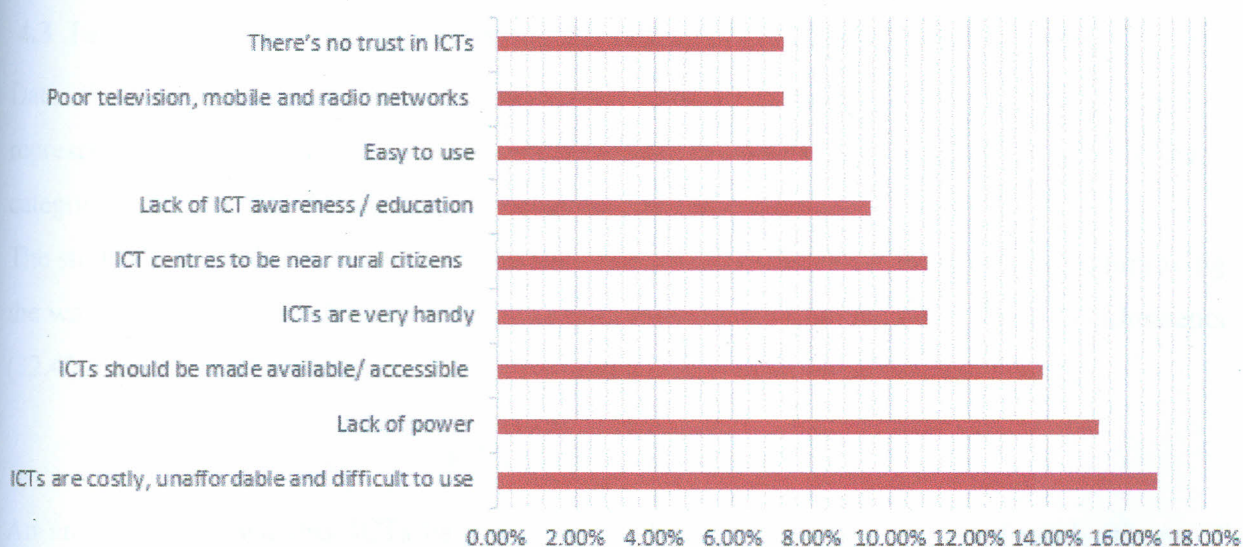
Respondents who do not use the radio on a daily basis indicated that it becomes too expensive owing to the cost of batteries which they use to operate the radios since they lack access to electricity. Mobile phones are also less frequently used on a daily and weekly basis also owing to the costs of recharging of prepaid airtime. Several respondents indicated that they do not use most of the ICTs because of the high costs involved in using them. 21% indicated that they do not see the need to use ICTs and 18% do not have access to infrastructure required to use ICTs while 8% indicated lack of education capacity.

#### **4.2 Difficulties faced by rural citizens of Kisii County in accessing ICT facilities**

The results revealed that a significant number (23; 16.79%) of the respondents in rural Kisii County felt that ICTs were not only costly and unaffordable to them, but also difficult to use. Similarly, 21 (15.33%) felt that lack of electricity is one of the biggest impediment barring them from effectively utilizing ICT facilities. Nineteen (13.87%) indicated that ICTs should be made available and accessible, in other words they feel that they have not had substantial access to impact their lives appropriately. Coincidentally, the numbers of those who found ICTs to be

handy (15; 10.95%) and those who felt that ICT centres should be established near rural citizens (15; 10.95%) were similar. Thirteen (9.49%) respondents were of the opinion that there is lack of ICT education and awareness, while 11 (8.03%) affirmed that ICTs are accessible and easy to use. Another group of respondents both represented by 7.30%, pointed out problems with infrastructure, such as poor television, mobile & radio networks and lack of trust in ICTs. Therefore, on average, the results revealed that 111 (81.02%) respondents felt that ICTs were too far, too costly, difficult to use or not easily accessible. Only 26 (18.98%) acknowledged the availability of ICTs, citing that they were “handy” (15; 10.95%) or “easy to use” (11; 8.03%).

**Figure 4.3: Respondents’ observations during their access to ICTs**



Generally, the challenges revealed in the results largely revolve around resistance from users based on cultural or religious beliefs, traditions as well as economic hardship which restrict people from using ICT facilities. The rural community also believes that ICT has impacted negatively on the society in the form of increased violence and other crimes. They contend that Internet and TV expose youth to immoral stuff and that mobile phones can be used in committing crime. Lack of electricity and affordable telecommunication networks renders it difficult for individuals in rural areas to invest in telecenters. This shows that infrastructure is still a major obstacle towards livelihood interventions in rural areas. The infrastructure problem is further aggravated by lack of initiatives to coordinate and make use of existing infrastructure. Most respondents raised the need for supporting infrastructure such as proper roads and

electricity which were mentioned as constraints to ICT development. Another constraint remains the low income that these people earn; most people depend on subsistence agriculture which earns them enough for food and clothes and this leaves ICT tools and services very expensive. The charges for internet, airtime and prices of batteries were provided as examples. The rural communities also highlighted lack of ICT awareness among other issues as a barrier as reflected in the results that about 23% of respondents use radio, 21% use mobile phones and 17% use TV. Only 15% use email and internet combined. When asked which tools are best in providing them with local information, most respondents cited radio, word of mouth and mobile phones.

### **4.3 Influence of access to ICTs on the Livelihoods of Rural Citizens of Kisii County**

Data that was collected using questionnaires was later regrouped into three categories representing livelihood assets i.e. financial, social and human factors. The results from the three categories were used to draw general conclusions on the findings.

The study revealed that ICT has the potential to improve rural livelihoods through improving the way business and work is conducted (23.9%), increased access to educational requirements (32.4%) and ease of communication and increased access to key information (43.7%).

#### **4.3.1 Financial capital**

An analysis as to whether ICTs have a positive effect on financial capital of rural citizens of Kisii County revealed that most of the respondents represented by 36% agreed that the effect is much. 31% of the respondents were of the opinion that the effect is average while 17% indicated that there is a very positive effect on financial capital. A 7% of the respondents suggested that the effect little or rarely felt. The remaining 9% of the respondents disagreed that ICTs have had positive effect on financial capital of rural citizens of Kisii County. Majority of the respondents who agreed with the statement indicated that ICTs have helped them attain new clients for their business, provided information on better market prices of commodities, brought about increased sales as well as reduced time needed when making business arrangements among others benefits.

**Table 4.5: Correlation between ICTs and financial capital**

		ICTs	Financial Capital
ICTs	Pearson Correlation	1	.719**
	Sig. (2-tailed)		.000
	N	137	137
Financial Capital	Pearson Correlation	.719**	1
	Sig. (2-tailed)	.000	
	N	137	137

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

Source: Survey data 2013

The correlation between ICTs and their effect on financial capital was found to be positive 0.719. Pearson's correlation coefficient was used with significant level of 0.01.

**Table 4.6 Coefficient of determination between ICTs and Financial capital**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.719 <sup>a</sup>	.517	.513	.78219

a. Predictors: (Constant), ICTs

Source: Survey data 2013

From the table above, the coefficient of determination (R square) between ICTs and financial capital is 0.517 meaning that ICTs which is an independent variable influenced up to 51.7% of a livelihood asset, financial capital. The remaining 48.3% is determined by other factors other than ICTs.

**Table 4.7 Coefficient of regression analysis relating ICTs and Financial Capital**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.946	.231		4.100	.000
	ICTs	.748	.062	.719		

a. Dependent Variable: Financial Capital

Source: Survey data 2013

**Table 4.10 Coefficient of regression analysis relating ICTs and Human Capital**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.800	.268		2.987	.003
	ICTs	.781	.072	.681	10.803	.000

a. Dependent Variable: Human Capital

Source: Survey data 2013

### 4.3.3 Social capital

It was established that 70% of the respondents were of the view that ICT has either very much or much positive impact on their social lives, whereas 23% felt that the impact is average. A very small proportion of respondents represented by only 1% were of the opinion that ICTs do not have any impact at all on their social lives while 6% agreed that there is only a small effect.

**Table 4.11: Correlation between ICTs and social capital**

		ICTs	Social Capital
ICTs	Pearson Correlation	1	.610**
	Sig. (2-tailed)		.000
	N	137	137
Social Capital	Pearson Correlation	.610**	1
	Sig. (2-tailed)	.000	
	N	137	137

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

Source: Survey data 2013

The correlation between ICTs and their effect on social capital was found to be positive 0.610.

**Table 4.12 Coefficient of determination between ICTs and Social capital**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.610 <sup>a</sup>	.373	.368	.69482

a. Predictors: (Constant), ICTs

Source: Survey data 2013

From table 4.12 above, the coefficient of determination (R square) between ICTs and social capital is 0.373 meaning that ICTs which is an independent variable influenced up to 37.3% of a livelihood asset, social capital. The remaining 62.7% is determined by other factors other than ICTs.

**Table 4.13 Coefficient of regression analysis relating ICTs and Social Capital**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	
	B	Std. Error	Beta			
1	(Constant)	2.215	.205		10.807	.000
	ICTs	.495	.055	.610	8.954	.000

a. Dependent Variable: Social Capital

Source: Survey data 2013

The correlation between access to ICTs and social capital (R) is 0.610; the square of the correlation yields the coefficient of determination (R square).

#### **4.4 Discussion of research findings: Effect of ICT adoption on Livelihoods of rural citizens**

The correlation between ICT adoption and the various livelihood assets: financial capital, human capital and social capital was found to be 0.719, 0.681 and 0.610 respectively with a significance of 0.000. Since the significance is a value less than 0.05 then it can be interpreted to mean that at 5% level of significance, access to ICTs and the various livelihoods assets; financial; human and social capital had a positive significant relationship. These findings contradict those of Chilimo (2008) who argued that found that use of ICTs in rural areas is still faced with many barriers

The findings further contradicts those of Suleiman (2010) who found out that the impact and potential of ICTs have not been fully exploited in the Nigerian context.

The findings of the study in rural Kisii County shows there is need to create more data resources for locally produced content. The infrastructure of road, infrastructure of telecommunication, infrastructure of electricity supply, and money to buy ICTs equipment that add to improve infrastructure which support in skills development are the economic resources to create data resources. But these infrastructures are inadequate in rural Kisii County. Most rural parts of the County face problems of poorly developed infrastructure, such as in electricity and internet

facilities. Only 30% of the respondents indicated to have access to electricity. This finding concurs with those of Mago (2012) who established that Information and Communication Technologies promote livelihoods of smallholder farmers through the dissemination of vital information for improvement of agricultural productivity and recommended strengthening of ICT policy for effective smallholder farmers, enhancement of ICT awareness campaigns by the government directed towards rural people especially smallholder farmers, scaling ICT Infrastructural development and commissioning of livelihoods research in the country. However, better use of ICT tools like radio and mobile phones can facilitate communication and sharing of information and knowledge, and hence increase empowerment and voice of the rural people of the County. There is no doubt that ICTs can be used in support of poverty alleviation in ways that are effective, cost-effective, affordable, supportable, scalable and self-sustaining. Perhaps the key point is that ICTs are used in support of poverty alleviation, and not as an end unto itself. The issue is poverty, not the digital divide. Care should be taken so that ICT programs are not just technology-driven but respond to the needs of the poor, when it comes to content, language, skills, design, and price. It is important to address the sectors and areas that are of direct relevance to poverty reduction and where the use of ICTs can make a difference. Local communities should be involved in the design of universal access programs through consultations and surveys. In the long run, it is necessary to develop financing frameworks that attract private investment. It is an indicator that the private sector with the right goals and accompanying policies can be a friend of the poor. ICT can contribute to poverty reduction, if it is tailored to the needs of the poor and if it is used in the right way for right purposes and complemented with required reforms. Like all technologies, ICT offers tools and applications but no solutions. The solutions to the problem of poverty are what they have always been: economic growth, enabling infrastructure, the creation of livelihoods, social capital, education and healthcare, and sufficiently democratic government to ensure that economic benefits are not cornered by the powerful elites. By providing cheap and efficient tools for access to information and exchange of ideas and knowledge to the local residents, ICT can become an enabling tool for wider socioeconomic development. When properly used, it can greatly increase the ability of the rural poor to benefit from economic development and from development programs meant to help them. ICTs enable communication, a process that links individuals and communities, governments and citizens, in participation and shared decision making. This can be done through

use of a variety of ICTs to engage, motivate and educate rural citizens in opportunities for development and poverty reduction. In this way, promoting changes in peoples' attitudes and behaviours increases their participation in the development or poverty reduction processes. Most of the rural residents of Kisii County access radio more than any other tool. 23% of the have access to radio. Radio remains the most popular, viable, accessible and cost-effective means of communication for rural people in the County. It is cheap and overcomes barriers of distance, illiteracy and language diversity better than any other media. Other ICT tools, such as computer, fax, internet and email, are not as frequently used. This is mainly because of lack of power and also lack of usage skills by most residents of the rural regions of the County. A good number of respondents represented by 21% indicated that they have access to mobile phones. Mobile phones have made communication easy and cheap. Information is power: once you have access to it, you are likely to develop. Through the use of internet and mobiles, local residents of the County have been getting jobs and opening businesses. About 44% of the respondents use ICT tools to key information. This can improve livelihoods of the rural poor through the timely access to information on the current status of the market, allowing them to sell or buy products with a good profit margin.



## **CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS**

This chapter presents the summary, conclusions and recommendations of the study as captured from the analysis of the study objectives. This chapter further gives recommendations for further study.

### **5.1 Summary of Findings**

The main objective of the study was to determine the effect of Information and Communication Technologies (ICTs) on the livelihood of rural citizens in Kisii County, Kenya. In order to achieve this objective, the researcher pursued to investigate the level of access to ICTs and its influence on human, financial and social dimensions of livelihoods of rural citizens in Kisii County. Past studies reaffirmed that ICT is crosscutting and an enabler for growth and development and for maximum benefit, but was still underutilized. The studies recommended that countries must establish the right policy interventions, resource investments, appropriate networks and enabling environment. Previous studies further show that although much effort has been put towards availing ICT facilities, sufficient conditions for access are still lacking, especially with regard to skills, awareness and affordability.

#### **5.1.1 Effect on Financial capital**

An analysis as to whether ICTs have a positive effect on financial capital of rural citizens of Kisii County revealed that most of the respondents represented by 36% agreed that the effect is much. 31% of the respondents were of the opinion that the effect is average while 17% indicated that there is a very positive effect on financial capital. A 7% of the respondents suggested that the effect little or rarely felt. Lastly 9% of the respondents disagreed that ICTs have had positive effect on financial capital of rural citizens of Kisii County.

#### **5.1.2 Effect on Human capital**

A study on the effect of ICTs on human capital, revealed that majority of the respondents agreed that ICTs have substantial effect on human capital of which 23% indicated a very much positive effect. 45% agreed that the effect is much while 24% rated the effect as average. Respondents represented by 6% indicated that ICTs have no effect at all while 2% stated that though ICTs

influence human capital, the effect is minimal. The analysis identified that there is a positive correlation of 0.681 between ICTs and human capital.

### **5.1.3 Effect on Social capital**

70% of the respondents were of the view that ICTs have either very much or much positive impact on their social lives, whereas 23% felt that the impact is average. A very small proportion of respondents represented by only 1% were of the opinion that ICTs do not have any impact at all on their social lives while 6% agreed that there is only a small effect.

### **5.1.4 Correlation between ICT adoption and various livelihood assets**

The research result reveals significant correlations between access to ICTs and the selected dimensions of poverty; financial, human and social capital. The correlation between ICTs and financial capital, human capital and social capital was found to be 0.719, 0.681 and 0.610 respectively with a significance of 0.000. Since the significance is a value less than 0.05 then it can be interpreted to mean that at 5% level of significance, access to ICTs and livelihoods assets had a positive significant relationship. There was thus a positive relationship between ICTs and livelihoods. This infers that increasing access to ICTs opens gates to information which further accelerates access of resources and opportunities that generate more resources hence improving livelihoods. The study findings revealed that lower livelihoods are more likely to be witnessed in households without ICT relative to their counterparts with ICT. However, this finding does not imply causality. Put differently, lack of ICT does not cause poverty and vice versa. The poor households might not invest in ICT due to other urgent needs including food, health among others.

## **5.2 Conclusions**

The purpose of the study was to determine the effect of Information and Communication Technologies (ICTs) on the livelihood of rural citizens in Kisii County, Kenya. Livelihood was indicated using financial, social and human aspects while ICT was indicated using availability and frequency of use. The study found that increasing access to ICTs opens gates to information which further accelerates access of resources and opportunities that generate more resources hence improving livelihoods.

The results of this study point out that access to various ICTs plays a significant role in improving the livelihoods of rural citizens. This study revealed that ICT has the potential to

improve rural livelihoods through improving the way business and work is conducted (23.9%), increased access to educational requirements (32.4%) and ease of communication and increased access to key information (43.7%).

### **5.3 Recommendations**

The following recommendations were made based on the results of the study:

- i. Awareness campaigns should take place at all levels. Leaders need to change their approach and behaviour towards ICT and raise a lot of awareness on the opportunities of the information revolution and ICT through policy makers, the private sector and civil society. People should be educated on the importance of ICT knowledge, including ICT tools and how to use them.
- ii. ICT education should be incorporated in the school curriculum at all levels to encourage young readers embrace ICTs at very early stages.
- iii. It is also recommended that research and analysis be done to determine the role of government as stakeholders especially in meeting up the costs as well as developing alternative solutions.
- iv. Finally, technology is not the only challenge or the barrier to rural development. It is recommended that the human factor which plays the biggest role and remains the greatest barrier to development be considered. People must take responsibility of thoroughly educating themselves towards ICT.

### **5.4 Suggestions for further study**

The study suggests that in future researchers should:

- i. Do a much in-depth research over a longer time period and with a larger sample representing all the constituencies of Kisii County in order to infer more general conclusions. The unique needs and character of citizens in various regions make it difficult to multiply initiatives.
- ii. Explore the other factors that account for that remaining portion of livelihoods; 48.3% financial, 53.6% human and 62.7% social capital. This is because ICT was found to affect up to 51.7%, 46.4% and 37.3% of rural citizens of Kisii County's livelihood assets; financial, human and social capital respectively

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