ACCESS AND USE OF INFORMATION COMMUNICATION TECHNOLOGIES (ICTS) FOR RURAL POVERTY REDUCTION IN UASIN GISHU DISTRICT

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A thesis Submitted in Partial Fulfillment of the Requirements for the degree of Doctor of Philosophy of the School of Information Sciences, Department of Library, Records Management and Information Studies, Moi University

2011

DECLARATION

Declaration by the Candidate

This thesis is my original work and has not been presented for a degree in any other university. No part of this thesis may be reproduced without the prior written permission of the author and/or Moi University.

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Declaration by the Supervisors

This thesis has been submitted for examination with our approval as University Supervisors.

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DEDICATION

This thesis is dedicated to the following:
My late father, Mwalimu Alfred Bosire Omwenga, for inspiring me to work hard in school. He told me not to stop reading till
I become a Doctor.

My mother, Truphena Kerubo, for ensuring that we went to school on time.

My daughters, Valentine and Mechthild, who put up with my busy schedules and always urged me to go on even in their tender age.

My husband, Prof. Nathan Ogechi, for encouraging me to read and finish my assignments on time.

Last but not least, to my sister and brothers, for their support and encouragement.

ABSTRACT

Poverty is a human phenomenon associated with an unacceptable low standard of living. It arises from many dimensions. One of these dimensions is lack of relevant and appropriate information to carry out day-to-day activities. Reduction of poverty therefore entails raising these standards of living by providing the information. The advent of ICTs has changed the way people work, entertain and interact with each other. Yet, the reality is that such changes have bypassed the majority of human kind, the billions of poor people for whom ICTs do not mean much. The aim of this study was to investigate the use of ICTs in the provision of information for rural poverty reduction in the rural areas of Uasin Gishu District, with a view of proposing a framework/model of improving their access and use. The specific objectives were to: assess the information needs of the rural communities in Uasin Gishu District and how these needs are met; explore the extent to which ICTs are accessed and used in the provision of information for rural poverty reduction; establish the perception of the rural communities towards ICTs; explore the potential role of ICTs in meeting the information needs of rural communities; establish the challenges experienced by the rural communities in using ICTs; and to propose a framework of improving access and utilization of ICTs by rural communities in Uasin Gishu. The study was informed by Harris' info-mobilization theory. The study is a qualitative one, consisting of a sample size of 100 participants, drawn from all the six divisions of Uasin Gishu District. Purposive sampling was used to select participants from the key sectors of the economy namely: agriculture, business and health. Data was collected using semi-structured interview schedules. It was analyzed using Strauss's grounded theory. The findings of the study were that: rural communities of Uasin Gishu District need information to carry out day-to-day activities; they consult various sources to satisfy their information needs; they use ICT tools such as mobile phones to access information in smaller extents; the rural community perceive ICTs as major actors in their development efforts; ICTs have a potential role to play in meeting the information needs of rural communities in Uasin Gishu District; and the rural community faces challenges in accessing and using ICTs, among others. The study provides the following recommendations: creation of the right environment for ICTs; improvement of the flow and quality of information; skills development; development of market intelligence systems; zero taxing ICT equipment and accessories; facilitation of community workers; implementation of alternative power supply systems; validation of indigenous knowledge; programming in local languages; and establishing an integrated ICT centre, among others. A framework of reducing poverty using ICTs is proposed.

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ACKNOWLEDGEMENT

First and foremost I offer my sincerest gratitude to my supervisors, Professors Japheth Otike and Joseph Kiplang'at whose encouragement, guidance and support enabled me to develop this work. They supported me throughout my work with their patience and knowledge whilst allowing me room to work in my own way. I attribute the success of my PhD degree to this encouragement and effort and without them this thesis, too, would not have been completed or written. I appreciate all their contributions of time and ideas to make my PhD experience productive and stimulating. One simply could not wish for better and friendlier supervisors. I would like to thank Moi University for giving me research funds to carry out this study and the School of Information Sciences for giving me an opportunity to further my studies. In my daily work I was blessed with a friendly and cheerful group of fellow candidates - Grace, Jayne and Kingori, who contributed immensely to my personal and scholarly time at the university. I would also like to thank Peris Mongare, District Agricultural Officer, for introducing me to my respondents and ensuring that all was well.

I would also like to thank my family for all their love and encouragement. To my late father for showing me the joy of intellectual pursuit and to my mother for sincerely raising me since I was a child. To my brothers and sister for encouraging and supporting me in my studies. And most of all to my loving, supportive, encouraging, and patient husband for always being there when I needed him. Being a scholar, he kept me on my toes with the words – no star is out of reach, and for reading my drafts from time to time. To my daughters, Valentine and Mechthild for understanding that mummy needed time to read. Mechthild, being four years at the time of preparing this work, could come and sit on my lap patiently as I typed my drafts. I love you girls.

Lastly, I offer my regards and blessings to all of those who supported me in any respect in the preparation and completion of this thesis. I sincerely express my apology that I could not mention them personally.

Emily Kwamboka Bosire

LIST OF ACRONYMS AND ABBREVIATIONS

ABC	-	African Banking Corporation
ACP	-	African Caribbean and Pacific Countries
AEO	-	Agricultural Extension Officer
AIC	-	Agricultural Information Centre
AIDS	-	Acquired Immune-Deficiency System
AISI	-	African Information Society Initiative
AMPATH	-	Academic Model for Providing Access to Health
ARV	-	Anti-Retroviral drug
ATM	-	Automatic Teller Machine
ASK	-	Agricultural Society of Kenya
CABI	-	Commonwealth Agricultural Bureaux
CANKEN	-	Canada Kenya
CBO	-	Community Based Organization
CCK	-	Communication Commission of Kenya
CDF	-	Constituency Development Fund
CD-ROM	-	Compact Disk Read Only Memory
CEEWA	-	Council for the Economic Empowerment of Women in Africa
CICEANA	-	North American Centre for Environmental Information and Communication (CICEANA)
CIDA	-	Canadian International Development Agency
CPU	-	Central Processing Unit
CSK	-	Computer Society of Kenya
CSM	-	Community Sensitization Members
CTA	-	Technical Centre for Agricultural and Rural Cooperation
DAO	-	District Agricultural Officer
DEL	-	Direct Exchange Lines
DFID	-	UK Department for International Development
EASSY	-	East African Submarine System
EATEC	-	East African Tanning and Extract Company
EC	-	European Community

ECA	-	Economic Commission of Africa
ECTAD	-	Eastern Caribbean Agricultural Trading and Development Association
EU	-	European Union
ETISALAT	-	Emirates Telecommunications Establishment
FAO	-	Food and Agricultural Organization
FM	-	Modulated Frequency
Gb/s	-	Gigabytes per second
HFCK	-	Housing Finance Company of Kenya
HIPC	-	Highly Indebted Countries
HIV	-	Human Immune-deficiency Virus
HIV/AIDS	-	Human Immune-deficiency Virus/Acquired Immune-Deficiency Syndrome
IC	-	Information Communication
ICTs	-	Information Communication Technologies
ICT4D	-	Information Communication Technology for Development
ICT4P	-	Information Communication Technology for Poverty Reduction
IDRC	-	International Development Research Centre
ILO	-	International Labour Organization
IMF	-	International Monetary Fund
ISP	-	Internet Service Provider
ITU	-	International Telecommunication Union
IVR	-	Interactive Voice Response
KACE	-	Kenya Agricultural Commodity Exchange
KBC	-	Kenya Broadcasting Corporation
KIE	-	Kenya Industrial Estates
KPLC	-	Kenya Power and Lighting Company
KPTC	-	Kenya Posts and Telecommunication Corporations
KTN	-	Kenya Television Network
MDGs	-	Millennium Development Goals
MIS	-	Marketing Information System

NALEP	-	National Agricultural and Livestock Extension Programme
NEPAD	-	New Partnership for Africa Development
NGO	-	Non-Governmental Organization
NICI	-	National Information and Communication Infrastructure
NPEP	-	National Poverty Eradication Plan
NTV	-	Nation Television Network
ODI	-	Overseas Development Initiative
OECD	-	Organization for Economic Co-operation and Development
PDA	-	Personal Digital Assistant
POSTA	-	Postal Corporation of Kenya
PRSP	-	Poverty Reduction Strategy Paper
RASCOM	-	Regional African Satellite Communication Organization
RECORTIS	-	Regional Commodity Trade and Information Systems
RIVATEX	-	Rift Valley Textile Company
RoK	-	Republic of Kenya
SAPAP	-	South Asia Poverty Alleviation Programme
SEACOM	-	The South East Asian Telecommunication Cable System
SHEMP	-	Small Holder Enterprise and Marketing Program
SIM	-	Subscriber Identity Module
SNO	-	Second Network Operator
STD	-	Sexually Transmitted Disease
STS	-	Socio-Technical System
TEAMS	-	The East African Marine System
TKL	-	Telkom Kenya Limited
UAE	-	United Arab Emirates
UCC	-	Uganda Communications Commission
UN	-	United Nations
UNDP	-	United Nations Development Programme
UNCSTD	-	United Nations Commission on Science and Technology and Development
UNICEF	-	United Nations Children Fund

VO	-	Village Organization
VoIP	-	Voice over Internet Protocol
VSAT	-	Very Small Aperture Terminal
Wi-Fi	-	Wireless Frequency
WWW	-	World Wide Web
DSL	-	Digital Subscriber Line

CHAPTER ONE
INTRODUCTION

1.1 Background information

The last decade has witnessed an international consensus that poverty is a human phenomena associated with an unacceptably low standard of living. It has multiple dimensions, manifestations and causes such as lack of choice and opportunity, inability to fulfill one's potential, lack of voice and powerlessness, illiteracy, insecurity, hunger, lack of shelter, being sick or not able to see a doctor, losing a child to illness brought about by unclean water, lack of representation and freedom as well as material deprivation (Slater and Tacci 2004, Serwanga 2006). The World Bank defines the poor as those that live on less than a dollar a day (World Bank 2000). The European Commission suggests that poverty should not be defined merely as a lack of income and financial resources. It should also include the deprivation of basic capabilities and lack of access to education, health, natural resources, employment, land, credit, political participation, services and infrastructure (European Commission 2001). Broadly therefore, poverty extends beyond income and consumption to include inequality, health and education vulnerability. Serwanga (2006) identifies two types of poverty namely: absolute poverty and relative poverty. Absolute poverty refers to a situation where an individual or household is incapable of accessing the basic needs of life. It is characterized by malnutrition, illiteracy and disease. On the other hand, relative poverty is a situation under which one is poor relative to others. A broader definition of poverty sees it as being deprived of the information needed to participate in the wider society, at the local, national or global level (ZEF 2002). These dimensions of poverty impact the elements of well-being: security, empowerment and opportunity. Reduction of poverty and hunger is therefore a major macro-economic problem and is rated top priority in the Millennium Development Goals (MDG). These MDGs came as a result of the many UN resolutions and conferences that mainly took place in the 1990s. At the end of the UN Millennium Summit in September 2000, all the 191 UN member states signed the final declaration. In doing so, they created a vision that offers the opportunity to focus development outcomes and coordinate efforts among stakeholders. The MDGs include:

1. Eradicating extreme poverty and hunger

2. Achieving universal primary education
3. Promoting gender equality and empowering women
4. Reducing child mortality
5. Improving maternal health
6. Combating HIV/AIDS, malaria and other diseases
7. Ensuring environmental sustainability
8. Developing a global partnership for development

In 2001, the international commitment to reduce poverty resulted in the adoption of the MDGs as the road map for the implementation of the UN Millennium Declaration. The essence of the first of the eight MDGs is to halve the share of the world's population living in extreme poverty and hunger by 2015. The other seven goals and the eighteen targets associated with the MDGs aim at poverty reduction in various ways.

The MDGs have become a frame of reference for just about all organizations working in development. They have become the international standard of reference for measuring and tracking improvements in the human condition in developing countries. The goals are important because they are backed by a political mandate agreed upon by leaders of all UN member states, offer a comprehensive and multi-dimensional development framework, and set clear quantifiable targets to be achieved in all countries by 2015 (Juma 2006). They represent an agreement in the community to achieve measurable improvement in people's lives.

The MDGs, cover both income and non-income measures of well being. Each of the first seven goals addresses a specific aspect of poverty, such as health and education. They need to be viewed together, as they are mutually reinforcing and aim at reducing poverty in all its forms. The last goal, which aims at global partnership, relates directly to Information Communication Technologies (ICTs). It states: in co-operation with the private sector, make available the benefits of new technologies, especially information and communication. ICTs are the tools for achieving social goals as spelt out in the MDGs. They can be applied in order to bring about positive change in each of the MDGs.

At an OECD Global Forum on the Knowledge Economy, Ms Karima Bounemra ben Sultane, speaking on behalf of the Economic Commission for Africa, stated that ICTs can do much to help Africa achieve MDGs (OECD 2007). The current study is an attempt to find out the extent to which ICTs are used to provide information for reducing poverty in all forms (poverty being multi-dimensional) in the rural areas of Uasin Gishu District/Kenya.

In line with the process initially led by the UN for promoting the MDGs, the World Bank and the International Monetary Fund (IMF) have taken the lead on a new approach to co-operation for poverty reduction. Poverty Reduction Strategy Papers (PRSPs) which are to be prepared by lending countries are at the heart of the anti-poverty framework announced in 1999. They are intended to ensure that debt relief provided under the enhanced Highly Indebted Poor Countries (HIPC) initiative and loans from the international finance institutions help reduce poverty in the poorest and most indebted countries in the South. Approximately 70 heavily indebted countries are expected to prepare PRSPs, initially for a three year period (Mikkelsen 2009). According to the World Bank, the focus of PRSPs is on identifying, in a participatory manner, the poverty reduction outcomes a country wishes to achieve and the key publications – policy changes, institutional reforms, programs and projects – which are needed to achieve the desired outcomes (www.worldbank.org/poverty/strategies).

Poor people can be found in both rural and urban areas. The majority live in the rural areas, which is the focus of this study. If these people (in the rural areas) can be equipped with the right information, that is relevant and appropriate, they will identify opportunities that generate resources thus reducing poverty, on their part, and improving the country's economy. Eradication of poverty is at the heart of the Cotonou Agreement signed in June 2000 between the European; and African Caribbean and Pacific (ACP) Group of States (World Bank 2003).

Over time, a number of approaches have been used to measure poverty. These include: per capita income, household and per capita consumption, food ratio and calorific intake,

among others. The causes of poverty are also many, and have been understood differently by different people over time. For example, people argue that poverty is God given (derived), in other words, it is part of the natural process. This cannot really be true because God himself told mankind to till the land and eat from it, and that blessed are the hands that work (Bible: Deut 2 : 7). Others say that it is an individualistic problem caused by laziness, lack of initiatives and illiteracy (Alampay 2006).

1.1.1 Dimensions of poverty

Poverty is multi-dimensional, extending beyond low levels of income, as the World Development Report emphasizes (World Bank 2002). These dimensions include:

I) Lack of opportunity - This can be described as low levels of consumption and income relative to a national poverty line. Lack of opportunity is generally associated with the level and distribution of human capital, social and physical assets, such as land and market opportunities.

II) Low capabilities - This is when there is little or no improvements in health and education indicators among a particular socio-economic group.

III) Low level of security - This is exposure to risk and income shocks that may arise at the national, local, household and individual levels.

IV) Empowerment - Empowerment is the capability of poor people and other excluded groups to participate in, negotiate with, change and hold accountable institutions that affect their well being as well. This is lacking in rural areas

The UNDP (2001) also acknowledges the fact that there are multiple ways of defining poverty and categorizes poverty in the following way:

I. income poverty – the lack of sufficient income to satisfy essential needs,
II. capability opportunity – a deprivation in the range of things people do and
III. participation poverty – a deprivation in the range of things people can be.

These three categories fit very well into the above categorization by the World Bank. For instance, participation poverty is another way of saying that there is no empowerment. The four dimensions – economic opportunities, low capabilities, low level of security and empowerment are therefore discussed further below:

a) Economic opportunities: growth and rising incomes of the poor

Numerous statistical studies confirm that rapid economic growth is the engine of poverty reduction; using both the income and non-income measures of poverty (UNDP 2001, World Bank 2002). The process of acquiring assets is not determined by market forces alone. Regulatory and judicial forces, as well as political, social and demographic forces also affect the ability of the poor people to acquire a range of financial and human capital assets with high and stable rates of return. Removing barriers to new goods, technology and investment opportunities (through trade, investment and financial liberalization) has generally been associated with economic growth. Similarly, good governance is crucial to accelerating private investment and thus economic growth, in the same way, provide access to new goods, technology and investment opportunities. ICTs can be used to promote good governance as citizens will have access to government policies and even respond to them. In this way, the government will be held responsible and accountable to the citizens.

Well functioning labour markets play a central role in reducing poverty. Therefore removing obstacles to job creation, especially among the small and medium enterprises, and creating an environment conducive to private sector development will be an important element of the overall poverty reduction strategies. Again, information that is timely and relevant is important in this pursuit.

There are several asset endowments that affect the well being of the poor, namely: human capital, infrastructure – water, sanitation, transport, electricity, land, and credit – access to financial services is often problematic to the poor, partly because the poor lack the physical collateral necessary to obtain loans. Although attempts have been made to extend credit access to the poor they lack access to formal and informal institutions through which credit information can be obtained. ICTs have the potential of providing this information and the poor will even be able to compare the different terms and conditions of lending institutions.

b) Capabilities

Low educational attainment, illness, malnutrition and high fertility rates are major contributors to income poverty. Education and health capabilities are among the primary dimensions of individual well being. Different sets of factors and actors affect ways in which poor people achieve literacy and good health. These may include government policies and actions. Private providers of education and health service, the interaction between the public sector and the market, social norms and practices, and individual and household behaviour also play important roles. For example, child health outcomes depend on dietary choices at the household level and access to, and the quality of health services. Information on health services available, the right diet, child health, educational opportunities, et cetera, can go a long way to alleviate poverty and promote development.

c) Security

Insecurity can be understood as being vulnerable to a decline in well being. Such decline can be manifested in ills such as sickness, death, low income among others. Issues of insecurity can be overcome by providing economic opportunities, developing human capabilities and empowering poor communities as has been outlined above and below.

d) Empowerment: the influence of the poor

Empowerment, in this context, broadly refers to the confidence and capabilities to express oneself and to act more effectively in the social world. This comes as a result of communities or individuals becoming aware of the world outside the traditional spheres of activity. As a result, they are able to challenge restrictive social norms. This leads to an increase in perceived opportunities and a shift in power relations (Slater and Tacci 2004). Here empowerment means power.

One important dimension of empowerment is access to, and influence over, state institutions and social processes that set public policies. The level of empowerment among the poor increases as they gain access to economic opportunities, develop human capabilities and establish greater income security. As the poor become empowered, they

are more likely to influence public policy discussions on how well the policies and programs that constitute poverty reduction strategies meet their needs.

Information is an important tool for empowerment. It is important therefore to investigate the potential of ICTs to develop confidence and capabilities, especially as ICTs make it likely that more tangible or measurable outcomes will follow in time. Empowerment is a positive development. By dealing with challenging experiences, interacting with others and moving outside restrictive social norms, communities move towards development.

The links between ICTs and empowerment are diverse and combine both actual skills and (social and technical) confidence as well as more new understandings (on the part of users) of their status, possibilities and value. Information plays an important role in expanding an individual's sense of his/her own social and political agency. One is empowered when he/she is able to access basic information and facilities that might improve his/her conditions of living and livelihoods such as health and education, among others.

The empirical co-relations between these different dimensions of poverty are overwhelmingly positive. Using multiple dimensions to analyze poverty will not always increase the number of people considered poor, but it will highlight the fact that the poor suffer from multiple deprivations. Any poverty reducing interventions will therefore focus on improving income, security, education, and health capabilities, thus empowering those groups living in poverty or near the poverty line in addition to those at a relatively high risk of falling into poverty.

From the foregoing, the main characteristics of the poor emerge as follows:

1. very low incomes,
2. subsistence, unskilled wage labour as the dominant income source,
3. physical goods (especially food) as the dominant consumption good,
4. low education and high illiteracy, and
5. minority language group status.

Mikkelsen (2009) has presented the characteristics of poverty as follows:

1. poverty is complex – it comprises a wide range of aspects and situations that together constitute the livelihood of poor people,
2. poverty is context specific – the features of poverty are derived from the particular environmental, socio-cultural, economic and political characteristics of the situation in a given area,
3. poverty is relative – deprivation is defined by those concerned in relation to their notions of what is judged to be a decent life in terms of economic resources, security, adequate health and education, opportunities to participate in social life and fulfill important cultural functions, and
4. poverty is dynamic – the manifestations of deprivation will change over time. Individuals and groups may move in and out of poverty depending on the local situations as well as external forces such as natural or human disasters, economic crises and armed conflict.

Therefore, the actions and strategies of poor people in a certain location (area) provide a rich source of material for understanding poverty and for working towards poverty reduction. Most organizations that deal with poverty reduction fail to recognize the importance of these activities and the motivations and constraints faced by the poor. Subsequently, and these become the central reasons why poverty reduction policies and programs are often of little use or serve simply to reinforce problems of poverty. Developments in qualitative methods of research enable one to identify and research dynamics and dimensions that sustain marginalization and exclusion in ways previously unknown or ignored.

It cannot be gainsaid that lack of information is a crucial dimension of poverty. People are poor because they lack relevant information to apply in their day-to-day lives. Relevant and timely information will also allow the people to make choices to improve their current situations and have access to means of production (Mukoma and Bosire-Ogechi 2006). For instance, availability and access to relevant information on agriculture will increase the ability of the poor to raise their incomes and hence increase their quality

of life. The poor lack information about resources, tools and processes that could make them more productive; and information about new opportunities to increase their income and improve their livelihoods. In addition, they lack information about markets and prices, on one hand, and about the availability and reliability of persons and institutions on which they depend in their economic exchanges on the other. The poor also lack information on how they can convert their resources (such as labour, skills, experience, and the physical resources at their disposal) into value creating opportunities (such as producing either cash income and other resources valuable to their particular livelihoods).

Poverty itself is a barrier to participation which any poverty reducing interventions have to overcome before they can hope to make a difference in poor peoples' lives. In particular, the poorest are often restricted through lack of spare time to look for information, the need to earn daily wages, lack of mobility due to inaccessibility to the rural areas, and marginalization among others. Therefore, the very idea of poverty reduction depends on understanding how people formulate and act upon aspirations, concepts of social change and imaginations of the possibilities open to them. These themes are also crucial to understanding how people access and use ICTs. For example, some may view access to ICTs to represent real or symbolic access to modernity, the future, education and knowledge. Therefore, to them, ICTs will constitute a way into which people can project and develop a sense of change and possibility (Slater and Tacci 2004). ICTs are instrumental in increasing productivity, efficiency, competitiveness and growth in all spheres of human life. The potential benefits of ICTs, however, can be harnessed only if the technology diffuses across different sectors of the society. Unfortunately, we are living in the era of the 'digital divide' where half of the world population has never made even a telephone call (Annam 2002). It is argued that the future of the South to harness the benefits of the ongoing technological revolution in the North, places developing countries' populations at the ever increasing disadvantage in a globalizing world (Bridges.org 2001).

1.1.2 Global ICT industry

Information and Communication Technology (ICT) may be defined as a combination of computer hardware and software on the one hand and telecommunications technology on

the other. ICT is the World's fastest growing economic activity. The sector has turned the globe into an increasingly interconnected network of individuals, firms, schools and governments communicating and interacting with each other through a variety of channels and providing economic opportunities transcending borders, languages and cultures. This has made the world to be commonly referred to as the global village. ICT has opened new channels for service delivery in areas such as e-government, education, e-health and information dissemination (ITU 2009).

The rapid development of ICT, accompanied by the convergence of telecommunications, broadcasting and computer technologies, is creating new products and services as well as new ways of learning, entertainment and doing business. At the same time, more commercial, social and professional opportunities are being created through the unique opportunity provided by ICT. As a result, the world is undergoing a fundamental transformation as the industrial society that marked the 20th century rapidly gives way to the information society of the 21st century. The new society promises a fundamental change in all aspects of our lives, including knowledge dissemination, social interaction, economic and business practices and political engagement.

The rapid growth in ICT is evident from the fact that while it took the telephone close to 74 years to reach 50 million users, it took the World Wide Web 4 years to reach the same number. It took radio 38 years and the personal computer 16 years to reach the same number. Between 1995 and 1999, 88 million internet connections were made compared to 15 million made between 1991 and 1994, an almost six-fold increase. In 2002, over 580 million people were estimated to have access to the internet. Mobile telecommunication services are also increasing faster than fixed-line networks. There were less than 200 mobile operators around the world in 1992. Mobile cellular technology has been the most rapidly adopted technology in history. It was the most popular and widespread personal technology on the planet, with an estimated 4.6 billion subscriptions globally by the end of 2009. Mobile broadband subscriptions overtook fixed broadband subscribers in 2008. This highlights the huge potential for the mobile internet. In 2009, more than a quarter of the world's population was using the internet.

During this period, China overtook the United States in becoming the largest mobile telephone market in the world. Growth has also been robust in Africa where more than half the countries now have more mobile lines as compared to fixed lines (ITU 2009).

1.1.3 ICT industry in Kenya

The environment for ICT access has improved relatively rapidly in most urban areas in Africa. Five years ago, only a handful of countries had local internet access or mobile telephones but now devices and access are available in major cities in Africa. Hundreds of new radio stations, newspapers and TV stations have been licensed (Alampay 2006). Despite the rapid growth of the ICT sector, the digital divide is still at its most extreme in Africa. The primary motivation for growth in ICT has come from the private sector, with the role of governments being that of a facilitator for creating an enabling environment.

From the inception of the telecommunication services in the country up to 1977, the services in Kenya were managed as part of a regional network with neighbouring Tanzania and Uganda. In 1977, the East African Community under which the regional telecommunications services operated collapsed. As a result, the Government of Kenya established Kenya Posts and Telecommunications Corporation (KP&TC) to run the services. A telecommunications policy statement was issued in 1997 that set out the government vision on telecommunications development to the year 2015. The challenge at that time was to transform the existing policy structure from one designed for a monopoly to a policy for managing a liberalized telecommunications market. The government separated the functions and management of the sector. This clarified roles for the policy, regulatory and operational responsibilities whereby the government, and specifically the Ministry of Transport and communications, retained policy guidance. In 1998/99, the government launched the telecommunications sector reform and introduced competition in certain market segments, while at the same time disbanding KP&TC. The cornerstone of the sector reform was a new telecommunications policy and telecommunications laws. The reform had three major components, namely:

- Separation of roles in sector management – policy, regulation
- Creation of a multiple operator environment – liberalization

- Reduction and eventually elimination of government operational role in the telecommunications sector – privatization (CCK 2010).

KP&TC was consequently split into three legal entities, namely, Telkom Kenya Limited (TELKOM - to be abbreviated as TKL in this work), Postal Corporation of Kenya (POSTA) and the Communications Commission of Kenya (CCK):

- The Postal Corporation of Kenya (POSTA), which was established by the Postal Corporation of Kenya Act, 1998, is the public postal licensee with the specific role to ensure universal access of postal services. POSTA has exclusivity only in stamp provision and private letterboxes but competes in all other segments.
- Telkom Kenya Limited was established as a public telecommunications operator under the Companies Act. Consequently, TKL was issued with licenses in all areas that it is currently operating. It had universal access service requirements in its license and was obliged to provide interconnection facilities to other duly licensed operators.
- The Communications Commission of Kenya would be the regulatory body for the sector and was established by the Kenya Communication Act 1998.

The National Communications Secretariat was also formed under the Kenya Communications Act 1998 (CCK 2010) to serve as the policy advisory arm of the Government on all matters pertaining to the info-communications sector.

Since the launch of the telecommunications sector reform, Kenya has made great strides in the expansion of telecommunications services. Between 1999 to-date, the government has implemented policy reforms that have resulted in a number of structural changes. The main structural changes are: redefinition and clarification of roles for policymaking, market regulation, dispute resolution and operation of services among multiple players. In the operation of services, multiple operators are competing in various market segments based on a policy of the private sector operating in a competitive environment that also safeguards consumer interest (CCK 2010).

While the growth of the ICT sector in Kenya has been significantly influenced by global trends, it can be evaluated in terms of the number of fixed and mobile telephone lines; the

tele-density; the number of computers and services; Internet Service Providers (ISPs), the number of internet users; broadcasting stations; and, the market share of each one of them. Telkom Kenya is today the only fixed national operator. The Government has liberalized the mobile cellular market and currently there are three mobile cellular operators, namely, Safaricom Ltd, Airtel International (it started off as Kencell Communications Ltd then became Celtel International and Zain) and Econet Wireless Yu. Telkom also provides mobile services through its two networks, namely, Orange and Telkom Wireless.

Besides liberalizing phone services, the Government has licensed 16 television stations and 27 FM radio stations (CCK 2010). Although electronic media services have experienced rapid growth over the last 8 years, it is estimated that 60% of the population has access to television and 90% has access to radio services. In terms of geographic coverage, the radio and television coverage by the Kenya Broadcasting Corporation stands at 90% and 50% of the Kenyan landmass, respectively. The Postal Corporation of Kenya (POSTA) already has a fairly extensive network with regard to postal services. The government hopes to create efficient, reliable, widespread and non-discriminatory postal services. POSTA pioneered internet access by setting up internet access points in some of its 890 post offices countrywide. However, the government accepted the premise that private sector capital in a competitive environment will vastly expand telecommunications sector faster and allow the government to channel its resources to other social development goals. Subsequently, the government took a decision to reduce its direct involvement in the provision of telecommunication services by privatizing Telkom Kenya. This process has however been put on hold for legislation which will allow for prudent privatization of public enterprises.

It is worth noting that the availability of trained manpower in the ICT sector is an important resource. The Kenya government has recognized this by introducing computer education in schools and other learning institutions. The private sector has also responded to the demand for skilled computer operators by setting up commercial computer training colleges in major urban centres all over the country. In the year 2001, over 150,000

Kenyans passed through basic computer skills training colleges and since 1980s, the number of Kenyans who have undergone computer skills training in the country stands at an estimated 1.1 million people (CSK 2009). Taking cognizance that ICT is a primary instrument for realizing economic growth, Kenya offers attractive incentives and presents various investment opportunities for potential investors as it prepares to leverage ICT in its national priorities of growth and poverty reduction. As an entry point to the regional market and a communications and financial hub for the region, Kenya also offers potential investors a wide market for their products and services in the utilization of ICT (Jensen 2003).

1.1.3.1 Government telecommunications policy

The government of Kenya has embarked on a series of initiatives to revitalize and transform the economy into a modern market-oriented one (CCK 2009). The aim is to improve the economic well being of Kenyans by establishing Kenya, in the medium term, as the centre of industrial and financial activities in the region. The sector policies aim at defining the framework within which telecommunications and postal services will be provided. The overall government objective for the sector is to optimize its contribution to the development of the Kenyan economy as a whole by ensuring the availability of efficient, reliable and affordable communication services throughout the country. In view of the anticipated growth of the economy and the re-assessed demand, the government has set the national telecommunications targets as being to:

1. improve the tele-density in rural areas to 5 lines per 100 inhabitants by the year 2015;
2. improve the tele-density in urban areas to 20 lines per 100 inhabitants by the year 2015;
3. increase the number of mobile subscribers from 2.8 million to 10 million by the year 2015;
4. expand the current international internet bandwidth to 1 Gbps by the year 2015;
5. ensure that all secondary schools and tertiary institutions have internet access by the year 2007 (this has not been achieved); and

6. encourage Internet Service Providers to establish internet access nodes at all districts and local exchange areas.

In order to exploit telecommunications for development, it is necessary that cheap and reliable telecommunications are available. The government has reviewed the policies to address application of telecommunications as part of information and communications technologies strategies. The telecommunications and Postal Sector Policy Guidelines gazetted in 2001 recognized the role of telecommunications in ICT. Arising from these policy guidelines, the government has developed a national ICT strategy. The strategy seeks to mainstream and optimize the use of ICT in all national development activities.

1.1.3.2 Cellular telecommunication

Competition in cellular telecommunication commenced in 2000 with the launch of a second mobile telephone operator. The combined connections for the two cellular operators (and two others that joined later) increased from 15,000 in 1999 to 17.4 million by mid 2009 (RoK 2009). This growth in cellular telecommunication quickly overtook fixed lines with fixed lines now comprising a small market segment. Traffic between providers has been low due to the high tariffs imposed for inter-mobile traffic. This has forced consumers to subscribe to the three networks to avoid inter-mobile calling. The government is currently working out modalities to remove this barrier to inter-mobile traffic, as it is anti-competition.

The telecommunications reforms framework required the government to reduce and, in the long term, get out of investment in the telecommunications sector. Thus, the private sector investment would be the engine of telecommunications investment and growth. A condition for the private sector investment is the requirement for local participation. The policy initially required that local investment comprise a minimum of 60%. Consequently, both cellular operators, namely, Safaricom and Airtel (formerly Kencell, Celtel or Zain), had 60% local ownership at set up. Strategic equity partners retained management in both companies. In December 2001, the government reviewed this limitation on ownership to a minimum of 30%. A concerted effort between 1999 and

2002 to privatize Telkom Kenya did not succeed on the grounds that bids from potential partners were low. Consequently, the company is still fully government owned (CCK 2010).

The volume of investment varies widely among the key operators. TKL has not been able to invest heavily due to the uncertainty of privatization and it does not have adequate funds for investment. The company has been investing approximately KHz. 2 billion annually since 1999/2000. More investment is needed to upgrade and expand the network. Cellular operators have invested heavily resulting in rapid expansion as already mentioned. In just under three years ending on 31st March 2003, Safaricom had invested Kshs. 18 billion for the rollout of its network. This expansion is still growing. In March 2004, the company announced that it would invest a further Kshs. 8 billion for further expansion to provide high speed data services. The expansion has extended its services to most of the major commercial and administrative centres and the entire Mombasa - Nairobi - Busia highway. Airtel had also invested in similar levels to roll out its network since starting operations in August 2000. It has also covered most of the major towns and commercial centres countrywide. Other networks – Yu and Orange - have also done similar investments.

1.1.3.3 Radio and television services

It is estimated that 90% of the Kenyan people have access to radio and 60% have access to television receivers (CCK 2010). The liberalization of broadcasting media has led to the emergence of a number of private TV and radio stations. These include Nation, Family, Citizen, Kameme, Capital, Egesa, Ramogi, Kass, Chamgei, Kiss, KBC (English & Swahili) radio stations among others and KTN, KBC, Metro, Nation, Citizen, Family TV stations.

1.1.4 Impact of competition and liberalization on telecommunications

The impact of competition in cellular services has resulted in faster expansion and growth. The government expects that competition in basic voice through the licensing of the Second Network Operator (SNO) will have the same impact of network expansion.

The impact of liberalization on Kenya's telecommunications sector can be viewed from the perspective of affordability, accessibility and availability as addressed below.

1.1.4.1 Affordability

This parameter is a demand side indicator that seeks to measure the capacity of consumers to pay for telecommunications services. The parameter addresses how the operators are responding to the pressure to make the services cheaper to the consumers. Affordability is the greatest impediment affecting growth of telecommunications particularly in poor localities. Over the last five years since the telecommunications sector reform, the price of certain services has come down due to competition in certain market segments. This makes the services more affordable to the general consumer. In particular, the prices have come down on cellular and internet services due to competition. A per second billing, in cellular services, has been a useful tool for the customers to reduce the cost of using the services. In the internet, many people are increasingly using cyber cafes to overcome the cost of purchasing computers and maintaining an account with an ISP and for having a telephone. Features such as, per second billing are still currently not available in fixed line services.

Tariff re-balancing for mobile operators

Cellular operators have introduced a range of tariff packages to suit different categories of users and ward off competition. The tariffs are now as low as Kshs. 3 per minute across networks and as low as Kshs. 1 per minute within the same network (as from September 2010). This is way down from what has been the scenerio (on average Kshs. 8 within the same network and Kshs. 14 across networks). Handsets now cost as low as Kshs. 1,000. The other reason why this service has experienced tremendous growth is due to the flexibility in charging where per second billing has been adopted by all mobile operators and the introduction of prepaid service. *Current tariffs for the mobile providers can be obtained from their websites – www.africa.airtel.com/kenya for Airtel Kenya and www.safaricom.co.ke for Safaricom Ltd, www.orange.co.ke for Telkom's orange and www.yu.co.ke for econet's Yu.com/*

Data services

The licensing of more data services players resulted in competitive tariffs and the improvement of the services. New operators are providing wireless broadband tariffs that are very close to the TKL Kenstream charges. Due to the quality, security and flexibility of the wireless broadband, more corporate customers are taking the service especially ISPs and banks for their Automatic Teller Machine (ATM) connections. CCK has licensed new private data operators to offer data services in competition with TKL. The new operators are currently based in Nairobi but as they expand in the country the leased data line service charges are expected to come down. Access to data services by corporate, small and medium enterprises is now improved through the introduction and availability of high-speed data networks. Additionally, access to broadband services has been provided through VSAT, wireless, optical fibre and DSL technologies. The tariff for the data services is changing as competition increases.

SMS tariffs

The volume of Short Message Services (SMS) has drastically increased since the introduction of the service by the mobile operators. From almost no SMS in 1999, the volume has increased to 860 million between April-June 2009 (ITU 2009). A key driver of this has been the low cost of SMS. The cost of SMS has come down from Kshs. 10 in 2000 to the current average level of Kshs. 1.00 (as from September 2010). It is even lower in some networks where subscribers are allowed to subscribe for a certain number of messages and pay a fixed amount of money. For instance, one can subscribe for 100 messages in a day for only Kshs. 20. In some instances, the SMS are offered free of charge by the mobile service providers on subscription. For instance, one can send unlimited number of messages within the same network on subscription to a service known as Club 20 on the Airtel network. Beyond the low cost, SMS is now widely used for commercial and social information dissemination (CCK 2010).

1.1.4.2 Availability of services

Availability of services as a parameter, describes growth in quantity of lines and services and bandwidth available to the consumers for business or personal use. It seeks to express

the efforts and results of operators to supply 'adequate' services to the consumers. A notable feature in the Kenya market since the sector reform in 1999 is the fast expansion and uptake of cellular services. Cellular communications, as earlier indicated, has grown from under 15,000 customers in 1999 to over 17.4 million in June 2009 (RoK 2009). This growth is remarkable and far exceeds the operators' projections.

Indeed the country was highly underestimated on its capacity to support cellular services. This fast growth has occasionally caused congestion, a factor that irritates customers and calls for the attention of the regulator. This fast growth against a stagnant economy is to mop up latent demand not served during the monopoly era. Unlike the cellular services, the fixed line services perform poorly. A key objective for the monopoly status granted to Telkom Kenya Ltd was to enable the company build over 800,000 lines by 2004 and use the resources to take services to the rural areas. Telkom Kenya, however, has not been able to achieve this objective.

Internet services

There was very rapid internet growth with the fast growth of ISPs, user base, and the cyber cafés. The estimated customer base rose to 1 million users through cyber cafés or office LAN networks (RoK 2009). The greatest challenges include the cost of bandwidth, its quality and a competitive access to the local loop. Licensing of data operators will also provide the much needed competitive supply of the local loop options. Business applications and data services were areas that the telecommunications reform failed to address. By offering exclusivities to TKL in key market segments, access to wide band services was limited. This has been changing since 2002 with the re-classification of market segmentation by the CCK. This brings a refreshing opportunity for business and manufacturers to access broadband services.

1.1.4.3 Accessibility of services

The urban areas have reasonable access to all types of services with high rates for penetration. This is also the source of most of revenues. TKL, for example, generates over 70% of the revenues from the two major cities of Nairobi and Mombasa.

Additionally, 60% of the telephone lines are in Nairobi alone (CCK 2010). Outside the urban areas, the revenue generation is low and so is the effort and interest to invest in the rural areas. To take services to the rural areas, the government offered TKL a monopoly in key market segments to enable it use resources from a monopoly market segment to deliver services to rural areas. This monopoly dividend did not pay off. There is no expansion to the rural areas yet. Already, TKL reports under-utilization of its exchanges in the rural areas by up to 40% resulting from low incomes of the rural population.

Usage of internet has increased tremendously. According to ITU (2009), Kenya's internet users grew from an estimated 35,000 users in 1999 to about 500,000 users by 2001. There are now over 1 million users. This use was, however, confined to shared services in office LANs and cyber cafes. Internet tariffs have come down tremendously due to competition. This reduction affects all categories of service provision, that is, leased lines, dial-up as well as cyber cafes. Usage tariffs for cyber cafes, for example, have fallen from Kshs. 15 per minute in 1998 to less than Kshs. 1 per minute in 2010. These tariffs have now stabilized and are not likely to reduce any further unless bandwidth costs reduce drastically. With the current tariffs, internet services are affordable in most towns in the country. This will greatly increase access to internet in the country, as there are post offices in almost all towns in Kenya including the rural areas. As indicated earlier, most post offices offer internet access services.

1.1.5 Legal and regulatory framework

a) Government laws

As earlier indicated, the Ministry of Information and Communications is the overseer of the ICT sector in Kenya. The following laws govern/affect the sector:

- Kenya Communications Act 1998
- Postal Corporation Kenya Act 1998
- Kenya Broadcasting Corporation Act 1989
- The Telegraph Press Message Act 1983
- The Science & Technology Act 1965
- State Corporations Act 1987
- The Education Act 1968

b) Fiscal environment

The government has resolved itself to supporting ICT through fiscal instruments. Import tariffs have been removed for PCs. They attract a preferential 5% for other instruments, that is, the lowest rate allowable without parliamentary approval.

c) Institutional capacity

The government has resolved that ICT is an important issue to warrant separate institutional attention. The government has, for example, established the post of IT Director in the Ministry of Finance. In addition, in 1977, the National Council for Science and Technology was established to co-ordinate the Science and Technology sector, including the ICT sub-sector. The government also established the Kenya Bureau of Standards, which has standing committees dealing with ICT standards.

d) Kenya's relationships with the global information infrastructure

Kenya is an active member of the International Telecommunications Union, ITU. It is also a participant and/or signatory to a number of international conventions and standards relating to ICT.

1.1.6 Sector regulation

a) National Communications Secretariat

Telecommunications and information infrastructures are vital for any country's economic productivity, competitiveness and national security. These sectors are experiencing rapid technological advances which make it imperative for the government to maintain an effective and dynamic policy environment that will facilitate sustainable development and advancement of strategic interests. The Kenya Communications Act, 1998, provides for the establishment of a National Communications Secretariat to serve as the policy advisory arm of the Government on all matters pertaining to the info-communications sector. The functions include:

- formulation of info-communication policies and recommendations that aim to advance strategic interests.
- carrying out telecommunications and postal policy, research and analysis.

- advising Government on the most efficient and effective way of managing the radio frequency spectrum.
- conducting continuous review of all phases of development in info-communications.
- assisting in the preparation of country position papers for all international meetings and conferences relating to info-communications.
- updating sector policy statements, sectional papers and legislation pertaining to info-communications.

The regulation of the sector and granting of licenses will remain the responsibility of the Communications Commission of Kenya.

b) Communication Commission of Kenya

The Communication Commission of Kenya (CCK) was established in February 1999 by the Kenya Communications Act, to license and regulate telecommunications, radio communication and postal services in Kenya. The following are the functions of CCK:

- Licensing (Telecommunications and Postal/Courier) operators tariffs for monopoly areas
- Establishing interconnection principles
- Type-approving communications equipment
- Managing the radio frequency spectrum
- Formulating telecommunication numbering schemes and assigning them to network operators
- Implementing Universal Service Obligation for both postal and telecommunication services.

CCK issues licenses to vendors, contractors, engineers, resellers, network operators, internet and paging service providers, among others. The operators must meet the following conditions:

- Must be a registered company in Kenya.
- The company must have at least 30% of its shares owned by Kenyan entrepreneurs.

- The applicants are required to have a qualified workforce in the field of telecommunication engineering.
- Pay a non-refundable fee for each application.
- For Internet Service Providers, Paging Services Providers (PSP) and Network Operators, applications shall be subject to a 60 days gazette notice followed by CCK board approval.
- Successful applicants shall pay the appropriate registration fee.
- The company must be in possession of adequate tools, measuring instruments and test gear.
- The company must give two different and independent referees.

1.1.7 Poverty in Kenya

Poverty is not a new phenomenon in Kenya. It has been a major concern of the government since independence in 1963 (RoK 1999). Several programmes and plans have been directed towards alleviating poverty over time and across regions. The government has pursued poverty reduction through various development strategies with emphasis being on economic growth, employment creation, provision of basic social services, and more recently, free primary education. These have, however, not arrested the problem of poverty. By 2003, 56% of Kenyans lived in poverty (RoK 2003). The Kenya Government's definition of the 'poor' is those who live below the poverty line; that is, all "those with income below Kshs. 2,648 and Kshs. 1,238 per adult equivalent per month, in urban and rural areas, respectively" (Ibid.). The Investment Programme for Economic Recovery Strategy for Wealth and Employment Creation 2003 – 2007, (Ibid.) indicated that poverty has been on the rise since 1994. It revealed that only 3 million people out of a population of 30 million control the country's wealth, leaving the rest to subsist either in poverty or just above the poverty line. This is despite the fact that the government since independence (1963) has come up with strategies of reducing considered poverty, ignorance and diseases. But these have been major development challenges. Indeed the desire to alleviate poverty has always been a priority. It was spelt out in the National Poverty Eradication Plan (RoK 1999) and the Sessional Paper No 10 of 1965 on African Socialism and its Application to Planning in Kenya. The NPEP views

poverty eradication as both a moral obligation and an economic imperative for Kenya's development. The NPEP articulates a national policy, sets out a plan to tackle poverty and provides the institutional framework to implement the plan. In addition to the long term plan, the government has developed the Poverty Reduction Strategy Paper (PRSP) as a short term plan to facilitate identification of the development strategies to reduce poverty and enhance growth. Uasin Gishu district, where the study was based, has also come up with a poverty assessment report and a PRSP to facilitate reduction of poverty in the district.

However, the gains made in the poverty eradication efforts in the last 44 years have been overshadowed by the dismal performance of the economy, which culminated in negative 0.3% of growth in GDP in 2000 (RoK 2002). It improved to 7% in 2006 but nosedived in 2008 t0 1% before picking up in the first quarter of 2010 at 4.9%. Nevertheless at present, there is rising poverty as both the formal and informal sectors cannot provide adequate and gainful employment opportunities for a rapidly growing labour force (RoK 2003). This is witnessed across the country and in different agro-ecological zones.

1.1.8 An overview of Uasin Gishu District

According to the Government of Kenya (RoK 2002b), Uasin Gishu is one of the 18 districts of the Rift Valley Province of Kenya. The district shares common borders with Trans-Nzoia District to the north, Marakwet and Keiyo District to the east, Koibatek District to the South East, Kericho District to the south, Nandi District to the west and Lugari District to the north west.

Uasin Gishu district has a total area of 3,327.8 Km^2. Administratively, it is divided into 6 divisions: Kapsaret, Ainabkoi, Kesses, Turbo, Soy and Moiben. It is further divided into 51 locations and 96 sub-locations. Moiben is the largest division covering an area of 778.2 Km^2 with 10 locations and 23 sub-locations. Kapsaret is the smallest division with an area of 297 Km^2. The district is divided into 3 constituencies namely: Eldoret East, Eldoret North and Eldoret South. Following the promulgation of the new constitution on 27th August 2010, Uasin Gishu is now a county. However, in this thesis, I use district to refer to Uasin Gishu County.

Table 1: Area and administrative units

Division	Area (km^2)	Locations	Sub-locations
Soy	766.8	10	19
Moiben	778.2	10	23
Ainabkoi	472.5	10	22
Kesses	692.1	10	17
Kapsaret	297	4	6
Turbo	321.1	7	10
Total	**3,327.8**	**51**	**96**

b) Physiological and natural conditions

Uasin Gishu district is a highland plateau. Altitudes fall gently from 2700m above sea level at Timboroa in the east to about 1500m above sea level at Kipkaren in the west. The district can roughly be divided into two broad physiological regions with Eldoret town forming the boundary between the regions. The district is the Lake Victoria catchment zone. That is, all the rivers in Uasin Gishu drain into Lake Victoria. Major rivers in the district include Sosiani, Kipkaren, Kerita, Kipkuner, Nderugut, Daragwa and Sambu. These provide water for livestock, domestic and industrial use.

Rainfall in the district is high, reliable and evenly distributed. The average rainfall is between 900mm-1200mm (between March and September) with two distinct peaks in May and August. The dry spells begin in November and end in February. Temperatures range between 8.4^0C and 26.1^0C. An estimated 90% of the land area is arable with four major soil types, namely, loam, red clay, brown clay and brown loam. This means that if proper information systems are put in place, this potential can be harnessed and poverty will be alleviated.

c) Population density

In 2004, the population of Uasin Gishu District was estimated at 729,079. With an annual growth rate of 3.35%, it was estimated that by the end of 2008, the figure will stand at 834,250. According to 2010 population census, the population stands at 893,361. The total fertility rate for the district is also estimated at seven. This is a very high rate and it adversely affects the ability of families to meet basic needs. This subsequently leads to

family instability resulting in high absolute poverty levels in the district that is currently estimated at 42.2%.

(The following figures are in thousands)

Table 2: Population density

Division	**1999**	**2002**	**2004**	**2008**
Soy	215	238	254	290.6
Moiben	119	131.6	140	160.8
Ainabkoi	163	180.1	192.2	220.3
Kesses	123	136	145.4	166
Kapsaret	314	347	371	424.5
Turbo	340	376	402	459.6

Source: RoK. 2002b

Turbo and Kapsaret Divisions are densely populated due to a high urbanization rate whereas Moiben is sparsely populated due to extensive large farms. There exist packets of poverty in the densely populated areas of Huruma (Turbo Division) and Langas (Kapsaret Division) where urbanization has led to the emergence of slums. In Moiben Division, Meibeki location, poverty especially during dry seasons is attributed to harsh climatic conditions.

d) Labour force

The district labour force constitutes about 53% of the total population. A majority of these are males who are mainly engaged in the agricultural and informal sectors. About 57.8% of the poor in the district are engaged in subsistence farming compared to 42.6% of the non-poor. Thirteen point eight (13.8%) and 17.6% of the non-poor are engaged in commercial farming and formal sector employment respectively. Fifteen point seven percent (15.7%) and 5.4% of the poor are engaged in casual labour and business respectively.

e) Poverty

Poverty in the district is a major development challenge after population growth. Although the district is ranked a major food producer in the country, the poverty incidence is still high. Rural poverty was estimated at 41.86% of the population in 1997 as compared to 33.13% in 1994. Those vulnerable to poverty in the district include persons with disabilities, the elderly, women (particularly female headed households), the landless, the youth, the unemployed, orphans and children in difficult circumstances.

The major cause of poverty in the district is unemployment due to the closure of major industries such as the East African Tanning and Extraction Company (EATEC), Rift Valley Textile Company (RIVATEX) and Raymond Wollen Mills. Other causes include lack of markets for farm produce, high costs of farm inputs and poor food storage facilities. Food poverty is as a result of farmers' use of poor quality seeds, limited access to credit facilities and poor delivery of services. High population growth rate has also contributed to increasing poverty as social facilities such as health, education, and transport among others have been over stretched.

f) Agriculture

Agriculture is the mainstay of the district's economy. The acreage under crop production is over and above 126,311 hectares while over 204,000 of the population work in agriculture alone. The sector also contributes 35.3% of household income, and is an important revenue and foreign exchange earner. It creates jobs while at the same time promoting better environmental management for sustainable production. Therefore, poverty reduction strategies involving the use of ICTs should focus on this sector to fully reap its benefits.

g) Physical infrastructure

The district has a generally well developed infrastructure with good roads. It is strategically positioned on the Trans-African Highway. It is midway between Nairobi and Kampala. It has a railway and the Kenya Ports Authority Inland Depot container service. The banking sector is also developed with a Central Bank and other major commercial banks such as Barclays Bank of Kenya, Standard Bank of Kenya, Kenya Commercial

Bank, the Guardian Bank, Equity Bank, Bank of Baroda, Family Bank, Commercial Bank of Africa, Housing Finance Company of Kenya and African Banking Corporation (ABC).

The district has good telecommunication services provided by Telkom, Airtel, Yu and Safaricom. There is also a modern airport, which is recognized both as an Aviation Centre and an International Airport. The airport has all key facilities including a modern air traffic control runway, modern control tower, sufficient packing, modern terminal building, cargo terminal as well as immigration and customs departments.

h) Health and Education

The District has a referral hospital - Moi Teaching and Referral Hospital, which has attracted specialist medical staff who work in the District. This hospital serves the entire western region of Kenya. It also offers employment to many. On education, the district has several institutions of higher learning which include: Moi University, Chepkoilel University College, Catholic University, Mt. Kenya University, Kisii University College, Methodist University, Eldoret Polytechnic, Rift Valley Institute of Science and Technology as well as private commercial colleges that take care of educational needs.

The above scenario brings to light the fact that Uasin Gishu District has a great potential for growth and development. A network of physical infrastructure in both urban and rural areas is a critical requirement for economic growth. Production costs, competitiveness and access to markets depend upon the quality of infrastructure. The state of all infrastructure – roads, transport, energy, water and sanitation, buildings and housing and communication must therefore be improved to revive the economy and help reduce poverty.

1.2 Statement of the problem

The information revolution is a phenomenon that affects everybody, bringing fundamental changes to the way people work, entertain and interact with each other. Yet, the reality is that such changes have bypassed the majority of humankind, the billions of

poor people for whom ICTs mean nothing. For many, the poor need food not technology, a luxury they see as the domain of the rich. That is why many people feel that the African continent is not ready to invest in ICTs, when other more deserving and accurately pressing and perhaps life threatening areas of action such as, health, education and agriculture are still in dire need. This feeling exists even among the very educated, well placed and arguably well informed Africans (Pigato 2001). The truth, however, is that ICTs now have the potential to improve the livelihood of communities in both rural and urban areas of Kenya. The mobile telephony, for instance, has revolutionized the way people do business, communicate and go about their day-to-day activities in the rural areas. The digital divide exists and for the world's estimated 1.2 billion people living in abject poverty such technology is directly out of their reach. Many experts have pointed out that in Africa, ICT is yet to be effectively integrated into national development policies (Jensen 2003, Harris 2004 and Olatokun 2009). For instance, the ECA notes that traditionally, decision makers have regarded ICTs as a completely separate area and often fail to see its role in poverty reduction. ICTs have a real impact only when they are addressing a direct need such as poverty and hunger, HIV/AIDS, education, environmental sustainability, all of which are MDG target areas.

The assertion that a knowledge gap is an important determinant of persistent poverty, combined with the notion that developed countries already possess the knowledge required to assure a universally adequate standard of living, suggests the need for policies that encourage greater communication and information flows. Information is critical to the social and economic activities that comprise the development process. Thus ICTs, as a means of sharing information are a link in the chain of the development process itself (ILO 2001).

In a growing number of instances in Kenya, a variety of local organizations, aid agencies, government bodies as well as individuals have argued that ICTs can be used to enhance access to information to the poorest of people living in the remotest corners of the world. Under the right circumstances, ICTs have been shown to be capable of inducing social and economic development in terms of healthcare, improved education, employment

creation, agriculture and trade, and also enriching local culture. The pertinent issue here is whether society accepts that the poor should, in addition to the existing deprivation of income, food and health services, also be deprived of new opportunities to improve their livelihoods. The strategic choice is whether to accept the rapidly growing gap caused by a very asymmetric architecture of opportunities or whether to use ICTs in a creative manner to level the playing field in economic, social, cultural and political terms. ICTs for development have an increasingly vital role to play in the management of policies aimed at achieving the MDGs in data collection, creating networks, in informing greater numbers of people, ensuring greater accountability and in governance issues.

The notion that information has to flow from the developed world is not true because a wealth of knowledge is already available within the developing world, particularly with regard to health and agriculture. This knowledge is culturally sensitive and context specific. It needs to be acknowledged, validated, reinforced, disseminated, innovated upon and preserved through practice. A bottom-up approach may provide a more realistic opportunity to capture the ideals of people-centred, need-based sustainable development. But is this the case in Kenya? How does knowledge flow in the country? Do ICTs comprise of appropriate technologies that are demand-driven, people-centred and need-based? Do the rural communities take part in the implementation of ICT projects? Are they involved in the making of decisions on what they also want in terms of content for instance? These are some of the questions that the study seeks to address.

So, how can ICTs (both old and new) be harnessed for poverty reduction? According to the World Bank (1998), recent development thinking has been based on the assumption that markets work well enough to ensure development and alleviate poverty. The understanding of information constraints suggests that societies require policies and institutions to facilitate the acquisition, adaptation and dissemination of knowledge, and to mitigate information failures, especially as they affect the poor. This requires effective consideration to be taken on the role of knowledge in poverty reduction in order to facilitate greater access to and use of ICTs through policy planning. But do the people in the rural areas hold substantial human and natural potential to realize development goals

by harnessing knowledge? What role will ICTs play in not only raising more people out of poverty but also raising the poorest people out of poverty? How will the understanding of their information needs be important in forming the basis upon which poverty reduction efforts will be anchored?

Rural areas in Kenya are characterized by low income levels, unskilled labour force, low education and high illiteracy. How will these factors impact on the access and use of ICTs in the rural areas? Is there evidence for empowerment, income generation and poverty alleviation through the use of ICTs? Can ICTs serve as tools for development or just rewards for economic progress? Therefore, to eradicate rural poverty and promote development in Uasin Gishu district, individuals need to be empowered to gain control over their own lives and resources. This can be achieved through the provision of information that is specifically targeted towards their information needs. As noted earlier, the district has a high potential for growth and it is only through empowering the community that this potential will be realized. ICTs can play an important role in this initiative. They can, no doubt, assist Uasin Gishu District to move towards food security and sustainable livelihoods. This will mark an important step towards the achievement of the Millennium Development Goals, hence raising the economic standards of the country as a whole.

ICTs are ineffective unless they are used in the dissemination of information. The convergence of ICTs means that there is an improvement in their access and use. People can now use their mobile phones to call radio stations and give their views on issues affecting them. One does not require a computer to enjoy the benefits of the internet. Advanced mobile phones are equipped with facilities that connect to the internet. In other words, ICTs are useless if their potential is not fully utilized. It will be pointless for the government to invest so much money to improve ICT infrastructure in the country if the potential users are not known, or if the niche is not established. It is in the light of this that the present study was conducted to find out whether, indeed, rural populations need ICTs for the acquisition and dissemination of information. Experts have argued that ICTs can contribute to poverty reduction if they are specifically tailored to the needs of the

poor (World Bank, 2003). Like all technologies, ICTs offer tools and applications but no solutions. The solutions to the problems of poverty are what they have always been – economic growth, an enabling infrastructure, creation of livelihoods, education and healthcare, and sufficiently democratic governments to ensure that economic benefits are not cornered by powerful elites.

1.3 Aim of the study:

The aim of this study was to investigate the use of ICTs in the provision of information for rural poverty reduction in the rural areas of Uasin Gishu district with a view to proposing a framework /model of improving their use.

1.4 Objectives:

The research was guided by the following objectives:

1. To assess the information needs of the rural communities in Uasin Gishu District and how these needs are met
2. To explore the extent to which ICTs are accessed and used in the provision of information for rural poverty reduction
3. To establish the perception of the rural communities towards ICTs
4. To explore the potential role of ICTs in meeting the information needs of rural communities
5. To establish the challenges experienced by the rural communities in using ICTs
6. To propose a framework of improving access and utilization of ICTs by rural communities in Uasin Gishu.

1.5 Research questions

The inquiry endeavoured to address the following questions:

1. What activities are carried out by the rural population of Uasin Gishu District on the improvement of their livelihoods?

2. What kind of information does the rural community need to effectively play its role in society?
3. From where does the rural community obtain the information it needs? Is the information obtained able to meet its needs?
4. To what extent does the rural community access and use ICTs to obtain relevant information for the day-to-day activities?
5. What skills/knowledge should the rural community be equipped with in order to exploit the potential of ICTs for poverty reduction?
6. What factors hinder the use of ICTs by the rural community?
7. What framework can be proposed to improve access and use of ICTs by the rural community?

1.6 Assumptions of the study

The following assumptions were drawn from the investigation:

1. Although information is critical for rural development, the rural communities in Uasin Gishu District do not have access to the right information
2. Communities in the rural areas of Uasin Gishu need information that is comprehensive, relevant, timely and accurate to alleviate poverty
3. ICTs have a crucial role to play in the creation, utilization, dissemination and preservation of information for rural development and poverty reduction
4. Rural communities in Uasin Gishu experience problems in accessing and using information and ICTs

1.7 Scope of the study

This research was carried out in the rural areas of Uasin Gishu District of the Rift Valley Province of Kenya, before the new district structure (whereby Uasin Gishu comprises Wareng, Sirikwa and East districts) was implemented. This was done because the area is the main producer of maize and wheat in the country, and if supplied with appropriate information, it can help them produce enough food for their consumption and for sale, thus reducing poverty. Apart from just maize and wheat, the residents in the rural areas

are engaging in other agricultural activities such as horticulture in order to produce goods for export. Hence, there is need for information that is appropriate and relevant. The study focused on men and women aged thirty years and above.

In this research, ICTs are divided into two categories: old and new. Old ICTs include radio and television which have been gradually ingrained in the daily habits and lives of people and communities in the rural areas. Although fixed line telephones, and facsimile machines are normally included in this group, they have not been included in this study because they are almost non-existent in the rural areas of Uasin Gishu District. The new ICTs consist of computers and specific data processing applications accessible through computers (email and internet). Cellular phones and, more generally, wireless technologies, have also been included in this category. The ICTs investigated in the present study included both the old and new ICTs. Old ICTs included radio, television and print media while new ICTs comprised of computers and the associated applications such as the internet and mobile phones.

1.8 Limitations of the study

The study was not smooth sailing as the researcher faced a few difficulties. First and foremost, it was not easy to interview rural populations, who are busy with their day to day activities. It took the intervention of District Officers at the location to identify days that it would likely be possible to get respondents, and these were normally market days. Secondly, there were instances of communication problems related to language of choice. Thus, the researcher had to translate the interview items to Kiswahili, in cases where the respondent could not understand English.

1.9 Significance of the study

First and foremost, this is a study of its own kind as no similar research has been carried out in Kenya to focus on access and use of ICTs in a rural area. The large volume of literature that exists in this area is general. Much of it either covers sub-Saharan Africa, Asia and even the entire globe (such as, Adeya 2001, Pigato 2001, Giannini 2004 and

Slater and Tacci 2004). Most of the literature looks at poverty mainly from the income and consumption of food point of view. The current research, to emphasize its uniqueness, studied the poor person him/herself. The research has brought to light the fact that indeed ICTs, especially new ICTs, are an important tool in the provision of information for poverty reduction. They can contribute to improving the living standards of people in rural Uasin Gishu. ICTs can make this contribution by helping to meet the dynamic and changing expectations of people in rural Uasin Gishu in such areas as agriculture, business, health and governance. Studies that have been conducted elsewhere have shown that as people become familiar with ICTs, they discover the opportunities that these tools can offer and express their needs on the basis of the anticipated usefulness of these technologies (Giannini 2004). ICTs can be used to capture local knowledge, process it, store it and facilitate its dissemination to rural communities. Since these rural communities would have taken part in its collection, they would embrace it as their own and use it appropriately for poverty reduction. It is hoped that the rural communities of Uasin Gishu, through sensitization, would anticipate the capacity of ICTs to deliver information that will solve the practical and concrete problems that they face.

It is hoped that the findings of this investigation will sensitize the government and assist policy makers to establish information systems that would address the information needs of rural communities. This means that, government policies that will be drawn will have the rural poor person as the reference point – policies such as communication policies, ICT policies, poverty reduction policies and even government legislations and plans, namely, development plans. In that way, the government will be able to tap the local and traditional knowledge of the rural poor, their skills and cultural endowment.

It is also hoped that the study would establish the potential role of ICTs in reducing poverty in rural Uasin Gishu. As earlier mentioned, the potential of ICTs has not been studied especially in the rural areas of developing countries like Kenya, where the satisfaction of basic needs takes precedence. This would form the basis upon which the government and stakeholders would strengthen the use of ICTs to provide up-to-date and relevant information to rural communities so as to alleviate poverty. There is need to fully harness this potential so as to reap the full benefits of ICTs.

It is also hoped that the findings of this research would show clearly that information is indeed a critical factor in poverty reduction efforts. In this regard, policy makers who intend to make any decision on poverty reduction in the rural areas would seek information first from the beneficiaries.

Finally, it is hoped that the findings of this inquiry would contribute to the existing body of knowledge on access and use of ICTs in the provision of information for poverty reduction in rural Uasin Gishu, Kenya, in particular and sub-Saharan Africa, in general. This contribution will be complimentary and at the same time, fill gaps that already exist.

1.10 Dissemination of the findings

A study such as this will be futile if the findings were locked up in cabinets accumulating dust. In this regard, the former president of the republic of Kenya, Daniel arap Moi observed:

> I am pleased to record that our farmers continue to respond positively in support of our major objectives in agriculture. It is also gratifying to witness the success of our agricultural research activities…. The researchers can however not be an end in themselves. They can only be useful if they are matched by improved farming methods by our farmers ……(Bosire 2002)

The researcher intends to disseminate the findings as presentations in international conferences and seminars, book chapters and articles in refereed journals. The findings will also be disseminated to decision makers and stakeholders in the ICT sector as well as rural development.

1.11 Definition of terms

Access

Expected changes would be dependent on access to ICTs. Access should be understood in this study to mean the opportunity to use ICTs (such as, availability, financial capacity, and technical capacity).

Community

The term ‘community’ here designates the individuals that live in rural Uasin Gishu. It does not matter whether they are women’s organizations, youth associations, trade organizations in the informal sector, or groupings of arts and crafts workers and farmers.

Community development

The use of ICTs is expected to bring about a change in the behaviour of the individuals and groups who make up the community. Community development can be defined as a global, dynamic, iterative, and interactive process of change that constitutes the source of significant and measurable improvements in various aspects of life and provides some degree of satisfaction. In this specific context, it will be taken to mean the sustainable satisfaction of basic needs, for example, in education, health, employment and entrepreneurship, natural resource management, and governance through the use of ICTs. Community development concerns individuals and organizations or institutions and their inter-relationships and inter-connectedness. It implies the participation of all community components in this process. It also implies capacity building in order to favour the creation of the conditions required for an increase in necessary resources.

Digital divide

A situation in which some members of society or areas of the world are left behind by those who have access to ICTs.

Digital Subscriber Line (**DSL**)

This is a family of technologies that provides digital data transmission over the wires of a local telephone network. DSL originally stood for *digital subscriber loop*.

Field day

A field day is an open day that is specifically constituted by a certain group of individuals. For instance, the Ministry of Agriculture can organize for a Field Day to have certain demonstrations made on such areas as safe application of pesticides, making of fireless cookers, baking, preservation of fruits and vegetables among others. Unlike a

public baraza, a field day is not limited to a location. Participants can be invited from neighbouring locations.

Global Positioning System (GPS)

A space based global navigation satellite system that provides reliable location and time information in all weather and at all times and anywhere on or near the earth where there is an unobstructed line of sites to four or more GPS satellites.

Global System for Mobile (GSM)

This is a cellular network to which mobile phones connect by searching for cells in the immediate vicinity.

Impacts

Given the transforming capacity ascribed to ICTs, their use is expected to produce more or less significant impacts. This impact should be understood here as changes in behaviours, relations, activities, or intervention strategies that are influenced by projects which introduce ICTs to communities. These changes are expected to contribute to the achievement of a better quality of life for the population or communities.

Information revolution

This is an era characterized by information as the main economic good. The world has gone through the agrarian revolution (characterized by agriculture as the main economic good) and the industrial revolution (characterized by industrialization).

Memo

These are short documents that one writes to oneself as one proceeds through the analysis of a corpus of data, e.g., field note and the code note.

Mobile phone

This is an electronic device used for two-way radio telecommunications over a cellular network of base stations known as cell sites. A mobile phone is also called a cellphone,

a cellular phone or a hand phone. It uses rechargeable cells. In addition to being a cellphone, mobile phones also support many additional services and accessories such as SMS, email, internet access gaming, bluetooth, infra-red, camera, multi-media messaging (MMS), MP3 player (Moving Picture Expert), radio and GPS (Global Positioning System).

M-*PESA*

Pesa is a Swahili word for money and *M* stands for mobile. It means sending money through a mobile phone. It is an affordable service and therefore an affordable and speedy option for transferring money from one person to another via short messaging system (SMS). Most respondents indicated that they do not operate bank accounts. Thus to them, the phone subscription acts as a bank account and as a debit card.

MP3

This is a potential digital audio encoding format. It reduces the amount of data required to represent the audio recording and still sound like a faithful reproduction of the original uncompressed audio for most listeners.

Participation

The use of ICTs for community development implies the participation of all components of a given community. Participation is understood in many ways but in this document it refers to an organized effort accomplished by the members themselves with a view to achieving the development objectives that they had assigned to themselves. Community participation is seen in this context as a process that creates the conditions required to speed up changes induced by, and expected from, ICTs.

Post-paid

A telecommunication service for which a customer pays after using the service. Payment is usually done on a monthly basis on subscription.

Pre-paid

A telecommunication service for which a customer pays in advance for services.

Public baraza

Baraza is a Swahili word for gathering. A public *baraza* is normally organized by a chief (of a location) or any other public officer such as a District Officer (DO). Guests can be invited (from agriculture, health and education offices) to give speeches on important matters affecting that location.

Rural development

Rural development refers to the process of socio-economic activities meant to bring about positive change in the rural areas, improving the quality of life among rural people.

SMS

It stands for short messaging system. It is a text message sent and received with mobile phones

Theoretical note/theoretical memo

A theoretical note is anything from a post-it that notes how something in the text or codes relates to the literature, to a 5-page paper developing the theoretical implications of something. The final theory and report is typically the integration of several theoretical memos. Writing theoretical memos allows one to think theoretically without the pressure of working on "the" paper.

WiMAX

This is a high speed wireless data transmission technology. It enables especially high-speed Internet surfing, or to telephone (VoIP), or better still to connect enterprise networks. Contrary to ADSL or another non-wireless technology, WiMAX uses radio waves, just like radio or mobile phones. This technology makes it possible to transport the entire communication flow (Internet, data, VoIP), with a level of guarantee defined according to needs.

1.12 The structure of the thesis

The thesis is divided into six chapters. The first chapter provides an introduction to the study. It provides a global overview of poverty and narrows it down to the area under study, Uasin Gishu District. It also provides the building blocks of the research such as statement of the problem, aim, objectives and research questions of the study as well as the main assumptions drawn from the study. In this chapter, the scope and limitations of the study are provided, significance of the study as well the definition of operational terms.

The second chapter is literature review. It discusses the conceptual framework upon which the study is based as well as the literature that is related to this study. The literature review is presented thematically under the topics: information, information need, users and information seeking; information needs of rural communities; ICTs; ICTs and development; ICTs and poverty and the relationship between development, information and ICTs, among others.

The third chapter presents the methodology of the study. It discusses the philosophical perspectives of research, research design, methods, techniques and tools for conducting the research. Chapter four presents an analysis of the data that arose from chapter three. This data is presented and interpreted in this chapter, with the aim, objectives and research questions of the study in mind. Chapter five discusses the major findings of the study and is broadly centred on the socio-economic and demographic factors of the target population, their information needs, their access and use of ICTs, and the challenges they face while using and accessing ICTs.

The last chapter, chapter six, provides a summary of the findings and conclusions drawn from the study. Recommendations are provided on how access and use of ICTs can be improved so as to reap the full benefits of this technology by the rural community. Finally, a framework is proposed concerning this improvement.

CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction

This chapter discusses the theoretical framework upon which the study is based. It also reviews the literature related to the investigation. The purpose of reviewing related literature is to identify strengths, shortcomings and contributions to the current research. It was necessary to highlight success stories of adopting ICTs in rural areas of developing countries so as to justify the relevance of a study such as this. Several of such cases have been provided and there is documentary evidence to show that where ICTs have been deployed in the rural areas, poverty has been reduced. The challenges have also been highlighted.

2.2 Theoretical framework

A theoretical framework is a collection of interrelated ideas based on theories. It is a reasoned set of propositions, which are derived from and supported by data or evidence. They are meant to account for or explain phenomena by clarifying why things are the way they are (Okombo and Tromp 2006). A theoretical framework guides the research in determining what things to measure and the relationships between them. The present study was informed by info-mobilization theory. This theory developed systematically from other theories namely: the systems theory, socio-technical systems theory and social mobilization theory. It is therefore important to briefly discuss these theories so as to appreciate the development of info-mobilization.

2.2.1 Systems theory

According to Littlejohn (1995) system is a set of things that relate to one another as a whole. Any system can be said to consist of four things, namely:

i. objects – these are parts, elements or variables of the system.
ii. attributes – these are the qualities of the system and its objects.
iii. internal relationships - these are relationships among objects. This characteristic defines the quality of systems.

iv. environment – systems do not exist in a vacuum but are affected by their surroundings.

In the rural community under study, the community itself is an example of a system. The members of the community are the objects. Their characteristics as individuals are attributes, and their interactions form relationships among the members. This community exists in a social and cultural environment. There is a mutual relationship between the community and the environment. In the application of ICTs in the rural areas, all these components/parts will have a role to play for better results. For instance, the government (which will be the environment in this case), will determine whether policies and regulations will be put in place to ensure maximum utilization of ICTs in the rural areas.

The systems approach regards everything as ultimately connected to everything else; and the most favourable outcome for the whole system is not achieved by each sub-system selecting its best option, but by coordinating their activities, i.e., A causes B causes C causes D causes A – in a circular causality (Littlejohn 1995).

2.2.2 Socio-technical systems theory (STS theory)

This is theory about the social aspects of people and society and technical aspects of machines and technology (Harris 2004). The socio-technical system draws from the systems theory in that parts of an organization are inter-related. It considers that every organization is made up of people (the social system) using tools, techniques and knowledge (the technical system) to produce goods and services (Liu and Errey 2006). The inter-relationships between people and technology means that it is not a matter of simply installing new technology to solve performance problems. How well the social and technical systems are designed, with respect to one another and with respect to the demands of the external system, determines to a large extent how effective the organization will be. The interaction leads to increased productivity and well being, rather than the all too often case of new technology failing to meet the expectations of designers and users alike (Walker et. al. 2007).

The STS theory was established to emphasize the two-way relationship between people, machines and their environment. Its role is to foster the program of shaping the technical and social conditions of work in such a way that efficiency and humanity would not contradict each other. It was established in the 1960s by Eric Trist and a prominent Australian psychologist, Fred Emery, at the Travistock Institute (Liu and Errey 2006).

It is therefore important to integrate the social requirements of individuals with the technical requirements needed to keep the work environment functional. Many systems are implemented without analyzing how the people will interact with the system. This means that the technology will just be imposed on the users. What is required is the needs of the users ought to be studied so as to provide 'a' technology that satisfies these needs. This will promote direct participation of end-users in the design of the system. This is important in this study because, if the rural community is involved in the implementation of technology, the technology is likely to be received well by the users (which means that the adoption rate will be high), the users will feel that they own the system, and consequently its utilization will be high. In essence, what this means is that technology will never exist in isolation. Rather, human beings have to be part of the system.

2.2.3 Social mobilization

Social mobilization means organizing people living in the same community with a specific purpose (Sah 2000). On one hand, the deployment of ICTs in rural areas in developing countries experiences difficulties like those that the top-down national programs experience in incorporating the specifics of the local context of a rural community. On the other hand, scaling up the successes of focused projects and initiatives to wider implementations is also proving to be a challenge. It is evident that some communities do better with their ICTs than others, and whilst the technology is the same, many of the differences in achievement can be attributable to differences between the communities. This being the case, advocates of ICTs for development need reliable mechanisms that will enable them to influence those characteristics of communities that have some bearing on ICTs.

Social mobilization engages communities in ways that empower them to take the initiative in furthering their own development. This is an important characteristic that is critical to the success of ICTs in rural areas (Harris 2003). Consequently, social mobilization process offers a basis for developing a methodology that can be implemented alongside rural ICT adoption to ensure that the recipients get the most out of the technology. In 1993, for example, UNDP launched the South Asia Poverty Alleviation Programme (SAPAP), with the objective of demonstrating the feasibility of social mobilization for poverty alleviation. The programme's major aim was to help remove the constraints that poor rural communities faced in harnessing the potential of ICTs to develop themselves. A three tier strategy was followed, based on social organization, capital formation and human resource development. People in the village were brought together through Village Organizations (VOs) in order to discuss local development issues of common interest and to initiate local development initiatives at the village or household level. Subsequently, they were encouraged to accumulate savings, which became an important source for credit operations for income generating activities. Additionally, they were trained, mainly in management techniques and income generating activities, in order to create the foundation for grassroots institutional development, to improve sectoral service delivery, and to support those who wanted to undertake socio-economic activities.

After nine years, in 2002, this social mobilization led to the following benefits: decrease in poverty by 8%; improvements in health and education; reduced dependency on money lenders; enhanced status of women; reduction in out-migration; improved local planning; and strengthened social fabric. In other words, social mobilization brought about community empowerment, a very important step towards poverty reduction. Community empowerment came about because: group solidarity and collectiveness were promoted; access to external sources was enhanced; and management and leadership skills were improved.

Projects with such an objective are said to have a strong sense of ownership from the people (Karcher 2001, Harris 2003). Characteristics of such communities are thought to

have a significant influence on their ability to make good use of ICTs and these, according to Harris (2004), include:

- community aspirations: an ambition for a better life
- learning: people discovering new knowledge and teaching it to each other
- capacities: individuals taking on new roles
- organization: harnessing the social dynamics of a community towards its own betterment
- unity: a sense of unity of purpose within the community that transcends its internal differences
- participation: desire to include rather than to exclude sections of the community
- relationships: which can amplify the effects of the other characteristics
- personalities: one or more individuals within the community who seem to have an important role in the outcome.

It seems that both mobilization and the community characteristics that are important for the successful use of ICTs have much in common, including such traits as community organization, solidarity, leadership, equity, capacity, social capital and willingness. Harris (2003) argues that methodologies for the analysis, design and implementation of information system account for all the logical processes that need to be considered for ICT projects to achieve their objectives. They go beyond the mere installation of technology by addressing the behavioural changes of technology users that are known to be necessary for technology to fulfill its potential. Social mobilization represents a methodology for achieving social development. When it is extended to encompass ICTs, it is known as info-mobilization.

2.2.4 Info-mobilization

This is an organic process of change in which collaborative groups explore and learn about problems and solutions in an interactive manner (Harris 2004). It is a collection of participative activities that ensure ICTs have optimal impacts for development within communities. It provides a methodology to design technology and social systems simultaneously through a participative and incremental process that does not require coercion and creates no resistance to change. With info-mobilization, ICT architects and

target community groups jointly determine how technology can be used to develop new ways of accomplishing group and community goals.

Info-mobilization confronts communities with the information requirements. According to Harris (2004), info-mobilization addresses the design, delivery and utilization of community information systems by:

- defining community information requirements based on needs and priorities that have been expressed by the communities themselves
- igniting community aspirations and empowering communities with appropriate skills for fostering local development that is information-based
- expanding a community's social capital through enhanced access to communication facilities and information resources
- embedding community-based ICT services within existing economic, governance and social structures
- infusing enhanced capability for information access within communities
- achieving sustainability of financing, service delivery and operating functionality
- ensuring that the benefits arising thereof are equitably disseminated among the socially and economically disadvantaged groups
- extending and intensifying existing development programmes that carry a significant potential for additional community benefit from enhanced information management capabilities that are based on ICTs.

The info-mobilization theory consists of the actions necessary to ensure that ICTs have optimal impacts for development within communities in developing countries. These include:

- familiarizing communities with their existing use and sources of information as well as with the gaps that exist between existing and desired information resources
- alerting communities to the potential application of information to their problem-solving efforts and to their development aspirations

- sensitizing communities to the existence and accessibility of abundant information resources and to the capabilities of ICTs for accessing and manipulating information
- propelling communities towards the acquisition of the new knowledge they will require in order to exploit the power of ICTs
- empowering communities with information literacy; that is, the skills necessary for the mastery of new media, the internet and multi-media
- motivating communities to apply ICTs to the new opportunities that become possible from their relationship with ICTs
- encouraging the collection, classification, preservation and dissemination of indigenous knowledge and cultural information artifacts and
- fostering appropriate local mechanisms for sustaining the equipment, services and operations of community based ICTs.

In info-mobilization, the focus is on concurrent processes of technological and social change and on the joint optimization of human and technical processes within communities. The implication of info-mobilization for the implementation of ICTs for development is that incremental change allows for a collaborative learning process based on evolving community needs.

The info-mobilization theory is based on the socio-technical systems theory which (as already seen), shows that separate efforts to optimize the technical and the social system will lead to sub-optimal results and can even be infeasible. The same system can be a success in one organization/community but a failure in another, while the same organization/community can experience success with one information system but fail with another (Harris, 2004). Hence, the information system and its context must be studied, understood and managed together, not separately. Info-mobilization applies these theories (social, STS and social mobilization) to rural communities in developing countries, where they are seen to be even more applicable than in commercial or government organizations because community actions are influenced more by social factors and individual choices than are organization actions.

The applicability of a socially-based approach to information systems in communities arises from information technology being an intellectual technology as opposed to an industrial technology. Industrial technologies, like a water pump, typically have a fixed set of functionalities. Information technologies, however, have functionalities that are not fixed at the outset, but can be innovated endlessly, depending on the interaction with the people who implement and use them. In the process of its implementation within an information system, a given set of information technology becomes subject to the shaping influence of the intellects of its implementers and users, who can end up creating an information system that the inventors and promoters of the technology never had in mind (Harris, 2004).

Info-mobilization differs from change management in that it involves adaptive, planning, continuing change, community learning, disjointed incrementalism, adaptive learning, alignment of social and technological systems, participative values (as opposed to coercive), organic change (as opposed to direct change), discretionary coalitions, social and stakeholder groups, and outside/inside activists (as opposed to outside change agents).

From the foregoing, it can be concluded that while ICTs are essential for substantial development to occur, they are not in themselves sufficient. It is the right approach that ensures success. Various techniques are available for successful system implementation as well as deployment of ICTs. The development community must recognize the need for equivalent techniques in order to achieve a high degree of assurance that ICT projects in poor communities will deliver on their promise. Info-mobilization acts as a link between the development community (such as government) and the community. It allows national programs to tap local resources by detailing how implementers should interact with recipient communities and what communities need to do in order to achieve development with ICTs. It provides a blueprint towards full utilization of ICTs in the rural areas.

2.3 REVIEW OF RELATED LITERATURE

This section presents the literature that was reviewed that is related to the study. This literature was reviewed thematically under the following themes: information, information need, users and information seeking; ICTs; development; poverty; community response to ICTs; relationship between poverty, ICTs and rural development; and major projects and initiatives in Africa to promote access and use of ICTs.

2.3.1 The concepts of information, information need, users and information seeking

The concept 'information' has been variously defined in the literature. From the information seekers perspective, Debons (as cited in Bosire 2002) defines it as "that which adds or changes (their) picture of the universe", reduces uncertainty and changes one's life. From the development point of view, information has been defined as that which can be used to empower an individual or group and to continue relations of power and control. When a ruling group uses information to dominate or control people, those people are led to despair, powerlessness and unsustainable lifestyles (Mchombu 2004). As human creations, people naturally use information and knowledge to organize their view of history and culture. To become critical users of information and knowledge, community members will want to analyze critically both the knowledge that comes from outside the community, and their own inherited knowledge.

With respect to an information need, Ojiambo (1993) defines a need as a value judgment that some group has a problem that can be solved. The value in judgment exists due to differences in need requirements by individuals or groups of people. One person may regard some information as vital while another will not see this as vital. The recognition of need is therefore one's judgment. In other words, a need can only be discovered.

Need(s) are "very significant messages within the human system" which create instability within the person leading to a cycle of behaviours that ultimately will correct this instability. Debons (1986) defines an information need as a psychological statement that seeks to be relinquished throughout the commodities which can be objects or beings. Reneker (1992) adds that information needs arise whenever individuals find themselves

in a situation requiring knowledge to deal with the situation as they see it fit and that "information needs arise in all aspects of everyday life: the home, office in relation to the family or friends or the insurance company out of idle curiosity, or as a requirement of work."

According to Wilson (1981), a need is a subjective experience which occurs only in the mind of the person in need, and, consequently, is not directly accessible to an observer. The experience of need can only be discovered by deduction from behaviour or through reports of the person in need. Odini (1993), on specifying what an information need is, sees:

> … an information need as a concept that is difficult to define, to isolate and especially to measure. This is because users do not specify what is needed under defined conditions. If a user could specify what is needed under defined conditions, his or her problem might well be on the way towards a solution.

Around the same time, other scholars also observed that:

> … ascertaining information needs is indeed a complex phenomenon. Even users themselves most of the time, have difficulty in clearly defining and expressing their information needs. It is therefore important that some rigorous data collection procedures are employed to study the information needs of any group (Chaudhry and Saijadur 1993)

On balance, it can also be said that information and need are related in that information is sought to meet a need.

Users have been defined as those for whom information is intended - the "ultimate beneficiaries." In the context of their direct use of information, they are often referred to as end-users to distinguish them from users in the sense of intermediaries who use or supply information on behalf of and for users (Fleming 1990).

Belkin (1980) points out that end-users may not know the concepts they may be searching for information about. He further asserts that they may not be able to relate them readily to concepts that are known to express clearly what is wanted, even within their own minds. Furthermore, Fleming (1990), argues that there are users who know exactly what they need in appropriate terms. He notes that there are different categories of users of a community, environment or system. That is why such studies as this are

important so that they can assist users to articulate their information needs, and, because different categories of users need different kinds of information, there is need to study these categories separately.

Finally, "information seeking process" is the process an individual (user) goes through looking for information to satisfy his/her information needs. It is the user's constructive activity of finding meaning from information in order to extend his/her state of knowledge on a particular problem or topic. It incorporates a series of encounters with information within a space of time rather than a single reference incident. When an individual or group of individuals feel there is need, they will search for information to satisfy that need. Information seeking therefore results from the recognition of some need. Uncertainty and anxiety are integral parts of the information seeking process, particularly in the beginning stages. As the search progresses, the feelings shift from vague and anxious to clear and confident (Wilson 1981).

In this context, information seeking is viewed as a process of sense making in which a person is forming a personal point of view (Dervin 1983). The individual is actively involved in finding meaning which fits in with what he/she already knows or has experienced, which is not necessarily the same answer for all, but sense making within a personal frame of reference. Therefore, people have a limited capacity of assimilating new information. And because of this, they purposely construct meaning by selectively attending to that which connects to what they already know. Factors that affect the information seeking process include: personal factors; social/interpersonal barriers; information source characteristics such as access, credibility; prediction; uncertainty; redundancy; interest; environment; attitude and personality; and motivation

2.3.2 Information needs of rural communities

It is important to emphasize that ICTs only provide new mechanisms for handling an already existing resource, that is, information. Therefore, to understand their application in rural areas, one must first understand the information needs of rural communities (Harris 2004). According to Arnstein (2002), information needs of rural communities include:

- growing crops
- fertilizers - prices, usage, benefits from use, quantities, mixes
- pesticides - which ones to use and how
- plant diseases and how to combat them
- farming methods
- marketing of farm products - how, where, and how to get best prices
- product storage - when and how
- veterinary services - where to get them
- human health diseases - malnutrition, dysentery, AIDS, cancer, blindness, pneumonia etc. their causes, symptoms and treatment and how to avoid them
- family planning, pregnancy, pre- and post natal care
- childcare
- education, IT education, e-learning opportunities, opportunities for higher study
- local NGOs- especially those geared towards poverty reduction
- experiences of using ICTs in other countries such as India and Bangladesh
- leadership development
- how to find resources
- drugs and drug abuse
- old age care, old age homes, government schemes
- transportation, licensing
- housewife issues, women's development
- savings and loans- where to get credit
- enterprise development
- skills development
- sanitation, etc.

This is a multiplicity of information needs and they touch on every aspect of an individual well being. For the urban rich, the information can easily be obtained from various sources such as libraries and other information centres, which the poor might not be having access to. Therefore, availing information to the rural communities is an

important step towards poverty reduction. This is because a person who is healthy (free from disease) will be strong enough to work on the farm, and if he has the right and relevant information on various farming issues, he will produce enough not just for consumption (fighting hunger) but also for sale (fighting poverty).

Studying user needs therefore is an important step towards successful rural deployment of ICTs. It ensures that:

- extensive information needs are prioritized
- sources of information are identified and located
- responsibility is assigned to appropriate people to acquire information and
- adequate support structures are activated that will be able to translate information into opportunities for improved well-being

2.3.3 Information Communication Technologies (ICTs)

The term ICTs has been variously defined as shall be discussed here. Mansell and Silverstone (1996) point out that ICTs include electronic networks – embodying complex hardware and software linked by a vast array of technical protocols. Therefore, ICTs are embedded in networks and services that affect the local and global accumulation and flows of public and private knowledge. According to the United Nations' Economic Commission for Africa (1999), ICTs consist of a wide range of services, applications and technologies, using various types of equipment and software, often running over telecommunication networks. It sums this up that ICTs are enabling and facilitating technologies. Individuals, community groups, business or government departments with access to affordable communications and computers can use them to save time and money and improve the quality of their work or home lives (European Commission 2001 in Kwake, Ocholla and Adigun 2006). A similar definition offered by Chowdhury (2000), who defines ICTs as encompassing technologies that can process different kinds of information (voice, audio, video, text and data) and facilitate different forms of communications among human agents, among humans and information systems and among information systems. They have been categorised into old and new ICTs. Old ICTs include radios, televisions, public address systems and newspapers, among others.

New ICTs include computers, fax, mobile phones and the internet. They are all about capturing, storing, processing, sharing, displaying, protecting and managing information.

Over the last few decades, ICTs have undergone rapid changes. They have enabled the advent of the information society, in which more information is available than ever before. However, access to this enormous body of information and to the technologies that facilitate communication and information transfer, is by no means equitable, a situation that creates the digital divide. Digital divides exist between countries of the North and those of the South, and because of connectivity constraints between urban and rural areas. The rural communities are further away from digital opportunities than their urban counterparts. They also tend to be less well educated, less mobile, have less control over material resources, and are often unable to seek out and access the information they need (Kiplang'at 2001). UNCSTD (in Kwake, Ocholla and Adigun 2006) stresses that:

> ICTs do not offer a panacea for social and economic dislocation, and these may lead policy makers to give lower priority to the need to create effective national ICT strategies. However, on the basis of the evidence, it is apparent that the risks of failing to participate in the ICT revolution are enormous. Failure to give priority to ICT strategies that enable developing countries and countries in transition both to develop their national infrastructures and to join the GII (Global Information Infrastructure) will exacerbate the gap between the rich and poor. There is a growing need to evaluate the social and economic impacts of ICTs and to create opportunities for capacity building that will ensure their beneficial use and absorption with national economies and civil society.

ICTs, if well deployed, will therefore provide a means of narrowing this information gap. Excluding developing countries from the global information society would have severe implications to their societies and economies.

2.3.3.1 ICTs and development

Heeks (1999) observes that ICTs play a role as communications technologies rather than as information processing and production technologies. He notes the following about the poor, that:

- the poor need knowledge to access, assess and apply existing information and also need resources for action more than they need access to new information;

- the poor need access to new, locally contextualized information rather than access to existing information from an alien context;
- the information needs of the poor may be met by more informal systems than by formal ICT-based systems and
- the poor will reap the fullest benefits of ICTs only when they know and control both the technology and its related know-how.

Therefore, before one can advocate for the development of ICTs among the poor, they must understand the existing information systems of the poor, how they interact with more formal information systems and the best way to strengthen them before intervening with new information sources and means of access sources (O'Farrell 2001).

There is a belief that ICTs can lead to socio-cultural, economic and political change. This has resulted in a shift in development discourse (Hafkin and Wild 2002, G0U 2002, Hafkin and Taggart 2001, Adeya 2001). It is now common to hear about summits, meetings and conferences on 'ICTs for development', 'cyberspace', 'digital economy', 'information superhighways', 'the information society' and 'networked society'. A number of bilateral and multilateral donor organisations have now mainstreamed ICTs in their development programmes in order to more effectively meet the Millennium Development Goals.

These organisations look at ICTs as a 'magic bullet' that can offer Africa a great opportunity to "leapfrog stages of development" and raise their standards of living". Leapfrogging here means that Africa should skip industrialism entirely and leap directly into the information age (Soltane 2002, Castells 2000, Hudson 2001). This has led to massive investment in ICTs. For instance, the Canadian Government, that is known to be the biggest supporter of ICTs for development (ICT4D), through its agencies CIDA, IDRC and Industry Canada, invested over US $ 50.3 million just for the 2000-2001 financial year alone for Africa (Mikkelsen 2009).

The faith in ICTs as a 'miracle' technology has also been embraced by some African governments which have made it a top priority for development. Their leaders now view ICTs as a tool that can provide opportunities in key sectors like; education, health, agriculture and trade (Soltane 2002, UCC 2001). In 1995 for instance, the African Information Society Initiative (AISI), was endorsed by the Council of African Ministers of Communication. Most of the ICT work being implemented in Africa, including formulation of ICT policies is now done within the framework of the AISI (Soltane 2002). The AISI has also been adopted as the regional component of the New Partnership for African Development (NEPAD) ICT programme.

It is in this endeavour that ODI, DFID and FAO, for example, identified eight policy pillars on which information and communication for development should be built in their 2003 study "Livelihoods Approaches to Information and Communication in Support of Rural Poverty Elimination and Food Security" (Chapman and Slymaker 2002). The "8 pillars" that need to be addressed to make sure that ICT programs benefit the rural communities are:

- sharing of costs appropriately, between government (for public goods information services and social protection), and users (for private goods), and working in partnership with the private sector to ensure effective coverage in remote rural areas;
- ensuring equitable access to all, especially women, the poor, the disabled, people living in remote areas and otherwise disadvantaged communities;
- addressing diversity, including issues of equitable access and use between men and women;
- contain a high proportion of local or appropriately localized content, both to maximize local usefulness and uptake, and to enrich local, national and international knowledge;
- building on existing systems, including information content (indigenous knowledge, local sources and databases among others), information technology (TV, radio, telephone, internet), processes (existing surveys, research and extension), and policy environment;

- building capacity at the local level to generate content and using new technologies, among intermediaries and knowledge brokers, practitioners and policy makers;
- using realistic technologies, which can easily be used, managed and maintained, and integrating existing and new technologies that are affordable;
- building knowledge partnerships between knowledge users, producers and intermediaries at and across all levels to convert information into useful knowledge.

2.3.3.2 ICTs and poverty

Information and knowledge are critical components of poverty alleviation strategies. Hudson (2001) has argued that if information is critical to development, then ICTs, as a means of sharing information are not simply a connection between people, but a link in the chain of the development process itself. They offer the promise of easy access to huge amounts of useful information for the poor. However, it is argued that the digital divide is the result rather than the cause of poverty, and efforts to bridge it must be embedded within effective strategies that address the causes of poverty. Moreover, earlier patterns of adoption and diffusion of technology suggest that ICTs will not achieve their full potential without suitable attention being paid to the wider processes they are intended to assist and to the context within which they are being implemented. Although ICTs can contribute significantly to socio-economic development, investments in them alone are not sufficient for development to occur. That is why, as Harris (2003) says, the application of ICTs is not sufficient to address problems of rural areas without adherence to principles of integrated rural development. Unless there is at least minimal infrastructure development in transport, education, health and social and cultural facilities, it is unlikely that investments from ICTs alone will enable rural areas to cross the threshold from decline to growth. Hudson (2001) further adds that ICTs should complement other infrastructure required for development such as clean water supply, transportation and electrification. Even when information is available, the poor do not get it due to poor infrastructure, ignorance or illiteracy.

Wresch (1996) identifies four major information problems faced by the poor as being geographical isolation, lack of communication channels, language problems and lack of computer systems. He says that many poor people suffer from lack of communication beyond their local confines. For example, the telephone is the main medium of communication the world over, and yet, there are many places where telephone lines do not exist. The only solution to this problem is for governments to integrate networks to develop policies of access and diffusion of ICTs. ICTs have the potential to improve the livelihoods of low income people by reducing costs of providing services to the poor (Kibati 1999). It is important to remember that technology is not a goal in itself. Instead, it is a means for achieving development.

Spence (n.d.), notes that ICTs are generating changes in markets, private and public sectors and economies in the more and less developed world. With their networking possibilities, ICTs massively reduce transaction costs, change the structure of markets and of public services and institutions, integrate local and global markets, untrap human resources, and immediately increase the potential values of human capital. They further embody enormous knowledge and can serve to empower (and manipulate) people at community and national levels (Spence n.d. and Heeks 2004). There has been a large wave of investment in ICTs for development (ICT4D) over the recent past, and some significant part of it is directed at poor people (ICT4P) – both in terms of bringing ICT access to poor communities, and in using ICTs in many other ways that support poverty reduction. There have been successes, lessons learnt and experiences documented as discussed later in the chapter.

Although there is wide application of ICTs, it is difficult to consistently focus on ICTs and separate poverty reduction from broader economic development insights (Bonanet 2009, Mikkelsen 2009, Spence n.d., Harris 2004). These writers note that, based on information on ICTs and poverty including the current development thinking, growth and development are necessary but not sufficient for poverty reduction. In addition, pro-poor strategies and investments are as important for ICT and development and knowledge economy strategy as are other connected areas of social and economic development. In their studies (ibid.), successes generally occurred in productivity, growth and poverty

reduction, with ICTs contributing strongly. Strategic government intervention and support were also generally essential and culturally, politically and socially specific. There is a lot of very positive experience in connectivity and use in poorer communities where effective usage includes e-commerce, market information services, education/health-education, gender empowerment, social and political empowerment, and combinations of these in multi-purpose community access investments. The good message is that poor communities in most of the world are increasingly aware of the potential of ICTs and with some help, are keen to adopt ICTs and help other communities to do so. Clearly, poverty will not be eradicated by ICTs – and for many poor populations, many basic needs may take precedence (Pigato 2001). But equally, poverty will not be eradicated without these technologies and failure to maximize their potential for poverty reduction in this PRSP/MDG era would be incongruous. The positive dynamism often created by ICTs and the commitment of their beneficiaries and supporting groups, appear highly valuable to global poverty reduction objectives, and it is hard to see poverty reduction succeeding if a large part of humanity is excluded from the knowledge shared by everyone else (World Bank 2003). However, there are challenges that the poor face in ICT access and utilization. These include hard line technologies, low community development capacity, lack of national information policies and poor telecommunication and connectivity infrastructure. Government investment support for ICT infrastructure is an essential ingredient in ICT4P. The areas of connectivity infrastructure such as Wi-Fi (broadband internet by radio frequency) and wireless/mobile/PDA, increasingly need specialized attention from governments and bilateral donors in ICT and poverty reduction strategies (Spence n.d.).

Other ways of fighting poverty using ICTs include:

- fighting against child nutrition by ensuring information is available to the household especially mothers
- creating marketable skills among poor young workers
- making it possible to impact literacy and numeracy to children in the rural areas
- giving policy makers access to real time information and best practice knowledge from the internet

- reducing private and public search and transaction costs
- responding to environmental modifiers
- fostering diversification of the economy
- using spatially-sensitive informational strategies for poverty alleviation programmes
- harnessing the capability to mount early warning information systems

A United Nations Development (UNDP) report (2001) states that on overcoming poverty, ineffective governance often short-circuits the connection between anti-poverty efforts and poverty reduction. The recommendation is to shift decision making closer to poor communities. Moreover, since poverty is a multi-dimensional problem, it should be addressed multi-sectorally across government ministries and departments.

Below are some examples of ICT application and use in Africa:

- ✓ In Togo and Mauritius, call centres now provide telephone support services for international companies with customers in Europe and North America. Callers do not realize they are calling Mauritius or Togo. They pick up the phone, dial a local number, and are routed to one of these countries where the operators provide the support that they require.
- ✓ Many African craft makers are selling their wares on the world-wide-web, supported by NGOs such as PeopleLink.
- ✓ The government of Lesotho recently declared that all announcements for cabinet and committee meetings would be made only by email.
- ✓ Some governments, such as those in South Africa, Algeria, and Tunisia, now provide immediate global access to tender offers via the Internet.
- ✓ In South Africa, the results of blood tests are being transmitted to remote clinics that are not connected to the national telecommunications grid via mobile telephone text messages.
- ✓ In Uganda a local women's organization, the Council for the Economic Empowerment of Women in Africa (CEEWA) posts prices and market information for agricultural commodities regularly on its web site and women in rural trading

centres can access this information at a number of community telecentres to determine which market to take their wares and what to charge for them.

- ✓ In Senegal local fishing communities are using Personal Digital Assistants to improve distribution and marketing of their products and improving their incomes.
- ✓ In Kenya, the Weltel Project is an initiative to use mobile phones to improve health systems in the rural areas of Kajiado to track HIV/AIDS patients through calls and text messages.

2.3.3.3 Capability of ICTs to alleviate poverty

Several ICTs have been identified in the literature as capable of alleviating poverty. These include:

Radio and television:

The radio, has proved useful in generally disseminating information for development (Mwansoko 1995, Makunja 1995, Saleh and Kasisa 1995, Mpiranya 1995). A radio is found in most homes in Africa, hence it is the best tool to use in pursuit of development. It is generally popular as it benefits from established channels, and, it requires little or no literacy at all to operate. In addition, one need not own a radio to listen to a broadcast as it can have a shared audience. Elsewhere, it has been shown that radio is a "lethal weapon" in the fight against the enemies of development, namely, disease, ignorance and poverty in Kenya. It is cheap to purchase, service and use even in the most remote corners of the country (Ogechi 2007). For instance, the radio has been effectively used for edutainment in the communication of messages on family planning and the HIV/AIDS pandemic in Kenya since the 1990s. The FM radio stations are especially effective when they broadcast content on local issues and in local languages that listeners identify with (Kembo-Sure and Ogechi 2006) as seen through the case of KASS and Chamgei FM Radio in the Rift Valley Province, Star in Gusii, Ramogi in Nyanza Province and Inooro in Central Province among others. Such local FM radio stations play a critical role not only in development issues but also in passing peace and reconciliation messages (Ogechi and Sang in press). Although the history of FM radio stations in Kenya only goes back to the freeing of airwaves in the early 1990s, Musau (2000) and Orao (2009) sum up the profound effect of these stations as follows:

> Today, FM stations, whether privately or state-sponsored, command large audiences with their customized programmes on news, entertainment, consumerism and especially political commentary. They have given voice to the masses in two ways. Firstly, in the spirit of free-market economic principle of demand and supply, the people have a greater say in the format, timing and even language of broadcasting. Failure to adhere to consumer tastes normally renders a radio station marginal and unpopular in the competitive field. Secondly, popular call-in interactive programmes such as the "People's Parliament" ensure greater engagement of the masses in topical and political issues affecting their localities and countries.

Elsewhere, in South Africa, clockwise radios that do not require battery or mains electricity supplies are being distributed to villages to enable them listen to development programming – Baygen Free Play Radio (Harris 2004). This kind of radio employs a clockwise mechanism as its power supply. The same radio can be employed in the rural parts of Kenya where there is no electricity and where the rural community cannot even afford to buy batteries.

In NEPAL, a digital broadcast initiative is being tested that will broadcast digital radio programming via satellite to low cost receivers in rural and remote villages. The programme targets HIV/AIDS awareness, and has the potential to link with computers to receive multimedia content. The Kothmale community radio station in Sri Lanka accepts requests for information from community members and searches the internet for answers, which it then broadcasts on air (Oguya 2008). Such good initiatives can also be tried in the rural areas in Kenya to broadcast development and poverty reduction information.

Television is commonly cited as having considerable development potential. The most notable example of TV for development comes from China with its TV University and agricultural TV station. In Vietnam, two universities work with the local TV station to broadcast weekly farmers workshops that are watched by millions (Oguya 2008). In Kenya, local TV stations air programs in various areas such as health, agriculture and business.

Besides the radio, newspapers and magazines as forms of old ICTs have been exploited in passing general messages of development and particularly messages on HIV/AIDS. Beck (2006), for example, explored the HIV/AIDS communication or prevention campaigns through the Kiswahili comic in *Kingo* magazine and a UNICEF-ESARO sponsored comic *Sara* initiative in Kiswahili. Following a similar trend, Luganda (2001) had earlier argued that regional newspapers printed in Kiswahili under the sponsorship of UNESCO were particularly useful in enhancing rural development when they existed in the 1980s.

Mobile Phones:

A major benefit in the use of telephones is the instantaneous two-way interaction. Like radio, there are already established channels, no software or translation is needed – one can speak any language so long as the other party is conversant with it. The well known case of Grameen hand phones is in Bangladesh where the village-based micro-finance organization, leases cellular mobile phones to members (Harris 2004). This has delivered significant benefits to the poor. The phones are mostly for exchanging price, business and health related information. They have generated information flows that have resulted in better prices for inputs and outputs, easier job searches, reduced mortality rates for livestock and poultry among others. Phone owners also earn additional income from providing phone services to others in the community. For villages in general, the phones offer additional non-economic benefits such as improved law enforcement, reduced inequality, more rapid and effective communication during disasters and stronger kinship bonding. The phones also have perceptible and positive effects on the empowerment and social status of the women and their households (Bayes et. al. 1999). Farmers are also able to make more appropriate decisions as to where they will sell their produce and where to get inputs (Eggleston et. al. 2002) and thus empowering them.

Computers and the internet:

The new ICTs and especially the internet's distributed nature in addition to the relatively low cost of digital production has made it a site of multiplicity and diversity since the mid-1990s (Harris 2007). Furthermore, it is worth noting that whereas computers, mobile

phones and the internet have been in use in the First World for a long time, their use in Kenya especially among the masses is a recent phenomenon. Computers and the internet have revolutionised the traditional snail mail to e-mail. According to ITU (2009), www.sites register million page impressions while so many people spend many minutes and hours on the internet and even do so as the first thing in the morning. The *Daily Nation* Tuesday June 1, 2010 reported about a Kenyan fiction writer who received news of her being shortlisted for the 2010 Caine Prize for African Writing thus:

> There was this e-mail from her, on a Friday morning late April, with the subject: "some good news from *Wasafiri"*. I opened it while still in bed. My eyes blinked and my mind went into a spin. I remember thinking – this is one reason, Lily, why you should never ever log into your e-mail before taking a shower and drinking two mugs of strong tea to shepherd your brains into the real world.

Such a behaviour shows how the Kenyans have been overtaken by the internet. Besides the internet, the computers are now widely used by social networks such as facebook and twitter. No wonder Hintereder (2009) in an editorial said:

> ..shame on you. After all everyone in this network and app page is always on the move and always online – day and night, of course. The brave new media world has also pretty unashamedly thrown the established theories of communication studies abroad, radically expanded old transmitter-reciever patterns, created a new and boundless cosmos of communicative freedom, brought to life new channels, new content and new formats.

Computers and the internet can be made available to poor communities through community-based telecentres (Harris 2004, Raju 2004, Mehta and Kalra 2006 Mathur and Ambani 2005). These centres can provide shared access to computers and the internet. Indeed, they can be the only realistic means of sharing for poor communities. Although telecentres come in many guises, the two key elements are public access and a development orientation. It is the latter characteristic that distinguishes telecentres from cybercafés. It is suggested that telecentres should embody the principle of providing access for a purpose – that of implementing a development agenda (Jensen 2003). He further notes that, for this to be effective, it requires a needs assessment to be done to determine the kind of information that the community needs, which can be used to foster development activities, a fact that informed this study. Other services that can be

provided in a telecentre include photocopying, printing, email, word-processing, etc. These can promote the financial sustainability of the telecentre.

CD-ROMs:

A Compact Disk Read Only Memory (CD-ROM) is a storage medium that together with a micro-computer offers rapid access to a very large volume of data including: text, sound, computer graphics, animation slides and a limited amount of motion video. Kiplang'at (2001) points out that a CD-ROM is used in all sectors of the economy including agriculture, natural resource management, medicine and social sciences. He cites the Commonwealth Agricultural Bureaux (CABI) as one of those that use CD-ROMs. He adds that there now exist other agricultural producers of CD-ROM databases that provide access to a vast amount of information on agriculture and related areas. These databases can be used to support decision making in crop and livestock production, management and control, thus increasing productivity and reducing the environmental impact on agriculture as well as other areas.

Videos:

This is another form of communication that can be utilized for rural populations. Videos can be used as educational tools. In Kenya, Regional Reach, a Non-Governmental Organization (NGO), with the objective of disseminating information to improve the lives of people, uses video as a means of communicating information. The staff of this organization carry out a needs-assessment of the rural people located in different parts of the country. They then produce videos in the form of documentaries, training packages, plays recorded in Kiswahili or vernacular. These videos contain information on rural health, agriculture and education among others (Kiplang'at 2001). The Agricultural Information Centre in Kenya also produces videos for disseminating agricultural information.

2.3.4 Community response to ICTs

Several researches have indicated that community response to ICTs is very dynamic (IDRC n.d., Harris 2004). The response varies over time according to the amount of information delivered to the community and the level of usefulness that communities

expect from the ICTs. Although this response can be measured by the level of use, the literature reveals that many other factors lead to people having a fairly passive response to ICTs (such as level of education, information, involvement and training in ICTs) (Mehta and Kalra 2006, Mathur and Ambani 2005). A study by IDRC (n.d.) on the challenges and prospects of appropriation of ICTs, found training to be an important element in the process of appropriation of ICTs. In the study, most beneficiaries felt that they had a good understanding of the opportunities that ICTs could offer. It further revealed that the uneducated populations were not trained in ICTs and therefore had passive attitudes towards these tools. These perceptions were based on the tools themselves and not on the content they could deliver. In fact, it is true that most of the community members think that ICTs have not been made for them because they are poor and uneducated. This perception can be explained by the fact that the information is limited to the equipment alone (IDRC n.d).

Some potential users do not employ ICTs even when they are well informed of the advantages and opportunities that ICTs can offer. A case study in Senegal demonstrated that the great majority of individuals, who were aware that ICTs are useful, did not use them and adopted wait-and-see attitudes (IDRC n.d). Similar observations were made by Jensen (2003) in Ethiopia. Using a qualitative approach, they found out that information on ICTs was not a sufficient condition for their immediate adoption. Adoption requires a long learning period and substantial investments. Therefore, in addition to sustained briefing and ICT awareness sessions, training and technical capacity building sessions are necessary to encourage potential users to use ICTs. Other factors such as age, educational level, income and location have also been cited as affecting access to ICTs (ITU 2009, Alampay 2006, Olatokun 2009).

The same case study by IDRC (n.d) in Senegal showed that the use of ICTs varied across age groups. Young people (age group 18-35 years) seemed to be the most regular users of ICT services. The young were also the most educated in the areas studied (rural and sub-urban). ICTs were perceived as a means of social rehabilitation and inclusion. In these communities, having an e-mail address or using word processing is considered a sign of

modernity by the arts and crafts workers. Indeed, to them, having a telephone line enhances the standard of domestic servants (IDRC n.d.).

The majority of people or groups that frequently go to community access points and request services of ICTs, use them more or less regularly after their first contact with those tools (Jensen 2003, Harris 2004). These writers also note that these people are generally willing to travel (from the village to the city) where they can use the services. This shows that people will not be attracted by ICTs (or any other technology) unless they find them to be useful. After they discover their usefulness, they will be much more likely to integrate their use into their everyday life (Mehta and Kalra 2006). The potential users adopt a wait-and-see attitude. They wait to see concrete evidence that others have been able to benefit from information presented through ICTs. This shows the importance of sensitization and the demonstration of the opportunities that ICTs can offer. It also points to the need to establish networks between different communities to share their experiences with a view to learning from each other and disseminating the lessons arising from community use of ICTs (IDRC n.d).

Studies have also indicated that ICTs are regularly used for social reasons and especially as communication tools, and little is made of their informative potential (Heeks 2007). Although there are a few reported cases of the use of ICTs to seek information that would serve as inputs or production factors (Alampay 2006, Oguya 2008), the potential of ICTs as decision making instruments is not yet systematically exploited. Nonetheless, ICTs and the information they convey can have a transforming effect when they are used to accommodate user needs (Harris 2004). When this is done, ICTs can contribute significantly to the transformation of working methods and processes. However, the challenge is to find appropriate sensitization and demonstration strategies, methods and materials that will allow the majority of potential users to become aware of the existing relevant information that can be conveyed by ICTs.

As already been mentioned, the educational level of populations affects the use as well as perception of ICTs. Active users of ICTs are well educated (formal education) and most

of them can read and write in English as seen in South Africa, Kenya and Uganda, or in French (e.g. in Senegal) (IDRC n.d). A great proportion of such individuals can also read and write at least one of their local languages. Does this mean that the uneducated are excluded from access to ICTs? It is prevalently reported in the literature that limited education is one of the factors that limits access to ICTs. The functional relationship between ICTs and educational level exists (ITU 2009, Alampay 2006, Olatokun 2009) but it is risky to exclude the uneducated from development projects. They are greater in number in the rural areas which generally have very low literacy rates yet they represent the majority of the working population in a country. For instance, agriculture is the backbone of the Kenyan economy and the Rift Valley Province is considered Kenya's food basket. This justifies our choice of the study area to ascertain whether or not ICTs are in use. In Senegal, for instance, 70% of the working population is found in the primary sector (mainly rural). Similar proportions are observed in Uganda. It is argued that this active proportion of the population should be one of the engines of growth and development. The challenge is to find technological solutions that can be directly and indirectly used by these people both to improve their living conditions and to participate fully in economic and social development in the context of an information economy (Mikkelsen 2009, IDRC n.d.).

Training and capacity building are other factors that affect access to ICTs. Africa does not have all the technical skills required for the efficient development of ICTs particularly because technologies are imported and they are fast changing. ICTs were developed, to a large extent, in the context and for the cultural and social standards of the Western world. In this context, the use of ICTs for development implies the need to develop the indigenous technical skills to significantly reduce the current gap between Africa and developed countries (Mehta and Kalra 2006, Mathur and Ambani 2005). This same literature has shown that training is essential for ICT use – training in computer use, office software applications, use of e-mail and internet navigation and maintenance of ICTs among others. Intermediaries between the demand and supply of information need technical skills and skills to collect, process, store, transform and disseminate information through materials in different languages and channels appropriate to the end users. ICT

policies have been mentioned as being very appropriate here because they could outline training needs and subsequently make possible the process of using ICTs (ITU 2009). This would also lead to the integration of training needs in the school curricular. It would also standardize the training programme, avail training materials, find appropriate training formats and contents for the many variable needs of the target communities (IDRC n.d. Bonanet 2009, Heeks 2007). Education and learning does help one in using information communication technologies. So, increasing literacy is a critical factor in expending choice and enabling the poor to use ICTs to their fullest potential. This in turn would enhance their capability and strengthen local institutions to behave in a more responsible manner (Annam 2002).

The language/medium in which content is presented is an important factor that affects access and community response to ICTs (Mehta and Kalra 2006). Most of the content in ICTs such as the internet is in English and to a lesser extent in French, and more recently, Kiswahili. With the rate of illiteracy being high in most African states, this information becomes out of reach for many. Rural African states are still in a 'pre-market' situation and most of the information available on the internet does not necessarily correspond to the needs of rural communities. Sometimes the information is not presented in a format that is understandable and accessible to these communities. Even when the content is adaptable, its transition into understandable language and presentation in appropriate and affordable formats requires not only skills but also financial and technical resources that are not always available in the communities concerned. The constraints in many cases are many and they include:

- technical constraints – limited number of computers and limited human resource capacities
- economic constraints – high cost of computer services and content adaptation
- knowledge constraints – requires questions to answers such as: what are the information needs? how can content be adapted to local needs? and in what format should the information be presented?

For the rural populations to be able to choose the types of application, services and content that they need, they must first become familiar with the technologies and then

learn about applications and content that are adapted to their realities and needs (Harris 2004). However, because their knowledge of ICTs is still very limited, it is difficult for them to make decisions about content and applications that may be appropriate to their needs (Kenny 2001). Other factors that are crucial for access and utilization of ICTs include: location, affordability, ease of use, socio-economic factors and cultural factors such as age, income and gender among others (e.g. World Bank 1998, Gomez and Hunt 1999, O'Farrell, Norish and Scott 1999, Richardson 2000, Richardson et. al. 2000, Campbell 2001, O'Farrell 2001, Alampay 2006, Olatokun 2009, ITU 2009).

2.3.5 Relationship between development, information and ICTs

From the foregoing, it is clear that information is a strategic development resource that should be incorporated as a routine element into the development planning process. It confers power on societies and individuals that possess it – i.e. the power to make decisions, to manage resources, to acquire knowledge and to build societies (Kiplang'at 2001). African countries require access to relevant information in order to develop. This is information which they can only get if they adopt ICTs for the acquisition, storage and dissemination of information. Appropriate application and use of ICTs could address development problems and make a qualitative impact in slowing the marginalization process. The most effective route to achieving substantial benefit with ICTs in development programmes, therefore, is to concentrate on rethinking development activities by analyzing current problems and associated contextual conditions and considering ICTs as just one ingredient of the solution. This implies need for an approach to developing strategies for information systems and technology that are derived from and integrated with other components of the overall development strategy (Harris 2004).

There are several strategies that have been successfully pursued for poverty alleviation using ICTs. Some of these include: distribution of locally relevant information; promoting local entrepreneurship; improving poor peoples' health; strengthening education; promoting trade and e-commerce; supporting good governance; building capacity and capability; enriching culture; supporting agriculture; creating employment opportunities and reinforcing social mobilization (Harris 2004, Alampay 2006, Olatokun 2009, Mehta and Kalra 2006, Mathu and Ambani 2005).

If ICTs are well deployed, they will lead to social transformation – a process which Harris (2004) refers to as social appropriation. Social appropriation occurs when internet resources help transform daily lives of users by contributing to the solution of concrete problems. Evidence of appropriation is not found in the use of ICTs, rather in the changes that they have brought about in the real world. The social appropriation of ICTs for development can be demonstrated in a number of ways such as offering better medical information to patients, improving the quality of education through the use of innovative teaching resources, increasing sales of local products in the market place, disseminating the results of local research, introducing varied, relevant programming into the community radio broadcasting and coordinating action among diverse groups with common goals.

The general rule for adoption of ICTs is that the application of ICTs for development should always begin with a development strategy. From that, an information plan for implementing the development strategy can be derived and only out of that should come a technology plan. It is suggested in the literature that it is essential to have clear development targets that are specific to the context before the form of use of the ICTs is defined (Harris 2004). He further adds that in considering the development strategy, bottom-up, demand-driven development objectives are usually preferable to top-down, supply-driven objectives, so that goals begin with an appreciation of the needs of development recipients as they would themselves express them. After a development strategy is activated, an information plan is drawn. This will set down the information resources required to achieve the development strategy. A plan for the technology is then

drawn and it should be capable of delivering the information resources required for the achievement of the strategy.

The literature provides the following as areas where ICTs have had a positive impact (e.g. Gerster and Zimmerman 2003, Chapman and Slymaker 2002, Annam 2002, Harris 2004):

Promoting local entrepreneurship

It has been argued that ICTs have the potential to impact the livelihood strategies of small scale enterprises and local entrepreneurs in the following areas:

- Natural capital – opportunities for accessing national government policies
- Human capital – increased knowledge of new skills through distance learning and processes required for certification
- Financial capital – communication with lending organizations such as micro-credit
- Social capital – cultivating contacts beyond the immediate community
- Physical capital – lobbying for the provision of basic infrastructure

Improving poor peoples' health

Healthcare has been demonstrated as one of the promising areas of poverty alleviation with ICTs. There are many ways that have been mentioned in which ICTs can be applied to achieve desirable health outcomes such as remote consultation, diagnosis and treatment (Harris 2004, Chapman and Slymaker 2002). Health workers can access relevant medical training through ICT – enabled delivery mechanisms. In addition, centralized data repositories connected to the ICT networks enable remote health care professionals to keep abreast of the rapidly evolving stock of medical knowledge. To share this knowledge, public media such as radio and television can effectively facilitate the dissemination of public health messages and disease prevention techniques.

Promoting trade and commerce

Mobile commerce, defined as the buying and selling of goods and services using wireless handheld devices such as mobile telephones or personal digital assistants (PDAs), is

growing at a rapid pace (Heeks 2007). The introduction of wireless communications has also brought wireless data services which are essential in conducting m-commerce. If the convergence of mobile and fixed internet and ICTs continues, fast access to the internet for a significant part of the world will be achieved using mobile handsets and networks. Wireless technologies have made inroads even in relatively low income areas where pre-paid cards allow access to people who cannot take out a subscription because of billing or credit worthiness problems (ITU 2007). The main areas of m-commerce use have been identified as text messaging or SMS, micro-payments, financial services, logistics, information services and wireless customer relationship management. However, difficulties in making electronic payments and concerns over the security and privacy of transactions are limiting the conduct of m-commerce. People especially in the rural areas, would want to transact in a system that is tangible such as actual exchange of money as they see this as the only sure way of ensuring security (Harris 2004).

Enriching culture

Culture is a people's way of life in its entirety, the pillars being politics, economics, ethics and aesthetics (Getui 2008). ICTs can simultaneously be a threat and an opportunity to a culture. On the one hand, ICTs threaten to engulf indigenous minorities in the relentless processes of globalization. On the other hand, ICTs can be used as tools to help indigenous minorities to engage positively with globalization on their own terms. Studies of indigenous communities regularly point to the importance they place on their cultural heritage. But they also highlight the almost complete lack of control or participation that such communities have in how their culture is collected or represented. ICTs can be used by these indigenous communities to achieve custodial ownership and rights of interpretation besides commercialization over their own cultural heritage. They can record their oral histories and geological records in order to come up with digital heritage. Digital heritage is part of all digital materials that has lasting value and significance. Harris (2004) suggests that strategies can be developed using ICTs to ensure that digital materials are saved for posterity. Digital heritage is either 'born digital' where there is no other format or created by conversion from existing materials in any language and area of human knowledge or expression. Things like cultural artifacts can be

represented digitally and this can be made available to all now and in the future (Chapman and Slymaker 2002, Annam 2002).

Apart from digitization of indigenous cultural artifacts, ICTs can provide a means for cultural communities to strengthen cultural ties. The internet can unite members of a community regardless of their geographic, educational and economic backgrounds. These people can also use it as a means of sharing ideas on development and other things that affect them as a community. Finally, ICTs can harmonize cultures or provide an opportunity to celebrate the diversity of culture.

Supporting agriculture

Increased agricultural productivity benefits the poor and landless through increased employment opportunities (Annam 2002). Because the vast majority of poor people live in the rural areas and derive their livelihoods directly or indirectly from agriculture, support for farming is a high priority for rural developments. ICTs can deliver useful information to farmers in the form of crop care and animal husbandry, fertilizer and feedstock inputs, drought mitigation, pest control, irrigation, whether forecasting, seed sourcing and market prices among others. To illustrate how useful ICTs can be to farmers, farmers in India, in the past, were harvesting their tomatoes at the same time. This practice gave rise to a market glut that pushed prices to rock bottom. At other times, when tomatoes were not available and the prices shot up, the farmers had none to sell. At present, they use a network of telecentres to coordinate their planting so that there is a steady supply to markets and more regulated and regular prices (Heeks 2007). Harris (2004) also notes that elsewhere, a software package has been developed for farmers that aims at providing the latest information on agriculture such as on fertilizers, pesticides, machinery hire, tools and spares for sale, soil and water analyses, weather monitoring, and weekly field inspections among others.

Despite the above benefits, there are several challenges that face the deployment of ICTs in rural areas. Some of these include: equipment deployment; lack of mains power supply; lack of funds for initial capital investment; operation and maintenance, lack of

technical support and computer repair facilities among others (IDRC n.d. Adeya 2001, Harris 2004, ITU 2009).

2.3.6 ICTs in Africa

The continent of Africa has not been left behind in the quest for ICTs for development. A Summit of leaders interested in the development of ICTs in Africa was held in Kigali (Rwanda) in October 2007. This Summit was organized by Rwanda, the International Telecommunications Union (ITU), African Union, World Bank Group, United Nations Global Alliance for ICT and Development, African Telecommunications Union, United Nations Economic Commission for Africa and Global Fund for Digital Solidarity. This was the start-off point of the "Connect Africa" project by virtue of the organizations involved: active stakeholders in the regions, namely African countries, China, India, the World Bank, European Commission, the G8, OECD, Arab countries, major ICT companies, the UNDP and other international organizations.

Major projects and initiatives

Globally, Africa is considered as the most backward continent with regard to the development of telecommunications, regardless of the parameter or indicator used (telephone density, telecommunications penetration rate in rural areas, availability and efficiency of telecommunications services) (Adeya 2001, Pigato 2001, Annam 2002, Harris 2004). Furthermore, almost all direct lines between African countries pass through Europe or even the United States in order for them to communicate between them. This leads to extremely high annual costs estimated at several millions of US dollars (Bonanet, 2009).

Taking cognizance of the role that telecommunications play in the social and economic development process, and, moreover, recognizing the fact that investments in the telecommunications sector are likely to substantially increase productivity in all sectors by improving the quality of life, African leaders decided to combine their efforts to endow the African continent with a telecommunications infrastructure. This is an infrastructure that is capable of supporting the sustainable development of

telecommunications throughout the entire continent, and in each country, lay special emphasis on servicing rural areas (Bonanet 2009).

1. RASCOM

In May 1992, African States, meeting in Abuja, Nigeria decided to sign the Regional African Satellite Communications Organization (RASCOM) convention. RASCOM is an intergovernmental organization that operates on a commercial basis and whose capital is open to the private sector. The mission of RASCOM is to design, implement, exploit and maintain the spatial sector of Africa's satellite telecommunications system. It also seeks to translate all the opportunities offered by satellite into services and tools for African integration, by combining it with any other appropriate technology, if need be.

In March 2005, 45 African countries out of a total of 53, signed the RASCOM Convention. These were Algeria, Angola, Benin, Burkina Faso, Burundi, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Congo, Côte d'Ivoire, Democratic Republic of Congo, Djibouti, Egypt, Eritrea, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Liberia, Lesotho, Libya, Malawi, Mali, Mauritius, Mauritania, Mozambique, Namibia, Niger, Nigeria, Senegal, Sierra Leone, South Africa, Sudan, Swaziland, Tanzania, Togo, Tunisia, Uganda, Zambia, Zimbabwe.

RASCOM offers a series of opportunities:

- *For economic operators,* by developing a national traffic base in order to make their income less dependent on international traffic of which they are increasingly having less control over tariffs. This could consequently increase income opportunities through the influx of inter-African traffic generated by direct connections between all African countries and all associated islands. It could also increase income by reducing, thanks to economies of scale, the cost of national telephone communication (less than US $ 0,10).
- *For radio and television corporations,* by offering them a unique opportunity to produce radio and television broadcasts at the continental level and to establish

and strengthen professional relations between radio and television organs corporations in Africa.

- *For governments*, through viable integration, at low cost, of a telecommunications component in every development project (integrated rural development projects and health or education programmes among others).
- *For economic operators and investors*, by offering opportunities to create new jobs in the domain of telecommunications (equipment assembling plants, manufacturing of certain equipment, notably rural terminals, creation of plants for spare parts, and sale of components among others).
- *For the African continent*, a powerful means, an indispensable tool and a unique opportunity for regional integration at the political, economic (commercial) and cultural levels. RASCOM will truly contribute to this integration and will above all enhance the building of the African Economic Community.

2. EAST AFRICAN SUBMARINE SYSTEM (EASSy) PROJECT

The project was launched in May 2008 to install a submarine fibre optic telecommunication cable to connect East Africa with the rest of the world. EASSy aims at considerably reducing the cost of telecommunications and improving access to information and communication technologies. Connecting 21 coastal and landlocked Eastern and Southern African countries between themselves and the rest of the world, this cable will considerably reduce the costs of telephone calls on the continent and will make communication accessible to the general public. This will reduce telecommunication cost along the Eastern Coast of Africa where users generally pay between US $200 and US $300 monthly for internet access. Prices will drop immensely and the number of users will go up too. This cable should be fully operational any time now (before the end of 2010) and will cover 10,000km from the southern end of the continent to the Horn of Africa. The countries involved in this project include: South Africa, Burundi, Botswana, Djibouti, Eritrea, Ethiopia, Kenya, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Uganda, Democratic Republic of Congo, Rwanda, Somalia, the Sudan, Swaziland, Tanzania, Zambia and Zimbabwe.

3. THE EAST AFRICAN MARINE SYSTEM (TEAMS) PROJECT

The East African Marine System is an initiative spearheaded by the Government of Kenya to link the country to the rest of the world through a submersible fibre optic cable. It was proposed as an alternative to EASSy (East African Submarine Cable System). This system is developed in partnership with ETISALAT (Emirates Telecommunications Establishment). The fibre optic cable of 4,500km will link the town of Mombasa (Kenya) to Foudjarah (United Arab Emirates). This TEAMS cable was originally designed for an initial capacity of 40 Gb/s extensible to 640 Gb/s if need be.

At the moment, East Africa is the only region in the world with no access to the intra-African or direct international cable network. The region relies on satellite communication which is, of necessity, very expensive. The costs of data in these countries are among the highest in the world, reaching up to 7000 dollars per million broadband bits. It is expected that the cable will reduce the costs to less than 500 dollars per million bits although UUNET Kenya is of the opinion that a substantial drop in prices will only be effective with the advent of other cables like SEACOM and EASSy, which will usher in competition (Bonanet 2009). The distribution of ownership of the cable is 85% TEAMS (Kenya) and 15% ETILASAT (UAE). Construction started in January 2008 on the Emirates side. The cable arrived at the Kenyan seaport of Mombasa in June 2009.

4. THE SOUTHEAST ASIAN TELECOMMUNICATION CABLE SYSTEM (SEACOM) PROJECT

The SEACOM project is a private enterprise which constructs, owns and exploits undersea optic fibre, vectors of communication by providing connectivity from Europe right to India via the South–Eastern part of Africa. It is expected to provide broadband by satellite to East African countries which in the past has been very expensive and very slow. South Africa, Madagascar, Mozambique, Tanzania and Kenya are connected through a protected structure in a continuous loop on the continent. A second pair of express fibres connects South Africa with Kenya. The SEACOM undersea optic cable system is designed to function in total security over a period of twenty years by providing broadband access at a low cost, thus freeing the region from international infrastructure

bottleneck. This project will contribute to the economic growth of Eastern and Southern Africa.

In July 2009 the cable of 15,000 km was operational by supplying Eastern African countries (Djibouti, South Africa, Tanzania, Kenya, Uganda and Mozambique) with high speed Internet connectivity to Europe and Asia. This operation will bring about reductions in the cost of the Internet which could reach up to 95% for major clients with a high speed Internet connection while broadening connections to rural populations.

The anchoring points of the cable are: France (Marseille), Egypt, Djibouti, Kenya, Tanzania, Madagascar, Mozambique and India. Given that East Africa has been one of the last major regions in the world to have suffered from the lack of broadband internet, it could finally, through this system, reduce the gap that exists between Africa and the richest geopolitical regions in the world. This system will offer a real advantage to local industries, particularly those based offshore.

Since these initiatives are dominated by the developed world (they are the major financiers) in their design as well as in the distribution of communication services, Africa finds itself in a situation where it is a major consumer but without any real benefit for the initiatives development at the local level.

This chapter has discussed the theoretical framework upon which the study is based, that is, the info-mobilization theory. This theory provides a methodology to design technical and social systems simultaneously through a participative process that does not require coercion and creates no resistance to change. In other words, services are to be designed involving the community so that these services attract use. The chapter has also provided a summary and explanation of the current state of knowledge in the area of ICTs and development, identifying strengths, weaknesses and contributions to the current study. The researcher took a thematic approach where the literature was discussed under relevant themes such as information, information needs, ICTs, development and poverty, among others. It is evident from the literature that ICTs (both old and new) have a role to

play in socio-economic development. The benefits of ICTs are however difficult to point in most African countries particularly where other challenges such as poverty, hunger and disease are experienced. Despite the challenges, various success stories have been provided where ICTs have been used to provide access to an enormous body of knowledge, as well as facilitate communication and information transfer. It is apparent from the literature that ICTs, if well deployed, will provide a means of narrowing the digital divide as well as act as a 'magic bullet' or 'miracle technology' that can offer Africa a great opportunity to leapfrog several stages of development and jump into the information revolution. ICTs have an important role as communication technologies rather than information processing and production technologies, an important fact for rural development. There is therefore a very strong relationship between development, information and ICTs. With convergence of media and penetration of mobile telephony in the rural areas, ICTs have a role to play in the rural areas. It is indeed true that rural communities can positively make use of ICTs.

Therefore, African governments cannot afford to remain behind in this information revolution. They have to make ICT development a top government strategy and create enabling environments for ICTs to flourish. Challenges such as poor connectivity, lack of electricity, illiteracy, lack of local content and affordability, have to be overcome through the development of national information infrastructure, capacity building and political goodwill.

CHAPTER THREE
RESEARCH METHODOLOGY

3.1 Introduction

This chapter describes methods used in carrying out the study. Research is about knowledge production, seeking answers to questions through enquiry (Mikkelsen 2009). But how does one determine the appropriate research strategy to focus a particular study? To this, Patton (2002) says:

> There is no rule of thumb that tells a researcher precisely how to focus a study. The extent to which a research question is broader or narrow depends on purpose, the resources available, the time available, and the interests of those involved. In brief, there are no choices between good and bad, but choices among alternatives, all of which have merit.

Research methods have been defined as tools to be used for answering specific questions and for solving different scientific and practical problems (Mikkelsen 2009). The author states that, it is the substance of the matter – the questions to be answered – that must guide the selection of the methods, not vice versa. She further provides a distinction between methods, techniques and tools. In this distinction, she defines a research method as a comprehensive set of approaches to gather evidence and analyze specific problems, and that it encompasses techniques and tools. The concept technique is used to designate a practical way of collecting data and for analyzing the information obtained in the research process. Tools are the instruments that are used in the process. Methodology encompasses theory and is not directly operational like method. Research methods could be qualitative or quantitative or both; techniques include surveys, observations, interviews and experiments; whereas tools include diaries, questionnaires and interview schedule. In a nutshell, this information can be presented as follows:

Science of science

Methodology

Method

Investigation technique

Investigation tool/instrument

The current research is a qualitative one (with very few elements of quantitative data such as bio-data). It employs interviews as the techniques for data collection while using

interview schedules as data collection tools. Data is analyzed qualitatively using qualitative methods. This is discussed in greater detail in the sections that follow.

The chapter is organized under the following sections: philosophical aspects of research, research design, qualitative research methods, target population, sampling techniques, rationale for sample size, data collection instruments and procedures, validity and reliability, ethical issues, and data analysis and presentation.

3.2 Philosophical perspectives of research

All research (whether qualitative or quantitative) is based on some underlying assumptions about what constitutes ‘valid’ research and which research methods are appropriate. The most pertinent philosophical assumptions are those underlying epistemology (epistemology refers to assumptions about knowledge and how it can be obtained) which guides the research. Mouton (2009) suggests three categories, as ones underlying research epistemology: positivist, interpretive and critical. However it needs to be said that, while these three research epistemologies are *philosophically* distinct (as ideal types), in the practice of social research these distinctions are not always so clear cut. There is considerable disagreement as to whether these research "paradigms" or underlying epistemologies are necessarily opposed or can be accommodated within one study.

It should be distinguished that the word 'qualitative' is not a synonym for 'interpretive' - qualitative research may or may not be interpretive, depending upon the underlying philosophical assumptions of the researcher. Qualitative research can be positivist, interpretive, or critical (see figure 1 below). The choice of a specific qualitative research method (such as the case study method) is independent of the underlying philosophical position adopted. These three philosophical perspectives are discussed below.

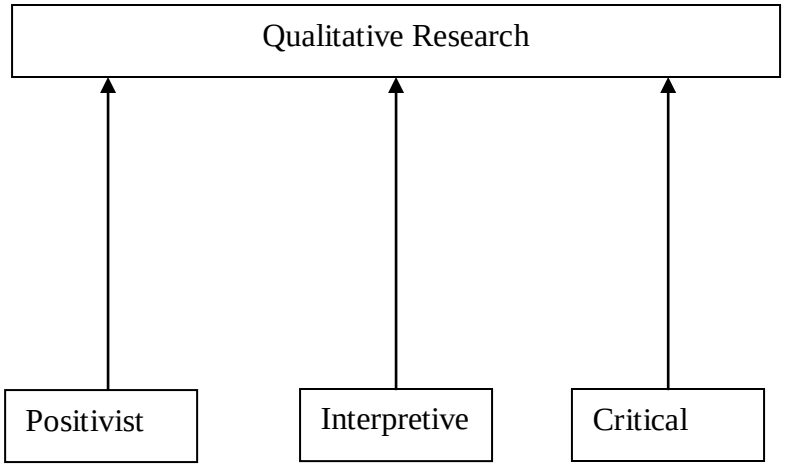
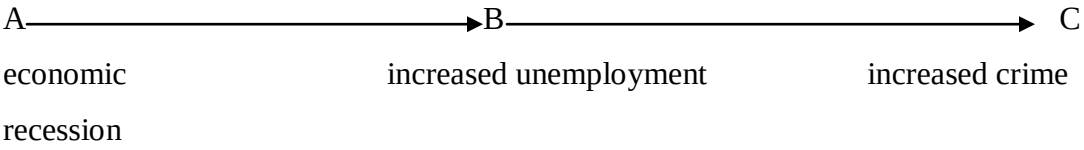


Figure 1: Perspectives of research

3.2.1 Positivist research

Positivism originated as a philosophy of science and its key idea is the unity of scientific method. This means that although the content of the various sciences is obviously very different, the form of all scientific enterprise is essentially the same. Scientific enquiry is based on the systematic accumulation of facts rather than on belief, opinion, tradition or divine revelation. Many of the early sociologists writing in the 19th century such as Auguste Comte (1798-1857) and Herbert Spencer (1820-1903) believed that by applying the principles and practices that had worked so well in natural sciences, sociology could discover the laws that explained how societies worked and changed (Mouton 2009).

Positivism has three main characteristics, namely: causality, determinism and empiricism. In causality, positivism sees the social world – like the natural world – as comprising phenomena that are causally related to each other. In simple language, this means that something (a cause) makes something else (an effect) to happen and an effect of one thing can then be the cause of something else. For example, an economic recession in society can cause higher unemployment and poverty in some sections of the society such as rural areas. This may then be a cause of increasing rates of crime.



A second characteristic of positivism is determinism - a view of the relationship between individuals and society. This means that the organization of the societies in which people live causes them to think and act in the way they do, irrespective of their free will, or choice. For example, in the case of crime above, increasing unemployment and poverty and not free choice "causes" the increase in crime. Researchers adopting a positivist point of view may still be interested in finding out about people's subjective views. For example, they explore such things as attitudes and opinions. They tend to explain why people behave in the way they do. Understanding the causes of people's behaviour can, in principle, be used to engineer social change. It is argued that it is possible to know (about the world), to predict (what would happen in the future) and to control (what they discovered was wrong in the world) (Mouton 2009).

Empiricism is a third characteristic of positivist approaches. It is the distinction researchers make between 'theories' (ideas) and 'observations' (empirical knowledge). Empirical or factual knowledge is that which can be directly perceived. This is known as an empiricist concept of knowledge, or epistemology. Empiricist epistemology holds that the only valid source of knowledge is that based on experience. For example, if you are sitting on a chair reading this treatise, you know the chair exists because you can see it and feel it. In scientific terms, an empiricist epistemology means that research has to be grounded in concrete evidence that can be checked out. The positivist view is that good social science involves constructing the ones that express relations between observable phenomena (or things) (Mouton 2009). Theories are then tested out in research designs to see if the phenomena behave in the way predicted by the theory. The important consequence of this sociologically is that positivist research is confined to relationships between observable social phenomena. According to this view, social science provides objective knowledge that is, as far as possible, value free. What proves a scientific 'truth' is the empirical evidence, not the researcher's subjective values or arguments. In other

words, ‘facts speak for themselves’. Positivists generally argue that the methods of natural sciences are applicable to the study of societies (naturalism). They further assume that reality is objectively given and can be described by measurable properties which are independent of the observer (researcher) and his or her instruments. Positivist studies generally attempt to test theory, in an attempt to increase the predictive understanding of phenomena. In line with this, Mouton 2009 classified information systems research as positivist if there was evidence of formal propositions, quantifiable measures of variables, hypothesis testing, and the drawing of inferences about a phenomenon from the sample to a stated population.

3.2.2 Interpretive Research

The interpretivist tradition developed largely as a criticism of the dominant theory of positivism. It did not necessarily reject the positivist account of scientific knowledge, but what they questioned is the idea that the logic and methods of natural science can be imported into the study of societies. Marx Weber (1864-1920) was one of the main influences on the interpretivist tradition in sociology. For him, natural science and social science are two very different enterprises requiring a different logic and therefore different methods (Mouton 2009).

At the heart of the interpretivist critique of positivism is a human viewpoint. Some of those favouring the interpretivist view have long argued that in their quest for a scientific explanation of social life, positivists have sometimes forgotten that they are studying people, and to study people, you need to get out and explore how they really think and act in everyday situations (ibid.). The key idea of interpretivist ontology is that there is a fundamental difference between the natural world and the social world. The social world is meaningful.

As people engage in conscious, intentional activities and attach meanings of their actions, human societies are essentially subjective realities. Interpretivists argue that the positivist idea of a chain of causation is quite logical in the natural world where a particular stimulus consistently produces a given effect, but does not apply in the social world.

People do not merely react to stimuli. Rather, they actively interpret the situations in which they find themselves and act on the basis of these interpretations. The Interpretive researchers start out with the assumption that access to reality (given or socially constructed) is only through social constructions such as language, consciousness and shared meanings. The philosophical base of interpretive research is hermeneutics and phenomenology (Mouton 2009). Interpretive studies generally attempt to understand phenomena through the meanings that people assign to them and interpretive methods of research in information systems are "aimed at producing an understanding of the context of the information system, and the process whereby the information system influences and is influenced by the context" (Okombo and Tromp 2006). Interpretive research does not predefine dependent and independent variables, but focuses on the full complexity of human sense making as the situation emerges (Mikkelsen 2009).

The current research is an interpretive one as it seeks to understand the rural community in its context, and how ICTs can be of benefit in their set up and activities as well as livelihoods. The primary goal then is to understand human behaviour rather than explain it. This is research characteristic of interpretivists.

3.2.3. Critical Research

Critical researchers assume that social reality is historically constituted and that it is produced and reproduced by people. Although people can consciously act to change their social and economic circumstances, critical researchers recognize that their ability to do so is constrained by various forms of social, cultural and political domination. The main task of critical research is seen as being one of social critique, whereby the restrictive and alienating conditions of the status quo are brought to light. Critical research focuses on the oppositions, conflicts and contradictions in contemporary society, and seeks to be emancipator. That is, research should help to eliminate the causes of alienation and domination (Mouton 2009).

3.3 Research design

The concept research design has been defined variously as a plan or blueprint of how one intends to conduct research; the structure of research as well as the glue that holds all the

elements in the research project (Gilbert 2008). A research design is therefore used to structure the research to show how all the major parts of the research work together in achieving the objectives of the study (Okombo and Tromp 2006, Moulton 2009 and Mikkelsen 2009). The current study applies a qualitative research design in an attempt to provide answers to the research questions and hence address the research objectives.

3.3.1 Quantitative and qualitative research

Quantitative research methods were originally developed in the natural sciences to study natural phenomena. It involves the use of structured questions where the response options have been predetermined and a large number of respondents involved. By this definition, measurement must be objective, quantitative and statistically valid. Simply put, quantitative research is about numbers, objective hard data. On one hand, Wilson (2000), notes that, up to the 1960s, the dominant school in sociology particularly in the USA, was functionalism, with Parsons as the 'headmaster'. The emphasis of functionalism was upon causal relationships with a strong quantitative, statistical component. On the other hand, qualitative research had its origins in sociology. It involves the process of collecting, analyzing and interpreting data by observing what people do and say (Okombo and Tromp 2006). Qualitative researchers always attempt to study human action from the perspectives of the social actors themselves (also referred to by anthropologists as the 'emic' perspective). The primary goal of studies using this approach is defined as understanding rather than explaining human behaviour (Ritchie and Lewis 2003, Moulton 2009). They note that qualitative research will typically use qualitative methods of gaining access to research subjects (such as theoretical selection of cases, snowball sampling), qualitative methods of data collection (such as participant observation, semi structured interviewing, the use of personal documents to construct life stories) and qualitative methods of analysis (such as grounded theory approach, analytical induction, narrative analysis, discourse analysis).

Both quantitative and qualitative styles share basic principles of science but the two approaches differ in significant ways. Each has strengths and limitations, topics or issues, but the styles also complement each other thus:

> The key feature common to all qualitative methods can be seen when they are contrasted with quantitative methods. Most quantitative data techniques are data condensers……Qualitative methods by contrast, are best understood as data enhancers. When data are enhanced, it is possible to see key aspects of cases more clearly (Neuman 2003).

The methods employed in qualitative research overlap to some extent with those of traditional 'quantitative' social research in that they include interviewing. In contrast, the qualitative researcher is likely to use less formally structured interviewing procedures and may, in addition, use methods such as observation, free-flowing discussion, and the analysis of documents, whether personal or organizational, produced by the subjects. This study used a semi-structured interview schedule to conduct the interviews. Under one school of thought, 'qualitative research ... is concerned with developing concepts rather than applying pre-existing concepts,' (Mouton 2009). Given the state of theory in information science (that is, its undeveloped state) it can well be argued that 'developing concepts' is what is needed. This is the essence of the choice of this research design. Examples of quantitative methods that are now well accepted in the social sciences include survey methods, laboratory experiments, formal methods (such as econometrics) and numerical methods such as mathematical modeling (Mikkelsen 2009).

Qualitative research is much more subjective than quantitative research and uses very different methods of collecting information, mainly individual, in-depth interviews and focus groups. The nature of this kind of research is exploratory and open-ended. Small numbers of people are interviewed in-depth and/or a relatively small number of focus groups are conducted (Slater 1994). Participants are asked to respond to general questions and the interviewer probes and explores their responses to identify and define peoples' perceptions, opinions and feelings about the topic or idea being discussed and to determine the degree of agreement that exists in the group. The quality of the finding from qualitative research is directly dependent upon the skills, experience and sensitivity of the interviewer (Patton 1992, Ritchie and Lewis 2003). Qualitative research is extremely effective in acquiring information about people's communications needs and their responses to and views about specific communications.

This study adopted a qualitative approach. The motivation of doing qualitative research as opposed to quantitative research, came from the observation that, if there is one thing that distinguishes humans from the natural world, is their ability to talk. So, it is important to give the people being studied a chance to talk and explain on issues being studied such as perceptions on ICTs, whether they are using them or not and why they use or not use them. Such responses will help the researcher to understand the people and the social and cultural contexts within which they live. Okombo and Tromp (2006) argue that the goal of understanding phenomena from the point of view of the participants and its particular social and institutional context is largely lost when textual data are quantified.

Whereas quantitative research refers to counts and measures of things, qualitative research refers to the meanings, concepts, definitions, characteristics, metaphors, symbols and descriptions of things. Qualitative research is primarily concerned with 'why' something happens. It involves detailed, verbal descriptions of characteristics, cases, settings, people or systems obtained by interacting with, interviewing and observing the objects.

Basically, quantitative research is objective. This is achieved through the maximum control of extraneous variables (Mouton 2009). It seeks explanatory laws whereas qualitative research aims at in-depth description. According to Mikkelsen (2009), qualitative research measures what it assumes to be a static reality in hopes of developing universal laws. It is an exploration of what is assumed to be a dynamic reality. It does not claim that what is discovered in the process is universal, and thus, replicable. Wilson (2000) provides some comparisons between qualitative and quantitative research, thus:

- ✓ the epistemological issue is fundamental: social phenomena are different in kind from physical phenomena and the fact that different ways of knowing are appropriate should direct one's entire research strategy;

- ✓ associated with this is the notion of differing perceptions of the same phenomena or situations by the different actors, and the need to uncover these perceptions through the choice of appropriate method;
- ✓ the in-depth analysis of situations and their perception is more appropriately undertaken through the study of cases than through the study of samples;
- ✓ the analysis of case data proceeds by interpretation rather than by causal analysis. It is here that problems arise in demonstrating the rigour of qualitative research and of revealing how the interpretation has been performed;
- ✓ to speak of 'data' in qualitative research may be misleading: the word 'evidence' may be more appropriate since the relevance of the evidence to the research objectives involves a greater exercise of judgment than in quantitative research;
- ✓ in qualitative research, the emphasis is on interpretative analysis and understanding, while in quantitative research the emphasis is on causal analysis and predictive understanding;
- ✓ finally, the application of the results of qualitative research must take place through a comparison of a given situation with that reported. The researcher will usually say, "This is what I believe to be the case in the situations I have studied. Examine my evidence and my interpretation and consider for yourself whether the conclusions I reach are applicable to your situation". In quantitative research, the results and conclusions are presumed to be of general applicability because of the representative nature of the sample members.

Wilson (2000) further states that qualitative research seems particularly appropriate to the study of the needs underlying information-seeking behaviour because:

- ✓ our concern is with uncovering the facts of the everyday life of the people we are studying;
- ✓ by uncovering those facts we aim to understand the needs that exist which press the individual towards information-seeking behaviour;
- ✓ by better understanding of those needs we are able to understand what meaning information has in the everyday life of the people; and

- ✓ by all of the foregoing we should have a better understanding of the user, be better able to design more effective information services, and be better able to create useful theory of information-seeking behaviour and information use.

In general, qualitative research generates rich, detailed and valid (process) data that contributes to in-depth understanding of the context. That was the interest of this research namely, to understand the rural person in Uasin Gishu, in his/her rural setting, and how best ICTs can be accessed and used in that context. On the contrary, quantitative research generates reliable population based and generalizable data and is well suited to establishing cause-and-effect relationships.

The decision of whether to choose a quantitative or a qualitative design is a philosophical question. Which methods to choose will depend on the nature of the project, the type of information needed, the context of the study and the availability of resources (time, money, and human). It is important to keep in mind that these two different philosophies are not necessarily polar opposites. In fact, elements of both designs can be used together in mixed-methods studies. Combining of qualitative and quantitative research is becoming more and more common. Every method is a different line of sight directed towards the same point, observing social and symbolic reality. The use of multiple lines of sight is called triangulation. It is a combination of two types of research. It is also called pluralistic research. There are various advantages of combining both types of research which include:

1. research development (one approach is used to inform the other, such as using qualitative research to develop an instrument to be used in quantitative research)
2. increased validity (confirmation of results by means of different data sources)
3. complementality (adding information, that is, words to numbers and vice versa)
4. creating new lines of thinking by the emergence of fresh perspectives and contradictions.

However, there are also barriers to integration, namely: philosophical differences, cost, inadequate training and publication bias.

Reasons for choosing qualitative research method

Having provided the above overview of qualitative and quantitative research, the research chose to use qualitative research for several reasons, some of which have been mentioned in the above discussion. First and foremost, qualitative researches are often about depth, nuance and complexity. Through qualitative research the researcher was able to explore a wide array of dimensions of the social world such as attitudes, perceptions and behaviours that are best understood in natural settings. This was done by using interview method – a methodology that embrace richness, depth, nuance, context, multi-dimensionality and complexity. Instead of editing these elements out in search of the general picture or the average, the researcher was able to factor them directly into its analyses and explanations. This means that it has an unrivalled capacity to constitute compelling arguments about how things work, in particular contexts. This qualitative habit of intimately connecting context with explanation means that the researcher was capable of producing very well founded cross-contextual generalities, rather than aspiring to more flimsy de-contextual versions (Mason 2004, Mouton 2009 and Mikkelsen 2009).

Therefore, qualitative research seemed particularly appropriate to the current investigation because:

- ✓ the concern was to uncover the facts of the everyday life and activities of the people under study, including their behaviour and attitudes, best understood in a natural setting. That is why the researcher sought to visit them and know their daily activities right at their rural settings
- ✓ by uncovering those facts, the researcher aimed at understanding the needs that exist which press the individual towards information seeking such as the need to sell produce at competitive prices, stay healthy and be informed of what goes on around them
- ✓ by better understanding those needs, the researcher was able to understand what meaning information would have in the everyday life of the people and
- ✓ by all the foregoing, researcher was able to better understand the rural community and their information needs and hence recommended ways to design more

effective information services that would go a long way to satisfy the information needs of the rural community.

3.4 Qualitative research methods

Just as there are various philosophical perspectives which can inform qualitative research, so there are various qualitative research methods. A research method is a strategy of inquiry which moves from the underlying philosophical assumptions to research design and data collection. The choice of a research method influences the way in which the researcher collects data. Specific research methods also imply different skills, assumptions and research practices. Examples include action research, case study research, ethnography and grounded theory. The researcher will only discuss the grounded theory and case study because of their relevance in the current investigation.

3.4.1 Grounded Theory

Grounded theory is a research method that seeks to develop theory that is grounded in data systematically gathered and analyzed. A grounded theory is inductively derived from the study of the phenomenon it represents. That is, a phenomenon is discovered, developed and provisionally verified through systematic data collection and analysis of data pertaining to it (Mouton 2009). Therefore, data collection, analysis and theory stand in reciprocal with each other. One does not start with theory and prove it. Rather, one begins with an area of study and what is relevant to that area is allowed to emerge.

Mikkelsen (2009) further notes that grounded theory holds a basic tenet that qualitative researchers do not go round testing hypothesis to add to an already existing body of knowledge, rather they "do not know what it is that they do not know". So, grounded theory allows one to study a relatively unknown social phenomenon around which no specified theory may exist yet. In the process, one may literally build a theory from the ground up, brick by brick, so to speak. Bricks in this case are the concepts that a researcher grounds as the analysis process proceeds. In other words, there is a continuous interplay between data collection and analysis.

The grounded theory method is becoming increasingly common in the information systems research because it is extremely useful in developing context-based, process-oriented descriptions and explanations of the phenomenon. More on grounded theory as a method of data analysis will be discussed in later sections of this chapter.

3.4.2 Case study research

The term "case study" has multiple meanings. It can be used to describe a unit of analysis (such as a case study of a particular organization) or to describe a research method. The discussion here concerns the use of the case study as a research method. Case study research is the most common qualitative method used in information systems (Okombo and Tromp 2006). Although there are numerous definitions, Yin (2004) defines the scope of a case study method as follows:

> "A case study is an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident (Yin 2004)".

It has also been argued that a case study is an intensive study of a single group, incident or community (Okombo and Tromp 2006). Case study methods involve in-depth, longitudinal examination of a single incident or event: a case. Therefore, compared to other methods such as surveys, the strength of the case study method is its ability to examine in-depth a "case" within its real life (Yin 2004).

Mouton (2009) has identified the distinctive situations for applying the case study method. First and foremost, the case study method is pertinent when a research addresses either a descriptive question (what happened?) or an explanatory question (how or why did something happen?). The current research therefore demanded that a case study be carried because an explanation was needed as to why and how ICTs should be utilized so as to alleviate poverty in the rural areas of Uasin Gishu, as well as answer research questions. Secondly, a researcher may want to illuminate a particular situation and to get a close (that is, in-depth and first hand) understanding of it as was the case in this research. The case study therefore enabled the researcher to collect data in natural settings (in the rural area), instead of relying on 'derived' data, so as to have an in-depth

understanding of them. In other words, the case study method is best applied when research aims to produce a first-hand understanding of people and events. Other methods such as surveys could have been used but they could not have satisfied the researcher's needs as much.

Doing case study research is not different from using other research methods in many ways. All methods require reviewing of literature, defining research questions and analytic strategies, using formal data collection protocols and instruments, and writing good research reports. However, case studies call for at least one additional skill – one may need to do data collection and data analysis together (Yin 2004). For instance, an interview with one person may produce information that conflicts with that from an earlier interview. This will prompt the interviewer either to modify the data collection instrument or to re-conduct the earlier interview, or to disregard this and interview a third person. The researcher found this a strength because the choice of grounded theory as a method of analyzing this research also emphasizes that analysis of data starts with data collection. This was in line with the use of case studies as a method to create new theory in social sciences as further developed by Barney Glaser and Anselm Strauss who presented their research method, Grounded Theory in 1967 (Mouton 2009). This requires that the researcher masters the intricacies of the study's substantive issues while also having the patience and dedication to collect data carefully and fairly. Furthermore, Yin (2004) contended that a key demand of the case study method is the investigator's skill and expertise at pursuing an entire (and sometimes subtle) line of enquiry at the same time as (and not after) data is being collected.

The case study method requires that cases are chosen carefully. In choosing specific persons, groups or sites to be cases, there are common problems that need to be overcome as identified in the literature (Mouton 2009, Mikkelsen 2009). The authors note that one of the most common misconceptions for one to overcome is believing that case studies are to represent a formal 'sample' from some larger universe, and that generalizing from cases studies depends on statistical inference (statistical generalization). Instead,

generalizing from case studies reflects substantive topics or issues of interest, and the making of logical inferences (analytical generalization).

Having presented the above scenario, the case study research method is particularly well-suited to information systems research, since the object of our discipline is the study of information systems in organizations, and "interest has shifted to organizational rather than technical issues" Alampay (2006). Mouton (2009) affirms that the case study approach “has a rich history of success in applied research and evaluation…. (and is) a particularly powerful approach in situations where depth and richness of evaluation information (are) needed”. Such is the nature of the contexts in which the current study was undertaken. A case study allows a great deal to be learnt from a few examples of the phenomena under study. It brings out deeper insights and understanding of the phenomena (Okombo and Tromp 2006).

3.5 Target population

A population is a group of individuals, objects and items from which samples are taken for investigation (Okombo and Tromp 2006). It refers to an entire group of persons or elements that have at least one thing in common. They are the larger groups from which a sample is taken. In this study, the population consisted of the rural community of Uasin Gishu District who comprised of adult men and women aged above thirty. They included farmers, businessmen and women, and those that need health information.

3.6 Sampling techniques

Sampling is the procedure a researcher uses to gather people, places or things to study. A sample is a set of respondents selected from a larger population for the purpose of determining parameters or characteristics of the whole population (Okombo and Tromp 2006). The respondents were drawn from the key sectors of the economy, namely: agriculture, health and business. Agriculture is the mainstay of the Uasin Gishu District economy. The people in this sector sell their produce to earn their living. They also need to be healthy in order to be productive. That is why priority was given to the three sectors (agriculture, health and business). The sectors also complement each other. For instance,

the improvement of food security and achievement of better standards of health depend heavily on the agricultural sector. The agricultural sector is also an important revenue and foreign exchange earner. It creates jobs and at the same time promotes better environmental management for sustainable production.

From each of the three sectors, key persons (to be referred to as key informants) such as medical officer and agricultural officer among others were interviewed plus the persons that the respective sector serves. This kind of categorization ensured that the sample was as diverse as possible (the greater the diversity and differences that exist in the population sample, the higher the applicability of the research findings to the whole population), representative (as the respondents have been identified from the rural community), accessible (an effective population sample is one that is accessible to the researcher) and knowledgeable (an effective population sample should have some idea of the topic being investigated).

The study utilized various sampling techniques in different stages. First, the stratified random sampling technique was used to stratify Uasin Gishu District by its administrative boundaries. The district is divided into six divisions, namely: Kapsaret (424,500), Ainabkoi (220,300), Kesses (166,000), Turbo (459,600), Soy (290,600) and Moiben (160,800). This technique allowed the population in the district to be grouped into homogenous sub-groups (called strata - a stratum is a subset of the population that shares at least one common characteristic). In other words, people in the same division were grouped together as long as they shared certain common characteristics.

The second stage involved getting a sample from each division according to the activities they performed (agriculture, health and business) using purposive sampling. Purposive sampling allowed the researcher to select participants selectively. During this stage, the researcher visited the divisional offices from where cases were selected purposively. These were cases that divisional officers knew would provide the information that the researcher was seeking. This exercise was done during the local area's market days when the community members congregated at the market centres. Those that the divisional

officers considered information rich but did not attend a particular market day were contacted on phone and an appointment date fixed. For instance, one respondent from Moiben was interviewed at Chepkoilel University College where he was pursuing his studies in the School of Agriculture. This approach was considered suitable for this study because the researcher did not know in advance precisely who to sample a fact acknowledged by Patton (1990). The target audience is rural-based with high incidences of poverty and illiteracy. Thus the choice of this method was appropriate as it enabled the researcher to purposively get information rich cases. Random sampling, for instance, could yield information poor cases that could not be satisfactory for a study such as this. It should be emphasized that purposive sampling is the dominant strategy in qualitative research since it seeks to investigate information rich cases that can be studied in-depth (Patton 1990, Sandelowski 1995). Information rich cases are those from which one can learn a great deal about issues of critical importance to the purpose of the research, thus the term purposive sampling. In Patton's (1990) view, all types of sampling in qualitative research may be encompassed under the broad term 'purposive sampling'. He states that qualitative enquiry typically focuses in-depth on relatively small samples even single cases, selected purposively, a fact also acknowledged by Mouton 2009, Sandelowski (1995), Ritchie and Lewis (2003) and Slater (1994).

Sampling in this study was also informed by Yin (2004) who discussed about screening criteria that are necessary when dealing with several if not many qualified candidates and there is need to select from among them. This includes: the willingness of the key persons to participate, the likely richness of the case; and the preliminary evidence that the case had the experience or the situation that one is seeking to study. Therefore, the goal of case selection or screening is to avoid a scenario whereby, after having started the actual study, the selected case turns out not to be viable or represent an instance of something other than what one intended to study. This screening is also referred to as information oriented sampling, as opposed to random sampling. This is because, an average case is often not the richest in information. It is often more important to clarify the deeper causes behind a given problem and how frequently they occur. Random samples emphasizing representativeness will seldom be able to produce this kind of insight; it is more

appropriate to select some few cases chosen for their validity (Okombo and Tromp 2006). A total of one hundred persons were interviewed with 40 being from agriculture, 30 from business and 30 from health.

3.7 Rationale for the sample size

A feature of qualitative sampling is the fact that the number of cases sampled is often small. This is because, as mentioned earlier, phenomenon only needs to appear once to be of value. The study therefore used the concept of grounded theory in defining the sample size, whereby the point at which all the responses are represented and no new information is gained through continued interviewing is known as 'theoretical saturation' (Strauss 1991). Studies have shown that in most cases, 'theoretical saturation' occurs at between ten and thirty interviews (Strauss 1991, Slater 1994) and up to fifty (Ritchie and Lewis 2003). Theoretical saturation occurs when: nothing happens on further review of the data; the category and its properties exhaust the data; the relationship among categories are well established and validated; and the category is well developed in terms of its properties and dimensions demonstrating variation (Strauss 1991).

The key in grounded theory is to generate enough in-depth data that can illuminate patterns, concepts, categories, properties and dimensions of given phenomena. This was monitored in the process of data coding and analysis. The sample provided rich data and led to theoretical saturation.

According to Strauss (1991), sample size in qualitative research relies on the point of theoretical saturation. Although on average saturation occurs at the 10^{th} interview, he advices researchers to test the level of saturation by conducting a few more interviews. This was exercised in this study, and theoretical saturation was achieved at different points for the different sectors as can be seen in the different sample sizes above (e.g. 40 for agriculture, 30 for business and 30 for health).

The study also sought more information from key informants involved in the management of the affairs of the rural community. These included key personnel from

each of the activities identified above - agriculture, health and business, and divisional officers from the six divisions. Purposive sampling was also used to select these key informants. This technique allowed the researcher to select information rich cases for in-depth study such as District Agricultural Officers, District Medical Officers, District Public Health Officers and District Commerce and Industry Officers. These were selected because it was thought that they understood the activities that are undertaken in their dockets better than anyone else.

3.8 Data collection instruments

Each of the research methods discussed above uses one or more techniques for collecting empirical data (many qualitative researchers prefer the term "empirical materials" to the word "data" since most qualitative data is non-numeric). These techniques range from interviews, observational techniques such as participant observation and fieldwork, through to archival research. Written data sources can include published and unpublished documents, company reports, memos, letters, reports, email messages, faxes, newspaper articles and so forth.

In anthropology and sociology, it is a common practice to distinguish between primary and secondary sources of data. Generally speaking, primary sources are sources which are unpublished and which the researcher has gathered directly from the people or organization. Secondary sources refer to any materials (books and articles among others) which have been previously published (Okombo and Tromp 2006, Mikkelsen 2009).

Typically, a case study researcher uses interviews and documentary materials first and foremost, without using participant observation. The distinguishing feature of ethnography, however, is that the researcher spends a significant amount of time in the field. The fieldwork notes and the experience of living in the field/community studied become an important addition to any other data gathering techniques that may be used.

In this research, the main data collection instrument was a semi-structured interview schedule. This was a list of questions or topics that needed to be covered by the interviewee. The schedule also consisted of both open and closed ended questions. By

using both the open and closed ended approach, the researcher was able to get a complete and detailed description of the issue under investigation. Closed ended questions provided bio-data being sought such as age, marital status and level of education among others. In-depth information was gathered by the open ended questions. In qualitative research, interviews play an important role because they enable the imparting of expert analysis of the informants' subjective perspective, or the collection of data relating to their biography. It also allows the interviewer to probe for clarification and opinion, and has greater overall flexibility in the data gathering process (Mouton 2009), bearing in mind the fact that this research was conducted in a rural setting. If questionnaires were to be used for instance, the respondents might not have been able to comprehend and respond to them. Above all, this is a qualitative study that called for a qualitative instrument to be used. Mouton (2009) states that, probes are one useful way to get answers in more depth without biasing later answers. Probing made the researcher to learn skills of being a good listener, be more interested rather than interesting and learn to say things like "How is that?" In what ways?" How do you mean that?" "What would be the example of that?" She also had to learn to look and listen expectantly and let the person being interviewed fill in the silence. Mouton (2009) says that through the semi structured interviews, incidents could be explored until behaviour, thoughts and feelings are adequately reported. An interview also allows for the study of phenomena in their natural setting, which is a qualitative requirement. Another advantage of using the interview schedule is that it ensured uniformity and consistency in asking questions as these were previously outlined.

The researcher used a tape recorder to record the interviews. To ensure order, quality and consistency of the collected data, tapes were labeled before being used and the researcher ensured that care was observed in changing the tapes to avoid confusion. The recording ensured that the researcher captured the responses just as they were presented, a very important aspect of qualitative research. Field notes were also taken to supplement the recorded interviews. At the end of the day, the recorded tapes were transcribed for analysis. These notes were also titled and labeled properly, and each of them assigned a serial number to avoid mix up during data analysis. Details on the tapes included the

sector, division, date and time of the interview (such as Agriculture, Soy1, 28/9/08, 12.01 pm). A tape representing a second respondent from the agricultural sector in Soy Division was labeled as follows: Agriculture, Soy2, 28/9/08, 2.30 pm).

3.9 Structure of the interview schedule

The interview schedule is divided into four sections. Section one sought information about the respondents' personal data such as age, gender, marital status and level of literacy, among others. This information is important because they affect the way one seeks and uses information and ICTs.

Section two sought information about the economic status of the respondents, as this also dictates the way one seeks and uses information. The information that was sought included: their sources of income, the modes of transport they owned, whether they had electricity in their homes or not and the kind of livestock they owned, among others.

Section three sought information on the information needs of the respondents. Information was sought on the activities they undertake on a daily basis and the information they need to carry out these activities appropriately; where they get the information from; and whether the information they get satisfies their information needs or not, among others.

The last section, four, is on access and use of ICTs. Information is sought on the kind of ICTs the respondents own or do not own, reasons why they do not own particular ICTs; the information they get from the ICTs, the relevance of this information to their needs, and whether the information is well presented or not in terms of timing, format, language and content, among others. The respondents were also asked to explain the extent to which they have benefited from ICTs and whether they face any challenges in their access and use. Finally, the section sought information on how the identified challenges would be overcome to ensure the potential of ICTs is fully utilized for rural poverty reduction in Uasin Gishu District.

3.10 Data collection procedure

The researcher obtained a research permit from the government before embarking on the study as per the Kenyan Government requirements. In addition, a clearance letter was obtained from the District Commissioner, Uasin Gishu District. A copy of this letter was circulated to all Division officers (DOs) in the six Divisions of the District together with another letter explaining the purpose of the study, its nature and how the information obtained will be used.

3.11 Validity and Reliability

Validity is a measure of how well a test measures what it is supposed to measure. Reliability is a measure of how consistent the results from a test are. A pilot study was conducted to test both validity and reliability. The purpose of the pilot study was to: allow the researcher to determine the completeness of the frame; test the relevance of the collected data; test the suitability of the data collection instrument and assess at random the probable cost and duration of carrying out the study. This was the only way the researcher would find out if the data collection instrument and field procedures worked out the way they were meant to. In most cases, it is rare for the researcher to foresee potential misunderstandings of the questions to be asked. A pilot study also enables the researcher to find out if the selected questions are measuring what they were supposed to measure, if the wording is clear and all questions will be interpreted in the same way by the respondents, and to monitor the context in which the data will be collected and the topic areas addressed. Six respondents were selected at random and the semi-structured interview administered. The corrected schedule was then used in the main research.

3.12 Ethical issues in data collection

The researcher was dealing with human beings and therefore gave attention to the ethical issues associated with carrying out research. Some of these issues include: confidentiality – only the researcher knew the identity of the respondents; the researcher obtained informed consent from the respondents and ensured that all subjects participated voluntarily. The researcher remained open and honest and in no way did she exploit the

respondents. She also informed the respondents that a tape recorder was being used to record the responses to clear any suspicions that arise from concealing the recorder.

3.13 Modes of Analysis

Although a clear distinction between data gathering and data analysis is commonly made in quantitative research, such a distinction is problematic for many qualitative researchers. For example, from a hermeneutic perspective, it is assumed that the researcher's presuppositions affect the gathering of the data - the questions posed to informants largely determine what you are going to find out. The analysis affects the data and the data affects the analysis in significant ways. Therefore, it is perhaps more accurate to speak of "modes of analysis" rather than "data analysis" in qualitative research. These modes of analysis are different approaches to gathering, analyzing and interpreting qualitative data. The common thread is that all qualitative modes of analysis are concerned primarily with textual analysis (whether verbal or written).

There are many different modes of analysis in qualitative research such as hermeneutics, semiotics, approaches which focus on narrative and metaphor and grounded theory is also a mode of analysis. Only grounded theory will be discussed here because of its relevance to the study.

3.13.1 Grounded theory

According to Glaser and Strauss (1990), theories are either deduced from logical assumptions or generated from observation. Grounded theory is a qualitative approach that generates theory from observation. It provides the structure often lacking in other qualitative approaches without sacrificing flexibility or rigor. Grounded theory is so termed because of its emphasis on the generation of theory and the data on which that theory is grounded. It is a detailed grounding by systematically and intensively analyzing data, often sentence by sentence or phrase by phrase of a field note, interview or any other document. By constant comparison, data are extensively collected and coded, thus producing a well constructed theory. The focus of analysis is not merely on collecting or ordering “a mass of data”, but on organizing many ideas which have emerged from

analysis of data. The method was chosen because it is based on the premise that theory at various levels of generality is indispensable for deeper knowledge of social phenomena. Such theory ought to be developed in ultimate relationship with data, with the researcher fully aware of herself as an instrument for developing the grounded theory. The involvement of the researcher is important in qualitative research. Grounded theory experts Glaser and Strauss (1990) say that a researcher needs to be alive not only to the constraints and challenges of research settings and research aims, but to the nature of his/her data. He/she must also be alert to the immense significance of his/her own experience as a researcher and the local contexts in which the research is being conducted. Another advantage of grounded theory is that it offers guidelines which are not merely a kind of list of suggestions, but rather a stronger than that for they emphasize that certain operations must be carried out. For instance, coding must be done early in the research and continually. Analytic memos must also be done early and continually. Grounded theory also allows the researcher's personal experience to be incorporated into the research.

Grounded theory advocates that:

1. there should be extensive data collection which means that both the complex interpretation and the data collection be guided be successively evolving interpretations made during the course of the study.
2. the phenomena under study must be conceptually dense – with many concepts and linkages among the concepts.
3. it is necessary to do a detailed, intensive, microscopic examination of the data in order to bring out the analyzing complexity of what lies in, behind and beyond those data.

As earlier pointed out, the experiences of researchers affect the way one analyses data. This experiential data consists not only of analyst's technical knowledge and experience derived from research, but also their personal experiences. Strauss (1991) says that experiential data are essential because they not only give theoretical sensitivity but provide a wealth of provisional suggestions for making comparisons, finding variations, and sampling widely on theoretical grounds. All this will help the researcher eventually

to formulate a conceptually dense and carefully ordered theory. It is however important to note here that the researcher's will not be the only possible interpretation of the data. Only God's interpretation can make the claim of "full completeness" but it will be plausible, useful and allow its own further elaboration and clarification.

Grounded theory is based on a concept-indication model, which directs the conceptual coding of a set of empirical indicators. The latter are actual data observed or described in documents and in words of interviewees and informants. These words are indicators of a concept the analyst derives from data, at first provisionally, but later with more certainty. By making constant comparison of indicator to indicator, they are 'coded' naming them as indicators of a class of events/behavioural actions. They may be given a class name, thinking of it as a coded category. After a conceptual code is generated, then indicators are compared to the emergent concept. From the concepts of additional indicators to the conceptual codes, the codes are sharpened to achieve their best fits to data. Meanwhile further categories are generated until the codes are verified and saturated yielding nothing much new. The more a researcher finds indicators that work similarly regarding their meaning for the concept, the more the analyst saturates the properties of the concept. Nothing new happens as he/she reviews the data. The beauty of grounded theory is that through this saturation, the category and its properties exhaust the data. Meanwhile, the analyst continues to saturate other categories by the use of constant comparative method.

There are three stages of data analysis using grounded theory and as applied in this research namely: open coding, axial coding and selective coding.

3.13.1.1 Open coding

This is the first step in grounded theory approach to qualitative data analysis. It is the initial type of coding done and is unstructured.

Open coding is based on the concept of data being 'cracked open' as a means of identifying categories. It is the part of analysis concerned with identifying, naming, categorizing and describing phenomena found in the responses. So, the process of naming and labeling things, categories and properties is known as coding. It is the analysis of

data collected in a research and a general term for conceptualization; thus coding includes raising questions and giving answers about categories and about their relation. A code is a term for any product of this analysis (whether category or relations among two or more categories (Strauss 1991).

Open coding was done at the end of each day's field work upon completion of fieldwork transcription. In each case data was very closely scrutinized, line by line and word by word, in such of the answer to the repeated question – what is being referenced here? The aim was to produce concepts that seemed to fit the data such as activities and ICTs among others. These are nouns and verbs of phenomena under study/ a conceptual world. At this stage, the concepts and their dimensions were entirely provisional. The goodness of open coding is that it forces the analyst to fracture and break the data apart analytically, and this leads directly to excitement and the inevitable payoff of grounded conceptualization. It also allowed the researcher to use her technical knowledge and theoretical sensitivity, experiential knowledge and research knowledge. The researcher maintained an inventory of codes with their descriptions (that is, created a codebook) along with pointers to text that contained them. In addition, as codes were developed, the researcher thought it useful to write memos (known as code notes) that discussed the codes. These memos become fodder for later development into reports.

A contrasting approach to open coding worth mentioning here is overview approach. This approach requires the analyst to read data over rather quickly and this yields an impressionist cluster of categories. This approach is not recommended by itself because it yields only a few ideas and does not force the evolution of conceptual density. It does not give any idea of what has been missed. To continue in that vein gives conceptually thin and often poorly integrated theory.

3.13.1.2. Axial coding

Axial coding is the next process after open coding. It is called axial coding because the analysis revolves around the 'axis' of one category at a time (Strauss 1991). It is the process of relating codes (categories and properties) to each other, via a combination of

inductive and deductive thinking. The researcher was able to achieve this by utilizing a coding paradigm, i.e. a system of coding that seeks to identify causal relationships between categories. The aim of the coding paradigm was to make explicit connections between categories and sub-categories. This process is often referred to as paradigm model and involves explaining and understanding relationships between categories in order to understand the phenomenon to which they related as shown:

Element	Description
Phenomenon	This is what in schema theory might be called the name of the schema or frame. It is the concept that holds the bits together. In grounded theory it is sometimes the outcome of interest, or it can be the subject.
Causal conditions	These are the events or variables that lead to the occurrence or development of the phenomenon. It is a set of causes and their properties.
Action strategies	The purposeful, goal-oriented activities that agents perform in response to the phenomenon and intervening conditions.
Consequences	These are the consequences of the action strategies, intended and unintended.

In this research, one of the phenomena was poverty (derived from open coding), the causal condition is lack of information, the action strategy is information seeking, and the consequence is empowerment or poverty reduction. The researcher took the respondent's understanding of what causes what as truth. That is, she saw the informant as an insider expert, and the model created was really the informant's folk model. It is important to note here that without inclusion of the paradigm items, coding is not coding.

Such an intense analysis done around one category at a time, resulted in cumulative knowledge about relationships between that category and other categories and subcategories.

3.13.1.3 Selective coding

This stage pertains to coding systematically and concertedly for the core category. It is the final stage of analysis. At this point, the researcher delimited coding to only those codes that relate to the core codes in sufficiently significant ways (Strauss 1991). The code then became a guide to further theoretical sampling and data collection. The researcher constantly looked for conditions, consequences et cetera, that related to the core category, coding for them. The essential idea was to develop a single story line around which everything else draped, and this became the report of the research.

3.14 Data presentation

After analysis, data was presented in narrative, tables, charts and graphs for ease of comprehension.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND INTERPRETATION

4.1 Introduction

This chapter presents the findings of the study as provided by various categories of respondents in the following key sectors of the economy: agriculture, health and business. Responses from each of these sectors are presented separately. Within each sector, responses obtained from key informants, namely, agricultural, health and business officers are used to validate and compliment responses from the users within those sectors. As indicated in the previous chapter, a total of one hundred persons were interviewed.

The chapter is organized as follows: section 4.2 presents the demographic analysis of all the one hundred respondents; and section 4.3 presents analysis of the sectors in terms of - respondents information needs, sources consulted to obtain information, access and use of ICTs, role of ICTs for poverty reduction, challenges encountered in the access and use of ICTs, and suggestions for improvement.

4.2 Demographic analysis of respondents

4.2.1. Age

Age is a very important demographic factor because it affects the way one seeks and even uses information in any form, be it oral, print or electronic. Eighty three percent of the respondents were aged above forty years, while those aged between 30-39 years old were 17%. It was noted that most people in the age bracket of below 30 years had left the rural areas to look for white collar jobs in towns. They argued that the rural areas were for the elderly.

Table 3: Age (n=100)

Age in years	31-40	Above 41	**Total**
No.	17	83	**100**
Percentage	17	83	**100**

4.2.2. Level of literacy/education

It was important to study the level of literacy of the respondents so as to ascertain whether this affects their perceptions on ICTs, the way they seek and use information, the way they access and use ICTs and their use of information for poverty reduction. It was found that 72% of the respondents had primary level of education. Most of the respondents mentioned standard 7 and 8 as the highest primary level education attained. Twenty four percent had achieved post primary education while 4% had never been to school. Asked whether they were able to read and write, all the respondents indicated that they were able and that this enabled them to keep basic records/statistics of their harvests, business or even health.

Another important finding was that, all respondents understood either English or Kiswahili. This fact made it easier for the interviews to be conducted as language was not a barrier. Either English or Kiswahili was used depending on the respondent's mastery of either. Asked about their preferred language of communication among themselves and with the officers, 15% of the respondents preferred English while 25% opted for Kiswahili. The remaining percentage preferred their local language – *Kalenjin*.

4.2.3. Marriage, family income and role in the house

All the respondents were married with the least number of children being four while the maximum number was eight. Thirty percent of them were grandparents with grand children. On family income, it was found that men were the sole breadwinners, with a few exceptions. In this regard, one female respondent had this to say:

> *"I live with my family. I have six children and four grandchildren. All of them depend on me for everything. If I had a smaller family, I would not have been suffering the way I am".*

When it came to decision making, most of the decisions concerning income were made by men. It did not matter whether the money was earned jointly or singly. The study also established that the women waited upon their husbands to make major decisions in the family such as when to sell produce and how to spend the money among other key financial decisions. Women were expected to agree with all that their husbands decided. The women argued that they were not comfortable with such arrangements because they demoralized them as most of them were involved directly in the generation of that income. They wished they could be given an upper hand in making family decisions, including financial decisions.

4.2.4. Occupation

Uasin Gishu District is basically an agricultural region with the main activities being the cultivation of maize and wheat (in relatively large scale) and rearing of livestock. It was therefore quite obvious for all the one hundred respondents to indicate farming as their main source of income. Livestock was also mentioned by 90% of the respondents. The animals that the respondents kept included cattle, goats and sheep and that provided meat and milk. In addition, there were initiatives by the government and other Non-Governmental Organizations (NGOs) to encourage the rural community to venture into other farming activities such as horticulture for sustainable development. An example of an NGO that assists farmers to venture into horticulture is CANKEN, a Canadian company. It assists farmers by providing finances and technical information, as well as marketing their products. Through CANKEN, farmers who have mainly been maize and wheat farmers for many years, are now engaged in the production of horticultural crops such as tomatoes, cabbage, kales, spinach, onions, sweet potatoes, blacknight shade, pumpkins and many other horticultural crops for home consumption and some for export. CANKEN has its offices at the Eldoret International Airport. The farmers also keep poultry, whose products - eggs and meat, earn them income.

4.3 SECTORAL ANALYSIS

4.3.1 AGRICULTURAL SECTOR

Agriculture is the mainstay of Uasin Gishu District economy. Over 120,000 hectares is under crop production, while over 200,000 of the population work in agriculture alone (RoK 2002). This is about 25% of the total population in the District. The sector contributes 35.3% of household income. The vision of the sector is "sustainable and adequate rural development for all" while the mission is "to contribute to poverty reduction through the promotion of food security, agro-industrial development, trade, rural employment and sustainable utilization of natural resources". It further indicates that the achievement of the objective of alleviating poverty is largely dependent on the agricultural and rural development sector. This is because the bulk of the population is directly or indirectly dependent on agriculture. So, the importance of the sector cannot be over-emphasized because a great proportion of the population earns its livelihood from it. The sector is an important revenue and foreign exchange earner. It creates jobs and at the same time promotes better environmental management for sustainable production. However, agriculture has performed dismally because of inefficient marketing systems, inadequate dissemination of research outputs, inaccessibility to credit and poor information networks. Most of these constraints can be overcome through the provision of relevant and timely information through ICTs.

4.3.1.1 Information needs

As indicated in earlier chapters, an information need is a requirement that drives people into seeking information. It arises from an awareness of something missing, which necessitates the seeking of information that might contribute to the understanding of that situation. Sometimes information needs exist even when one is not aware. Thus is important to probe people in order to ascertain their information needs. In this study, an information need is taken as a situation requiring information based on the nature of one's work. That is why it was important to study and understand these activities in order to ascertain the respondents' information needs. Duties, responsibilities and activities that individuals are engaged in affect their information seeking. They define the individuals' information needs and trigger an information seeking process.

The study established the following as the activities for which the respondents seek information: growing of crops, rearing of livestock, community development, buying of farm inputs, selling of farm produce and the general management of the farm, among others. Women performed other duties such as housekeeping, childcare, fetching water, cooking and fetching of firewood.

To undertake the above activities, the researcher asked the farmers if they needed information. The information needed centred on: business, family care/housekeeping/home economics, crop and animal protection, farm management, price and pricing, record keeping, horticulture, climate, socioeconomic, political and cultural trends, product quality control, markets and marketing strategies, import and export policies, harvesting and post harvest handling, technical and weed control, among others. Their responses are presented in table 4:

Table 4: Information needs (n=40)

Information need	No. of respondents	Percentage
Crop and animal protection	40	100
Animal husbandry	40	100
Farm management	40	100
Harvesting and post harvest handling	40	100
Markets and marketing strategies	40	100
Product quality control	40	100
Use of pesticides	40	100
Price and pricing	40	100
Technical	36	90
Financial	33	84
Horticulture	20	50
Socioeconomic, political and cultural trends	20	50
Climate and weather	18	46
Transport	18	46
Family care/house keeping	17	44

According to table 4, all the respondents expressed need for information on crop and animal production, farm management, harvesting and post harvest handling, market and marketing strategies, product quality control (value addition), price and pricing and use of pesticides, as discussed below:

1. Crop production and animal husbandry

This information pertains to the health of the crop. It included information about pests and their control, keeping pest levels below economically damaging thresholds and regular crop inspection to identify and assess pest levels. It is important that this information is availed to them to maximize on crop/animal yields. Farm inputs such as fertilizers are expensive. Therefore, it is important that the crop is protected as much as possible for best yields/harvest. This in turn translates to higher income and the end

product is the reduction of poverty levels. At the same time, they needed information on animal husbandry, such as, the general care of animals and the control and treatment of diseases. They also needed information on breeding, where to obtain animal feeds and where to sell animal produce such as milk and meat.

2. Farm management

Farm management is the key to high productivity in agriculture. Respondents needed information on keeping farm records, soil management, and the use and application of the right fertilizers, among others. Respondents practicing horticulture (which is a new enterprise in the District) needed information on: what crops to plant, what crops to intercrop and the benefits thereof, new farming techniques, types of irrigation systems to use and whether to apply the same fertilizers on a *shamba* that has more than one crop as well as pesticides. The general concern here was how to take care of all farming activities right from agriculture to livestock.

3. Harvesting and post harvest handling

Harvesting is the climax of any agricultural activity. It is a time when farmers count their profits or loses. Respondents indicated the need for information on when to harvest each of the different types of crops. Equally important to the respondents was how the crop should be handled after harvesting. This, they said, included information on storage and pest control on stored produce especially cereals. For instance, to control weevil infestation, a certain pesticide must be applied in the right quantity and at the right time. If the quantity is less, weevils will infest. If too much is applied, the nutritional value of the product will be compromised; hence it will be harmful for human beings. It is also important to note here that agricultural products such as maize, beans, wheat et cetera, have to dry maximally before storage in order to avoid growth of moulds. They needed this information too.

4. Market and marketing strategies

Respondents indicated need for information on new markets, when to take their produce to the market and current and future product needs of customers among others. A

respondent indicated that before he delivers his tomatoes to the market, he first makes calls to his acquaintances on his cell phone to get information on where the prices are good. The respondents also suggested that if they would sell their products outside their local markets, they would be able to make higher profits. They indicated that local markets usually have the same products at any one time because of the season. Farmers can benefit from a wide range of information on other markets, prices and market trends if they are empowered with information. This information can help them to decide when, where and at what price to sell their produce, thus enabling them to make the right decisions and increase their revenue.

5. Product quality control

Respondents needed information on quality control. Quality has a direct impact on price, market penetration and viability. The specific information they needed included: using plant material that is high in genetic potential, of good quality, using certified seeds appropriate for their soils and environmental conditions, acquiring planting material and animal feeds from accredited sources such as registered stockists, proper handling of produce during and after harvesting, and ensuring sanitation (especially milk and milk products). In other instances, respondents called for product quality control information value addition, which is, adding value to produce right from the time of planting to the time of harvesting. They further stressed the importance of the product maintaining its quality because a high quality product will definitely fetch more money to the farmer. Subsequently, this could improve his/her livelihood.

6. Use of pesticides

Respondents needed information on pesticide use which included: the range of pesticides available (the respondents revealed that new pesticides keep being introduced while old ones are removed from the market), what they cure and their effects both to human beings and the environment, use instructions in line with the recommendations by the Pest Control Products Board (PCPB) and their application and equipment to use. They also needed information on the dangers of exposure to spray concentrations, dangers of over-spraying, use of personal protective equipment such as goggles, respirator; disposal

of pesticides and any other information that pertains to the use, care and disposal of pesticides.

7. Price and pricing

The need for this kind of information was indicated by all the respondents. They needed to know how much their produce would fetch them at any one particular time. Further probing also established that such information needed to be updated daily because market prices of goods are usually dictated by the state of demand and supply. Therefore, there was need for daily closing prices in local markets. The respondents also indicated that they needed to track global price trends.

8. Technical information

The respondents who indicated that they needed technical information were 90%. They needed information on how to keep the soil well drained and its pH neutral (one respondent mentioned that he was told to use ash from the fireplace to neutralize soil); and in other areas such as: soil management, crop management, weed control, and planting requirements for the different kinds of enterprises, among others. This is the information needed to make production possible.

9. Financial information

Eighty four percent (84%) of the respondents needed information on where to access credit facilities. This included information on where they could borrow money, at what interest rates, repayment period and penalty for defaulting. They needed money to buy farm inputs such as fertilizers and even to expand their agricultural activities. They also needed access to financial services such as insurance and money transfers. The financial services have traditionally been provided by local money lenders. Vegetable vendors even borrowed this money from their fellow workers at some interest rate (usually 10% in most areas) a day to finance their daily working capital needs. This money was then returned at the end of some agreed period of time, like after a day or week. Most people preferred this because the lenders were known to them which reduced chances of

defaulting. There were also no lengthy procedures that usually go with taking loans from institutions like banks.

10. Horticulture

Horticulture is slowly emerging as an equally important enterprise (agricultural activity) in the district just as the traditional maize and wheat. Farmers are engaged in growing of tomatoes, cabbage, kales, spinach, onions, sweet potatoes, pumpkins, and beans among others. Some of these crops are grown for export. 50% of the respondents indicated the need for information on planting, management, harvesting and even storage of these crops. They said that being perishable crops, they needed to know how to handle them, right from the time of planting to harvesting. They also expressed the need for information on their various stages of development and what should be done at each stage in order to get maximum yields.

Information was also sought on the right pesticides to use bearing in mind that these products are consumed directly from the *shamba*. They also sought to know whether they can be inter-cropped and how rotation can be done, if need be. For those grown for export, the respondents indicated need for information on export policies such as how quality for export is measured, minimum quality requirements, right stage of maturity, and control of environmental conditions, among others. They also indicated need for information on trading such as major trading patterns, trading standards and ethics, trends adopted by competitors, export procedures and exchange rates.

11. Climate

The respondents who needed information on climatic changes in the region were 46%. They said that climate has become very unreliable and unpredictable in the recent past and that there are no defined weather patterns. They needed this kind of information to be able to plan their farming activities, especially now that a number of them are venturing into horticulture.

Other kinds of information that the respondents needed included:

- ✓ Business (this will be covered in later sections)
- ✓ Socio-economic, political and cultural trends
- ✓ Transport
- ✓ Human rights
- ✓ Family care and
- ✓ Record keeping, among others

From the foregoing, it is clear that the rural farming community in Uasin Gishu District undertakes various activities on a day-to-day basis. Such activities have given rise to varied needs for information. The above findings demonstrate that it is not possible for someone to categorically claim to know all information needs of a group especially in an information dependent sector like agriculture where there are new and rather complex problems facing farmers every day. This means that approaches to disseminate and manage agricultural and other types of information will definitely require an understanding of the information needs of the users. Identification of such needs will go a long way in ensuring that systems are put in place to provide relevant and up-to-date information to the farming community. Provision of timely information would enable farmers to carry out their activities in a more efficient manner. This would go a long way to economically empower the farmers, ensure that there is food security and hence reduce instances of poverty and hunger.

4.3.1.2 Sources of information

This section presents the various sources/areas of information used by the farming community to enable them carry out their day-to-day activities and to be able to make the right decisions. These include: agricultural extension officers, field days, agrochemical firms such as TWIGA, SYGENTA, and family, neighbours and friends.

1. Extension officers

Most of the respondents (90%) consulted agricultural extension officers because they felt these officers would not disappoint them. They were consulted either in their offices or

when they (officers) visited the farms. The respondents observed that this was a popular source of information because:

1. the farmers believed that the extension officers understood their problems better having worked in the area,
2. the extension officers provided the information in the language the rural farmers could understand as most of the extension workers came from the local community,
3. the extension officers can be easily accessed using mobile phones that majority of the rural community owned. They could then describe their problem on phone and get the solution in the same way, and more often instantly, and
4. the extension officers identified themselves with the respondents and this made the respondents approach and interact with them freely.

The information that the respondents obtained from the extension officers included technical information, marketing information, farm management information, application of fertilizers and pesticides, harvesting, storage, soil management, land preparation, and planting, among others.

2. Field days

Eighty percent of the respondents obtained information through field days. These are days that the Ministry of Agriculture sets aside to meet farmers at the locations and divisions. Important issues affecting people in the area are discussed. Such fora provided them with an opportunity to meet with the agricultural officers from the district and provincial offices. An interview with one of the Agricultural Extension Officers (AEOs) established that they use such fora to talk about different kinds of enterprises (crops). This is because each enterprise has different information requirements in terms of variety, land preparation, diseases and pests including their control, harvesting and post harvest management, marketing and value addition, among others. Despite the importance of these public meetings, the study established that most of the people who attended were men. Women remained at home to attend to other activities. The latter became losers because since most information is oral it never reached them as intended, yet, the women

are the 'real' farmers, as the study established. The trickle down effect of this is that women continue performing agricultural and other activities poorly because of limited to information.

It was found out that the above channel of communication was better because the interaction between the experts and farming community is face to face (or as some of them put it, one-on-one). The respondents also said that the language of presentation/communication was easy to understand. Kiswahili was mostly used and places where the entire audience was *Kalenjin*, the local language was used. In other words, the constitution of the group dictated what language was to be used for communication.

3. Agro-chemical companies

The respondents who obtained information from agro-chemical companies and their marketing representatives were 46%. The study established that these representatives did not organize their own meetings rather they made use of the field days or public *barazas* to market and sell their products. The respondents felt that the information obtained from these representatives was relevant. They believed the representatives were informed about the products they were selling because they gave the farmers detailed information on how the chemicals are used, for what crops, safety measures, environmental implications and dangers of under-and-over utilization/application. A particular agro-chemical company that majority of the respondents mentioned was SYGENTA whose motto is '*uwezo'* – (directly translated as ability) - one that gives them ability. They said that the SYGENTA products are good, and that they gave them the power to fight disease.

4. Family neighbours and friends

Other strategies that were employed to get information included consultations with fellow farmers, friends, relatives, neighbours and opinion leaders, among others. Two respondents said the following on different occasions:

Respondent 1.

> *"I have friends who work at a farm belonging to Jane (not her real name), a large scale farmer around here. I normally ask them - what are you planting this time round? If about cows I ask them - what are you feeding them on?"*

Respondent 2.

> *"One of the extension officers is my neighbour. She is the one that I really ask questions like what variety of seed to plant. So she helps me".*

From the foregoing, it is clear that the respondents consulted several sources for information. What is also established is that the respondents sought information from the source that was nearer to them and one that they trusted. They also sought information from a source that they could easily understand in terms of language and familiarity. Far away sources of information such as libraries and other information centres were not mentioned. Information sources that needed money before acquiring them such as newspapers were also not mentioned. The information they obtained from the above sources was used to undertake their various activities such as planting, pest control, land preparation, soil management, farm management, harvesting, pricing and marketing, among others.

4.3.1.3 Access and use of ICTs

This section presents findings on old and new ICTs that the respondents in the agricultural sector had access to. The old ICTs that will be discussed include: radios and televisions, whereas new ICTs include mobile phones and the internet.

1. Radio

The respondents that owned radios were 86%. Some female respondents indicated that there was a radio at home, but it belonged to their husbands. They further stated that during the day their husbands carried the radios away from home to wherever they spent their time. This made access to and use of the radio difficult.

Majority of radio listeners tuned to the local channels for information, among them, KASS FM and CHAMGEI FM (a Royal Media Service station). They indicated that

programmes in these two stations were aired in *Kalenjin* (their mother tongue), a language that they understood. One lady had the following to say:

> *"We farmers are very busy. We get back home very late in the evening like 9 pm. When I get home, I tune to KASS FM. This is in our language. It 'enters' properly. It fits me so much. Even if there is something being discussed, I will really understand".*

They also indicated that there were certain programmes that benefited them. For instance, KASS FM, aired programs that provided them with information on good farming practices. Almost all respondents with radios mentioned KASS FM as their preferred channel. One respondent had this to say:

> "Y*ou listen to how other people are working elsewhere and you apply the same knowledge to your own situation".*

The study also established that the same station also airs programmes on pest control using UWEZO from SYGENTA.

Most radio programmes are now interactive and listeners get opportunities of asking questions to which they get immediate responses. A female respondent indicated that she listened to women programs on radio. Further probing revealed that women programs - programs touching on the life, work and well being of a woman such as homecare, body hygiene and cleanliness, cookery, childcare and the general cleanliness of the home. This is very interesting because it is an indication that however poor a woman is, she will want to give the family the best she can get and keep the home clean and beautiful!

Apart from the two stations mentioned above, the respondents indicated that they tuned in to Kenya Broadcasting Corporation (KBC), which is a national radio station for a program known as *chapa kazi* (meaning work hard). The Agricultural Information Centre (AIC) in Nairobi also airs programs through KBC in seven local languages, *Kalenjin* being one of them. These programs are interactive and callers call in through a dedicated line and get responses in real time. However, an interview with an officer at

AIC revealed that producing programmes in local languages is very expensive and that is why they are very few.

Respondents in the study area expressed dissatisfaction especially in the timing of the programs. This is because most of the relevant programs are aired during the day when the respondents are not at home. They had no problem with the way the information was presented. One respondent had this to say:

> *"..presentation of the programs is good. However there are so many adverts that come in between and they spoil the programme"*.

2. Television

The study established that only 30% of the respondents owned television sets. Among the channels the respondents indicated that they tuned to included: Citizen, KBC, Nation Television (NTV) and Kenya Television Network (KTN). Just like the radio, the programmes that the farmers watched included those on farming because they offered tips on various farming activities. The problems mentioned were more or less similar to those that radio listeners experienced such as poor timing of the programs. They observed that presentation of information was not specific to their needs owing to the fact that they were meant for the general public. The language used was Kiswahili and English and not *Kalenjin*. One respondent said that whenever he gets information that he is not sure of, he asks the extension officers to clarify.

3. Mobile (cellular) phone applications

Of the new ICTs, the mobile phone was the most used tool by all the respondents. Ninety six percent of the respondents used the mobile phone to communicate with friends and family members only and not for business for instance. A lady respondent attributed this to the high costs of calling, saying that it can only be economical if one makes only crucial calls.

The study established that a significant percentage of the respondents (64%) used their mobile phones to "call" extension officers on several issues such as plant and animal diseases, confirmation of any information obtained from other sources (as reported

earlier) and on markets among others. The study further established that sometimes it was possible to get the symptoms of diseases right. In such cases, a prescription was made and communicated to the farmer via short messaging service (SMS). To the researcher, this was quite amazing!

Another respondent who owns an eatery in Turbo Division said that she used the mobile phone to communicate with her customers. She further indicated that her customers called to make orders for food thus:

> *"Customers make orders on phone. This enables me to prepare just enough food that will not go to waste. I also use my mobile phone to order for meat, which is delivered at my food joint. When the delivery delays, I normally call to find out what the problem is".*

What this means is that she does not have to walk to the butchery (about 1 kilometre away) to pick the meat, hence no time is wasted. She can also make alternative arrangements if the supplier failed to deliver the meat.

Fifty four percent of the respondents also indicated that they used the mobile phone to call their suppliers to know the prices of their products. One of these respondents said that it is important to make such a call in order to compare the various prices of the same product as offered by different suppliers, and then make a decision on which supplier to buy products from.

> *"A mobile phone is a very important thing. It helps us a lot. When one goes to look for maize, she must use a mobile phone. If we want a customer to bring us maize from Bungoma, we use a mobile phone. Mobile is number one! Even when you don't know someone and you have been given the mobile phone number, you use the phone to communicate".*

The same number of respondents (54%) also indicated that they use mobile phones to either make or cancel orders. One respondent said that when the price turns to be high, a supplier she had placed an order with, she calls to cancel instead of traveling all the way to make the cancellation. This saves on time and money.

The study confirmed that the voice prompt is an important feature of mobile telephony. Forty four percent of the respondents indicated that the voice prompt enabled them to leave a message if the recipient was not available to receive the call or if s/he was busy. The recipient could then get the message later:

> *"When you call, the phone tells you to leave a message after the tone (She laughs). Long time, I didn't know the meaning of that. I used to ask myself ... sasa nitawachia message nani? Lakini vile utaiongea, yule mwenye simu akikuja kushika, anasikia ile kitu ulikua unasema. Nikaona hii ni kitu ya haraka sana kwa sababu ukishawacha hiyo message, baada ya dakika kama kumi au kumi na tano, akifungua simu yake, anapata hiyo message na anakujibu (*now with whom do I leave the message? But the way you will talk, the owner will get it when he comes online. Then I realized that this is a very fast thing because after you leave the message, after 10 or 15 minutes, the phone owner will get the message and get back to you)".

The mobile phone has also been used as an electronic money transfer tool. Respondents said that they use the mobile phone to send and receive money to and from family members and friends, pay for goods delivered, and make advance payment for products ordered, among others. One lady respondent said that she communicates with her supplier of onions from a neighbouring district. Then this supplier puts the products on public transport, calls her and gives details of the vehicle such as the name of the driver or conductor, their mobile phone numbers, et cetera. The lady then waits for the products to be delivered. She calls from time to time to enquire how far the vehicle is. When the products/goods are delivered, the lady makes her payments through the same way and the supplier is informed through the mobile phone or better still, through M-*PESA* (Mobile *Pesa*). Depending on how the two parties agree, payments can either be made before or after the delivery is made. This is a confirmation that M-*Pesa* is being applied in the rural community to conduct business as illustrated in the responses above.

A horticultural farmer indicated that before he takes products to the market, he calls his customers to enquire whether they need products such as vegetables and tomatoes. He said some products are perishable and therefore, it is important that the time between harvest and disposal is kept as short as possible to avoid unnecessary loses. He added that

without information on where to take the produce, one could end up not selling the produce at all or selling it at throw away prices, thus sinking further into poverty.

> *"I interact with vegetable vendors at the market. They call me to tell me to take certain products to them. One can tell me to take him/her a crate of tomatoes. So I just carry that knowing that I am bringing so and so tomatoes. I don't have to carry so much that I will not be able to sell. In fact, I don't have to harvest what I will not sell on that day".*

A small number of respondents (4%) used their mobile phones to access the internet either through the mobile service subscribers Safaricom and Airtel or through Telkom.

Key informants also used the mobile phone greatly to contact other staff, farmers, family and friends. For instance, the District Agricultural Officer (DAO) said that she used the mobile phone to communicate with her staff in all divisions and locations, call them for meetings, and send group messages, among others, from the comfort of her desk:

> *"when I want to hold a meeting of all the Divisional Agricultural Officers, I just write a message and send it to them all at the same time using the group function of the message settings in the phone, or better still just call them! It is however cheaper to SMS".*

The study also established the existence of the following mobile phone applications:

1. The National Agricultural and Livestock Extension Programme (NALEP) launched a telephony information service in Githurai constituency, Kiambu East District in 2008, known as National Farmers Information Service (NAFIS). This is a government initiative through which a farmer can access information from anywhere through gadgets like the mobile phone or internet. It is aimed at improving extension services through ICTs. It also means that extension information is provided to the farmers without going through the extension officers. A farmer only needs to call 020-4762347 or visit the web at www.nafis.go.ke for information. One can also use the SMS application. For instance, if one wants to know the type of seed to plant in his/her area, the following steps are followed:

> Write the word maize or beans, #, division and send to 2964. The message will look like this: maize#kesses. This message costs Ksh. 10. A response is received in real time from 2964. It details the different varieties of maize seed that can be

planted in Kesses division of Uasin Gishu district as: KEPHIS: H6213, WH 699, WH 904, PAN 683, KH 600-17A, KH 600-18A, KSH. 6214, KSH. 624, KH 500-31A, KH 500-32A, KH 500-33A, KH 500-34A, PHB 30G19, PHB 30V539, KH 600-20A, PHB 30H83.

The same can be done for other agricultural products such as beans, potatoes and wheat among others. However, the research established that this information has not reached the rural person. It is only the officers that know about it.

2. Mobile telephony can also support other voice, image and video applications. For instance, the Kenya Agricultural Commodity Exchange (KACE) is collaborating with a local company, Interactive Media Services Ltd, to offer market information through Interactive Voice Response (IVR), a service that uses voice mail for information delivery. Callers can dial 0900-552-055 (called *kilimo* hotline) and follow an easy step by step pre-recorded voice prompt menu to choose the language and access the information. The service is available in both English and Kiswahili. The voice delivers a mail message with prices, trade information and extension messages. Commodities currently covered by this service include maize, beans, potatoes, tomatoes and cabbages. Each call for information at present (October 2010) currently costs Ksh. 20 paid to the IVR service providers. Like the SMS *sokoni* (discussed in the next section), the IVR *kilimo* hotline service is low cost, timely and convenient to use. The user gets a response in real time.

KACE is also harnessing the SMS technology to disseminate market and intelligence information. The SMS technology has been branded SMS *Sokoni* in partnership with Safaricom. A farmer anywhere in the country where the Safaricom mobile phone network covers can, in easy-to-follow steps, access market information like commodity prices in different markets, who is buying or selling what commodity at what prices, and where and when. A phone owner can send an SMS request to a special number and information on prices will be sent automatically via SMS to the person. A message detailing current price information for a commodity in five markets costs Kshs. 7. KACE provides this service in partnership with Safaricom. The SMS service is easy to use, reliable, convenient and low-cost. The information is updated every day and hence is most current

and timely to the user. A subscriber gets updates as per the requested information, three times a week. The SMS service works as follows:

> Example for maize:
> Go to Safaricom menu, choose option 2 – Get-it. Click on it. A list of options appears. Choose 8 – Agric-Produce. Click on it. A list of all produce covered by the service appears such as maize prices, beans prices, potato prices, cabbage prices, selling and buying. Clicking on any one of the produce (in this case maize) brings another menu for Get, On, Off. This means that one can either get the price once or get regular updates (if one chooses ON). The service can also be de-activated by choosing the OFF option.

The following responses from Safaricom 411 were given for maize and beans requests on different dates in 2009:

> **Maize**: KACE: Dry maize: Wholesale price in Kshs. Feb 12, morning; per 90kg bag, NRB 2500; ELD 2,400; KTL 2340; MBS 2700.
>
> **Maize**: KACE: Dry maize: Wholesale price in Kshs. Mar 26, morning; per 90kg bag, NRB 2475; ELD 2,300; KTL 2450; MBS 2350.
>
> **Beans:** KACE: Beans Rosecoco; wholesale price in Kshs. Feb12, morning; per 90kg bag, NRB 4800; ELD 5100; KTL 4900.

It is again regrettable to note that, this information is only known by officers and the respondents did not seem to know about it.

4. Internet applications

The internet was not a common ICT tool among the respondents. Key informants also used the internet and were aware of the applications. Only 4% of the respondents used it to seek information. However, it is becoming an important tool that should be embraced by many. Many internet applications that can benefit the rural community of Uasin Gishu

are available. For instance, as noted earlier, NAFIS has a website that has a user friendly interface. It can be navigated in both English and Kiswahili. It has more information than what can be obtained using the mobile phone. The Agricultural Information Centre has a website too that can easily be navigated.

KACE has a website too – www.kacekenya.com. It provides information on prices of agricultural commodities plus a library of agricultural information and a virtual trading floor. Users can subscribe to a system that sends out daily e-mails with commodity prices in markets in Kenya, Uganda and Tanzania. Subscription is US$ 125 a year. The virtual library contains information on major farmers' organizations and their commodity interests, input suppliers, commodity traders/brokers, other marketing service providers (such as storage, transport, credit), trade policies and tariffs, export and quality requirements (such as European market), et cetera. On the other hand, the trading floor is an electronic platform where clients can place commodity offers and bids.

Regional Commodity Trade and Information System (RECOTIS)

This is an internet based interactive electronic system developed by KACE which enables a client interested in buying and selling of agricultural commodities to receive price information of 25 commodities like cereals, pulses, vegetables, fruits and livestock, among others, daily from all markets in Kenya via electronic mail. Subscription fee is Kshs. 5,500 for every 6 months, and Kshs. 10,000 for 12 months' membership. KACE staff collect and disseminate marketing information on commodity offers to sell, bids to buy and prices through RECOTIS. A request can be made through e-mail kace@kacekenya.com. RECOTIS is a cost effective, timely and efficient means of accessing market information.

e-wakulima.com

This is a website that provides information on best practices of farming. The Kenyan farmer can access top quality information on every aspect of farming – from crop management and animal husbandry to farm equipment and market conditions. e-wakulima is part of an integrated media strategy developed by 3 Mice Interactive Media

in collaboration with a number of other development partners. This programme aims to increase the quality and quantity of income of mainly rural, agricultural related businesses through the creation and evolution of quality mass media programming and support media channels. What farmers need to do is just walk into an internet café and access tips, market prices and other information from the convenience of their computers.

All in all, one can say that, ICTs, together with the ability to use them and adapt to them, are a critical factor in generating and accessing wealth, power and knowledge in this age and era. ICTs can increase search activities and eventually raise the quantity and quality of available information which will reduce uncertainty, lower transaction costs and enhance market penetration. The overall reduction of costs and the increase in efficiency will eventually have an impact on the development of food markets and food security. Small holder farmers in rural areas can therefore be empowered to bargain for better prices in the market place. Relevant and timely market information packaged and delivered by low-cost ICTs can improve the competitiveness of the rural farmers in the market place for better prices. He can also provide a level playing field in the market place, not only between rural farmers and middlemen, but also, between women and men players as noted by (Mukhebi 2003). Access to better markets and better prices means better incomes for the farmer, ensuring food security and a means out of the vicious cycle of poverty and food insecurity.

4.3.1.4 Challenges in accessing and using of ICTs

This section highlights the challenges the respondents experienced in their access and use of ICTs.

Radio and television

One of the challenges that was cited by most of the respondents (90%) was wrong timing of both the radio and television programmes. They indicated that the radio and television programmes they would prefer to listen to and watch respectively were aired during the day when they were away on the farms or at the market.

The second challenge that was cited by 84% of the respondents was lack of electricity. The study found out that most rural homes in Uasin Gishu District did not have electricity. The farmers had to use batteries to power their radios and televisions. They further said that this was very expensive, bearing in mind their poor economic status.

A problem that was cited by 78% of the respondents was language. This issue came out clearly in the way respondents preferred tuning in to the local stations (KASS and CHAMGEI) that broadcast in the local language, *Kalenjin*. Unfortunately, there was no television station broadcasting in local languages. National radio and television stations aired their programmes in both English and Kiswahili. The study further established that as much as the respondents were conversant with the two languages to some degree (more especially Kiswahili), they preferred getting information in their local language.

Seventy four percent of the respondents indicated that programs aired on radio and television were general in nature as they were not prepared for a specific or particular user or problem. Yet, different people lived in different climatic zones, with different soil types, different crop requirements, et cetera. These differences meant that they also needed different types of information and programs that were specific to those problems.

Another challenge cited by 66% of the respondents was the theoretical nature of the information disseminated. This meant that the information did not have a practical or application component. One of these respondents strongly indicated that whenever he got some information from either radio/television, he first confirmed with the area field officers (either belonging to the Ministry of Agriculture or agrochemical companies) before applying it. This showed a lack of trust in such general information.

New ICTs

Eighty three percent of the respondents indicated lack of electricity as a major challenge. Just like old ICTs, new ICTs require electricity to operate, and yet most of the rural homes do not have electricity. This, they said, forces them to take their phones to market centres that have electricity to have them powered/charged. As a result, the mobile

phones were never left on throughout, so as to ‘save’ on power. This definitely cut off the communication process.

Farmers found it difficult to describe their challenges explicitly on phone for the extension officers to act on them. This was indicated by 70% of the respondents who said that such a call takes so much time, meaning that a lot of money is also spent.

A challenge indicated by 90% of the respondents was that there was no ICT centre in their locations or even divisions where they could get the information they needed. They said an ICT centre would be the best resource as it would provide them with the information they require to carry out their day-to-day activities. They also indicated that it would be the best thing especially for the few that did not have mobile phones, and to the many that were not able to load their phones with air time as often as it was necessary.

Fourteen percent of the respondents mentioned poor connectivity as a challenge. These were from an area in Ziwa division that is not covered by any of the major mobile networks. This cut off the residents from the rest of the community and of course the rest of the world in terms of information and communication because they could neither make nor receive calls.

It is very interesting to note that a very small number of respondents (4%) mentioned having used the internet to look for information. One, they said that it was an expensive exercise because they had to travel to Eldoret town (headquarter of Uasin Gishu District) to access it there. This means that they incurred traveling expenses. Secondly, they said that the connection speed was very slow. This meant that they had to pay more than they anticipated.

An internet café at Turbo division, the only one in the entire rural area of Uasin Gishu, seemed to be experiencing a myriad of problems. First and foremost, the owner, who was one of the respondents, indicated that the speed of connection was very slow. What this

meant was that people avoided the café because it would be expensive to use the service. Secondly, the café was connected to the internet through Airtel which was not very fast. The same person had approached Telkom Kenya for internet connection but found it too expensive and so did not install it.

> *"I wanted to connect but when I approached Telkom, they told me that it will be expensive for me. If they were to connect me, they were to give me at Ksh. 3 per minute. Then I saw that at Kshs. 3 per minute, even if I were to charge customers, how much would I charge them? I saw it would be expensive. They told me to wait for the under sea cable to be laid down, then it will be cheaper for me. So am still waiting".*

Thirdly, the same respondent said that the connection became a little fast at night, but he wondered loudly whether it was worth mentioning because nobody would be there at night to use the service! The respondent also stated that whenever he wanted to buy any equipment such as computers, he had to travel to Nairobi. He said that the suppliers in Eldoret town sold such equipment expensively. This made the whole business an expensive undertaking.

4.3.1.5 Suggested solutions to the challenges

First and foremost, 88% of the respondents said that the government should financially facilitate the agricultural officers on the ground by giving them money to buy air time and even travel to attend to individual farmers. This would enable the officers to serve the farmers better. As the study established, farmers simply 'flashed' the officers and expected these officers to call back. To the farmer, the officer was financially better than him.

Secondly, 74% of the respondents needed to have as many cyber cafés as possible close to them. This would facilitate access to information and may be its use. In other words, there was need for rural telecentres to make access to information easier and cheaper.

Third, that the government should zero-tax all ICT equipment and accessories, a fact that was emphasized by 88% of the respondents. A reduction in the cost of the equipment

would mean an affordable service, which would improve access for the rural community of Uasin Gishu.

Fourth, 60% of the respondents felt that the government should hasten the process of laying down the fibre optic cable. In this way, it would be cheaper to make calls as well as use the internet to access information needed to carry out the day-to-day activities in an appropriate manner.

Fifth, 96% of the respondents suggested that the rural electrification programmes should be initiated so as to provide electricity to rural homes. With electricity, they said, they could have their phones on throughout without switching them off to save power. This means that they could be open for communication all the time. Electricity, they said, could also enable them to preserve perishable products that go to waste whenever the market is over-supplied.

Sixth, 86% of the respondents indicated that relevant radio and TV programmes should be broadcast in the evenings and when the farmers were at home instead of doing so during the day when they were away at work. A respondent had this to say:

> *"Useful radio programs should be aired in the evening or at night when everyone is back home from work – probably between 7 pm – 10 pm. They shouldn't bring those programs at a time like now (12.15 pm). Nobody is at home. Everybody is at work at this time. A farmer wakes up very early in the morning and goes. He will not watch or listen to the programs".*

Seventh, 94% of the respondents suggested that local radio stations should be promoted as these were ideal in providing information in local languages and with local content. This is evidenced by the fact that most respondents preferred listening to KASS and CHAMGEI FM stations.

Finally, 82% of the respondents suggested that the government and stakeholders should improve the existing infrastructure that supports agriculture so as to realize better yields, increase revenue from agricultural produce, ensure a lot of food and hence reduce hunger

and alleviate rural poverty. The end result could be the reduction or elimination of rural poverty and the promotion of a country's development.

From the foregoing, it can be concluded that ICTs are indeed important tools in rural poverty reduction and development. It is also important to note that the mobile telephony network covers most areas in rural Uasin Gishu, except for a very small portion. This means that it is possible to package and disseminate relevant and timely information using ICTs to the rural populations and thus give them a competitive edge. When this is done, it implies that the rural farmers shall be able to get the information they need at the time they need it. The yields are likely to be good, fetching better market prices. ICTs would also provide a level playing ground in the market place, not only between rural farmers and middlemen, but also between women and men players. Access to better markets translate to better incomes for the rural farmer, ensure food security and be a means out of the vicious cycle of poverty and food insecurity.

However, there are a few handicaps to this positive observation, such as high tariffs, poor connectivity, poor network and poor electricity among others, that need to be tackled by the government and relevant stakeholders.

Other challenges that emerged for old ICTs included: poor timing of programs, lack of appropriate content and poor language of presentation. These also need to be tackled to ensure free flow of information and communication.

4.3.2 HEALTH SECTOR

The district has identified the health sector as one of the sectors that can help it in achieving sustainable development (RoK 2002b). Among key priorities include: improve public health through provision of safe water and sanitation; control of communicable diseases; disease surveillance and health education and develop an effective health support and management information system.

This section presents data collected from the respondents concerning their health information requirements. It covers their information needs, information sources consulted and ICTs used (both old and new). Challenges encountered in accessing and using ICTs are explored as well as suggestions on how these challenges can be overcome. It is important to note that the people interviewed were the same farmers in the previous chapter. This is because, in rural Uasin Gishu, majority of the population are farmers, hence their different roles in this research. This information is also supplemented with what was obtained from key informants in the health sector in the district such as the Medical Health Officer and Public Health Officer. It is also important to note at this point that the Department of Health does not have an elaborate administrative structure at the grassroots (i.e. from the district to the location) as seen in the agricultural sector.

4.3.2.1 Information needs

As already indicated in the previous chapter, an information need is a requirement that drives people into seeking information. This requirement arises from the nature of work a person is engaged in. The study established that the community is divided into cohorts for ease of administration by health personnel as follows:

Cohort 1 – comprises any expectant mother and new born babies up to two weeks old

Cohort 2 – comprises children under the age of five

Cohort 3 – comprises children aged between five and thirteen

Cohort 4 – comprises those aged between twenty and twenty four

Cohort 5 – comprises those adults aged between twenty five and fifty nine

Cohort 6 – this is the last cohort comprising those aged above fifty nine.

It is important to mention here that members of the cohorts (cohort 1-4) were not interviewed, as they did not form part of the sample as their ages are below thirty years. However, their information needs were articulated by those interviewed. For example, a mother aged forty not only mentioned her own health information needs but also those of her children who fell between zero and twenty four years.

The study established that each cohort has unique information needs. For instance, expectant mothers needed information on pre-natal care such as need for a mosquito net as they were prone to malaria, anti-malarial drugs that are friendly to pregnancy (these are taken twice in pregnancy during the second and third trimesters), use of multi-vitamins and blood boosting drugs, and ante-natal care (4 visits are recommended for the whole period of pregnancy). Expectant mothers also needed information on danger signs to watch out for such as swelling of the feet and limps; bleeding, and passing of fluid, et cetera. One mother said that in case the danger signs manifest, she needed information on what to do to counter the effect. Such information may be to visit a doctor who could administer the right medicine. The mothers needed to know the reasons for attending ante-natal clinic such as to be able to know their blood groups, blood count and HIV status. All these are important in preparation for delivery.

After birth, mothers needed information on good breastfeeding practices, protection against infections (to both mother and child), weaning (when and how to do it), use of treated mosquito nets, and immunization, among others.

Cohort 2 comprising older children had its information such as: the child's development stages, schooling, and diseases these children are prone to. Cohort 3 comprised those in the youthful stage. These people required information on: sexually transmitted diseases (STDs), drugs, youth friendly centres, youth programs in the community and family planning information. The medical officer commented that decisions on whether to provide family planning information to the youth at this stage should be made carefully as this might be misused.

Cohort 5 starts with young adults that are active, working and reproducing and ends with mature adults belonging to the retirement age. The study established that the health information needs vary within the group as much as there are the ages/individuals. They included: getting the right number of children, diseases (such as HIV/AIDS, diabetes, hypertension, cancer), drugs, family planning and behavioural changes necessary to avoid some of the chronic diseases.

The study found out that cohort 6 needed health information on such matters as management of loneliness, management of chronic diseases that are prevalent at this age, et cetera. Others included: general/ personal hygiene, nutrition, health education and prevention of diseases. These are public health matters. It is important to note that the public health component deals with prevention of diseases whereas the medical health component deals with the actual treatment of diseases. This group is prone to chronic diseases and that is why it is important for them to take a proactive step – to prevent the occurrence of disease rather than wait for an attack and then treat it.

The study established that the need for information on preventive measures cuts across all the cohorts and included such information as spraying against harmful insects such as mosquitoes, clearing of bushes, drinking clean water, using mosquito nets, and personal hygiene, among others. The departments of Public Health and Medical Health work together.

4.3.2.2 Sources of information

The respondents indicated the following as sources of information:

Table 5: Sources of information (n=30)

Source of information	No of respondents	Percentage (%)
Churches	21	70
Trained health workers	20	63
Community action days	17	56
Information communication materials	15	50
Schools	9	30
Magazines	3	10
Newspapers	3	10
Radio	3	10
Television	3	10

Information Communication materials (IC – as they are commonly referred to in the health sector) – included materials such as posters placed in hospitals, shops, roadsides, schools and government departments. Fifty percent of the respondents indicated using these materials for information. The study further revealed that these materials were written in three languages, namely: English, Kiswahili and *Kalenjin*. A smaller number (30%), indicated that they obtained their health information from radio and television adverts, newspapers and magazines. They however lamented that this information was general in nature and was meant for public consumption. It therefore did not address their specific needs.

Churches were also cited by quite a significant number of respondents (70%) as a good source of health information. Health personnel used churches especially to reach such groups as children, expectant mothers and the youth. Such gatherings were also used to administer drugs like vitamin A or any other drug that the government was promoting.

Fifty six percent of the respondents mentioned community action/dialogue days as their source of information. Community action/dialogue days were conducted once every three months. They were like public *barazas* where important health matters were discussed such as immunizations, vaccinations, nutrition and general hygiene, among others. Sixty three percent said that they obtained information from trained community health workers (these can be equated to the agricultural extension officers). The study established from the key informants that a group of persons was selected from the community, trained and these people became community health workers. They were also referred to as Community Sensitization Members (CSM). A committee was then selected from these health workers to become part of the committees of the nearest health facility. The respondents sought information from community health workers because these were people they knew, and secondly, the health workers understood the community and its problems better. The study further established that through such community groups, the rural community was able to solve their own problems and own the results.

Another source of information that was cited by 30% respondents was schools. The study revealed that the health personnel ran some programs in schools that provided a good source of information to the children as well as the community. Such programs included: de-worming exercises, hand washing exercises (to mark the World Hand Washing Day), and dental care (children were provided with toothbrushes and toothpaste and then taught how to take care of their teeth). It was noted that the Ministry of Health decided what to be undertaken within the year in all schools. For instance, the initiative in 2008 was to de-worm all primary school children at least once a year. Otherwise, twice would be better. This created demand for the service.

From the foregoing, it is evident that the health personnel are using all possible avenues to provide health information as health is life. They also provide information to homes through initiatives such as home counseling and tuberculosis (TB) sensitization programs done in the district. Through these programs, staff employed by the Academic Model for Providing Access to Health (AMPATH) at Moi University's MTRH make door-to-door

visits to homes and offer testing for HIV and tuberculosis, provide them with treatment and counseling as needed and give them both anti-malaria bed nets and de-worming medication. They also provide them with any other information that they might need. They are then sensitized to visit the clinic at Turbo Divisional headquarters, for instance, where they get further counseling, drugs and even food.

On awareness, it was found that majority of the respondents (80%), were aware that they could obtain their health information from the Ministry of Health as well as the Ministry of Public Health. They mentioned the community based resource persons, CSM, as their main source of information. They said that they knew these people because they appointed them. The study established that the community sensitization members were trained on almost all matters of health ranging from simple ailments like common cold to dreaded ones like HIV/AIDS. After this rigorous training, they qualified to be called Community Health Workers. A key informant confirmed that the community, through public fora such as public barazas, was always sensitized to recognize the CSM in their locations so that whenever there was an issue concerning the community, consultations could be done freely. It was found that the kind of information provided to the community was demand driven. This meant that the community members were given what they requested for. For instance, if the teachers in a school wanted a talk on, lets say, personal hygiene, safe sex or dental care; they requested the health workers to prepare for the same.

On language of communication, the study established that, just like in the agricultural sector, the languages used were English, Kiswahili and *Kalenjin*. In meetings where all present were *Kalenjin* speakers, *Kalenjin* language became the preferred language. The information was presented in various ways depending on the nature of the audience. For instance, if the audience was educated and was in an appropriate place, powerpoint presentations were used. If the audience constituted mostly adults, participatory methods were used whereby, a few questions were set, given to the group and the group was left to generate information about the issues addressed in the questions. This method is good because the group owns the information generated and is not imposed on them. In

primary schools, picture presentations were used especially for the lower primary classes and nursery school children, not forgetting face to face communication which was the preferred mode of presentation.

4.3.2.3 Access and use of ICTs

As in the previous section, the respondents here used radios and televisions (old ICTs) to obtain health information. However, majority used mobile phones to contact the CSM. The field officers also owned mobile phones which they used to communicate with the officers at the division and district, and even community members. The common practice here, as seen in the previous chapter, was that the rural community members used the flash back service and waited for the health officers to call them back. They believed the officers had more money than them. It is important to note that all other information (such as benefits, usage, challenges and solutions) concerning radio, TV, mobile phones and internet, are similar to the previous section. However, it is important to emphasize here that the mobile phone was the most preferred ICT tool because of the benefits of real time responses.

4.3.3 BUSINESS AND INDUSTRY

It was found that out of the 30 businessmen and women interviewed, 30% were involved in selling groceries (tomatoes, onions, vegetables, fruits, potatoes, beans), 24% were involved in the sale of grains (maize and wheat), 10% were involved in retail business – they owned a shop, 10% sold second hand clothes (commonly known as *mitumba*) and another 10% owned hotels where they sold foodstuff like *chapati*, *ugali*, vegetables such as *sukuma wiki*, among others. Two percent owned a bureau where they provided such services as internet, photocopying and printing to the rural community. Another 2% sold liquid soap that they prepared with other women who did not form part of the interview and the remaining 12% did other smaller businesses such as selling chicken and milk, among others. It is important to note that most of these businessmen and women were also farmers (agriculture being the mainstay of Uasin Gishu District economy).

Therefore, the information they provided was not very different from what is presented in section 4.3.

The statistics above show that the rural community in Uasin Gishu District is involved in various business activities to earn a living. However, as the study established, most of these business activities were very small and did not tend to grow as the owners lacked enough resources to expand them. The money obtained from the business was used to feed the families instead of being channeled back into the business. They also lacked business as well as marketing skills. Business was also an expensive activity as one respondent in Turbo division who owned a bureau said. He said that the cost of the electronic equipment was very high. He lamented that he buys his computer accessories very expensively in Eldoret town and yet the same could be obtained from Nairobi at a much lower price, thus:

> *"I usually prefer to go to Nairobi, where things are much cheaper, because a computer like this (CPU Pentium 4) costs Ksh. 10,000 in Nairobi. The same costs Ksh. 20,000 in Eldoret. The same applies to software and other computer accessories like flash disks".*

He also complained of high communication tariffs from TELKOM Kenya for internet connection as earlier indicated. Poor connectivity and slow speeds were other challenges that made it hard (if not impossible) for the residents to visit the internet café. This finding simply means that if the same situation remains, poverty will never be alleviated. The respondents depended on their businesses for their livelihood.

4.3.3.1 Information needs

The rural community of Uasin Gishu District needed information to enable them carry out their activities in an appropriate manner. This included: sources of finance, markets and marketing strategies, business management, registration of business requirements, insurance, customer care and satisfaction, sources of goods at cheaper prices, public health issues, competitors, export regulations and requirements, government regulations, quality control, personal hygiene, training opportunities, customer preferences, banking information, taxation and trading seasons (so as to sell their products at a time when

prices are high, e.g., much later after harvest before the next harvest). In Uasin Gishu, maize and wheat are harvested between October and December. During this season, there is plenty of the same in the market and the prices are therefore low for the farmer. But as time goes, just after the next harvest (say between July and October), prices almost double. So the farmers/businessmen who keep their produce will definitely fetch good prices as compared to those who disposed off theirs immediately after harvesting.

The rural community also indicated need for information on how to store produce awaiting sale. Women needed information on such activities as home baking/cookery to prepare good meals for the family in order to be healthy – as one of them put it – "*a healthy nation will work hard to produce more food and hence alleviate poverty".* Other respondents needed information on how they could form partnerships in business as illustrated below:

> "*How can I partner with my husband in business? You know, if it is possible, we will not have a problem to get a loan because he will use land as security. And if we are in business together, the business will grow because you know he attends barazas, which I do not have time to attend. He can bring the information he has gotten into the business. Our business will grow and we will not be poor anymore. Our customers will also be happy".*

The study found the following example worth mentioning:

> *Five years ago, Mr. Chesire, a vegetable farmer in Moiben Division was barely living from hand to mouth, despite selling his produce in the market. Like most farmers in the village, the 50 year old father of six earned only a meager income from his vegetables. What kept him from reaping maximum benefits from his half acre farm of vegetables were his old ways of farming. Not only did he plant cheap seed of poor variety, but he also sold his produce in small quantities to brokers at throw away prices. Later, Mr. Chesire heard about better methods of farming from a friend, who later introduced him to an Agricultural Extension Officer. He, with his friends, learnt the benefits of planting hybrid seeds, which produced better quality and quantities of vegetables. Together with he formed a group. They decided to market their produce. By that decision, the farmers were able to eliminate the brokers and sell directly to traders at better prices. Their earnings have more than doubled. Chesire has used the revenue in buying three dairy cows that give him milk. He says that in five years time, he would have grown greatly. As a group, they are able to access better inputs and markets. They are also training other farmers to do the same. They now know where to access quality seeds and pesticides and how to distinguish between fake and genuine ones. He*

says that if this information is accessible to many, hunger and poverty will be unheard of in the rural areas.

Other respondents needed information on start-up of industrial activities such as soap making, recycling of waste papers to make things like envelopes, and recycling of glass, among others. They said that such activities not only earned them a living, but also, conserved the environment and added value to products such as dairy products.

4.3.3.2 Sources of information

The study established that the Ministry of Industrial Development does not have field offices to take charge of divisions and locations. The only officer at the district is in charge of several districts, namely: Uasin Gishu, Keiyo, Koibatek and Marakwet which makes it almost difficult to reach the rural poor. The officer tries to work in collaboration with the Ministry of Agriculture during public *barazas* and field days in an attempt to reach the rural poor. So, the people in the business sector obtained information from friends, relatives, colleagues and their fellow farmers. Information such as prices for goods, markets, and so on was obtained in the same way as section 4.3.2 above, because the farmers now change roles and become business men and women to sell their agricultural products.

4.3.3.3 ICTs used

The study established that the business community in the rural Uasin Gishu District used various types of ICTs including radios, televisions and mobile phones with the most popular being mobile phones. The pros and cons of using these ICT tools are the same ones as those discussed in section 4.3.3 as has already been mentioned earlier in this section. It will therefore not be necessary to repeat this as the information is the same. It is also important to emphasize that the respondents were the same, but with different roles such as farming, business and health.

The chapter has presented the findings of the study as provided by various categories of respondents in the sectors of agriculture, health and business. These findings have been discussed in line with the study objectives – information needs, access and use of ICTs,

perception of the rural community towards ICTs, potential role of ICTs, challenges in the access and use of ICTs, and suggestions as to how these challenges would be overcome. It was also important to establish the socio-demographic factors of the respondents and how these factors impact on poverty or lack of it. This included such details as age, level of literacy, marriage, family income and occupations of respondents. The study established that indeed, socio-demographic factors affect the way one accesses and uses information and ICTs. The study also established that rural communities have information needs which are as diverse as the activities they are involved in, and that these needs have not been fully met by the existing information systems. Another important finding was that both old and new ICTs are used in the rural areas although in different extents. For instance, the radio is found in most households simply because it has been around for a long time and it does not require skills to use as well as electricity to power. The mobile phone is the most used new ICT tool in the rural area, a fact that Bertolini (2004) also established. Its penetration has been positively received. It is being used mainly for communication and to a lesser extent for business. Therefore, ICTs have a role to play in the rural areas and it will not be so hard for development partners to build on what already exists to harness the potential of ICTs fully. However, various challenges hinder the access and use of ICTs such as lack of electricity, and an integrated ICT centre in the village, among others. If these challenges are overcome, poverty in the rural areas will be a thing of the past.

CHAPTER FIVE
DISCUSSION OF FINDINGS

5.1 Introduction

This chapter discusses major findings resulting from the study. The discussion is based on the objectives, research questions and assumptions of the study. The discussion is therefore broadly centred on the information needs of rural communities of Uasin Gishu District, access and use of ICTs, and the challenges faced while accessing and using ICTs. Solutions as to how these problems would be overcome are given in a later chapter.

5.2 Socio-economic and demographic factors with their implications on poverty

This section discusses the characteristics of respondents in terms of age, literacy level, marital status, family income and their implications on poverty or lack of it. Low literacy levels, cultural norms, age, sex and income, among others, are some of the factors that affect peoples' perceptions of information and ICTs and the way they seek information as has been noted by different authors. ITU (2003) notes that there is a digital divide in the access and use of ICTs because of socio-economic and demographic factors (including gender, income, age and education) around the world. This means that there are gaps in the access and use of ICTs among sex (male and female), age (young and old), education (skilled and unskilled), income level (high income and low income earners) and location (rural and urban). This is to say that despite people being effectively able to use ICTs, there are socio-economic and demographic differences in the access and use of these technologies along the dimensions of age, sex, location, education and income, among others, and the differences affect the use of ICTs (Alampay 2006 and Olatokun 2009). Sen (1998) also adds that:

> "social and economic factors……. are important not only on their own but for the role that they play in giving people the opportunity to approach the world with courage and freedom. In other words, they affect their capability to use ICTs"

5.2.1 Age

It was found out that majority of the respondents, (83%), were aged above 40 years. It was interesting to note that those below 40 years formed the minority of the people in the rural areas, and this is partly because they had moved to towns to look for white collar jobs, as it emerged. This is likely to be the reason why poverty levels in the rural areas of

Uasin Gishu District are high because the youthful and energetic members are not present. In addition, this group consists of people that are important for a country's economic development. However, lack of information and access and use of ICTs hinder them from exploiting their full potential. It is therefore important that the issue of ICTs is addressed so as to reap the benefits of this group. In 1984, Daniel arap Moi, the then President of Kenya, signed a presidential decree for a changed education system whose goal was to inculcate basic skills for entrepreneurship among the nation's learners. This idea was good but poorly planned and implemented, and it did not achieve its noble goal. Today, this system, known as the 8-4-4 system, has gone through several incremental changes. After going through this system, the learners seem to seek only formal employment and look down upon manual work. When clerical jobs are not available, they fail to acknowledge other options within their settings. No wealth is therefore created in the rural areas for families and there is no way to get out of the poverty trap.

Alampay (2006) conducted research on the use of ICTs with a focus group of educated men and women in the Philippines. From this study, it became apparent that age actually affects the use of ICTs, even when access is not a problem. The oldest among the group was the only one not using e-mail and the only one still familiar with telegrams. In a similar study conducted in Nigeria, Olatokun (2009) noted that the younger set of respondents are capable of using most ICTs. One explanation given to this is the fact that the internet is a recent development, and as such, only the younger segment of the population would have had the benefit of being exposed to it in school and other places.

5.2.2 Marital status, gender roles and family size

The study established that most of the respondents were married with the least number of children being four and a maximum of eight. The married women, living with their spouses spent long hours to produce most of the food for the family, while at the same time providing substantial labour for cash crop production. In a similar study, Chiuri (2008) found similar results and asked: when women are doing all these, what are the men doing? This is probably why there is persistent poverty in the rural areas. Persistent poverty occurs where labour, time and other resources are skewed towards members of

masculine gender. In most households, owing to hegemonic notions of masculinities, most men are in control of all other members' labour, time and resources available. They take the lion's share while often making the most minimal contributions towards their household production. They do this because they inhabit positions of power which legitimizes and reproduces social relationships that generate their dominance. Hence there is no gender equity in labour and time use or equality in resource distribution within the various levels of society. This is evident after the harvest period (usually between October and November for maize and wheat) when Eldoret town (the headquarters of Uasin Gishu District) gets visitors from all over the country in the name of commercial sex workers. This is the time when some men who have sold their produce and are now 'rich' move to the town to 'enjoy' the fruits of their hard earned money. Their wives are left at home with no money to spend (the researcher's own observation). Of course, the money gets used up before long and the household is thrown back to poverty, and the poverty cycle continues.

It also emerged that most couples preferred getting as many as eight children or more on the believe that, many children are a source of wealth to them (parents) and that they would help out on the farms. This is in agreement with what Chiuri (2008) points out that, women are helped by their children to provide the bulk of the labour in rural households' production. However, women's and children's labour is not adequate to lift rural households out of poverty because most of it is spent on domestic chores and subsistence production. Usually, women are blamed if the family is poor, if there is not enough food, if the house is unkempt, if farms are not properly cultivated and the yields are low and if children cannot go to school.

In reality, many children may be a source of poverty because these children need to be fed, clothed and taken to school and hospital. The more the children are, the higher the expenses. Men believed that having many children could be an indication of how rich they were. However, others differed as one respondent clearly pointed out that large families are the cause of her state of poverty and poverty in general in the present economic times.

5.2.3 Family income

A number of approaches have been used to measure poverty. These measures include per capita income, household and per capita consumption, per capita food consumption, food ratio and calorific income. A World Bank report (2002) noted that income can be used as an indicator of well being. The income of the rural people of Uasin Gishu district is low and that is why they are experiencing poverty. Studies have also indicated that the rate of technological diffusion in many countries and within individual countries/economies is uneven (Pigato 2001). This has been attributed to per capita incomes of individual countries. Higher GDP per capita economies are achieving rapid growth of ICT consumption, while low income economies are failing to keep pace. Olatokun (2009), Alampay (2006), ITU (2003) and Heeks (2000) also noted that income level plays a significant role in peoples' capability to use ICTs. It should be emphasized here that income is not only related to peoples' capacity to own ICTs, but also strongly connected with peoples' level of education. As such, income plays an integral part in two factors that significantly affect peoples' capability to use ICTs, namely: education and direct ownership of ICT facilities. Therefore, it is no doubt that income is a strong indicator of poverty levels and use of ICTs. Efforts to increase income levels will be a sure way of increasing access, ownership and use of ICTs, increased information flows and a sure way towards poverty reduction and socio-economic development.

The majority of the respondents, that is, the men were the breadwinners with a few exceptions of women. Even in situations where women did the actual production of food, the men made the main decision on how the proceeds would be handled. Chiuri (2008) notes that, those who control the production process and products, are themselves not producers but appropriators. She continues to say that man-the-hunter is basically a parasite not a producer, which means that, he depends on another person being to produce. This explains why Kenyan societies and other societies across the globe legitimize and concentrate power positions on men with exclusive control over decisions,

access and manipulation of social order and resources. A World Bank report (2003) states the following:

> ……gender equality is important not only as a goal in itself, but also as a path towards achieving other goals. Gender inequality … tends to lower the productivity of labour and the efficiency of labour allocations in households and the economy, intensifying the unequal distribution of resources. It also contributes to the non-monetary aspects of poverty – lack of security, opportunity and empowerment – that lower the quality of life for both men and women. While women and girls bear the largest and most direct costs of these inequalities, the costs cut broadly across society, ultimately hindering development and poverty reduction.

Chiuri (2008) also notes that while the rest of the world attempts to include their women in decision-making positions as well as challenge masculinity, Africa has been giving the debate little attention. Male domination is escalating and female subordination is deteriorating. Consequently, poverty has been escalating and is the reason for persistent poverty in the rural areas. In other words, if poverty is to be tackled, there must be a balance between gender roles, and decisions over family income must be made jointly.

5.2.4 Literacy levels

Use of information and communication technologies requires different levels of education and literacy, and specific user skills. Some level of literacy is therefore required for people to be able to interact with information and information systems requiring literacy skills. The findings of this study indicated that majority of the respondents (72%) had primary level of education. They all had basic reading and writing skills. Education is a very important aspect in the way a person perceives ICTs, seeks, accesses and uses information for poverty reduction. It is not only important with respect to gaining the needed skills to use ICTs but also with respect to peoples' motivation to even use ICTs. It gives people an opportunity to approach the world with courage and freedom (Sen 1998). Adeya (2001) and Alampay (2006) argue that even when information is available, on many occasions, the poor do not access it due to low levels of literacy. Huyer (1997) also identifies illiteracy as one of the barriers to the full use of information and ICTs. On balance, on educated user is able to use information presented to him/her in almost all manner of formats with minimum or no orientation/supervision,

and is therefore able to reap the benefits of ICTs which are vital for reaping the benefits of this era and getting out of poverty.

Another kind of literacy that is important for full utilization of ICTs is computer literacy which was found to be lacking in the rural areas of Uasin Gishu District as almost all the respondents were computer illiterate. de Boer and Walbeek (1998) in his study identified computer illiteracy as one of the threats to proper utilization of ICTs. It is important to point out that higher level of skills (language, computer literacy) are only likely to be acquired by those who have completed formal education, primarily those who have attained literacy and numerical skills at secondary level. Those with primary level of education will still be able to interact with computer based information systems, but their level of interaction is likely to be considerably reduced. Pigato (2001) notes that internet/email users in sub-Saharan Africa belong to the educated elite, are male, young and earn the highest incomes. The more knowledgeable an individual, the easier he/she would find it to encode information, thereby making further acquisition easier.

User technologies require different levels of education and literacy and user skills. For example, a radio and computer system requires different skills to operate. An illiterate or poorly educated people cannot wholly absorb ICTs. Ondari-Okemwa (2004) observes that basic education is essential for a skills-base to the promotion of access to global knowledge in any country. However, 'basic' is not defined as different countries have different levels of basic education. In some countries, a first degree may be considered basic education, while in others, primary education may be considered basic education. In Kenya, basic education means the minimum package of education that is appropriate for the nation to provide for its citizens. The Commission of Inquiry into the Education System of Kenya suggested in 1999 that basic education should comprise of pre-school, primary and secondary education whereupon it will be accessible to every eligible citizen (RoK 1999). Whereas this view still stands, the official structure in the Ministry of Education is different. There is a directorate for basic education (primary) and another one for secondary education. In the present discourse, basic education in Kenya will encompass both primary and secondary education both of which are free and compulsory.

According to TIQET report (Rok 1999), basic education is viewed as the fundamental cycle of formal instructions, which provides the learner with a firm foundation of knowledge for further learning and development. It embraces the cognitive, the affective and the psychomotor domains of learning. The content of basic education should therefore be designed with a view of equipping the learners with knowledge required for survival, the development of their full capacities, living and working in dignity, enhancing the quality of their lives, making informed decisions and continuing with learning as a lifelong engagement. According to the commission's view, the attainment of basic education is the minimum level of formal instruction that every learner needs in order to be adequately equipped, both mentally and physically, to pursue further education and to engage in other meaningful development activities for both personal and national development (RoK 1999). Education can go a long way to enlighten rural populations, increase incomes, improve their own health and in totality improve the quality of their lives. Education therefore becomes the key to unlocking the economic potential of the rural areas. In his study, Olatokun (2009) recommends that governments should educate its citizens in rural areas about ICTs. Such education would make the citizens develop an awareness of it, be provided with skills to know that information is useful in daily life, to be able to make decisions about which information is useful, to obtain it in the ocean of available information and to process and transform it into knowledge required for a specific purpose. Education is thus necessary in order to reduce exclusion and/or isolation due to lack of universal familiarity with and use of ICTs, avoid discrimination on the basis of illiteracy, and access useful sources of information. With the right education enabled by the right policies, more people would be able to access and use ICTs.

5.3 Information needs

The concept of 'information need' is central to the study of a user in any context. The study unveiled that the residents of rural Uasin Gishu needed information in order to perform various daily activities in an appropriate manner so as to alleviate poverty. This confirmed the fact that information needs arise out of the activities one is involved in.

Wilson (2000) concurs by saying that personal needs are at the root of motivation towards information seeking. He says that it is important to recognize that information needs arise out of the roles an individual fills in social life. Most relevant of these roles 'is work role', that is, the set of activities and responsibilities of an individual – the reason why this study set out to investigate the activities, roles and responsibilities of the rural community so as to understand the kind of information they needed. At the work environment, the performance of particular tasks will be the principal generators of cognitive needs. Needs also arise from an awareness of something missing, which necessitates the seeking of information that might contribute to understanding or meaning (Kuhlthau 1993). The rural community sought information when they felt something missing through various ways that will be discussed in a later section.

Different types of information needs were identified that largely depended on different enterprises under study – agriculture, business and health. These included information on how to start and conduct business, family care/housekeeping, home economics, health and marketing, among others. Each of these needs required very specific and unique information for its successful undertaking, which if provided would enable the rural community fight poverty. It is therefore important that user needs are identified and addressed to avoid instances of making decisions or acting in the absence of complete information. In such instances, decisions will be taken with incomplete information or on the basis of beliefs. In other instances, a decision may not be taken completely. Cases of incomplete decision making or no decision making at all, will definitely mean that activities will not be carried out well or in an appropriate manner. Farmers, for instance, will not know the right seeds to plant and where to sell their produce competitively. Such incidences will go a long way to deny the rural community their rightful incomes, and will therefore remain poor. Information presented to the rural community at the right time and in the right format will give them a competitive advantage and bring them out of poverty. Secondly, by acquiring the right information, the state of knowledge of the recipient will change as he/she will now become more knowledgeable. Van Lill (2000) concurs with this by saying that by conveying and assimilating messages, an individual may be spurred into action, make a decision, or change their state of knowledge.

It was found that the respondents were not able to perform their activities well when they lacked the right information to do so. This is what is called a state of incompleteness as far as information is concerned. Ikoja-Odongo and Mostert (2006) say that an individual with an information need has certain incompleteness in his/her picture of the world – an inadequacy that might be called 'his state of readiness' to interact purposefully with the world around him/her. It is this inadequacy that manifests itself as a gap, shortage, uncertainty or incoherence. What this means is that without the feeling of 'inadequacy' one cannot go out to look for information. This was clearly manifested in the study as different individuals had different feelings about the information they needed. Some went out to look for so much information while others were just contented with what they obtained from their neighbours and radio, among others.

Another revelation was that some users did not know their state of inadequacy. When one does not feel inadequate, he/she will not go out to look for information. In information needs researches, several methods of carrying out research have been explored and the interviewing method remains the most preferred. It allows a researcher to explore incidences until behaviours, thoughts and feelings are adequately reported (Mouton 2009). Such rigorous exploration became necessary in this research because some users did not know their information needs while others were just unable to express them. This also agrees with what Chaudhry (1993) recommended that, because users have difficulties in defining their information needs, rigorous data collection procedures should be employed. Odini (1993) gives this more weight by adding that when a need is adequately expressed, the problem might be well on the way to completion. It is because the rural poor had unexpressed needs that their information needs went unmet. Therefore, it was necessary to unveil the information needs of the rural community so as to recommend the right ways of providing them with the kind of information that they required. It is hoped that this will go a long way in giving them a competitive advantage in the way they carry out their day-to-day activities and bring them out of poverty. For instance, when a farmer needs to know where to sell his/her produce profitably, and he/she gets this information, it will mean that:

i) he/she will access the market without having to go through exploiting middlemen and

ii) the products will be sold at higher prices (because a choice will be made, based on the available information, on where to sell and at how much). This will fetch the rural poor more money, thus empowering them economically. Economic empowerment is one way out of poverty and an important step towards a peoples' or country's economic development.

From the foregoing, it can be said that, first, the rural community of Uasin Gishu District experienced need for information and that these needs varied from activity to activity. Secondly, that it is important for researchers to assist users in articulating their information needs. Thirdly, that information is an important tool in making important decisions that would lead to development of individuals and the country as a whole. Therefore, access to and utilization of information and ICTs is important in the daily activities of the rural communities of the district. Without information, the residents may make costly and dangerous decisions and this will have a negative impact on themselves and the country as a whole.

5.4 Sources of information

The potential of ICTs has not been fully realized in rural Uasin Gishu because access to knowledge and to technologies themselves is limited. The rural community sought information from various sources in order to carry out their activities in a more appropriate manner. Such consultations arose from their admission that their state of knowledge was less than adequate to manage a problem or issue. For instance, the produce could not fetch good prices because they did not have information on where to sell profitably. They then sought information to sort out the deficiency.

5.4.1 Informal sources

Overwhelmingly, majority of the sources consulted were informal. These included agricultural extension officers, public meetings such as field days and barazas, demonstrations, farmers' tours, ASK shows, business fairs and agrochemical company

representatives, among others. Others consulted their friends, relatives and neighbours for information. Those in business obtained information from business colleagues, associates, customers and public *barazas*. They also obtained information from informal networks such as family and friends, the local business community and their own knowledge and experience. Health information was obtained from posters that are normally placed in health centres, shops, roadsides, schools and government offices. Majority however obtained information from community-based resource persons, people who were drawn from amongst them. Information was also obtained from radio and television.

From the foregoing, several issues emerge. First and foremost, majority of the sources consulted were oral. Rural communication is largely oral with people expecting immediate feedback. Alampay (2006) concurs with this and adds that African societies have strong and enduring socio-cultural influences and will embrace technology that promotes greater interaction and sustains kinship. Based on this, we see the telephone as the 'future' technology as it embraces the central element of the African mode of communication - orality. The internet and other forms of communication such as newspapers, magazines and books are considered impersonal. The challenge to the government is therefore to improve basic infrastructure and ensure accessibility to and affordability of telephone services.

Another reason that favoured informal communication channels is accessibility. Farmers consulted area extension officers who were posted to work at the location level – very close to the people. They also consulted community persons to provide them with health information. Again, these were people who worked in the locations and villages. Businessmen and women sought information from their business colleagues and associates. These were also very close to them. The government departments that did not have representatives at the location such as Business and Industry went unmentioned in this regard. Access is a fundamental requirement if that source is to be used. The lack of an easily accessible source may inhibit information seeking altogether, or may impose higher costs that the enquirer is not prepared to pay (Bosire 2002). In a study of consumer

health information needs in a community hospital, Philips and Zorn (1994) found that more than two thirds of the consumers viewed access to health information as a problem, compared to less than half of the physicians surveyed. Consumers overwhelmingly indicated consulting their personal physician or other health professional.

Accessibility of community workers was favoured by the fact that they had mobile phones that the rural community frequently used when they had an issue that needed attention. It was quite interesting to note that the rural community securely kept the community workers' phone numbers. Whenever a problem arose, most used the Safaricom 'flash back' service to reach these officers. The officers would then call back depending on whether they had air time or not. It was further evident that the growth of mobile telephony has been explosive in rural Uasin Gishu and now reaches more than half the rural population. This concurs with what Bertolini (2004) observed that the telephone is the only ICT tool used (if any) by majority of farmers in sub-Saharan Africa. It also became clear that SMS or flash back system (commonly referred to as 'please call me') is the most commonly used application, a conclusion that Bertolini (2004) also reached at.

In a study on information and communication technology, poverty and development in sub-Saharan Africa and South Asia, Pigato (2001) noted that the growth of cellular phones has been most rapid in countries with poor existing infrastructure, and difficult geographical conditions, despite tariffs being considerably higher than those for fixed line connections, as also confirmed in this study. Cellular/mobile phones offer many advantages. First and foremost, they can be installed rapidly allowing customers to bypass lengthy waiting lists for fixed line connections. (Overall access to fixed line networks is called tele-density, i.e., telephone line per 100 inhabitants. It is also known as direct exchange lines (DEL) per 100 inhabitants, in relation to income per capita). Secondly, pre-paid mobile services offer more flexible monthly payment systems that are suitable for low income users who may not be able to afford regular monthly charges for fixed line services. Overall, the evidence suggests little relationship between the level of

mobile penetration and per capita income in rural Uasin Gishu, unlike the strong relationship exhibited for fixed line network services.

Thirdly, the extension officers became the preferred choice because many of them provided information to the rural community in their local language – *Kalenjin*. Earlier, the researcher had indicated that the rural community had a mastery of both English and Kiswahili. It however emerged that given a choice, they would prefer *Kalenjin*.

Another important source of information was the local meetings (field days or public *barazas*) that were called by district and division officers. The reasons why the respondents rated these fora highly were similar to those cited for extension staff. First and foremost, these meetings were held at the locations or divisions. Access was therefore not a problem as the rural community did not have to travel long distances to attend meetings. Secondly, the meetings gave them an opportunity to meet with senior officers from the District or even province (these could be invited from time to time). As earlier indicated, these meetings are convened by the District Agricultural Office because the office has officers right to the location. Other staff from the education, business, health and agrochemical companies, use the same meetings to discuss important issues in their respective departments that were affecting the rural community, such as dental care, small business start-ups and free primary and secondary education among others.

Thirdly, through such meetings, the rural poor were able to get immediate response to their queries, their preferred way of communication. This was because of the face to face nature of the communication. Demonstrations could be carried out such as soap making, preservation of fruits and vegetables and *jua kali* skills among others. The rural community could then ask questions and request for clarifications. In this way, the meetings became interactive with both sides taking part. The end result would be a satisfied audience. The meetings were also conducted in a language that all were conversant with. The researcher established that in times when all in attendance were from the local community, *Kalenjin* was used. In other words, the composition of the group dictated the language that was to be used for communication.

5.4.2 Radio and television

Radio is an ideal ICT tool for bridging the gap between researchers and rural populations (Oguya 2001). Studies conducted elsewhere (Alampay 2006 and Olatokun 2009) indicated that 100% of their respondents were capable of using radio and television more than any other ICT facility. The advantage of radio and television is that radio and television programs benefit from established channels and it is not necessary to own a radio or be literate to listen to a broadcast. The respondents who cited radio as an important source of information in this study were 86%. They indicated that they tuned in to the local stations where the language of communication was *Kalenjin*. They specifically mentioned KASS FM and CHAMGEI. The television was mentioned by only 30% of the respondents. Radio and television were in greatest demand from the majority of illiterate and semi-literate users because they did not require particular abilities for access. By contrast, effective use of computer and internet applications requires not only literacy but language skills, predominantly the use of English and to a small extent, Kiswahili. It also requires computer and technical skills, that is, the ability to operate and interact with a computer based information system. A research that was conducted by Pigato (2001) identified that user skills allow people to interact with technology and that oral communication, radio, television, fixed line telephones and mobile phones require no literacy; while newspapers and fax require some basic literacy and email and internet require high literacy and language skills.

It was also evident that the rural community of Uasin Gishu had specific radio and television programmes they listened to and watched respectively and these touched on farming, business, health and family care, among others. They, for instance, listened to such programmes as: *tembea na majira* (move with the times), *sikio la mkulima* (the farmer's ear)*;* advertisements such as: *epuka na ukimwi* (avoid AIDS) and *Mending the ribbon.* As earlier indicated, the main problem with radio and television programmes was that they were mostly aired during the day when most of the respondents were away from home, either at the farms or at the market. Studies that have been conducted have actually confirmed that high levels of radio usage are found in all low-income economies and provide considerable information access benefits, particularly for illiterate or semi-literate

populations. The penetration of radio and television therefore shows less association with income. The radio continues to be the primary ICT tool for both urban and rural population in all African countries. It is evident from the foregoing that the radio is still a channel of choice in the rural areas as it does not require any particular ability to access it, no installation costs and no subscription costs.

The Government of Kenya has liberalized the airwaves in the recent past and this has seen the emergence of very many radio stations, some of which are in local languages. In so doing, the government is establishing a competitive private sector led communication market to stimulate economic growth and development.

The success of the radio is also due to its affordability and coverage. Both radio and television have a wide geographic coverage, virtually throughout the country. This is a fact that Oguya (2001) acknowledged when she lamented that radio messages can penetrate to the remotest parts of the country. Radio stations are particularly effective in promoting the use of African languages within the information media (as opposed to the internet with its predominantly English content). In the past 10 years, the country has experienced tremendous growth in FM radio stations such as KASS and CHAMGEI (*Kalenjin*), EGESA (*Ekegusii*), Inooro and Kameme (*Agikuyu*), with some communities having more than one station. Such a tremendous growth and preference for local stations is an indication that there is a growing interest for local content – something trusted and familiar. It is true that a wealth of knowledge is already available within the community (indigenous knowledge), particularly with regard to health and agriculture. These two spheres are of great impact on the community. For instance, it was mentioned that there is a woman who sells herbs in Jerusalem (a centre that is about three kilometres from Eldoret town along Eldoret – Iten road) that supposedly treat all kinds of ailments such as diabetes, HIV/AIDS, hypertension and impotency/infertility, among other chronic ailments. This knowledge is usually culturally sensitive and context specific. It needs to be acknowledged, validated, reinforced, disseminated, innovated upon and preserved through practice. ICTs can be great in this pursuit.

The relatively high level of access to radio and television by those with little or no level of education reinforces the importance of not ignoring these information tools in poverty alleviation strategies. To the poor, newsprint is virtually of no relevance. This shows how levels of access to newspapers rise with higher levels of education. Interviews with respondents indicated that keeping abreast of current events and entertainment are important priorities for radio and television listeners and viewers respectively. The interviews revealed an unmet demand for problem-specific information regarding agricultural practices, markets and prices. However, the rural community indicated that they experienced a change in their consumption patterns, incomes and health by applying information retrieved through informal and formal sources. Overall, the poor are optimistic about the potential of ICTs for improving their socio-economic condition. They believed that there could be a qualitative change in their living standards, if they had better access to new means of communication and information.

5.4.3 Mobile phones

The majority of the population in the rural areas owned mobile phones. Mobile telephony in Kenya is slowly replacing postal services such as telegrams and money orders. Studies that have been conducted globally indicate that the global diffusion of mobile telephony has been unprecedented, expanding from 50 million in 1999 to over 2 billion by the end of 2005 (ITU 2003). This rapid growth stems from the cost of mobile infrastructure over fixed-line installation and from the fact that mobile network consumers can simply buy a handset and a pre-paid card and start using it as soon as the first base stations are in place (network coverage) without having to open a post-paid account. The pre-paid card allows access to people who cannot take out a subscription because of billing or credit worthiness problems. The authors noted that growth is especially pronounced in emerging and less developed countries (LDCs) where for decades, a vast majority of consumers have been unable to access ICTs. This is true because of the majority that own mobile phones in rural Uasin Gishu. Mobile phones were used in various ways, mainly for voice communication and short messaging services (SMS) or simply texting. Text messaging has been considered one of the primary reasons for the growth of the cell phone market and the most successful m-commerce application in developing countries,

where rates of low internet connectivity and internet access have made it an email surrogate (ITU 2009). The rural community used their mobile phones to communicate with friends, family and relatives. This is what is referred to as socializing. In socializing use, an individual views a mobile phone predominantly as a way to socialize with family, peers and friends. Meso (2005) agrees with this and adds that although mobile commerce (m-commerce) is likely to benefit from the use of mobile for business than socializing, the socializing use is an important first step towards use. Indeed, early stages of adopting a technology are characterized by the use of devices as tools of communication and socializing rather than for economic activity and business, a fact that Alampay (2006) concurs with.

Currently, the socializing use is more prevalent than any other use. A reason that emerged for predominantly using mobile phones for socializing was that ICTs have been culturally viewed as being devices for communication rather than as being business tools. Some mobile phone users were motivated to adopt the technology just for the status of having them. Use of ICTs for personal or social purposes, nonetheless, is important in development, as it helps contribute to developing stronger networks among people and builds social capital. It is in line with this socializing function that the rural community adopted another style of using their mobile phones. They normally 'beeped' or commonly referred to as 'flashed' extension staff, whom they expected to call back as these (extension staff) were thought to be economically privileged than the rural community as was discussed in the previous chapter. Bertolini (2004) concurs with this by saying that SMS and flash back services are the most commonly used mobile phone applications in sub-Saharan Africa. To this, Alampay (2006) adds that people use the cell phones to SMS/text more than they use to call and that the nature of their SMS messages is relatively mundane and social in nature. Furthermore, because SMS is cheaper than actual calls, this makes it a viable means for people to communicate on a regular basis. However, the respondents indicated that, if the message was considered urgent or very important, they preferred to call. They mentioned that calls were less difficult to do, faster to relay the message, less confusing, more personal, information was more detailed and feedback was immediate, made possible by the instantaneous two way interaction.

Also, unlike the situation with other ICT interactive media, there is no software interface that may need translation. Any appropriate language may be used.

ICTs have been widely touted as windows to global markets for small-scale developing country producers. An important use of the mobile phones in this regard in the rural area was in business, although in smaller magnitude than socializing. Mobile phone owners used their gadgets to communicate with their customers to sell their products. Businessmen and women used their mobile phones to order for commodities from farmers to sell and vice versa. Hotel owners used their mobile phones to order for things such as vegetables, meat and fruits from vendors. Mobile phones were also used to cancel orders previously made. Other uses included: comparing markets and prices of goods in the market; transferring money or making payments for goods delivered; (using M-*pesa*) and accessing the internet (though a very small percentage), among others.

One approach that has enabled broader access to mobile phones in Kenya is the liberalization of the telecommunication sector. There are now four mobile service providers in the country namely: Safaricom, Airtel, Telkom's Orange and Econet's Yu. Consumers are obviously not satisfied with the inadequacy of fixed line and wired technology. An ITU report (2007), states that mobile phone communications may be the technology that will overcome the barriers constituted by the high cost of installing fixed line infrastructure that developing countries continue to encounter. Increased access is an important first step towards the development of a feasible base for business transactions mediated by wireless technology. Most of the rural areas of Uasin Gishu have coverage (the mobile network), meaning that majority of the population has access to the mobile network.

Another approach is through prepaid service. The advantage of a pre-paid service is that one can control the way he/she spends whereas in post-paid, there is the temptation of spending a lot of time on the phone. Post-paid therefore becomes a more expensive service than pre-paid. Although the option of post-paid (monthly subscription or monthly payment) is available, many preferred the pre-paid option, for the simple reason given

above. This concurs with what was established elsewhere by Alampay (2006) that the pre-paid option was more popular among the respondents because it helped them control their budgets and monitor their communication consumption. Unlike post-paid accounts where subscribers had a minimum amount to pay monthly and expenses can even exceed their allotted plan, a pre-paid account allows them to spend only when they need to. This is consistent with the "emergency" purpose some grant to ICTs, that is, using mobile phones during emergencies only. In the same vein, in Uganda, while most Ugandans do not meet the financial criteria for subscription service, prepaid brought communication to the masses (ITU 2003). Uganda's overall mobile telephone density quadrupled between 1998 and 2001, rising from 0.41 telephone subscriber per 100 people to 1.72. Over 50% of the population has mobile coverage, and more than 80 towns and rural areas have service. Not untypical, about 98% of Uganda's mobile subscribers are pre-paid (Mehta and Kalra 2006). The pre-paid service has also allowed many people in rural Uasin Gishu who could not normally financially qualify for subscription based service to become mobile users. This is even clear by an increasing number of outlets that sell pre-paid phone cards – thus creating employment to the locals. Pre-paid billing is ideal because pre-paid customers do not always have fixed addresses or bank accounts against which a direct debit can be set up. Pre-paid solutions operate ideally in cash based economies (as opposed to credit). According to Cedran (2002) and Minges et. al. (2002), the cost of maintaining a line through monthly subscription fees was one reason why the cell phone took longer to reach the lower income classes. As such, pre-paid cards contributed to the dramatic growth in the cellular market in the Phillipines. In this respect, some see the use of pre-paid service by mobile users as an indication of cell phones substituting for main lines.

It also emerged that there is a high level of mobile sharing, especially among members of the same household or work environment. This means that lack of ownership of a cell phone does not prevent people from using ICTs. The reason given for this being that at times, there could be no charge (power) in one's phone. So, one borrows a handset, as the uncharged one is taken to the shopping centre for charging (most - if not all - of the homes in the rural areas do not have electricity). Maybe solar chargers will help in sorting

out these problems. Alampay (2006) notes that even if a person does not own a particular ICT, he/she could access one through another member of the household, friend or a neighbour, through the workplace or in public places (telecentres), phoneshops and payphones. It is important to mention that the reverse is also true. That, because people are capable of using ICTs although they have no access or do not own them, some may not use them even when they have access or own them (Heeks 2000). Sharing technology is a central part in understanding use of ICTs in developing countries. Skills are also shared such as: asking other people to text for them, asking for help in understanding what a text message means and accessing the phone book, among others. A corollary to mobile phone sharing is the use of mobile phones predominantly for receiving incoming calls and not for initiating calls. This is because subscribers do not pay for incoming calls, unlike the practice in some advanced economies such as the United States of America. This is the same reason for the predominant use of 'please call me' or the 'flash back' service. However, the "please call me" service is only available with Safaricom whereas 'flashing' or beeping can be done across all networks. Safaricom allows a subscriber to send a maximum of four 'please call me' messages per day as at the time of writing this thesis. One simply dials *130*phone number# and the receiver gets a polite message that reads 'Please call me. Thank you'.

The implications of the above scenario are many. First and foremost, the growing convergence of the internet and mobile phones are increasingly becoming an integral part of an electronic and computer mediated business infrastructure. For many people in the rural areas, mobile phones may be the main means of accessing information and communication applications, such as the internet, e-commerce and m-commerce. For instance, many companies are now using the mobile phone to deliver commercial messages to mobile phone users. This has been the case with Kenya Power and Lighting Company (KPLC), where one can now pay electricity bills via mobile phones; banks such as Equity, Barclays Bank of Kenya, Kenya Commercial Bank, National Bank of Kenya and Housing Finance Company of Kenya (HFCK); and insurance companies among others. The banks even use mobile phones to lure customers to take loans.

Electronic payments will significantly contribute to the realization of economic development goals for emerging and industrialized nations around the world.

While most mobile phone handsets do not have internet access, they support commercial SMS, which is being used effectively to promote the sale of goods and services, whether or not it invites or solicits a response from a recipient. Minges (2005) notes that, given that mobile phones outnumber personal computers, they become a logical channel for m-commerce in developing countries. Wireless communication has not only expanded telephony, but also introduced wireless data services which are essential in conducting m-commerce. As consumers become comfortable in using mobile phones as tools of business, they will find it increasingly easier to appreciate and therefore adopt portable computing devices, which are the base connecting points for m-commerce; and integrate these into business practices.

5.4.4 Internet

The internet is the most powerful ICT tool, combining 'broadcast' features of the radio, by disseminating information, and the 'interactive' features of the telephone, like e-mail or discussion fora. Yet internet access requires additional costs such as equipment, electricity, housing, technical support and specific skills. This is what makes the internet unaffordable in the rural areas of Uasin Gishu and other rural areas of Kenya. To make matters worse, the universal language of the internet is English, and yet we have learnt that the rural community would prefer to speak in their own local language. So, even the poor who might find access will face a significant language barrier. One way of using the internet efficiently in the rural areas after everything else has been put in place, is to involve grassroots intermediaries to add human skills and knowledge to ICTs. These will include community workers who will translate the information from the internet to the local languages of the local community. The youth could also be involved to communicate this information. The famous search engine – Google - has recently been localized through translation into several African languages including Kiswahili. In spite of this, searching might be limited because it will be determined by how much content on the internet is already translated into Kiswahili!

From the foregoing, a few issues emerge. First and foremost, face to face communication was the most preferred mode of communication. This is because, for the majority, the primary source of information was via social networks, i.e., family, friends and relatives among others. One of the strengths of local communities is that for any problem, there is a high possibility that at least one person has encountered a similar problem and perhaps has worked out a solution. It is rare to come upon a problem that no one has encountered before. Studies in India and Nepal (Raju 2004) revealed that populations in rural areas rely on traditional means of communication, that is, family, friends and village heads. It is also noted that development practitioners and those engaged in the provision of information services aimed at reducing poverty emphasize that face to face communication is the most effective mode of transferring information. Oral information and personal networking should therefore not be overlooked in any ICT initiative. Oral tradition and informal communication systems for many centuries have been part of the traditional information structure, particularly in rural areas. Informal 'verbally transmitted' information is seen as playing a greater role in less developed economies because of lack of a modern communication infrastructure, an over emphasis of confidentiality and secrecy, particularly within state run institutions, and the lack of capacity (education and skills) to assimilate formalized information. Information related interventions must recognize the critical and continuing role played by informal information systems and human interaction (Alampay 2006). The challenge however is how any information system or network can engage with this mode of communication.

Secondly, access was an important factor in the choice of an information source. The rural community sought information from those sources that were nearer to them such as extension officers and agro-chemical company representatives among others. Those that were far off like libraries, documentation centres and newspapers among others were not mentioned.

Thirdly, familiarity became another factor that dictated the choice of an information source. The rural community consulted people that they were familiar with. For instance, they felt more at home with community workers because these were drawn from amongst

them. Such familiarity facilitated communication because it eliminated instances of lengthy introductions whenever there were encounters. It is also much easier to express a problem to the person one knows than when dealing with a stranger. These are important factors that ought to be considered when one is putting in place information systems in the rural areas, or the general provision of information. Pigato (2001) noted that the poor favour and trust information sources close to their homes and those that are applicable to their existing knowledge base. He says that the most valued sources are friends, family and business networks. They have trust, confidence and security that are gained through the social networks and personal contacts.

Fourth, the language of communication was also important in the choice of an information source. Although the majority understood basic English and Kiswahili, they preferred *Kalenjin*. That is why, they tuned in to the vernacular radio stations, CHAMGEI and KASS. The mobile phone also seems to be the technology of the future. This is basically because it promotes informal communication that is part and parcel of the African culture; there is immediate response, and one can use any language as long as it is appropriate to the other party.

Finally, mobile phones are also more convenient than, for example, fixed lines because they can be accessible anywhere and at any time. Indeed, mobile phones are flexible in use. That is, whether one has air time or not, communication will somehow take place through the many services that mobile phone subscribers have developed such as flash back and beeping.

5.5 The role of ICTs

This section will present information on the potential role of ICTs in meeting the information needs of the rural community of Uasin Gishu as outlined in objective 4. It is true that ICTs have an important role to play in reducing poverty in rural areas by improving flows of information and communications at the community level. The full range of ICTs is relevant to the fight against poverty. For instance, radio and television are important tools that are more widespread in the country's rural areas than are

telephones and the internet. Print media is vital both to the spread of information and to fostering participation and diversity of views in society, although not preferred in the rural areas. It is important to emphasize that new technologies such as computers and mobile phones neither change the fundamental role of information and knowledge as drivers of development and poverty reduction, nor obscure the role of more established ICTs. However, they create new opportunities to expand the availability, exchange and impact of information and knowledge. For instance, the internet reduces the costs of making information available to others and accessing global information and knowledge resources.

5.5.1. ICTs can promote livelihoods

ICTs can be used by the rural poor to address their information needs, develop their own strategies and solutions for improving their lives. They can enable poor people to share knowledge and seek solutions to their problems. The study established that for any problem, there is a high possibility that at least one person has encountered the same problem and perhaps has found a solution, hence the need to share knowledge. New ICTs can facilitate the development of new products, services, business models and methods of interaction that will lead to increased growth and economic efficiency in Uasin Gishu. For example, through the use of ICTs, the information content can be separated from its physical location. This means that information generated in one location can be of benefit to another location experiencing similar problems. Mailing lists, e-groups and discussion fora can be constructed. Then one will only need to "pop up" a question, and wait for the 'world' to answer. A successful contribution to improving rural livelihoods lessens the pressure to migrate to urban areas.

The value of ICTs in promoting livelihoods can be seen in the following areas:

First, on agricultural productivity, information on improved agricultural technology, new farming methods and use of improved seeds, among others obtained through ICTs, can contribute to higher agricultural production leading to increased food consumption at the household level as well as to income gains from the sale of these products (Gerster and Zimmermann 2003, and Spence 2003). For instance, radio broadcasts can include

information on prices and the weather. Using the same principle (gathering information from different sources and redistributing it widely) can result in improved decision making on selling products, as well as resulting in better timing for seedlings, among others, with improved crops and livestock. On the other hand, agricultural extension agents can more effectively access and share local and global knowledge on crops, pest management, irrigation and other aspects of rural agriculture relevant to the needs of the poor through the use of ICTs. For example, respondents indicated that they consulted extension staff for advice on seeds and pesticides to use so as to realize higher yields.

Secondly, information received through ICT channels will not only stimulate an increase in productivity but also switch over to planting new crops. In rural Uasin Gishu, farmers said that they had started growing horticultural crops because of the information they obtained from CANKEN. Some of these products are meant for export and, of course, for domestic consumption. The farmers then save the money that could have been spent on buying vegetables from the market. The respondents indicated that some of this money was used to buy materials for children in school, clothing and meeting healthcare services. This concurs with a study that was done in Uganda where women are reported to have started small vegetable gardens as a result of information provided by Uganda Development Services (UDS) (Gerster and Zimmermann 2003). They improved their livelihoods through such enterprises as well as ensuring that there was enough food for the family.

Thirdly, ICTs can increase information flows, market efficiency and market access for locally produced goods and services. ICT-based information may mobilize farmers to grow new cash crops when, most importantly, they become aware that there is a profitable market. As earlier indicated, a company called CANKEN mobilizes farmers in rural Uasin Gishu to grow horticultural crops for export because this company has identified the market for such products. In Uganda, farmers learnt benefits of tobacco growing and marketing of it through the British American Tobacco. A radio programme taught farmers planting and post harvest-handling techniques. Tobacco became a key cash crop securing a reliable income to the farmers (Gerster and Zimmermann 2003).

Therefore, properly used and broadly deployed ICTs can increase the rural peoples' access to information on market prices for their crops and other goods. This can lead to increased competition and a reduced number of intermediaries between a buyer and producer, resulting in a reduction of prices. What this simply means is that broad and efficient information flows, and robust communication infrastructure, are vital components of well functioning markets. Weak information flows and poor communication infrastructure constitute one of the major impediments to sustainable economic growth.

It is worth noting that ICTs also have a role to play in employment creation. Two areas of employment arise from the deployment of ICTs. First, unemployed people can use ICTs to discover job opportunities. Second, they can become employed in the new jobs that are created through the deployment of ICTs. People in rural areas lack opportunities for employment because, more often than not, they do not have access to information about them. The greater transparency enabled by ICTs, opens up possibilities for more precise information seeking. Jensen (2004) points out that some developing countries have been able to create employment for thousands of men and women through community access points and tele-centres. The widespread use of English on the internet has created the need for local content and applications for non-English speakers. For the poor in particular, the vast amount of information on the internet requires an intermediary to identify what is relevant and then to interpret it in the light of the local context. People with language and ICT skills are well placed to perform this. Such people might as well be drawn from among the community youth who are moving to the urban areas in search of white collar jobs!

ICTs will definitely have a role to play in changing role of individuals in society and creating social capital. Social capital is a sociological concept which refers to connections within and between social networks (Harris 2004). It is a critical input to poverty reduction as people are able to share ideas within and between their social networks. In the same way social capital will lead to material benefits in the form of community

projects such as schools and bridges, affecting livelihoods through education, health and market access. It will also lead to improved networking both at the community level with existing networks and potentially amongst a much wider community. The ability to build social networks at a regional and national level can help to bring benefits to existing networks and institutions at a local level such as CBOs. The reduction on the time taken to travel to pursue social networking goals can also have a positive impact at a household level with family members spending less time and less money on transport. Expanded social networks may also result in increased opportunities for employment both locally and away (Chapman and Slymaker 2002).

5.5.2 Governance

There has been a growing recognition that development and prosperity are closely linked with non-economic concerns that are considered to belong to the social and political realm. Sen (1999) has, for instance, shown that famine has never affected any country that is independent, goes to elections regularly, has opposition parties to voice criticisms, and has a free and independent media. Poverty has thus come to be redefined as going beyond material resources and including lack of power and choice. Sen (ibid.) further argues that, the quality of life and well-being should be measured not by peoples' wealth but by their freedom. Freedom on human rights is both the primary aim as well as principal means of development. Without the effective realization of human rights, it is hard to foresee the success of any poverty reduction efforts or sustainable development as noted by Shingare (2008). Information is key to this realization of human rights, and with ICTs in place, the results can even be better as outlined below:

5.5.2.1. Promote good governance

Governance is the process of guiding a country. It so much depends on what the leaders know about the citizens and vice versa. When ICTs are deployed in governance, we then talk about electronic governance (e-governance). E-governance is an area of ICT use that shows a rapidly increasing promise of alleviating poverty. Harris (2004) notes that, where national and local governments have taken positive steps to spread democracy and inclusion to the poor, ICTs have dramatically demonstrated how they can be used to

facilitate the process. The effect can be to break down traditional patterns of exclusion, opaqueness, inefficiency and neglect in public interactions with government officials.

ICTs can be important in governance by increasing knowledge on human and constitutional rights, laws and regulations, government services and programs. They can allow the government to reach the people directly and create awareness of public policies. ICTs can provide a good medium for the government to provide information resources, beneficial programmes and also to monitor the effectiveness of various initiatives and projects. In the same vein, ICTs such as radio, television and internet can be used for monitoring government programmes (by the citizenry), thus making the leaders more accountable and giving the poor a voice. The rural poor can also be given an opportunity to make their complaints and problems noticed and acted upon without going through the bureaucratic hierarchies of the day. This view is shared by Mathur and Ambani (2006). The local radio programmes host radio shows where citizens are given a chance to air their views and contribute to topical issues such as corruption, education and health, among others. If such information gets to the leaders and they act on it, one can say that ICTs have enhanced government efficiency in service delivery that is directly relevant to the poor and fostered more participatory processes of governance.

Through ICTs, government officials can therefore get better information about the needs of the poor, communicate those needs more effectively to other levels of government, and be held more accountable by the citizens. For instance, the current live broadcasts of the Kenya National Assembly sessions have made citizens more aware of government activities and activities of their leaders. This, in turn, makes the leaders more accountable to the citizens. Such a practice, enhances democracy. For example, it is now possible for a member of parliament not to be voted back into parliament because the constituents have the information that he/she never contributed to any motions in parliament.

Therefore, ICTs will in the long run offer new ways for government to conduct business, enhance the process of decentralization and offer opportunities to increase the speed and

efficiency of transactions and increase transparency. They will give the rural poor opportunities for empowerment and increased voice in decision making

5.5.2.2. Transparency and accountability

Promoting good governance, transparency and accountability are concepts that are difficult to separate and the research separates transparency and accountability from governance for ease of emphasis. Lack of information, and thus lack of transparency, weakens the responsiveness and accountability of government institutions and creates an environment where corruption can flourish. When the poor have information about the programs and resources of government, their rights as citizens and the match between the declared objectives of government and the actual delivery of services and resources, they have greater opportunity to exert pressure and hold the government accountable.

ICTs can be used to provide civic education and information on voting procedures and regulations, monitor the election process and announce the results, in real time. Had the Kenyan Government put in place ICT systems prior to the 2007 general elections, the country wouldn't have experienced the problems it did. What lacked was an effective monitoring system of the election process, tallying and even the announcement of the results. This resulted in a lot of cheating that saw a lot of people lose their lives and property (majority of the Kenyan citizens believed that the elections were not free and fair). In Mali, for example, partnerships have been established between government representatives and Radio Belekan to broadcast programmes on elections (Raju 2004). In Kenya, the Government, too, used radio and television for civic education on the rights of the people and information on voting procedures. An environment where elections are conducted freely and fairly is conducive for poverty reduction projects and strategies to thrive.

ICTs can be excellent instruments in exposing misuse of power and corruption at both local and national levels. The radio call-in programmes that are a common feature with the country's FM stations enable the communities to call in and ask questions on issues that need clarifications, and this can lead to favourable action by the officials concerned.

5.5.2.3. Giving the poor a voice

ICTs can give the poor a voice. Their knowledge about their basic human rights as citizens can be provided through ICTs. This can enable them to make right decisions on the kind of leaders to elect. It can also facilitate citizen participation in elections, whose benefits are immense. Information and knowledge can enable the poor to understand their own circumstances and to voice their own opinions and needs. Through ICTs, they can articulate their interests in societal processes and institutions that affect them. Their participation in policymaking will increase and this will help them express their needs and priorities to decision makers. In this case, we will be talking of an empowered populace, an important step out of poverty. Rural radios can become instruments of peoples' empowerment. To make peoples' empowerment sustainable, it is important to have an environment with freedom of expression, media pluralism and courageous journalism. In Uganda, Panos is funding a programme to empower journalists' skills for development reporting and advocacy work (Gerster and Zimmermann 2003).

5.5.2.4. Improve security

ICTs can improve security of people as well as the relationships between conflicting groups. The relationship between farmers and technical staff will also improve because of the frequent calls between the two groups, courtesy of mobile phones. Alerts on threatening incursions can be issued on time and security measures implemented promptly to avoid disasters. Mobile phones can also improve the relationship between the community and the police. When the community is able to call the police freely, the police are considered as part of the community and can therefore be more effective in maintaining law and order and protecting people. It will become a respected institution.

5.5.2.5. Delivery of service

ICTs can be used by the government to inform citizens about government services and programs that would benefit them. For instance, radios can be used to organize and inform people about such programs as immunization, HIV/AIDS management, child rights, girl child education, mobilization of government workers and emergency sermons

among others. Corruption in government, misappropriation of government funds such as the Constituency Development Fund (CDF), corruption in awarding tenders, and political interference in the public service can easily be exposed in the media (through talk shows) as well as newsprint. Public exposure of corrupt deeds has a preventive value for the delivery of public services in future. A society that is not corrupt will find it easier to initiate poverty reduction strategies as compared to one that is corrupt. Therefore, ICTs can lead to a reduced level of corruption, or better still, a higher quality of bureaucracy, which is more important for effective public spending on health and education than simply increasing government spending under conditions of poor governance.

5.5.2.6. Empowerment

ICTs have the potential of empowering people. At the community level, ICTs can empower people through access to information and communication possibilities through mobile phones. At the macro level, political leaders can use ICTs to monitor what is happening in their constituencies and rural areas in that matter through mobile phones. On a global level, ICTs can lead to global transparency and accountability, the results of which trickle down to individual countries. Issues such as human rights, corruption and human rights can be harmonized globally.

5.5.3 Health

ICTs can be very relevant for health interventions and in the fight against HIV/AIDS. They can be a strong dissemination tool for the consistent management of the risk of the spread of HIV/AIDS. Stigma can be imaginatively addressed, the role of antiretroviral (ARV) drugs better understood and the youth can have improved access to information, which can impact on the Awareness, Behaviour and Change – the ABC of HIV/AIDS. AMPATH is using ICTs to penetrate rural areas. They use geographical information systems to locate the areas they want to penetrate. This system uses co-ordinates to locate the areas and even the staff on the ground can locate each other using the same co-ordinates.

Apart from the dissemination of information on diseases such as HIV/AIDS, the potential of ICTs in the healthcare sector is that they can be used for consultation to give advice to

rural health workers or directly to isolated patients. Health workers can access the latest information, get assistance with diagnosis and target interventions and resources more effectively. ICTs can also increase access of rural care-givers to specialist support and remote diagnosis. They can increase access to reproductive health information including information on HIV/AIDS prevention, through locally appropriate content in local languages.

ICTs can impact on the volumes and flow of information in the health sector. They can be used in data collection and analysis and record keeping; training for healthcare workers and the education of targeted populations, including pregnant mothers, mothers of young children, and special groups susceptible to contagious diseases among others. This target of the audience is key in HIV/AIDS prevention and treatment especially in children and among the youth. Other information that can be obtained through ICTs includes the control of malaria, immunization, and family planning among others.

In all the above initiatives, local knowledge is very important. This should be well developed in terms of content, well packaged and culturally appropriate using the right language. Then the combination of ICTs with traditional media (convergence of media) can be most effective and efficient agents of change, i.e., print, radio and internet. This is important for health related MDGs on child mortality reduction, maternal health improvement, and the combat against infectious diseases, in particular HIV/AIDS and malaria. As reported in the previous sections, there are people in the locality that have knowledge on the treatment of chronic ailments such as HIV/AIDS. If such knowledge is tapped, documented and disseminated through ICTs, it will be a big contribution to the health sector and any other health interventions.

5.5.4. Education

Much excitement in international circles has been generated by the educational applications of ICTs. Some people even suggest that ICTs can only effectively combat poverty directly through education. In such applications, teachers can access and share new training materials, continue their own training, and expose their students to the ideas and experiences of children elsewhere. The Okinawa Charter recommends “the

development of human resources capable of responding to the demands of the information age through education and lifelong learning…" Foremost in the education agenda is the development of ICT manpower that is versed not only with hardware and software expertise but also with content development skills. The economic returns of a highly trained workforce cannot be overemphasized.

ICTs such as radio and television can be used to reach students in poor areas. The internet can provide a virtual classroom in which intense interactivity and the sharing of resources and information take place. Spence (2003) agrees with this by giving an example of an initiative that has been successful in South Africa. This is the SchoolNet initiative that aims to connect schools to the internet and train teachers in developing countries. They operate in partnership with the private sector, governments, NGOs and the donor community. SchoolNet is focusing on historically disadvantaged schools and almost 3000 schools are already involved in this initiative.

5.5.5 Capacity building

Capacity building refers to developing an organization's (individual's) core skills and capabilities to help it (his/her) achieve its (his/her) development goals. This definition suits the context of ICTs well as it assumes knowledge of the existence of development goals without which ICTs are likely to be of little much value. Simply put, the full realization of the potential of ICTs requires skills training, individual and institutional capacity among the users and beneficiaries. But the question for poverty reduction is whether ICTs can build the capacity of the poorest people to achieve whatever goals they may have. In other words, if one is powerless, illiterate, homeless or jobless, will ICTs help? The answer is yes. These people will benefit from organizations or institutions that use ICTs and whose programs especially target them as beneficiaries. ICTs in the form of community centres/tele-centres, especially at the rural level can act as a centre of community connectivity, local capacity building, content development and communications, and serve as hubs for applications such as distance education, telemedicine, promotion of e-commerce, environmental management and empowerment of women and youth. Where such services are targeted for the poor, the benefits of ICTs can be directed to them and can be immense.

ICTs can also be used to create awareness in rural areas about government programs and entitlements available for their assistance. Capacity building also relates to the accumulation of social capital, which refers to those features of social organizations such as networks, norms and social trust that facilitate co-ordination and co-operation for mutual benefit. These can be facilitated through the use of ICTs. ICTs can help create networks (online and offline) of people who are working towards similar goals.

5.5.6 Business

ICTs can give micro and small enterprises access to market information (faster and cheaper than printed material), input prices and output markets and they may strengthen forward linkages to the market. The study revealed that the farmers were able to contact their customers before supplying their produce had a competitive advantage over those that were not. This means that ICTs can help local business to be more responsive to the customers, thus increasing their access. The current trend in all organizations that handle clients is that the client is an important customer who should be satisfied at all times. It is the same thing in business, and when a business focuses on the customer first, the business flourishes. ICTs, especially the mobile phone will definitely ensure this.

5.5.7 Exploiting public-private partnership

ICTs can foster successful partnerships between the rural poor and private sectors. Bhatnagar (2000) gives an example of the application of information technology in the management of milk collection of the co-operative societies in India. A system of testing and weighing milk was created and tested in a national, public laboratory and was subsequently marketed by two private firms. The automation of milk collection and payment procedures to farmers improved the efficiency of the process and introduced transparency. Producers trust the objectivity of the weighing and quality determination procedures, feel they are getting a fair price for their milk, and have an incentive to produce more. Providing dairy cooperatives with internet access has also improved the delivery of veterinary services (such as artificial intelligence and disease control) and improved breeding programmes.

Within the wider development community, ICTs are a valuable tool for information sharing and awareness raising to combat poverty and advance the international development targets such as Millennium Development Goals. Multilateral and bilateral development agencies can work more effectively with each other and with their partners in the country. A broader range of views and voices from the country can be brought into the international debate on poverty and development, including the voices of the poor.

5.5.8 Environment and natural resource management

ICTs can be used to manage the environment and natural resources. Developing countries are often faced with natural disasters due to insufficient emergency communication systems, especially on the local and village levels, that limit the effectiveness of responses by their governments. The government can therefore establish monitoring and information systems using Geographic Information Systems (GIS), remote sensing and satellite early warning technologies, to anticipate and proactively respond to such problems. In case of an actual disaster having occurred, ICTs such as mobile phones can be used to mobilize resources to salvage the situation.

All in all, to achieve the above benefits, local content should be developed and the rural population equipped with appropriate skills. When a government pursues a determined policy to develop an ICT sector and ensures all the enabling conditions are in place (such as political and economic stability, educated workforce, infrastructure), it can find a profitable niche in the global economy. We are living in a global world, an information society that cannot leave out anybody from universal information technology access. ICTs are a strong and important motivating force for poverty reduction and new technologies create excitement, energy and dynamism.

5.6 Challenges/threats to proper utilization of ICTs with special reference to Uasin Gishu

The World Wide Web (www) provides a powerful medium for communication and access to information the world over. In Africa however, despite a one thousand and thirty point two percent (1030.2%) growth of the internet between 2002 and 2008 (ITU

2008), the rural community has still been left out. This is due to the fact that growth has largely been confined to major cities where a minority of Africa's total population lives. ITU (2007) estimates that, some 55% of the total rural population of Sub-Saharan Africa remains without access to ICTs. This leads to a question that is frequently asked when issues of ICT and developing nations are being discussed that: can information and communication technologies help alleviate poverty in low income countries? This study found out that the reason why such a question is asked is because of the challenges that go along with the implementation of ICT projects in such countries. This section will therefore discuss challenges that face the rural community of Uasin Gishu in the access and full utilization of ICTs.

The most critical challenge is that most of the rural areas do not have electricity. The lack of power supply is therefore a bottleneck in the access and use of ICTs. This means that the rural community cannot charge their phones at home. They have to take them to shopping centres for charging and of course at a fee. The shopping centres are in most cases very far away, calling for other expenses such as bus fare. Studies that have been carried out in sub-Saharan Africa have strongly pointed out that this is a challenge towards the access and full utilization of ICTs for poverty reduction in the rural areas (Pigato 2001, Adeya 2001, Heeks 2007, Oguya 2008).

Poor men and women cannot access the full range of information that has been generated because, often, they only have partial knowledge of what exists. They also do not know where to find what else exists and how to access it. The little that is accessible and available is not appropriate to satisfy their information needs, either in content (that is, it doesn't reflect their reality) or packaging (such as language presentations of the information, among others), there are often gaps in information flows between information generators and providers, and intermediaries (who act as information service providers for the poor) on the one hand, and between these intermediaries and the poor themselves on the other. The rural community felt comfortable when information was communicated to them in their local language. This agrees with Heeks (2007) who says that without accessible, local content that addresses the real problems of local people in

their own language, and in terms that they can understand, ICT projects cannot achieve the scalability desired for financial sustainability. He further says that the poor need access to new, locally contextualised information more than access to existing information from an alien context. Harris (2004) also notes that the problems of access to ICTs are compounded by lack of appropriate content, both in terms of language and subject matter. Addo-Dankwa (2002), CICEANA (2002) and Delgadillo et al (2002) suggest that it is important for developing countries to develop models for access and information content because the capacity to generate and share information about local resources is as important as access to distant digital information. Free flow of information is a critical factor underlying poverty reduction strategies.

Another challenge is that majority of the rural population does not have appropriate skills to access and use ICTs. There is little to be gained from access to global or local resources if the skills to select, interpret and apply the information are absent or poorly developed through the population. It was evident from the study that most of the people in the rural area did not have the skills that would enable them to utilize ICTs to their full potential. They only had very basic writing and reading skills and no computer skills. Heeks (2007) says that use of ICTs calls for adequate ICT skills, and Oguya (2008) adds technical and management skills to this list. Mehta and Kalra (2006) say that, a high rate of illiteracy in India as well as lack of training are major personal impediments in the use of ICTs. It is important for the government of Kenya to understand that, the level of a person's literacy plays an influential role in the extent of his/her use of media available. It should therefore implement ways of imparting these skills to rural populations so as to reap from the full benefits of ICTs. The benefits of the current undersea cable will only be realized if these literacy skills are imparted to all. Heeks (2007) says that the poor need knowledge to access, assess and apply existing information. They also need resources for action more than they need access to new information.

Access and use of ICTs in the rural areas is also challenged by poor connectivity. This is a problem that is brought about by low bandwidth which causes information to flow very slowly. One respondent in Turbo Division said that the internet connection is so slow that

he even does not know how to charge the customers (who are even non-existent because of such speeds)! Heeks (2007) concurs with this by saying that internet connection in Africa is slow because of low bandwidth. Low speeds mean that more time is spent while connecting to the internet, and this further means that more money is spent in the process. But as earlier indicated, the current laying of the undersea cable is meant to increase the bandwidth and hence the speeds of connectivity.

The respondents also indicated that the timing of radio and television programmes did not favour them. This is because the programmes they like to listen to and watch are aired during the day when they are away on the farms working, or at the market selling their wares. They observed that the programmes are theoretical in nature and do not address their specific information needs. As earlier indicated, rural communities valued informal channels of communication and one reason for this was the immediate response that those channels offered. In the case of radio and television, the communication is one way and the rural community is not able to query (save for the radio call shows) and get instant responses. This is the reason they felt that such channels were not able to give them immediate solutions to their problems.

Another challenge to the access and use of ICTs was cost. As has been pointed out severally, the rural communities have economic challenges that impact on the ownership and sustainability of ICTs. Adeya (2001) says that for poor people as opposed to rich people, information and communication costs more in absolute terms, and costs 'astronomically' more in relative terms, as a percentage of a day's wages. On the same note, de Boer and Walbeek (1998) add that low purchasing power among rural poor affects their use of ICTs. Real access to technology is one of the key elements necessary for integrating technology into society. The technology has to be physically available and affordable to enable access, hence use.

Finally, there is no ICT centre in rural Uasin Gishu where the residents could access ICT services. The nearest place is Eldoret town which is miles away from the divisions and locations. This means that the time and money spent to travel hinder access and use of

ICTs. Despite the above challenges, rural Uasin Gishu cannot afford to remain in this state any longer. They must start to access and use ICTS so as to reap the benefits of the global economy.

In conclusion, the chapter has indeed confirmed that ICTs can be important tools for development in the rural areas. The rural community indeed experienced the need for information so as to make informed decisions on various aspects of their lives and their work. It also emerged that the growing convergence of ICTs is becoming an integral part of the ICT revolution that will see old ICTs such as radios becoming important tools of development in the rural areas. For many people in the rural areas, mobile phones may be the main means of accessing information and communication applications such as the internet and m-commerce. Therefore, if well deployed, ICTs can play important roles in improving livelihoods, promoting good governance, improving health and education, and building capacity in rural areas, among others.

CHAPTER SIX

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

6.1 Introduction

This chapter provides a summary of the findings, conclusions drawn from those findings and proposes recommendations that may be used in the access and use of ICTs in the provision of information for rural poverty reduction in the rural areas. The chapter is divided into five sections namely: introduction, summary of findings, conclusions, recommendations and suggestions for further research.

The research objectives were to:

1. assess the information needs of the rural communities in Uasin Gishu District and how these needs are met
2. explore the extent to which ICTs are accessed and used in the provision of information for rural poverty reduction
3. establish the perception of the rural communities towards ICTs
4. explore the potential role of ICTs in meeting the information needs of rural communities
5. establish the challenges experienced by the rural communities in using of ICTs
6. propose a framework of improving access and utilization of ICTs by rural communities in Uasin Gishu.

6.2 Summary of the major findings

The findings of the study are summarized according to the objectives of the study as follows:

6.2.1 Information needs of the rural community and how they are met

Poverty has multiple and complex causes. The poor are not just deprived of basic resources. They lack access to information that is vital to their lives and livelihoods: information about market prices for the goods they produce, about health, about the structure and services of public institutions, and about their rights. They also lack

political visibility and voice in the institutions and power relations that shape their lives. They lack access to knowledge, education and skills development that could improve their livelihoods. They often lack access to markets and institutions (governmental and societal) that could provide them with needed resources and services. They lack access to, and information about income earning opportunities. The study established that the respondents in the various sectors of the economy (agriculture, business and health) needed information in order to carry out their activities appropriately. This information also ought to be timely, up-to-date and relevant to their needs in order for them to make the right decisions.

In this era of information explosion, it is important for stakeholders to have an understanding of what information a particular group of people such as farmers need before going ahead to implement systems that do not reflect peoples' needs. Such an understanding will mean that systems are put in place that identify users first and then provide them with relevant and up-to-date information, which would enable them make the right decisions towards poverty reduction.

The information needs were met in various ways. Various sources of information were consulted ranging from oral to print to electronic. These included friends, relatives and neighbours; community workers, workshops, business tours, radio, television, churches and posters among others. The study established that the respondents consulted sources that were familiar and closer to them such as family and friends, and community workers, more than those that were far. This is because they felt that familiar sources understood their problems better as they worked together. These sources also provided information in their local language, *Kalenjin*. The study established that respondents preferred communication in their local language. There were also other reasons why familiar sources such as community workers were preferred. These included: familiar sources were able to respond to the rural community's "please call me" messages, communication was at times face-to-face, there was immediate feedback, and the communication was oral (the respondents preferred oral communication). Far away

sources of communication such as libraries and information centres were not mentioned at all as providers of information.

6.2.2 Access and use of ICTs

The study established that the respondents owned and used different ICT tools for their information needs. These included radio, television and mobile phones. The respondents that used radio as their source of information (86%) mostly tuned in to the local stations – KASS FM and CHAMGEI FM. They also tuned to KBC – a national broadcasting channel. This just confirmed their preference of communication in their local language. The programmes aired benefited them especially those that touched on their activities such, as *chapa kazi, tembea na majira, sikio la mkulima, epuka na ukimwi* and *mending the ribbon*. However, the respondents expressed dissatisfaction in the airing of the programmes as most of the relevant ones were aired during the day when most of the respondents were away at the farms or elsewhere. They also lamented that programmes on national radio channels such as KBC were general in nature and did not address their specific needs. This is because of the nature of the audience the programmes are intended.

A smaller percentage (30%) of respondents owned television sets compared to those that owned radios. They watched programmes that were relevant to their needs such as those on farming, business and health. However, the information and its presentation were not specific to their needs owing to the nature of the audience. The study also noted that radio and television were in greatest demand from the majority of illiterate and semi-literate users because they did not require particular abilities for access. This is discussed in section 5.4.2.

Just as the radio was the most owned old ICT, the mobile phone was the most owned new ICT. The study established that mobile telephony in Kenya is slowly replacing the use of postal services such as telegrams and money orders. This trend is especially pronounced in emerging and less developed countries, where for decades, a vast majority of consumers have been unable to access ICTs. The growth of mobile telephony in rural

Uasin Gishu has been unprecedented with a majority of residents owning mobile phones. Those who did not own mobile phones at least had SIM cards that they could use on borrowed handsets. They could also use other peoples' mobile phones for receiving calls but not for initiating calls. One respondent indicated that when she wants to contact someone who does not have a cell phone, she calls her through her sister or aunt who also lives in the area. This means that they use social networks to overcome problems of access, a fact that Alampay (2006) acknowledges.

The study further established that people used the cell phone to SMS/text more than they used it to call although the nature of their SMS/text messages was relatively mundane and social in nature. However, because SMS/texting is cheaper than actual calls, it makes SMS cheaper than actual calls, thus making it a viable means for people to communicate on a regular basis. They however indicated that if the message was urgent and very important, they preferred to call. They also indicated that although expensive, the calls were less difficult to do, faster to relay the message, less confusing, more personal, information was more detailed and feedback was immediate. A lady in one of the divisions indicated that she only called when the matter she was handling was urgent or during an emergency. Otherwise, she preferred texting. Texting allows one to store an important message and be reminded of it later. Others indicated that calls are more personal, a person is surer that the message has been received and there is no confusion on the message itself. Others simply said that they like texting suggesting that it had become a way of life. Others said that they express themselves easily via SMS/text, and reach more friends when need arises. Also, unlike the situation with other ICT interactive media, mobile phones do not need any software interface that may need translation. Any appropriate language may be used.

Mobile phones were also used in business though in a lesser magnitude than socializing. They were used in communicating with customers making and canceling orders, comparing prices of commodities in different markets, making payments for goods received and accessing the internet (though a very small percentage - 3%). Payments

were made through Safaricom's M-PESA service – a money transfer service using mobile phones.

The study also established that, of the two types of services, the respondents preferred the pre-paid service because it allowed them to have control over the way they spent their money. It is also a better option for people in the rural areas because the post-paid service requires that the subscriber owns a fixed address or bank account against which a debit could be set up, which many people in the rural areas do not have. On the other hand, the pre-paid service requires that one just buys air time and loads into his/her phone, then, makes a call.

In a nutshell, mobile phones were also used to:

- contact community workers
- make and cancel orders in business, agriculture and health
- compare commodity prices in different markets so as to make informed decisions on where to profitably sell produce
- leave a voice message when a recipient was not available using the voice prompt
- transfer money electronically to family and friends, pay for goods delivered, and make advance payments for products to be bought, among others, using M-*Pesa*
- manage perishable products by calling markets to know the demand first before the transportation of the same is done
- access the internet. This was however done by a very small percentage of the respondents

Internet application was not a common ICT tool among the respondents, yet, it is the most powerful ICT tool. The reason for this as the study established is that, internet access requires additional costs such as equipment, electricity, housing, technical support and specific skills, which are lacking in rural areas. This makes the internet unaffordable in those areas. Another barrier is the universal language of the internet, that is, English. Most of the rural community would prefer to speak in their own local language and not in English.

All in all, it was concluded in this section that, indeed ICTs, if well deployed, can be a great means of generating and accessing wealth, power and knowledge. They can lower transaction costs, access markets with better prices, improve competitiveness of the rural folk in the market place for better prices and provide a level playing field in the market place.

6.2.3 Perception of the rural community towards ICTs

The study established that the rural community perceived ICTs as important tools that one ought to have and use. They have embraced the new technologies especially mobile phones because a majority of people owned them. They indicated that mobile phones have changed the way they communicate with family and friends, the way they do business and the way they seek information.

6.2.4 Potential role of ICTs in the rural areas

The study established that ICTs have indeed a role to play in the various sectors studied – agriculture, health and business in various ways. First and foremost, they have enabled the rural communities to share knowledge and seek solutions to their problems though in a small scale. This has been through the community workers, friends, relatives, neighbours and family members. ICTs can also be used by the poor to directly address their information needs, develop their own strategies and solutions for improving their lives, and articulate their interests in societal processes and institutions that affect them. When properly used and broadly deployed, ICTs can increase access to information on various aspects such as market prices, health and educational resources, information about government services and their own rights as citizens.

Information obtained through ICTs on various activities in the above sectors led to improved productivity in some households that sought it. For instance, information on improved agricultural technologies, new farming methods and use of improved seeds, among others, obtained through ICTs led to increased food production and consumption at the household level as well as to income gains from the sale of these products. This increase in revenue would also mean better living standards, better health services, better

education to the children and an overall better populace. This can lead to a reduction in poverty in the rural areas and an increase in the country's socio-economic development.

Another role of ICTs that was very important was the ability to access markets through the use of mobile phones, though also, to a small degree. Some farmers were able to call and get information on markets that could offer them better prices for their goods and products. Absence of this information means that the farmer could make a decision in the absence of up-to-date and crucial information and perhaps sell the products at a nearby market at no competitive prices, or worse still, sell through middlemen, who are very exploitative.

ICTs were also seen to have a potential role in promoting good governance. This was however not the case in rural Uasin Gishu where information flow is inefficient and the ICT infrastructure is not well developed. Well developed information and communication systems would allow the government to reach the rural people easily. For instance, with such systems in place, it would be easier for the government to communicate government objectives, policies, resources, projects, legislations, regulations and initiatives. This will make the rural folk aware of what is expected of them hence giving them a voice on the decision making platform. In the same way, government officers will also be held accountable for their actions because the citizens would have known their rights as citizens. In other words, it could be possible to compare what the government has laid down to do and the actual delivery of services. One can therefore conclude that ICTs can be excellent instruments in promoting good governance, transparency and accountability, and exposing misuse of power and corruption at both local and national levels. An environment of freedom of expression, media pluralism and courageous journalism and where government business is conducted freely and fairly is conducive for poverty reduction and socio-economic development. A society that is not corrupt will find it easier to initiate and implement poverty reduction strategies as compared to one that is corrupt.

At the intermediate level, ICTs can help a range of intermediary institutions and agents to work more effectively and be more responsive to the needs of the poor. Health workers, for instance, can access latest information, get assistance with diagnosis and target interventions and resources more effectively with the help of ICTs. This will increase access by rural care givers to specialist support and remote diagnosis and reproductive health information including information on HIV/AIDs prevention through locally appropriate content in local languages. In agriculture, agricultural extension agents can more effectively access and share local and global knowledge on crops, pest management, irrigation and other aspects of rural agriculture relevant to the needs of the poor. In governance, government officials can get better information about the needs of the poor, communicate those needs more effectively to other levels of government, and be held accountable by the citizens. The current LIVE sessions of the National Assembly, for instance, have made citizens more aware of government activities, and this in turn makes their leaders more accountable to them (citizens). Democracy is therefore enhanced. In business, ICTs can help local business to be more productive and more responsive to its customers. Finally, ICTs can help local NGOs and community groups to mobilize more effectively, articulate the interests of the poor at the local level and share information and strategies with similar groups elsewhere.

At the micro level, ICTs can foster more efficient and transparent markets, more participatory processes of governance, and new forms of economic and social innovations that benefit the poor. Lack of information and thus lack of transparency, weakens the responsiveness and accountability of government institutions and creates an environment where corruption can flourish. When the poor have information about the programs and resources of government, their rights as citizens and the match between the declared objectives of government and the actual delivery of services and resources, they have greater opportunities to exert pressure and hold government accountable.

ICTs are also a valuable tool for information sharing and awareness raising within the wider development community, to combat poverty and advance the international development targets such as MDGs. Multilateral and bilateral development agencies can

work more effectively with each other and with partners in developing countries. A broader range of views and voices from developing countries can be brought into the international debate on poverty and development, including the voices of the poor. NGOs and civil society groups can use ICTs to network world wide and collaborate more effectively. This, if well coordinated, will trickle down to the rural areas and the benefits will be immense.

6.2.5 Challenges in accessing and using ICTs

The study established that indeed the rural community of Uasin Gishu faces challenges in the access and use of ICTs. Some of the challenges mentioned include:

- poor timing of radio and television programmes
- lack of electricity
- inappropriate language of communication
- most programmes in national radio and television stations are general and theoretical in nature. They lack a practical component
- high costs of making calls
- not easy to explain a problem explicitly on phone to the community workers such as symptoms of a plant disease, among others
- lack of an ICT centre in the locations and divisions
- lack of mobile coverage in some areas and this forced the residents to walk long distances to make or receive calls

6.2.6 Framework of improving access

The study sought ways of overcoming the challenges above. These include:

- carry out a needs-assessment study of the rural community to determine their needs
- create an awareness of the importance of ICTs for rural poverty reduction
- mobile phone subscribers to lower their tariffs
- community workers to be facilitated financially so as to be able to reach and serve the community appropriately

- establish a local ICT centre to bring services closer to the community. These centres should promote the use of different types of technologies and be manned by personnel from the local community.
- rural electrification programmes to be enhanced so as to enable the rural community to use ICTs
- proper timing of relevant radio and television programs
- the government to facilitate local stations to produce more appropriate programs in local languages and with a local content

6.3 Conclusions

6.3.1 Socio-economic and demographic factors of respondents

The study set out to determine the socio-economic and demographic characteristics of respondents so as to ascertain their implication to poverty as well as access and use of ICTs. These factors included age, marital status, gender roles, family size, family income and literacy levels. It was established that indeed these factors have affected the rural community's access to and use of ICTs, thus affecting development efforts as well as efforts to alleviate poverty in the rural areas.

Due to high literacy levels, for example, majority (72%) of the respondents had primary level of education and 4% had never been to school) of the rural community were not able to use ICTs such as computers (or internet) to seek information. Instead, they relied on their relatives, family and neighbours for information to carry out their day-to-day activities. Older members possessed indigenous knowledge that would help them improve their livelihoods. However, due to inaccessibility to ICTs, this information remains at the source and it is not shared, thus not being useful to many people. Therefore, one can conclude that education is a significant factor that determines the capability of using and accessing ICTs. Education is important not only with respect to gaining the needed skills to use ICTs, but also, with respect to peoples' motivation to use them. There is a strong correlation between access to education and knowledge, particularly for girls and women's health, and such key poverty indicators as infant

mortality, family size and women health. In the rural community, the scarcity of trained local personnel (teachers, health workers, agricultural extension workers) and the impediments they face in accessing vital information and enhancing their skills, perpetuate the low educational attainment and poor health of these people and makes them less able to come up with new challenges (such as HIV/AIDs, drought and natural disasters).

Age was also found to have an influence on the general access and use of ICTs. The younger members of the community are more capable of using most ICT tools while the older members do not take the initiative to do so. The study concludes that this trend is due to the fact that the internet is a recent development and as such, only the younger segment of the population has had the benefit of being exposed to it in schools and other places. A report on the benchmark survey (Olatokun 2009) shows that using the internet and other ICTs is greater among the younger age groups. In this survey, 70% of the 16-34 years claimed to have used the internet compared to 14% of those aged 55 years and above. The report further says that age has not only an impact on the use of ICTs, but also, on aspiration and use. Approximately three quarters of non-users aged 55 years and above said that there were no incentives to use computers or the internet, in this same report.

Another socio-economic factor that was found to have an influence on access and use of ICTs was family income. What the household owned was found to be significantly related to their income, which has already been discussed as not being much. Those with a little higher income were more likely to own multiple ICT tools such as radio, television and mobile phones for different members in the household. It is also important to emphasize here that income was found to be related to one's level of education one attains. People, who have gone through formal education such as the youth, are likely to move to town to look for white collar jobs. Assuming that they got the job, they are likely to own various types of ICTs.

Therefore, it is apparent that age, income and educational level, among others, play a significant role in the capability to access and use ICTs. They can be seen as the key "individual differences" that impact on the freedoms, capabilities and functions that relate to ICT access and use. They also have a role to play in giving people the opportunity to approach the world with courage and freedom (Alampay 2006). Understanding that these variables limit peoples' capability to access and use ICTs is important if the government is to develop new policies to bridge these differences. The results showed how some of these factors are inter-related such as low income factors into the type of education a person achieves and how it influences whether a person owns and uses particular ICTs.

6.3.2 Information needs

The study established that the rural community experienced need for information in various ways. It therefore concludes that the rural community had information needs that arose from the activities they undertook, and that the needs varied from activity to activity. These activities included agriculture (being the major activity), business and health. These were the activities from which the rural community earned their income as well as livelihood. It therefore emerged that because of the importance of the activities for their livelihood and poverty reduction (hence socio-economic development), they needed information that is relevant, up-to-date and applicable. This information helps them to undertake their activities appropriately, make informed decisions and avoid instances of making decisions without information. Information provided at the right time can give the rural community a competitive advantage over those who do not have it.

As much as the poor had information and communication needs, most of them were unable to address them. Yet, information and communication are the engines of economic and social interaction. However, given the multiple constraints they face, the poor are either unable to meet these needs, or must do so in costly ways that may perpetuate their disadvantaged positions. For instance, a farmer sells goods to middlemen at a low price because of lack of information about prices on the market. A mother watches her child die from diarrhoea because she has not learnt about oral rehydration therapy.

The study also brought to light the fact that individuals have different degrees of inadequacy as far as information is concerned. Some felt the need for so much information whereas others were satisfied with the little information that they obtained from social networks (that is, friends, family, neighbours and relatives). On the same note, the study also concludes that whereas some respondents did not know their information needs, others knew but did not simply know how to express them. Because of such a scenario, one cannot be able to address these unexpressed needs. This then calls for rigorous methods during data collection or when studying such groups so as to unveil the information needs. When this is done, the problem could as well be as good as solved. It is therefore important for researchers to assist users in articulating their information needs.

Another conclusion that can be made on this is that the rural community, especially in areas far away from the town centre, faced a lot of problems in accessing information, and that is why they were poorer than those nearer Eldoret town. For instance, ICTs such as mobile phones are mainly used for communicating with friends. They are not used to look for information such as markets and prices, among others. This is simply because of the high costs of making calls. Such barriers therefore make the process of information seeking difficult, and as mentioned above, the result is that information needs are not met, and decisions are made that will have a negative impact on the country's efforts to reduce poverty and promote development.

The study also concludes that the rural poor often lack an effective voice in the institutions, policies and processes that shape their lives. Not only do the challenges of their daily lives often leave them little time and opportunity to assert their rights and interests, but they are deprived of instruments for effectively articulating and aggregating their interests, learning about their rights and their entitlements to government services and pressurizing government at all levels to be responsive to their needs and interests. Their lack of effective voice perpetuates inefficient and sometimes corrupt forms of governance and service delivery that keep the poor in a subordinate position. The knowledge and experience of the poor (indigenous knowledge) is often undervalued and

their perspectives on their needs and on solutions to their own problems are often ignored.

6.3.3 Sources of information

The study found that the rural community sought information from various sources to satisfy their information needs and to be able to carry out their day-to-day activities. These sources ranged from informal sources such as friends to formal sources such as radios and mobile phones. For instance, majority of the respondents sought information from community workers (such as extension officers), public meetings (such as field days and public *barazas*), friends and relatives, family members and neighbours, among others. The study therefore concludes that the rural community preferred oral channels of information. The reason that emerged from this was that because of the cultural orientation of the people in the rural areas, they prefer immediate feedback. This a fact that Alampay (2006) concurred with when he said that African societies have strong and enduring socio-cultural influences and will embrace technology that will promote greater interaction and sustain kinship.

In this regard, it can also be concluded that the rural community consulted the informal sources because they were accessible and familiar to them. For instance, farmers consulted area agricultural extension officers who were close and familiar to them for information. Accessibility has a cost implication in that it adds to the cost of looking for information. Because of high levels of poverty, the rural community members sought information from sources that were cheaper to access. That is why newspapers, magazines and even libraries were not mentioned as sources of information; yet they can also contain information that can be used to make informed decisions. Another conclusion that can be drawn is that the rural community preferred informal channels because apart from the immediate feedback, information was mostly provided in the local language, *Kalenjin*, which was their preferred language of communication. In the same vein, the study also concludes that poverty is persistent in the rural areas because most of the information in the public domain is printed in English. This makes accessibility by the rural communities difficult because of the high levels of illiteracy. It is because of this

that the people in rural Uasin Gishu continue performing their activities without much regard for information that is up-to-date and relevant.

The research also concludes that the rural community consulted sources of information that it did not take a lot of time to reach. For instance, they found it difficult to travel to Eldoret town (those in locations so far from town such as Ainabkoi) to seek information rather than ask a neighbour. What this means is that information providers and the government should work hard to bring information closer to the people. Information on all aspects of one's well being as well as socio-economic development should be provided right at the locations such that time to look for that information does not become a hindrance.

Radio and television were also used by a significant number of the people in the rural community. The reasons were similar to those highlighted above such as language and accessibility. These tools did not require special skills to operate. They mostly tuned to the local stations KASS and CHAMGEI that broadcast in the local language. It can therefore be concluded that the radio continues to be a channel of choice in the rural areas. Other studies have also concluded that high levels of radio usage are found in all low income economies (Pigato 2001). However, what affects the use of these ICT tools (radio and television) is poor timing of programs, and lack of relevant and locally applicable content, among others.

6.3.4 Mobile phones

The study established that mobile phones are owned by a majority of the people in Uasin Gishu. The mobile phones allow the owners to communicate and conduct business, among others. They prefer the pre-paid service because of the poor economic status. One can therefore conclude that in cash-based economies like Kenya, users prefer the pre-paid services. Mobile service providers such as Safaricom have made this service friendlier by introducing pre-paid air time for as less as Kshs. 5, Kshs. 10 and Kshs. 20. It becomes absolutely unnecessary for those who use the "flash back" service or simply beep to do so. With this kind of development, mobile phones may be the first and main means of

accessing information and communication applications such as the internet, e-commerce and even m-commerce. This will be of benefit to the rural populations because banks such as Equity, Barclays Bank of Kenya, Family finance, Kenya commercial Bank, National Bank and parastatals such as Kenya Power, Lighting Company (KPLC), Family Finance, Kenya Commercial Bank and Water and Sewerage companies are providing some of their services through mobile phones. Because mobile phones outnumber personal computers, they remain the only logical channel for m-commerce in a developing country like Kenya.

6.3.5 Internet

The study found that internet penetration in the rural areas is almost non-existent. This is because of what is required to have internet up and running, such as good connectivity, installation equipment, housing, technical skills and specific skills, among others. The mobile phone therefore seems to be the technology of the future in the rural areas because the above barriers such as installation equipment are not a big deal. The mobile phone, as earlier indicated, promotes informal communication that is part and parcel of the African culture, there is immediate response during communication, one can use the language he/she is comfortable with as long as the other party is conversant with it and mobile phones are flexible to use. That is, whether one has air time or not, communication will somehow take place, through the many services that mobile service providers have provided.

6.3.6 The potential role of ICTs

The study established that indeed the full range of ICTs has an important role to play in reducing poverty in rural areas by improving flows of information and communication at the community level. This has also been made possible by the convergence of media, which enables the advantages of mobile phones, internet, radio and television to be combined together in one communication. Because of this convergence, new ICTs can play an important role in creating new opportunities to expand the availability, exchange and impact of information and knowledge. However, apart from mobile phones, other new ICTs such as computers were non-existent in the rural areas.

The study therefore concludes that computers and internet have very low levels of use because effective use of these technologies requires not only literacy, but also, language skills predominantly English and to a small extent, Kiswahili. They also require computer and technical skills. That is, the ability to operate and interact with a computer based information system. Therefore, with improved information flows and robust communication infrastructure, production in the rural areas will increase, livelihoods will improve, market access will be made easy and employment opportunities will be opened up because there will be need for knowledge managers, translators, intermediaries and researchers who would be employed in information centres or telecentres. In other words, ICTs will empower people at all cadres of society, namely, individuals, political leaders and the government.

6.4 Recommendations

Based on the above summary of findings and conclusions, the study came up with the following recommendations. The recommendations are mainly addressed to the government and other stakeholders.

6.4.1 Creating the right environment for ICTs

The research established that the people in the rural Uasin Gishu have information and communication needs. Therefore, addressing these information and communication needs and creating information rich environments is an essential part of the efforts to tackle poverty. This could be achieved by: first, the government working closely with development partners to address information and communication needs and secondly, by properly deploying ICTs that have an enormous potential as tools to increase information flows and empower people. There needs to be a move from looking at technology and asking, “what can we do with this?” to looking at the rural peoples’ needs and asking, “which technology could help here?” Thus matching the most appropriate communications technology with the rural people's needs and capabilities is a crucial task for ICT providers.

The country, in its approach to ICT issues, should focus her attention to the information and communication aspects of poverty and appropriate use of ICTs in the development

process as tools to combat poverty. The right enabling environment should be created for the spread of ICTs, for entrepreneurship and innovation, and for the free flow of information. To create such an environment, the government should enact policies and strategies that will lay down ground for such an environment to thrive. The Economic Commission for Africa (ECA) has established appropriate ICT policies as a priority with the formation of the African Information Society. The subsequent National Information and Communication Infrastructure (NICI) strategy papers argue that "Information and Communication technologies can no longer be seen as a luxury for the elite but as an absolute necessity for the masses" (ECA1999). The specific areas the government should therefore address include:

- creating well regulated, liberalized and diverse telecommunications and broadcasting services, including tackling market failures and seeking to maximize market coverage to poor and isolated areas – such as the section in Ziwa Division that does not have mobile network coverage
- supporting measures to protect and promote free flow of information
- promoting a local business environment that is conducive to investment, innovation and entrepreneurship. This is not only vital for encouraging local innovation in services and ICT related enterprises, but also in assuring the broader spread and benefits of ICTs within the country. It is clear from the daily media that the area of ICT, especially mobile telephony, has very frequent innovations with new packages being unveiled on a daily basis. These should be supported to grow.

6.4.2 Language and format of presentation

Apart from the telephone, the majority of information exchanged via ICTs, whether in text format or oral broadcast, takes place in foreign languages. The study established that this did not go down well with the respondents. Therefore, steps need to taken to address the needs of other languages and cultures through long term vision so as to make all ICTs accessible to all people. This will involve significant investment and support for local content (in broadcasting and the internet) and software design.

The investigation also established that respondents preferred oral channels of communication. It is therefore recommended that the information providers liaise with their local officers at Uasin Gishu to step up efforts to ensure that information is provided in a language and format that is appropriate to the rural community, a majority of whom are illiterate. Such formats could include posters, charts, films, videos, dances, oral poetry, group activities, drama and story telling, among others. The respondents also preferred face to face communication. Oral information and personal networking should therefore be taken into consideration when implementing ICT initiatives. Addressing the inequitable access to information in the rural and urban areas should be a key concern in order to ensure the success of poverty reduction efforts and to promote development in the rural areas.

6.4.3 Improved flow and quality of information

The respondents indicated that at times they do not know what information is available for them to use. Yet, it is a fact that poor people will benefit from improved information flows. Such an information flow will improve the effectiveness of government, markets and other institutions that affect them. Research has shown that in societies where information flows widely and access to communication services is widespread, markets and governments institutions are likely to become more efficient, transparent and accountable (Pigato 2001). This investigation recommends that, the institutions and organizations that serve the rural community in Uasin Gishu and defend their interests should work towards improving information flows. That way information could be more easily and widely accessible. Through such an improved information flow, the people in Uasin Gishu could make their own choices, voice their opinions, demand their rights and have more power over their own lives. Increasing communication and the flow of information and knowledge in ways that benefit the poor is therefore a critical component of poverty reduction and sustainable development in the rural areas of Uasin Gishu.

In the same vein, the quality of information is important for poverty reduction. Thus it is recommended that institutions and organizations working in rural Uasin Gishu should work towards quality information. The quality, diversity and relevance of information are

as important as the sheer volume of information available in a community, or the scale of its communication networks. Indeed relevant information might not of itself be sufficient. A rural farmer in Uasin Gishu, for instance could have the latest crop prices, but still be unable to get a fair price for his or her crop because of unequal power relations with middlemen or poor road networks. The study recommends improvement of income and communication flows, and infrastructure within the community, which could foster economic growth in the rural areas.

6.4.4 Skills development

The research established that the illiteracy level in the rural area is very high. This means that any development effort should look at ways of countering this because illiteracy hinders poverty reduction efforts. ICTs are dependent on the skills and capacity necessary to effectively use, manage and maintain the technology. This research recommends that the government, through the District offices, provides rigorous training courses on basic computer literacy, computer maintenance and networking, to build and improve the skills of people in the community. Such training sessions could even arouse interest in the use of computers especially among the older generation and create demand for computer based information services. The training will also provide them with skills to know that information is useful in daily life, to be able to make decisions about information that is useful to them, to obtain it in the sea of information, and to process and transform it into knowledge required for a specific purpose. According to Olatokun (2009), education is necessary in order to retain exclusion and/or isolation due to lack of universal familiarity with and use of ICTs, avoid discrimination on the basis of literacy, and access useful sources of information. With the right education enabled by the right policies, more people could be able to access and use ICTs. There is also need for the government to massively invest in upgrading teachers' skills and infrastructure including internet, computers and PDAs, so that they are able to impart these skills amongst the learners. Mansell and Wehn (1998) further suggest that governments should not only put emphasis on expansion of telecommunication systems (access to links in information superhighways), but must also consider development needs and skills development, including computer skills.

6.4.5 Development of market intelligence systems

The research established that farmers are not able to access ICTs because of the high costs associated with ICTs. It therefore recommends that, because there is strength in numbers, small scale producers should join up with others through producer organizations to ensure access to ICTs, streamlining time consuming exercises such as market research and offer bulk supplies to buyers. With market research done by their organizations, farmers could be able to make better decisions about what to grow and when to grow it. Efficient market information systems could link producers with buyers even before their crop is harvested – and in some cases before the seeds are sown. They could also provide details of prices of goods and stocks in given markets. Many Marketing Information Systems (MIS) that have been developed elsewhere use the versatile and popular mobile phone as a simple low cost means of relaying information via SMS to users in the field that have subscribed to the service (Olatokun 2009). KACE has developed a MIS that relays information via SMS as described in the previous chapters. This could be established in the rural areas of Uasin Gishu. CTA (2009) cites examples where such systems have had an impact. For example, in Senegal, Xam Marse Service provides information on the prices and availability of fruit, vegetables, meat and poultry products at all the country's markets. Advanced systems also exist that give more complex information such as availability, names and contacts of traders, quantities traded, stocks, market trends and price forecasts. In Benin, Burkina Faso, Cote d'Ivoire, Guinea, Niger, Nigeria, Mali, Senegal and Togo, the RESIMAO/WAMIS-NET network supplies the latest information on 400 rural and urban agricultural commodity markets. The Small Holder Enterprise and Marketing Program (SHEMP) offers a cross border market information service for farmers in Zambia and the Katanga Province of the Democratic Republic of Congo. In Northern Ghana, the Eastern corridor Agricultural Market Information Centre uses mobile phones to transmit market information to 24 community based farmers' co-operatives. An initiative in Tanzania's Ulugulu Mountains is enabling women farmers to access up-to-date market information. The Eastern Carribean Agricultural Trading and Development Association (ECTAD) is helping women farmers to use ICTs to tap export markets for specialty crops such as turmeric and thyme. In Samoa, the Tagiilima Collective runs an internet training centre for villagers

and sells women's craftwork online and in Senegal, mobile phones are strengthening the entrepreneurial initiatives of women fish processors (Olatokun 2009).

The above initiatives that have been successful elsewhere are a clear indication that mobile information systems are a reality in the rural areas. When proper ICT systems are put in place, leaders can organize meetings with their members to interpret information such as market prices for the benefit of illiterate farmers and discuss what actions to take among others.

6.4.6 Zero tax ICT equipment and accessories

From the research, it became evident that the only new communication service could take off in the rural areas and change the way activities are conducted is mobile telephony. At the moment, internet access in the rural areas is very marginal if not minimal. The government should therefore zero tax ICT equipment and accessories and especially mobile phones so that many people could afford them, bearing in mind that most of them are earning less than one dollar a day. A teacher from a private school observed that although some degree of e-learning has picked up in private schools, the government should subsidize efforts of schools to computerize, by exempting them from paying taxes and rates on ICT equipment. This could encourage their efforts to computerize, thus promoting e-learning in schools.

Mobile telephone service providers have lowered their tariffs, but they can still lower them further. As of January 2011, a call within the same network cost as low as Kshs. 1 per minute and Kshs. 3 per minute across networks. This low cost could not only allow the rural community to make calls with ease, but could also generate increased volumes of business for the service providers to provide at least the same revenue they could have generated. Service providers argue that they might not be able to charge very lowly because of high costs of installation. The ball therefore falls back to the government to take ICT initiatives seriously and to introduce inexpensive technologies that will enable the service providers to charge fairly for their services. Other initiatives could include subsidizing the cost of bandwidth, encouraging the use of voice over internet protocol

(VoIP) and building wireless internet systems in the rural areas. Even the cheapest phones should be web enabled to allow subscribers to be able to access the internet and other applications such as e-commerce and m-commerce. Affordability to ICT services will mean that many more people in the rural areas will afford them. This access could lead to other opportunities and services such as e-education, e-health, e-commerce and e-government/governance among others.

6.4.7 Facilitation of community workers

Community workers at the divisions, locations and villages lamented that the government does not provide them with funds by the government to enable them respond to the 'please call me' messages they get from the rural community. The study therefore recommends that community workers be provided with funds to enable them provide mobile information services to the rural community. The funds could also enable them to be active information seekers who would go an extra mile to visit internet cafes, browse for information, repackage this information and communicate it to the users in the villages. This will slowly be building local knowledge resources that will be of benefit not only in the current situations but also in the future. One problem that has been noted in this piece of work is lack of locally appropriate content. Local knowledge resources could correct this problem by providing locally available content. If all the community workers are able to do this, the information could be uploaded onto the internet and it will be available to everyone. In other words, this will be an important step towards building knowledge networks for the poor.

6.4.8 Implementation of alternative power supply systems

One of the major hindrances in ICT access and use in the rural areas was lack of electricity. Most homes do not have electricity and it was very difficult for them to own gadgets that require electricity to operate. They had to take their phones for charging in homes that had electricity or at shopping centres at a fee. The study recommends that the government should step up rural electrification programmes in the rural areas. The study also recommends alternative sources of energy such as solar, which is readily available almost throughout the year in the district. Solar chargers are now available in a few areas in the country such as Nairobi, courtesy of private developers. The government should

take up this initiative to make these solar chargers available to the rural areas at affordable rates, because if they are expensive, they will be out of reach for many. The government should also support mobile phone providers such as Safaricom that are coming up with solar powered phones. The solar powered phones should be made available by the government reducing tax charged on input so that most people in the rural areas could have access to them.

6.4.9 Validation of indigenous Knowledge

The research established the presence of local knowledge in the rural areas. Respondents indicated that at times they consulted their neighbours who had experienced and solved a problem that they were also experiencing. This is knowledge that exists among individuals and it needs to be tapped, documented and preserved for future use. It also needs to be disseminated to would-be beneficiaries. The government, through the district and divisional leaders should lay down strategies that could ensure that this knowledge is well developed in terms of content, language, packaging and culturally appropriate. Then appropriate ICTs could be used to document and share the indigenous knowledge once the right information systems have been established in the rural areas. In this way, the indigenous knowledge will be very important for poverty reduction initiatives and finally socio-economic development.

In developing local content, the solution to increasing local content online lies in developing content suited for mobile phones, a gadget that is increasingly assuming an all-round importance in the rural areas. More people are accessing the web through mobile phones than computers, hence development of content that is suited to their phones. It is possible to do websites in different local languages and even translating the existing content. Local knowledge can also be supported through the promotion of local radio stations.

6.4.10 Programming in local languages

The importance of programming in local languages came out very vocally in the study. Majority of the respondents preferred tuning in to programmes in their own language. It is therefore important to develop local languages. For instance, in early February, 2010,

the last speaker of Bo, an ancient language in India's Andaman Islands, died and with her ended a 70,000 year old heritage (Orao 2009). The Bo language originated from Africa. In many cases, many (even Africans themselves) view African languages as carriers of primitive idioms with communicative value only to illiterate hunters and gatherers, farmers and pastoralists. Some people believe that real language can only be obtained in a world language such as English and that is why in urban areas, elites have managed to tame foreign languages to their advantage. A conference on the Integration of African Languages and Cultures into Education in Ouagadougou, Burkina Faso, jointly organised by the World Bank and Association for the Development of Education in Africa, set the agenda for advocacy against marginalization of African languages in education (Orao 2009). Amid efforts to improve quality of education in sub-Saharan Africa, the conference urged the Academy of African Languages (ACALAN) which is a specialized affiliate of the African Union to sensitize governments on the importance of local languages. According to UNESCO, Africa is the only continent in the world where children go to school and are forced to speak a language that is completely different from that of their families. (Orao 2009). The vital role of African languages goes beyond their presence in classrooms. According to Dr. Anthony Aristar, a professor of linguistics at the Eastern Michigan University,

> "a language is not just words and grammar. It is a web and a network that binds together people who speak the language" (Orao 2009).

As education experts reflect on language in schools, they have also to contend with the issue of survival and preservation of local languages. At risk are those languages that have not been reduced into writing. UNESCO predicts that in the next 100 years, over 90% of African languages will become extinct (Orao 2009). Therefore, the government should facilitate/promote radio stations that broadcast in local languages in Uasin Gishu District such as CHAMGEI and KASS FM. Computer interfaces should also be done in the local languages of the people in Uasin Gishu if the full benefits of ICTs are to be realized. This is possible as the Microsoft experience with Kiswahili on the internet has shown. There is need for universities' language and ICT departments to work collaboratively towards this end. In Uasin Gishu for instance, the Kiswahili and Other

African Languages department at Moi University should work together with the School of Information Sciences to develop programmes for ICTs in Kalenjin.

6.4.11 An integrated ICT centre

The respondents lamented that there were no ICT facilities in their locations and divisions. The research therefore recommends that the government should put up integrated ICT centres in the locations. These ICT centres should provide all sorts of information required for overall economic and social development of community members. Such information could then provide support and assistance in sustainable agricultural development, achieving food security, developing rural enterprises and improvement of health and education. To be able to achieve all these, the centre should have computers and modems for internet connectivity as well as radios and televisions (so as to take advantage of convergence of media). Appropriate staff should then be selected from among community members to work at the centre, and an advisory committee from among them to oversee the operations of the centre.

The ICT centre should aim at the following:

- to serve as an information exchange centre and a repository of all sorts of information needed by the rural people in the community
- to provide information on all aspects of community life such as good health and hygiene
- to help people make use of information
- to help community members acquire skills, knowledge and confidence to participate more willingly in community affairs
- to assist the community improve its economic conditions through provision of information and training programs
- to co-ordinate and organize activities with extension and other community workers, such as workshops, discussion groups and practical demonstrations through which they can share ideas, information, concerns and emerging issues
- to provide a meeting and activity space for community use.

The centre should be able to provide the following services in order to achieve the above aims:

- photocopying, internet surfing, basic computer education, broadband internet connection, scanning and digital photo services, among others
- education services/resources to teachers and students
- training on any topic of individual or community interest
- library services – information in printed form to be collected from research institutes, other libraries, successful community members, individuals, NGOs, government publications and reports, newspapers, websites, radio and television, among others. This collected information should then be sorted out and repackaged in appropriate formats and made available for use by the community members.
- internet services for community members to surf the web. Information should be downloaded from the internet, repackaged and disseminated to users using ICTs such as mobile phones. The internet could be used by the following groups of people:
  - teachers and students to enhance their knowledge;
  - educated youths to search for jobs;
  - business entrepreneurs to get information about prices, markets, credit facilities as well as gain new business skills such as record keeping and developing products and services, product design and quality standards;
  - community members to have access to government information and services thus enhancing e-governance. This will create an enlightened population. When leaders know that they are dealing with a population that knows its rights and responsibilities, they become responsible in their activities because they know that they can be held responsible. LIVE parliamentary sessions can be shown in these centres.
- online links to experts on matters such as education, agriculture, health and business, among others. These can be consulted online and the information obtained communicated to community members on demand through cell phones.

- a television and equipment for cable television to receive national and international programs. Television programs relevant to the community to be recorded, repackaged and disseminated when demanded. Because television programs are broadcast in national languages, experts can be sought to translate them into local languages. They can then be stored for future use.
- community radio services where relevant programs can be aired in the community local language
- training services on the use of computers and other information technologies – basic computer courses such as word-processing and database management, among others, can be provided to community members across the board

Having said all the above, it will be safe to conclude that ICT is the most appropriate tool for disseminating information at the village level, and in this regard, ICT centres can play a vital role in providing information to every individual.

6.4.12 Framework for poverty reduction using ICTs in the rural areas

One of the objectives of this study was to propose a framework or model for improving access and utilization of ICTs by rural communities in Uasin Gishu so as to reduce poverty. The framework will focus on key issues that came up in the research, especially those that posed challenging situations. To start with, this research established that the government has the biggest role to play in the access and use of ICTs for poverty reduction in the rural areas. The government recognizes that information and knowledge are at the core of human progress, endeavour and well being and that ICTs are creating immense impact on the way services are delivered. So the approach to poverty reduction should start with the government acknowledging its role as a major employer and user of ICTs. With this kind of commitment in place, it will lead to studying the rural populations to determine the kind of information that they need and infrastructure development that will be required to achieve widespread poverty reduction (such as liberalization of the communications sector) through local access combined with suitable methods to ensure that access is used to the best effect. The government commitment will also see the government encouraging institutional reforms leading to the delivery of

services capable of exploiting the infrastructure. These services will then be directed to the poor that need them.

Other important components of this framework include: ICT policies, development strategies, local access, information infrastructure, institutions, specific services, information channels and information users. ICT policies are important as they lay ground on which issues of ICTs are anchored. These policies will be concerned with ICT production, access and use, and directly address the causes of poverty. Kenya has an ICT policy that outlines the importance of ICTs for economic growth, increase in productivity and improvement of people's quality of life. This is indeed a positive step towards harnessing the potential of ICTs. It spells out priority goals and objectives that will harness the potential of ICTs to improve living standards of Kenyans. It does not however zero in on the rural areas, a fact that this thesis strongly recommends in this framework.

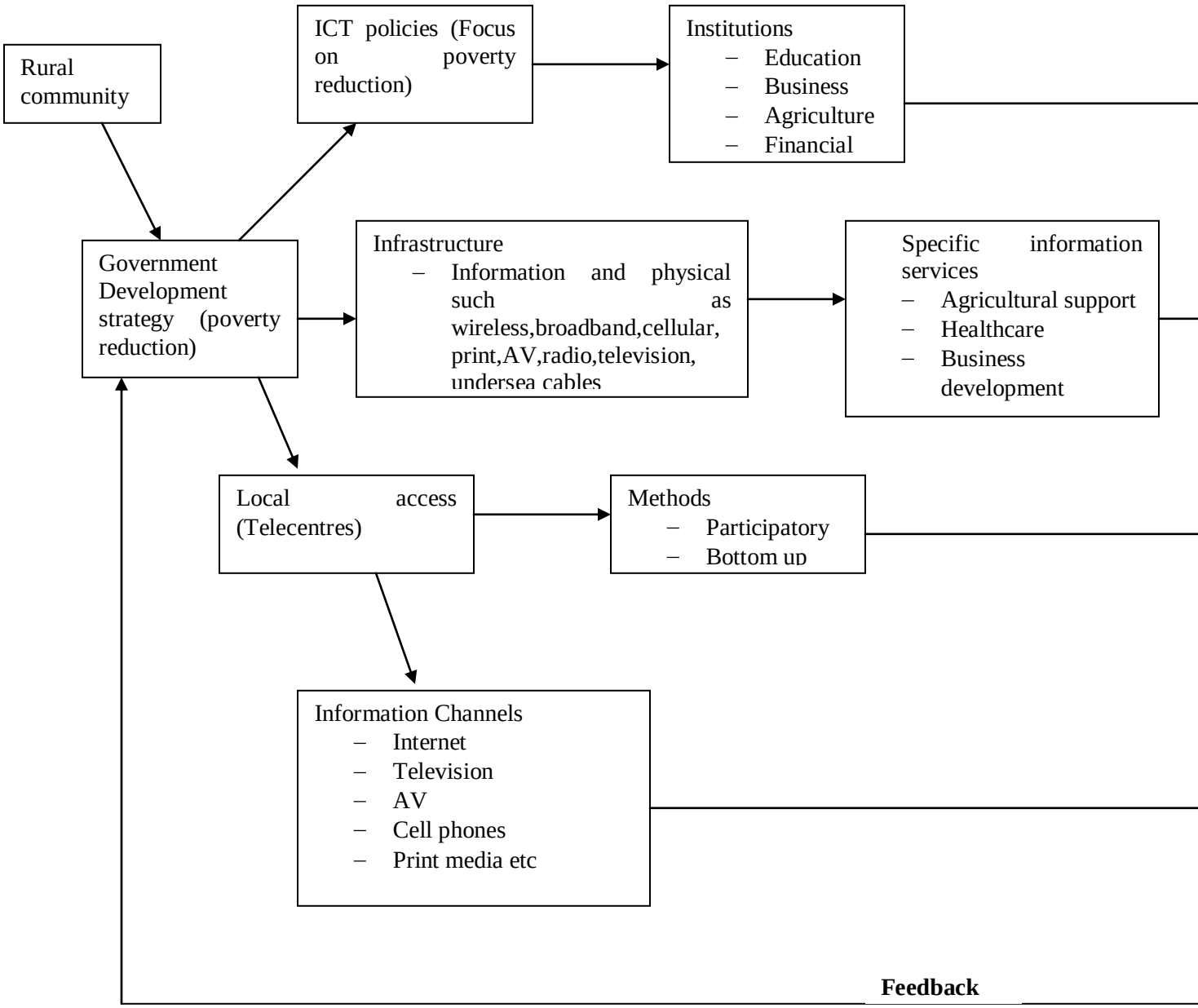
Development strategies, another component of the framework, will articulate how poverty reduction will occur specifically such as through enterprise development and health awareness campaigns, among others, with a focus on what the rural populations have indicated that they want. Most development strategies start from the government down to the citizen. However, this framework recommends a bottom – up approach, that is, from the citizens to the government.

On local access, the government should lay down modalities for access. Access to ICTs is very important to ensure proper utilization of the same. This access therefore has got to be planned, organized and well managed. Many ICT scholars (such as Jensen 2003, Kiplang'at 2001 and Annam 2002) have recommended the creation of community telecentres (which have been covered in section 6.4.11), which will be very much applicable in the current area of study to facilitate access. Local access can also be facilitated in established set-ups such as schools, libraries and any other development centres.

The other component is information infrastructure, which should deal with the diffusion of telecommunication services to rural areas of Uasin Gishu. As was noted in the study, some areas of Uasin Gishu are not served with the major telecommunication networks and are hence locked out of the country's communication grid. This of course hinders efforts to alleviate poverty using ICTs. The convergence of media is good news as it opens up new forms of information delivery that are complimentary to information flows, such as radio and television, without rendering them obsolete. The current phone calls to local radio stations in Uasin Gishu and the country as well, are just but an example of such convergence. Therefore, as has been mentioned earlier in this section, policies have to capture methods of communication that are bottom-up and demand-driven for development to effectively occur. Development that is demand-driven has a greater likelihood of achieving its aims and objectives.

Institutions such as agricultural enterprises, education, health, commerce and enterprise development, among others, are other components in this framework. These have to change the way they deliver services to the rural areas of Uasin Gishu if significant returns from ICTs are to be realized. Financial institutions and mobile phone companies have acknowledged that the masses live in the rural areas and their potential in revenue collection is immense. That is why Harris (2004) argues that if new technology is used merely as a substitute for old technology, without affecting existing patterns of behaviour, organization and relationship management, then sub-optimal outcomes can be expected. The people for whom services are intended should be specifically targeted for optimum outcomes to be expected, and this adds an important component, namely, specific services, to the framework.

Figure 2: <u>Proposed model of improving access and utilization of ICTs in Rural Areas to reduce poverty.</u>



It is clear from the model that using ICTs to reduce poverty is not a straight forward affair. It involves both local and national entities, each of which has an important role to play. It also shows that poverty reduction has to be strategized before ICTs are implemented, the telecommunication sector and institutions have to be transformed, public access laws have to be implemented and appropriate approaches of involving people have to be developed. In other words, because poverty is multi-dimensional, efforts to tackle it have got to be multi-dimensional too. In this way, Kenya will be moving towards securing a place in the information superhighway.

6.5 Areas for further research

The study investigated the use of ICTs in the provision of information for rural poverty reduction in the rural areas of Uasin Gishu and provided a framework of improving their use. The research revealed that indeed ICTs are important tools in the provision of relevant and up-to-date information that would go a long way to improve the livelihoods of people in the rural areas. The researcher therefore feels that similar studies should be carried out in all the rural areas of Kenya in order to develop national strategies and initiatives that would improve the provision of information in the rural areas.

The study also established that access and use of ICTs is affected by variables such as gender, educational level, income levels and age. These different groups have different information needs and preferences for different types of ICTs. The researcher therefore suggests that similar studies be carried out focusing on these variables. Such a study could focus on both the rural and urban areas, providing findings that could have a national outlook. Such a research based on real experiences is needed to better understand and measure the national economic impact of ICTs on poverty reduction and wealth production.

6.6 Achievement of the research

The study was important because it has stressed the importance of ICTs in rural poverty reduction. The main highlights included rural information needs, sources of information, available ICTs, their access and use, challenges and framework for improvement. In the

light of the findings of this research, one can affirm that ICTs can actually contribute to improving the living standards of the populations in the rural areas. They can be major tools for poverty reduction and wealth creation in the rural areas as well as economic development. The mobile phone is especially the technology of development in the rural areas.

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APPENDICES

INTERVIEW SCHEDULE FOR RURAL POPULATION

SECTION ONE:

a) Personal data

1. What is your position in society?

Opinion leader/traditional leader	( )
Youth leader	( )
Teacher/educator	( )
Women group leader	( )
Farmer	( )
Community Development Worker	( )
Agricultural Extension Officer	( )
Student	( )
Traditional healer/practitioner	( )
Business man/woman	( )
Religious worker	( )
Other (please specify)	( )

2. What is your age?

Below 20 years	( )
21 – 30	( )
31 – 40	( )
41 – 50	( )
Over 50 years	( )

3. Gender? Male ( ) Female ( )

4. a) What is your marital status? Single ( ) Married ( )
   Divorced ( ) Widowed ( )
   Any other (please specify)

b) How many children do you have?

5. a) What is your highest level of schooling?

   b) Can you read and write?

6. What languages do you speak?

7. In what language would you like the information to be presented to you? Why?

b) Household data

1. What is your role in the household?
   Head of the household
   Spouse
   Other, specify

2. How many people live in your household?

3. How many of these are
   Dependant on you for financial support
   Supporting you in cash or kind

4. To what extent does your family depend on support from family members living elsewhere?

5. What are your household's principal sources of income in order of importance?

6. Which of the following animals do you own?
   Cattle
   Sheep

Goats

Poultry

Others (please specify)

SECTION TWO

Information needs

1. What are your daily activities?
2. a) Do you need information to undertake the above activities?

   Yes ( ) No ( )

   If the answer is yes, what kind of information do you need? Do you always get this kind of information?

   If No, why? Please explain

   b) Where do you get the information you need from? How much time do you spend to get this information?

   How much money (if any) do you spend to get this information?

   c) Indicate whether the above sources of information are able to satisfy your needs or not, giving reasons for your answer.

   d) What kind of information needs are the sources not able to provide for/satisfy?

   e) What do you do when your information needs are not satisfied?

   f) Comment on the appropriateness of the way the information is presented to you in the sources of information that you consult?

SECTION THREE

Access and use of ICTs

(The researcher shall explain to the interviewee what ICTs are at this point and ask specific questions on individual ICTs)

1. a) Radio

i) Do you own a radio? If No, why?

ii) Do you listen to radio programmes? If yes, which ones? If no, why don't you listen to the radio programmes?

iii) Do these programmes provide you with the information you need? If no, which information are they not able to provide?

iv) Are these programmes aired at the right time?

v) Are you comfortable with the way the information is presented? Explain

vi) If No, how would you want it presented?

b) Television

i) Do you own a television set?

ii) Do you watch televised programmes? If yes, which ones? If no, why don't you watch televised programmes?

iii) Do these programmes provide you with the information you need? If no, which information are they not able to provide?

iv) Are these programmes aired at the right time?

v) Are you comfortable with the way the information is presented? Explain

vi) If No, how would you want it presented?

c) Computer

i) Do you know what a computer is?

ii) If yes, do you own one? Are you aware of its use?

iii) Do you use it to get the information you want? Which information?

iv) If no, which information is it not able to provide?

v) Are you comfortable with the way the information is presented? Explain

vi) If No, how would you want it presented?

d) Telephone

i) Do you own a mobile phone? If no, why?

ii) Do you use it to get the information you want? If yes, which information? If no, which information is it not able to provide?

iii) If you don't use a mobile, why is this so?

iv) Do you have a landline/fixed line?

v) Is there any public telephone around where you live?

vi) Is there a community telecentre in your locality?

vii) If yes, do you use the services of the centre?

viii) If no, why don't you use the services offered by the centre?

ix) If yes, what kind of information is available at the centre?

x) Is this information able to meet/satisfy your information needs? If no, why?

xi) Are you comfortable with the way the information is presented? Explain

xii) If No, how would you want it presented?

2. a) How do you rate the ICTs in question 1 above as providers of needed information?

b) What are your reasons for such a rating?

c). How affordable/or not affordable are the ICTs in question 1?

3. Explain the extent to which the use of ICTs has benefited you or not.

4. In what areas do you think ICTs will serve you best? (Explain each response given)

5. Which factors hinder you from effectively utilizing available ICTs?

6. What can be done to ensure that the potential role of ICTs is fully realized?

INTERVIEW SCHEDULE FOR KEY INFORMANTS

SECTION 1

Personal information

1. What is your designation?

Agricultural Officer

Education Officer

Administrator

Social worker

Health Officer

Business Officer

2. What institution/department are you affiliated to?

3. What are your responsibilities in the community you work for?

4. Who are your clients?

SECTION 2

Information dissemination and utilization of ICTs

1.a) What kind of information do you provide to the community?

b) How do you decide on which information to communicate to the community?

2. Does the community know the kind of information you provide?

3. a) Do the community members come to you for information?

b) If yes, who mostly come for this information?

Men

Women

c) How often do they come for information?

4a) In what format do you provide the information to them?

Oral

Print

Electronic

Audio Visual

Others (please specify)

b) Is this format appropriate to your clients?

c) If no, what format do they prefer?

d) Why do they prefer this format?

5. a) Is the information able to satisfy their needs?

b) If no, why?

c) What areas are you not able to satisfy and why?

d) What do you do when you have areas that you are not able to satisfy?

e) which sources of information do you consult in (d) above?

6. a) What methods of communication do you use to disseminate information to the community?

b) Is this method(s) satisfactory?

c) If no, which ones would you recommend?

7.a) In what language do you disseminate information to the community?

English

Kiswahili

Kalenjin

Others (please specify)

b) Is the language of communication that you use in (a) above appropriate? If not, what do you do in such a case?

8. a) Do you have the following ICTs - radios, television, computers and telephones in your office? b) Do they provide you with the information you need to carry out your day to day activities?

c) Do you use the above ICTs to disseminate information to the community? If yes, which ones? d)How effective are they in disseminating information?

e) If no, why? Please explain

9. a) What were the most serious information related problems you faced before you had access to ICTs?

b) Have these problems been solved with the use of ICTs?

c) Do you feel that computers/mobile phones can be used to solve problems that this community has?

10. What problems do you encounter in using ICTs to disseminate information to the community?

11. Would you like the government to put up a community internet centre – otherwise known as telecentre in this community? Why?

12. What other measures should be taken to improve the application and use of ICTs in the provision of information to the rural community of Uasin Gishu District?

RATIBA YA MAHOJIANO

RATIBA YA MAHOJIANO KWA WATU WA MASHAMBANI
SEHEMU YA KWANZA:
a) Data za kibinafsi

8. Nini cheo chake katika jamii?

Kiongozi wa maoni/kitamaduni	( )
Kiongozi wa vijana	( )
Mwalimu/mtaalamu	( )
Kiongozi wa kundi la wanawake	( )
Mkulima	( )
Mfanya kazi wa Maendeleo ya Kijamii	( )
Afisa wa Uenezaji wa Kilimo	( )
Mwanafunzi	( )
Mganga wa kiasili	( )
Mfanya biashara	( )
Mfanyakazi wa kidini	( )
Mwingine (bainisha tafadhali)	( )

9. Una miaka mingapi?

Chini ya miaka 20	( )
21 – 30	( )
31 – 40	( )
41 – 50	( )
Zaidi ya miaka 50	( )

10. Jinsia? Mume ( ) Mke ( )

11. a) Nini hali yako kindoa? Sijao/sijaolewa ( ) Nimeoa/nimeolewa ( )
Nimetaliki/talikiwa ( ) Ni mjane ( )
Nyingine (tafadhali bainisha)

b) Una watoto wangapi?

12. a) Ni nini kiwango chako cha juu cha elimu?

b) Unaweza kusoma na kuandika?

13. Unazungumza lugha zipi?

14. Ungependa kupokea habari katika lugha gani? Kwa nini?

b) Habari kuhusu nyumba yako

1. Nini nafasi yako katika nyumba yako?

Kiongozi wa nyumba yako
Mume/mke
Mwingine, bainisha

2. Ni watu wangapi wanaishi katika nyumba yako?

3. Ni wangapi
Wanategemea usaidizi wako kifedha

Hukusaidia kifedha au vyo vyote vile

4. Ni kwa kiasi gani familia yako inategemea usaidizi kutoka kwa watu wa familia yako wanaoishi kwingineko?

5. Orodhesha vianzo vikubwa vya pato la nyumba yako kwa kuanzia vililvyo muhimu zaidi hadi vile vya chini.

6. Unamiliki wanyama gani kati ya hawa wafuatao?
Ngómbe ----------
Kondoo ----------
Mbuzi ----------
Kuku ----------
Wengine (bainisha tafadhali) ----------

SEHEMU YA PILI
Habari za mahitaji

3. Nini shughuli zako za kila siku?

4. a) Je, huwa unahitaji habari ili utekeleze shughuli ulizotaja hapo juu?
Ndio ( ) La ( )

Iwapo jibu lako ni **Ndio**, unahitaji habari za aina gani? Je, unapata habari hizo kila wakati?

Iwapo jibu ni **La**, nini sababu za hali hiyo? Tafadhali eleza

b) Unapata habari unazotaka kutoka wapi? Unatumia muda kiasi gani ili kupata habari hizi?

Unatumia kiasi gani cha pesa (iwapo unatumia) ili kuzipata habari hizi?

c) Eleza iwapo vianzo vya habari ulivyotaja hapo juu vinatosheleza mahitaji yako au la, huku ukitoa sababu kwa jibu lako.

d) Ni aina gani za habari hazitoshelezwi na vianzo hivyo?

e) Unafanya nini wakati ambapo mahitaji yako ya habari hayatoshelezwi?

f) Toa maoni yako kuhusu ufaafu wa jinsi habari inavyowasilishwa kwako katika vianzo vya habari unavyovirejelea?

SEHEMU YA TATU
Upatikanaji na utumiaji wa TEKNOHAMA
(Mtafiti atamweleza mtafitiwa katika hatua hii maana ya TEKNOHAMA na kuuliza maswali mahsusi kuhusu TEKNOHAMA)

1. a) Redio

) Je, unamiliki redio? Iwapo jibu ni **La,** kwa nini?
ii) Je, unasikiliza vipindi vya redio? Iwapo jibu ni **La,** ni kwa nini?
iii) Je, vipindi hivi (vya redio) hukupa habari unazozihitaji? Iwapo jibu ni **La,** ni habari gani huzipati?
iv) Je, vipindi hivi vinapeperushwa katika wakati unaofaa?
v) Je, unaridhika na jinsi habari hizi zinawasilishwa? Eleza.
vi) Iwapo jibu ni **La**, ungependa ziwasilishwe vipi?

b) Televisheni
i) Je, unamiliki kisanduku cha televisheni?
ii) Je, unatazama vipindi vya televisheni? Iwapo jibu ni **Ndio,** ni vipindi gani? Iwapo ni **La,** ni kwa nini hutazami vipindi vya televisheni?
iii) Je, vipindi hivi hukupa habari unazozihitaji? Iwapo ni **La,** ni habari gani hazitolewi?
iv) Je, vipindi hivi vinapeperushwa katika wakati unaokufaa?
v) Je, unaridhika na jinsi habari zinawasilishwa? Eleza.
vi) Iwapo ni **La,** ungependa ziwasilishwe namna gani?

c) Kompyuta
i) Je, unajua kompyuta ni nini?
ii) Iwapo ndio, je, unamiliki kompyuta? Je, unaelewa matumizi yake ni nini?
iii) Je, unaitumia kupata habari unazozihitaji? Hizo ni habari zipi?
iv) Iwapo ni **La,** ni habari gani haiwezi kukupatia?
v) Je, unaridhika na jinsi habari inavyowasilishwa? Eleza.
vi) Iwapo ni **La,** ungependa habari hiyo iwasilishwe vipi?

d) Simu
i) Je, unamiliki simu? Iwapo jibu ni **La,** kwa nini?
ii) Unaitumia kupata habari unazohitaji? Iwapo jibu ni **Ndio,** hizo ni habari gani? Iwapo ni **La,** ni habari gani huzipati?
iii) Iwapo hutumii simu ya mkononi, ni kwa nini huitumii?
iv) Je, una simu isiyo ya mkononi?
v) Je, kuna simu simu ya umma karibu na unakoisihi?

vi) Je, kuna kituo cha kijamii cha simu katika eneo lako unakoishi?
vii) Iwapo ni **Ndio,** je unatumia huduma za kituo hicho?
viii) Iwapo ni **La,** kwa nini hutumii huduma za kituo hicho?
ix) Iwapo ni **Ndio,** ni habari za aina gani hupatikana katika kituo hicho?
x) Je, habari hizi zinatimiza mahitaji yako ya habari? Iwapo ni **La,** kwa nini?
xi) Je, unaridhika na jinsi habari zinavyowasilishwa? Eleza.
xii) Iwapo ni **La,** ungependa iwasilishwe vipi?

2. a) Unakadiria vipi ufaafu wa TEKNOHAMA katika Swali la 1 hapo juu kama vitoa habari zinazohitajika?

b) Una sababu gani kwa ukadiriaji wako wa hapo juu?

c). Je, TEKNOHAMA katika Swali la 1 zinamudika au hazimudiki kwa kiasi gani?

3. Eleza ni kwa kiasi gani TEKNOHAMA zimekufaidi au hazijakufaidi

4. Unafikiri TEKNOHAMA zinaweza kukuhudumia vilivyo katika maeneo gani? (Eleza kila jibu ulilolitoa)

5. Ni sababu gani zinakuzuia kutumia kikamilifu TEKNOHAMA zilizopo?

6. Nini kinaweza kufanywa ili kuhakikisha kuwa nafasi iliyopo ya TEKNOHAMA inatumiwa vilivyo?

RATIBA YA MAHOJIANO KWA VIJUMBE WATOA HABARI WA KIMSINGI

Sehemu ya 1.

Habari za kibinafsi

1. Nini cheo chako?
   - Afisa wa Kilimo
   - Afisa wa Elimu
   - Afisa wa Utawala
   - Mfanyi kazi wa Kijamii
   - Afisa wa Afya
   - Afisa wa Biashara
2. Unatumikia taasisi/idara gani?
3. Nini majukumu yako katika jamii unayoihudumia?
4. Ni nani wateja wako?

Sehemu ya 2.

Usambazaji na utumiaji wa TEKNOHAMA

1.a) Unatoa habari za aina gani kwa jamii?
   b) Unaamua vipi kuhusu habari unazozitoa kwa jamii?

2. Je, jamii inajua aina ya habari unazozitoa?

3. a) Je, wanajamii hukujia ili kutafuta habari?
b) Iwapo jibu ni **Ndio,** ni nani aghalabu huja kwako?
   - Wanaume
   - Wanawake

c) Ni mara ngapi wanakuja kutafuta habari?

4a) Unaitoa habari kwao kwa muundo gani?
   - Kimazungumzo
   - Kimaandishi
   - Kielektroniki
   - Kusikika na kuonekana
   - Vinginevyo (bainisha tafadhali)

   b) Je, muundo huu unawafaa wateja wako?
   c) Iwapo jibu ni **La,** wanapendelea muundo gani?
   d) Kwa nini wanaupendelea muundo huu?

5. a) Je, habari hiyo inaridhisha mahitaji yao?
   b) Iwapo jibu ni **La,** kwa nini?
   c) Ni maeneo gani ya mahitaji yao huyaridhishi na kwa nini?
   d) Unafanya nini wakati ambapo una maeneo ambayo huwezi kuyaridhisha?
   e) Unarejelea vianzo gani vya habari kwa ajili ya (d) hapo juu?

6. a) Unatumia mbinu gani za mawasiliano ili kusambaza habari kwa jamii?

b) Je, mbinu hii (hizi) zinafaa?
c) Iwapo jibu ni **La,** ungependekeza mbinu gani?

7.a) Unawasilisha habari kwa lugha kwa jamii?
Kiingereza
Kiswahili
Kikalenjin
Nyingine (Tafadhali bainisha)
b) Je, lugha ya mawasiliano unayoitumia katika (a) hapo juu inafaa? Iwapo jibu ni **La,** unafanya nini katika hali hiyo?

8. a) Je, una TEKNOHAMA zifuatazo katika ofisi yako – redio, visanduku vya televisheni, kompyuta na simu? b) Je, vinakupa habari unayohitaji ili kutekeleza shughuli zako za kila siku?
c) Je, unatumia TEKNOHAMA za hapo juu kwa jamii? Iwapo jibu ni **Ndio,** ni zipi hizo?
(d) Zinakufaa vipi katika kusambaza habari?
e) Iwapo jibu ni **La,** kwa nini. Tafadhali eleza.

9. a) Ulikumbana na shida gani kubwa zinazohusiana na habari kabla hujapata TEKNOHAMA?
b) Je, shida hizi zimesuluhishwa kwa matumizi ya TEKNOHAMA?
c) Unahisi kwamba kompyuta/simu za mkononi zinaweza kutumiwa kusulushisha matatizo katika jamii hii?

10. Unakumbana na matatizo gani unapotumia TEKNOHAMA ili kusambaza habari kwa jamii?

11. Ungependa serikali ianzishe kituo cha kijami cha mtandao – ambacho kinaitwa kituo cha simu (telesenta) katika jamii hii? Kwa nini?

12. Ni hatua gani zaidi zinahitaji kuchukuliwa ili kuboresha utekelezaji na matumizi ya TEKNOHAMA katika kutoa habari kwa jamii ya vijijini mashambani ya Wilaya Uasin Gishu?