THE EFFECTIVENESS OF TELECENTERS IN RURAL DEVELOPMENT: A CASE OF SEGA SILICON VALLEY TELECENTER IN KENYA

by

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THE EFFECTIVENESS OF TELECENTERS IN RURAL DEVELOPMENT: A CASE OF SEGA SILICON VALLEY TELECENTER IN KENYA

I declare that this thesis is my original work and has not been submitted to any other college or university for academic credit.

Signed:____________________________ Date:__________________

Beatrice Awuor Ouma
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<tr>
<td>CCK</td>
<td>Communications Commission of Kenya</td>
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<td>DVP</td>
<td>Digital Villages Project</td>
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<tr>
<td>ECD</td>
<td>Early Childhood Development</td>
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<tr>
<td>EPZ</td>
<td>Kenya Export Processing Zones Authority</td>
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<td>EITO</td>
<td>European Information Technology Observatory</td>
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<td>FGDs</td>
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<td>ICT</td>
<td>Information and Communication Technologies</td>
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<td>ICT4D</td>
<td>Information and Communication Technologies for Development</td>
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<td>IDRC</td>
<td>International Development Research Centre</td>
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<td>ISPs</td>
<td>Internet Service Providers</td>
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<td>IT</td>
<td>Information Technology</td>
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<td>International Telecommunications Union</td>
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<td>JAB</td>
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<td>KRA</td>
<td>Kenya Revenue Authority</td>
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<tr>
<td>PIN</td>
<td>Personal Identification Number</td>
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<td>SSV</td>
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ABSTRACT

Information and Communication Technologies (ICTs) are seen as important resources in enabling millions of people in rural areas participate in their development while bridging the global digital divide (Rogers & Shukla, 2001). Since most of these people in the rural areas are unlikely ever to own their own computers, access to ICTs is increasingly being enabled through community telecenters which are viewed as community resources that offer access to information and other services that community members need to make informed decisions to improve their livelihoods. The telecenter model is increasingly being championed in the developing countries by governments, donor agencies and NGOs who see their potential in generating rural development while affording marginalized communities the opportunity to enjoy the benefits of the information revolution (Parkinson, 2005). But relatively little is known about how rural communities benefit from telecenter projects and whether information accessed through telecenters impact on their lives and livelihoods. The Government, donors, NGOs and private sector actors are investing in community telecenters while basic needs such as food, health, clean water, and education still remain a big challenge in the rural areas.

The study was modelled on the following objectives; one, it seeks to find out the type and relevance of information being accessed by users from Sega Silicon Valley Telecenter. The study also set to find out whether information obtained from the Telecenter lead to changes in decision making, to improve people’s welfare as well as investigate the flow of information from telecenters to community networks. Finally, the study looked at the prospects of telecenters in rural development and made appropriate recommendations for telecenter development in Kenya.
The study was based on a field work carried out in Sega Silicon Valley Telecenter through evaluative and descriptive research designs and used both quantitative and qualitative methodologies.
CHAPTER ONE
INTRODUCTION AND BACKGROUND TO THE STUDY

Introduction

McLellan (1998) once said that even if a woman in a village has access to the internet, she will not necessarily be able to use the information to improve her child’s health because “trying to get information from the internet is like drinking from a firehose- you don’t even know what the source of the water is.” The argument here is that Information and Communication Technologies (ICTs) are not necessarily about equipping a community with fancy computers, or providing them with access to the internet but it is how that information is translated into meaningful knowledge to meet their daily needs. It is about relevance, trustworthiness and practicality of that information to the users. As Colle & Roman (2002) put it, it’s about information and communication. This means that for ICT projects in the rural areas to be successful in alleviating poverty and developing the rural economy, there must be an information system where content generated from the ICT projects feed into the community networks which are then translated into actionable practices to improve the development initiatives in the rural areas.

This study looked at the effectiveness of ICT projects in development in the rural setting. The study focused on community knowledge centers, popularly known as telecenters set up in rural villages to enable the rural population access information for development. The study also looked at the relevance of information accessed through these community telecenters in meeting the population’s development needs as well as the flow of information right from the telecenter to the illiterate woman who is trying to find medicine for her sick child or the farmer worried about disease attacks such as striga on his maize plantation. The focus of the study was Sega Silicon Valley Telecenter, an ambitious project that is meant to be
a communication nerve center for Sega village, enabling community members to access information that they can use to improve their livelihoods and participate in their own development.

Background to the Study

The information gap in rural communities has largely been associated with endemic underdevelopment in most developing countries. Lack of access to information and communication (ICT) services have impacted adversely on these rural communities which cannot access information to uplift themselves socially, economically and politically (Rodriguez, 2007). The potential of ICTs for development has therefore largely been welcomed in the developing nations and even though many of them are still struggling with the provision of basic services like clean water and electricity, governments and development agents in these countries are increasingly looking to ICT to improve social and economic development needs of the people (Shih, Kraemer, & Dedrick, 2008; Walsham, Robey, & Sahay, 2007). The underlying assumption is that with access to basic ICT services and the Internet, these communities can access newer agricultural technologies to enable them move out subsistence farming to commercial farming, better healthcare and nutrition advice that is available online will enable them to and rural classrooms can instantly be connected to interactive online educational curriculums around the world. This will greatly transform the rural economy and improve livelihoods of the community members.

The telecenter model is one of the strategies being embraced and encouraged as an innovative ICT project that will bridge the information gap by providing public access to computers, the Internet, and other communication technologies as well as building the capacity of the rural population to stimulate the development of rural economy.
Telecenters for Development

There have been many attempts to define Telecentres. Some people see them as information *kiosks* with a mix of ICT tools such as radio, photocopier, telephone, fax and Internet connection. Gomez & Hunt (1999) define a telecenter as “a physical space that provides public access to ICTs for educational, personal, social and economic development” (p. 17). A simpler definition is provided by Proenza, Bastidas-Buch & Montero (2001) who say it is a “shared site that provides public access to information and communications technologies” (p.2). A basic telecenter in most developing countries usually consists of premises stocked with several computer terminals and simple furnishings consisting of chairs or classroom desks for users and regular desks or tables on which the terminals sit. The main service offered to the public is access to the Internet (chatting, e-mail and Web browsing) and often also, elementary software (word processing, spreadsheet.)

Telecenters are not a particularly new phenomenon (Bailur, 2007). In fact, Roman & Colle (2002) report that the idea of a community sharing computer technology emerged as early as the 1980s with the introduction of the telecottage in Scandinavia. The initial purpose of telecottages was to fight against marginalization of remote rural places in the information society. Telecenters can therefore be said to be improved versions of the telecottages equipped with better technologies including mobile money transfer, scanning, printing and photocopying services and information provision to the community members.

However, telecenters have been at the heart of ICT for development (ICT4D) when the euphoria of its potentials peaked around the millennium which saw more than one hundred donors funding ICT and development projects with some billions of U.S. dollars worth of investment poured into telecenter projects (Wakelin & Shadrach, 2001). Many leading agencies for example Canada’s International Development Research Centre (IDRC), UNESCO, WHO, USAID rolled out telecenter programs around Africa, Asia and Latin
The common belief was that they bridged the digital divide while helping people to build up social capital, increase social mobility, and improve their livelihood. Telecenters are thought to provide opportunities for access to information by overcoming the barriers of distance and location. By facilitating access to information and communication, telecenters have the potential to foster social cohesion and interaction (Young, Ridley & Ridley, 2001).

In recent years, telecenters have gained prominence as the primary instruments for bringing the benefits of ICTs to poor communities where technological infrastructure is inadequate and the costs of individual access to these technologies are relatively high. A report by IDRC indicates that hundreds of rural telecenter projects now exist worldwide with the explicit aim of providing benefits of social and economic development (e.g. ICT literacy and training, access to indirect medical services, information exchange to improve job creation to name a few) (Whyte, 2000). Telecenters are based on the premise that connectivity (a technical construct) as well as direct access (a more economic, social, and psychological construct) to information will lead to empowerment, capacity building, and, thereby, “development” (Whyte, 2000; Roman & Colle 2002).

Telecenter Development in Kenya: A Brief History

Ndeta (2003) states that there is little literature on the use and development of ICT in Kenya. According to a study by the African Connection Centre for Strategic Planning, Kenya still faces hurdles in its telecommunications sector and the penetration of the internet in rural areas is still very low (Dymond & Oestmann, 2003). Access to ICT remains a major challenge especially in the urban poor, rural and remote areas where the majority of the population lives. Citizens and businesses in these areas still continue to be marginalized and denied access to essential services (Mitullah & Waema, 2005). The concept of telecenter has
been used by Non-Governmental Organisations such as Arid Lands Information Network (ALIN). The NGO has been running a number of Maarifa centers (Swahili for knowledge centers) among arid lands communities in Kenya. More recently, Government initiatives, non-governmental organisations efforts, or partnership with private sectors has seen the rise of community telecenters in urban slums and rural areas to promote connectivity, access, capacity building and local content creation. A telecentre in Kenya is described by Jensen and Esterhuysen, (2001) as micro and mini telecentres as opposed to what is found in developed countries. In 2001 through its Poverty Reduction Strategy Paper for 2001-2003, the Kenya government recognised the importance of telecommunication, information services, and IT sectors as important drivers of economic growth. In 2007, President Mwai Kibaki established the Kenya ICT Board as a state corporation under the State Corporations Act Cap. 446. Among the notable objectives of the Kenya ICT Board included increasing access to ICT services especially by rural communities. In 2009, Kenya through the ICT Board launched a series of “electronic centres” which are called Pasha Centres (Swahili for information dissemination centers). According to Hallberg, Kulecho,Kulecho, & Okoth (2009) these Kenyan digital villages are what normally other countries refer to as telecentres. Pasha Centres are hubs that provide a host of services to the public via computers connected to the internet, or by using and marketing other ICT-enabled applications. Their main role is to provide Kenyans in rural areas with access to a world of information in a community-focused format that is self-sufficient (Pasha, n.d).

The Role of Kenya Telecenters Network (KENTEL)

Many of the telecenters in Kenya are under one umbrella organization called Kenya Telecenter Network (KenTel). KenTel was formed in February 2007 with the aim of establishing a national network for different models of telecentres and sharing of best
practices while coordinating individual efforts. While KenTel was founded by an international organisation, The Technical Centre for Agricultural and Rural Cooperation (CTA), supported by international donors such as IDRC, Telecenter.org, Microsoft, and the Kenya government, it seeks to provide majority of trainings for rural telecenter managers and staff in Kenya (KenTel, n.d).

Sega Silicon Valley Telecenter

Sega Silicon Valley (SSV) Telecenter is an ambitious project which is meant to transform Sega village, consisting of 7,836 inhabitants (Kenya National Bureau of Statistics, 2009) into a “Silicon Valley”, an African ICT emulating in a much smaller scale, the Silicon Valley in the US. The project is located in Ugenya District of Siaya County. The project was started in 2006 when Simba Friends Foundation, backed by funds received from the Polish Aid Program and administered by the Ministry of Foreign Affairs implemented its first African project, the renovation of Kogere Primary School in Sega, equipping it with state of the art computers. It was during this implementation that the community members began identifying other needs such as the need for ICTs to enable the community members and the schools nearby to access information related to education, agriculture, health and e-governance. The project has since grown providing services in the education sector through provision of Information Technology (IT) to schools; IT training; multimedia curriculum; and curriculum integration techniques for teachers. The project has an entrepreneurial wing which is meant to provide training for local businesses. Finally, it encourages community development by providing IT skills training for out-of-school youth and other community members; infrastructure enhancement of school buildings and other social services such as security services, extra-curricular activities for the youth (arts, sports, literature, linguistic
classes) that facilitate youth mobilization programs such as HIV and AIDS awareness campaigns and fight against drug abuse etc.

Problem Statement

Most developing countries are at the moment experiencing a process of *Informatization* described by Rogers (2000) as the process through which new communication technologies are being used as a means for furthering development as a nation moves towards an information society. The promise that these new communication technologies offer is being seen as the long awaited solution to broad, problematic issues that touch on the development of the general population such as agriculture, governance, health and social problems, especially in urban poor and rural areas. Most development projects in these areas are now geared towards fulfilling this promise and building communal facilities to provide electronic communication services in areas where the development of ICT is minimal or non-existent. The telecenter project is one of those initiatives being implemented in urban slums and rural areas to provide communal access to ICT services and afford the community members participation in development while bridging the digital divide. However, relatively little is known about how rural communities benefit from telecenter project services and whether information accessed through telecenters impact on their lives and livelihoods. Further, doubts have been cast over the effectiveness of telecenters by the communities in which they are situated particularly in the rural areas where a large number of the population remain illiterate. There have been reports on the underuse of the services offered by these telecenters, some of it attributed to information illiteracy of the targeted population and others to the relevance of the content being offered (Sey, 2008; UNDP, 2001). This research looked at whether telecenters contribute to rural development by providing community members with information and other ICT services to enhance their knowledge in areas such as
agriculture, health, governance and education. The community members can use that information to improve the way they engage in agricultural activities for better yields and higher income, take better care of their health, actively participate in governance issues and access good quality education through online curriculums.

Purpose of the Study

The purpose of this study was to find out the effectiveness of telecenters as instruments of rural development. The study examined how information accessed through community telecenters is translated into actionable strategies to uplift the livelihoods of rural community members.

Objectives of the Study

The overall objective of this study was to investigate whether telecenters are effective in rural development. Specific objectives included:

1. To find out the type and relevance of information being accessed by users from Sega Silicon Valley Telecenter.
2. To find out whether information obtained from the Telecenter lead to changes in decision making, to improve people’s welfare
3. Investigate the flow of information from telecenters to community networks.
4. Study the prospects of telecenters in rural development and make appropriate recommendations for telecenter development in Kenya.

Research Questions

This study sought to answer the following research questions:

1. What is the nature of access to information within the telecenter?
2. How relevant (i.e., useful and appropriate) are the services and content offered to community members and how well do they meet community needs?

3. In what ways does the telecenter lead to other community development initiatives?

4. How are the community members involved in the telecenter project?

Justification of the Study

Recent years have seen the establishment of telecenter projects by developing country governments and international development agents as instruments for bringing development to rural communities and urban slums. In 2009, the Kenya government launched a very ambitious project called the “Digital Villages” with an aim of encouraging new micro-enterprises by providing access to information, education and new markets in rural areas. This big project has the support of the World Bank which had planned to inject 10 million US dollars at the start combined with loans from local banks like Family Bank (Mutegi, 2011). Why is it that governments or donor agencies invest in telecenters in rural areas where access to basic human needs-food, health, clean water, and education still remain a big challenge and what benefits do the poor derive from these telecenters. This research has shed light into whether telecenters are able to deliver improvements in the lives of the rural communities as is envisioned by many development partners.

Significance of the Study

This study will inform further development of telecenters and ICT projects as the government, non-governmental organisations, private sector actors and donor community seek to strengthen ICT for development initiatives in rural Kenya. The study will also guide rural community members on how best to implement and make maximum use of telecenters for development initiatives. The study will also contribute to the knowledge already available
in studying the prospects of ICTs and development and as well, future researchers will be able to draw on the findings of this study to inform further researches on ICTs and development.

Assumptions

This research made the following assumptions:

1. The sponsors and management of Sega Silicon Valley were going to be receptive to the study and honestly give information related to the project to the researcher as well as embrace its findings.
2. All respondents were going to willingly participate in the research and give honest responses to questions asked.
3. The findings of the study will be well received to inform further developments of telecenter projects in Kenya.

Scope of the Study

This study focus was on Sega Silicon Valley (SSV) Telecenter in Siaya County in Kenya. The study involved the community members around the Telecenter. SSV was selected for its uniqueness and ambitions in trying to transform a rural village into a hub of communication activities to enable the community members develop themselves. The project provides unique services including its iSchool programme which is meant to bring the benefits of online and interactive educational curriculums to schools within the community. Its other unique programme is the Beehive which is a community portal that is meant to give local people access to information and resources on agriculture, financial management, jobs, education, health, and government issues. SSV seemed like a vibrant Telecenter which provided a good case point for a study like this one.
Limitations and Delimitations

As with most scientific studies, this study encountered some drawbacks including:

1. Difficulty (in terms of availability and distance) in accessing all respondents.
2. Dishonesty on the part of potential respondents for fear of being sidelined by the project if they give negative responses.
3. Lack of confidence on part of some respondents to contribute
4. Conducting follow-up discussions with some of the respondents since the researcher is not based in Sega.

The researcher proposed the following remedies to the above limitations:

1. The researcher used research assistants from the local community who have access to all potential respondents.
2. Respondents were assured of confidentiality.
3. For follow-up the researcher used mobile phones to contact respondents who have access to mobile phones.

Definition of Key Terms

*Telecenter*

Roman and Colle (2002) describe *telecenter* as a word loosely used to describe places that offer the public connectivity with computers and networks. This study has therefore borrowed from their concept of telecenter as a public place where people can get a variety of communication services, and where a major part of the operators’ purpose is to benefit the community. Thus this study uses the multi-purpose community telecenter approach suggested by the International Telecommunications Union (ITU) and others.

*Development*
Rogers (2000) defines development as a widely participatory process of social change in a society, intended to bring about both social and economic advancement, including greater equality, freedom, and other valued qualities, for the majority of the people through their gaining greater control over their environment.

Rural Development

According to Singh (2009) the term rural development connotes overall development of rural areas with a view to improve the quality of life of rural people. In this sense it is a comprehensive and multidimensional concept, and encompasses the development of agriculture and allied activities, village and cottage industries, crafts, socio-economic infrastructure, community services and facilities, and above all, the human resources in rural areas.

Empowerment

Empowerment is defined by the World Bank (2002) as the process of enhancing the capacity of individuals or groups to make choices and to transform those choices into desired actions and outcomes. Central to this process are actions which both build individual and collective assets, and improve the efficiency and fairness of the organizational and institutional context which govern the use of these assets. Lee (2005) defines it as the notion of people having the ability to understand and control themselves and their environments (including social, economic, and political factors), expanding their capabilities and horizons and elevating themselves to greater levels of achievement and satisfaction. Based on the above definitions, the working definition of empowerment in this study will be the ability of a people within a community to acquire information and technological skills through a telecenter to be able to make a positive change in their lives. The indicators for this form of development include higher agricultural yields, improved health, participation in governance and good quality education.
Community Networks

A community network is defined by Kranich (2001) as a locally based, locally driven communication and information system designed to enhance the community and enrich lives. In this study, community networks refer to members of the community who have been tasked with disseminating information to other members of the community especially those with literacy challenges.

Digital Villages

In Kenya, digital villages are referred to as Pasha Centres, meaning “to inform”, and are located in rural and resource-poor environments.

Summary

In summary, this section introduced the reader to the topic under study which is to understand how telecenters can be used as instruments of rural development. The researcher has provided background of the study by introducing concepts such as ICT projects for development and especially the telecenter, explaining its basic meaning and composition and its historical development. In this background it is quite clear that telecenters have long been accepted by development experts and the international community as good models for introducing ICT to places where there is little or no access to these technologies. The researcher has also introduced the main objectives under study and the research questions that the research will seek to answer. Other sections included in this chapter are the statement of the problem, purpose of the study, rational and significance of the study, underlying assumptions made by the researcher, the parameters of the study, potential limitations and their remedies and finally definitions of key terms. In the next chapter, the researcher reviews various literatures available on the area of study and draws a conceptual framework on which this study was based.
CHAPTER TWO
LITERATURE REVIEW

Introduction

Information and Communication Technology (ICT) projects for development have attracted interests of many researchers because of their huge potentials especially in bridging the digital gap between technologically advanced developed countries and the technologically challenged developing countries (Reitmaier, Schulz & Köhler, 2007). In this section, the researcher takes a critical look at available literature on the following concepts; the status of ICT in Kenya, the use of ICTs in rural development, public access to ICTs and telecenters as alternatives to providing access to ICTs to communities. The chapter also presents the theoretical foundation, a conceptual framework and an evaluation model upon which this study will be based.

The Status of ICT Development in Kenya

A look at available literature points to Kenya’s ICT sector as continuously growing, greatly influenced by global trends and with the liberalization of its telecommunications sector in 1999 (Tilvawala, Myers & Andrade, 2009; Communications Commission of Kenya, 2007). This growth, according to a report by the Kenya Export Processing Zones Authority is evaluated in terms of number of fixed and mobile telephone lines; the teledensity; the number of computers and services; Internet Service Providers (ISPs), the number of Internet users; broadcasting stations; and market share of each one of them (PKF Consulting, 2005). With more people now accessing electronic communications such as radio and television, Kenya is also experiencing an increase in internet usage especially in urban areas. In 2010, the International Telecommunication Union (2010) reported internet usage in Kenya to be at 9.7% of its total 38.6 million population (Kenya National Bureau of Statistics, 2009). In
2011, the Kenya ICT Board put the figure at 10.2 million users with 25.9% of the population now accessing internet (Kenya ICT Board, 2011). This represents an impressive leap on internet penetration from just 0.7% of the population when the millennium dawned (Miniwatts Marketing Group, 2008).

Since many people in Kenya do not have fixed phone lines, computers, or electricity, access to internet and email is mainly provided by commercial cyber cafes, found in the major towns. A report by the Kenya ICT Board (2011) indicates that unlike developed countries where the total number of connection vis-à-vis the number of users are evenly spread, in Kenya, there are lower numbers of connections but higher numbers of users indicating most connections are shared connections and largely comprise business connections (including publicly accessible connection like cyber cafes). There has also been a sharp increase in internet access through mobile phones targeting especially Kenya’s younger technology savvy generation who are increasingly using various social media such as Facebook and Twitter.

However the Government with support from private sector, donor community and non-governmental organizations is stepping up access to ICT and as a result there are several projects being put in place to promote the use of and investments in ICTs. In doing so, the Government hopes to bridge the digital divide, (Wims & Lawler, 2007) while achieving its National ICT Policy which it promulgated in 2006 with an aim of improving the livelihoods of Kenyans by ensuring availability of ICT (Waema, 2005). But the fastest growing and most popular ICT in Kenya still remains the mobile telephony with an estimated 24.9 million subscribers by 2008 (CCK, 2011). This has spurred the growth of industry supported businesses such as mobile money transfer and easy access to the internet.

However, the sector is still experiencing challenges in universal implementation due to lack of resources, national ICT infrastructure, and even electricity supply particularly in
rural areas. This means that majority of Kenya’s population are still locked out of ICT services (Mitullah & Waema, 2005). A report by Communications Commissions of Kenya (CCK) documents some of these challenges including high cost of internet usage, limited penetration of personal computers, inadequate local fixed line infrastructure, low disposable incomes, information illiteracy amongst others (CCK, 2007). As Kenya moves into the new information age, researchers are calling for more to be done in implementing effective ICT policies, research and building capacity to spur socio-economic development. Only then can the quality and efficiency of ICT in Kenya be achieved (Kandiri, 2006).

ICTs and Rural Development

Development agents have long highlighted the power that knowledge has in development and indeed a report by World Bank (1999) states that recognition of the importance of knowledge has gained momentum, and there is a renewed impetus to integrate knowledge into countries’ development strategies. Much of this knowledge has greatly been enhanced by Information and Communication Technologies (ICTs) which if harnessed effectively, can break down barriers of poverty (Chapman & Slaymaker, 2002). This is because ICTs represent tools for achieving development (UNDP, 2001).

Academic interest and awareness of the ICT and the development agenda has grown dramatically over the last three decades (Heeks, 2002). During this time, the primary objective of researches such as this current one has evolved from understanding “if” there is a causal relationship between technology and development, to the more prescriptive exercise of understanding “how” to maximize the developmental benefits derived by ICT use and adoption (Walsham & Sahay 2006; Walsham, Robey, & Sahay, 2007). Different schools of thought have emerged within this period.
Sein & Harindranath (2004) in their model analyzing the role of ICT in national development tried to understand how ICT affects national development. They pointed out that ICT can be broken down into four aspects with regard to development namely: ICT as a commodity; ICT as a supporting development activity; ICT as a driver of the economy; and ICT can be directed at specific development projects. ICTs are therefore widely acknowledged as effective means of sharing knowledge and information especially in rural areas which have often been characterised as information-poor. The provision of information is now seen as central component of rural development initiatives (Lwoga, 2010; Chapman & Slaymaker, 2002). Indeed ICT has spurred economic growth especially in rural Kenya through mobile telephony which is enabling new business like money transfer. This has in turn created employment opportunities for many people and particularly the youth who were idling around waiting to be bequeathed a small piece of land to farm in order to earn a living. The ability to facilitate time-space distanciation (Giddens, 1990), provide voice to the marginalized and enable an interconnected, information-rich global community has positioned ICTs as a prominent disruptive force, able to influence the creation and evolution of social, political, cultural and economic norms (Brown & Grant, 2008).

The potential of ICTs to support the improvement of vital services in the rural areas such as health services, inadequate extension, education services, and farmers’ access to reliable information about agricultural technologies and markets, is just beginning to reveal itself and drawing considerable interest (Zijp, 1994; FAO, 1998). And research evidence has documented some of the early successes of ICT adoption which have reinforced the belief that ICT can indeed play a key role in development, including improved access to education opportunities, increased transparency and efficiency on government services, increased trade and marketing opportunities for marginalized communities, increased community access and empowerment through access to information, and new employment opportunities (Go´mez &
ICTs have also been recognized as having the potential to achieve social outcomes such as increased availability of healthcare and education, better civic dialogue and citizen participation in social development processes (Qureshi & Trumbly-Lamsam, 2008; Harris, 2001; Davison, Vogel, Harris, & Jones, 1999). The recent ‘Arab spring’ has vastly been attributed to the power of instant communication through social media which are powerful ICT tools to mobilize large crowds to engage in activism.

Some researchers therefore are theorizing that with improved access to information, the rural poor can be able to better defend their interests and articulate their needs; it also increases their bargaining power and ability to influence decision-making processes that affect them (Chapman & Slaymaker, 2002). A research conducted by Chilimo (2008) on ICTS and sustainable livelihoods in Tanzania revealed the economic, social and human capital benefits of ICTs to communities. Economically, the use of ICTs by communities led to better earnings and savings while socially, they helped in community interaction and knowledge-sharing, better follow-up for remittances and creation of savings and credit co-operative societies (Chilimo, 2008). The research also found out that ICTs improved farming techniques and better access to information on new cash crops (Chilimo, 2008). ICTs have indeed become an indispensable tool to fight against poverty and provide developing nations with an unprecedented opportunity to meet vital development goals such as poverty reduction, basic health care, and education far more effectively than ever before (Thadaboina, 2009).

Thus some conclusions have been drawn that ICTs are continuing to emerge as an integral part of the current technological revolution, which is driving the world towards a knowledge economy and hence essential for any socio-economic development of any society (Dzisah, 2006). Decision makers are therefore urged to urgently form a precise understanding of the relationship between ICTs with development, and start
using all available tools to take the maximum benefit of such infrastructures (Rodriguez, 2007).

But there are some cautions against overhyping the importance of ICT for development. As the initial euphoria that saw these new information technologies as a cure to development problems dissipates, more cautious and critical perspectives are emerging, as lessons are drawn from experiences in the field. While many people agree that ICT and the Internet can be used as a powerful tool for human development, it also said that access to information is not a magic cure for hunger or poverty and history has shown that technologies, left to their own devices, will only aggravate existing differences and information and communication technologies are no exception (Fuchs, Swaminathan, Gerster & Fonseca, 2003). There is also a worrying possibility that as we adopt these new technologies, we may end up getting alienated from our communal ties which is part of our social development in favour of transient relationships through the internet.

A report by the European Information Technology Observatory (EITO) says that the validation of the deployment of ICT tools to benefit the society is still at its early stages and it’s even harder to forecast the exact effects on sustainability (EITO, 2002). Views by most experts indicate that access to information be it via the Internet or telecommunication is not the very difficult task but a greater challenge lies in the assessment and transformation of that data to meaningful knowledge, as well as the availability of the social resources (Gigler, 2004).

Further yet, some researchers have questioned the amount of investments on ICT projects especially by developing countries which are still struggling to meet their population’s basic needs such food, clothing and shelter. Rodriguez (2007) poses very important questions; that in what context does investing in ICTs contribute better to reducing poverty and achieving development while primary needs are often not satisfied and many
humans are still lacking basic goods such as of food or water? Should we just ignore these fundamental needs and use available resources to develop information infrastructures? He calls for sober considerations in achieving the right balance to provide infrastructures that may finally improve people’s situations. An article by *The Economist* echoes these sentiments, that the digital divide is not a problem in itself, but a symptom of deeper, more important divides: of income, development and literacy. Fewer people in poor countries than in rich ones own computers and have access to the internet simply because they are too poor, are illiterate, or have other more pressing concerns, such as food, health care and security (“The real digital divide,” 2005). So even if it were possible to wave a magic wand and cause a computer to appear in every household on earth, it is still possible that it would not achieve very much to the majority poor in developing countries such as Kenya: a computer is not useful if you have no food or electricity and cannot read. Even technology giant Microsoft founder Bill Gates was famously quoted as saying that there are things that people who live in poverty need other than technology and the benefits of having a computer come when reasonable health and literacy have been provided (Verhovek, 2000). Provision of ICT to poor people will only be treating the symptoms and not curing the disease since ICT are technological tools but poverty often has social and political roots. This is because ICTs alone are not able to change the existing structural, social, political and economic inequalities (Rodriguez, 2007).

But regardless of which school of thought you subscribe to, we cannot just wish away the potentials of ICTs’ contribution to development and instead, experts are calling for a more careful approach in determining how best to use technology to promote a bottom-up development. The extent to which these technologies can effectively promote development must be clearly understood and their role must complement alternative strategies of development put in place by governments, and reinforced by other actors such as the private
sector and the civil society organizations (Go´mez & Ospina, 2001). It is essential, therefore, for us to use ICT in a way that would bridge rather than enhance the digital divide because even though ICTs are attractive tools, they are no shortcuts to development (Fuchs et al., 2003). While access to the technology is important, its meaningful use and social appropriation to solve development problems is far more important. (Go´mez & Ospina, 2001).

Impact of Public Access to ICT

In recent years, universal access to ICTs has become a policy goal for many national governments, international development agencies and intergovernmental agencies such as the United Nations. ICTs are widely seen as a fundamental element of a newly emerging global information (or knowledge) society. As such, they represent both a threat and promise. They may lead to greater opportunities for those who can partake of them; but they may also lead to greater exclusion for those who cannot (Parkinson, 2005). For this reason, the model of shared or public access to ICT has attracted considerable interest amongst researchers (Walkinshaw, 2007; Rutkauskiene, 2008) which has led to a number of localized case studies mainly focusing on the users of these public ICT sites. In the last decade, providing public access to information and communication technologies (ICT) has been seen as an important contribution to help address digital inclusion for social and economic development, sometimes referred to as bridging the digital divide. But research is now shifting to mapping how these facilities are being used (and not used) by the general public and their contribution to the development of the users (Selwyn, 2003).

A public access venue is defined by Gomez & Camacho (2009) as “one that offers public access to information with services available to all and not directed to one group in the community to the exclusion of others” (p.2). These shared access centres, provide direct
access to ICTs and related value-added services (Parkinson, 2005). Libraries, telecentres and cybercafés are key points of public access to information which make ICT accessible to broader sectors of the population (Gomez & Camacho, 2009). According to (Barzilai-Nahon, Gomez, & Ambikar, 2009; Warschauer, 2003), this broader access to ICT can have positive consequences to the social and economic development of marginalized and underserved populations and help bridge the so-called digital divide. In their recent study of public access to ICT in 25 countries, Gomez and Camacho (2009) found out that among the public access points, cybercafés are by far the most common type of public access venue, representing 73% of the total number of venues included in their study. Libraries and telecentres account for only 11% and 12% (respectively) of the total count of public access venues, and other venues account for only 4% of the total. They also observed that a clear concentration of public access venues is located in urban areas and while telecentres and “other” venues have a high proportion of non-urban locations, public libraries and cybercafés are primarily urban.

Public access centers are important means of making ICTs available. According to Sey & Fellows (2011) not only do they bring the technology closer (physically and financially) to people who would otherwise have no access, but they may also provide additional value through the teaching and learning environments they foster. They go further to argue that by making ICTs and related services accessible and usable by target populations, public access venues generate an impact – that of making it possible for previously excluded populations to reach for the offerings of information and communication technologies. The investments in public access centers mean that universal access to ICT can be achieved by making new technologies accessible to people at little or no cost (Selwyn, 2003).

An increasingly divisive debate among the research and development community is whether these public access centers do have the desired impact. In fact, some critics believe that the public access ICT model will soon have run its course, and will do so without leaving
any significant achievement on the landscape of ICTs for development (ICT4D) (Sey & Fellows, 2011). They go ahead to ask a very pertinent question, to what extent are public access ICTs being used, what specifically do they contribute to socio-economic development, and how big or small is this contribution? (Sey & Fellows, 2011 p. 2). In most cases there is a sense that public access venues in rural locations are underutilized, especially by those considered most disadvantaged or those who could benefit the most (Sey, 2008). Additionally there is the recognition that public access initiatives are serving social needs more so than the economic or other high priority welfare goals usually associated with public access ICT projects (Sey & Fellows 2009). In developing countries, low patronage to these access points have been observed which (Parkinson, 2005) attributes to affordability barriers or the perception that public access venues are appropriate places for highly educated people (Etta & Parvyn-Wamahiu, 2003). However, overall the central explanation given for observed low levels of use is the failure of public access venues to make their services relevant to the community (Sey, 2008).

There have also been concerns on sustainability of these public access centers particularly in the rural areas where technological capacity is low mixed with more pressing needs such as food. But those in favour respond by arguing that under the right conditions, public access ICTs can still deliver significant benefits to communities (Fillip & Foote, 2007; Roman & Colle, 2002) and in some instances may offer benefits over and above those possible with other types of ICT access (Bar & Best, 2008). Public access venues still remain the best way for millions of unconnected information poor to experience the digital era and benefit from new technologies. That is why Sey & Fellows (2009) caution about drawing general conclusions from existing body of research in this area mainly because there are so few of them, and they have such different contexts. Some of these studies find evidence of notable positive impacts, others do not.
In Kenya, the government is accelerating public access through the Digital Villages Project (DVP) locally known as *Pasha Centers* which was established in 2009. Hallberg, Kulecho, Kulecho, & Okoth (2009) did a comprehensive study on the Digital Villages Project. Although their study was focused on women and girls access to the *Pasha Centers*, a lot of lessons can be drawn from this study. They conducted field studies at four *Pasha Centers* and concluded that these Centers have potential impact to address the needs of rural communities and especially women. Some of the notable benefits from their study include increased employment in the rural areas, which they say will reduce the level of poverty in the villages. They also documented that several students were using the *Pasha Centers* to access learning materials which lead to improved education within these communities. Another potential effect that they note is that as more people get employed or study, there is a reduction of crime rate and bad morals in the villages; this is because the idle youth and women will have something that can keep them busy without incurring any high costs. The *Pasha Centres* have also been a link to the world from the village as many users are able to communicate with the children who go to study abroad. This, Hallberg, Kulecho,Kulecho, & Okoth (2009) reckon make the rural communities stay in contact without costs for travelling and post office charges, which would be more expensive.

The Telecenter Model

Community telecenters have become the focus of attention in international development circles over the last decade (Menou, Poepsel & Stoll, 2004). This is because they have become the preferred model for extending the benefits of ICTs especially to poor communities where the technological infrastructure is inadequate and the costs of individual access to these technologies are relatively high. Roman (2003) reports that research on telecenters is still in its infancy, or as he phrases differently, telecenters are in their early
years, and researchers are still dabbling around in the hunt for some common understanding. However, in recent years, there has been an increase in the amount of scholarly articles about telecenters in developing countries being published in specialized journals and books (Colle 2000; Colle & Roman 2003) as interest in telecenters peak.

Research indicates that telecenters have significantly different features, and researchers have proposed telecenter classifications based on multiple variables including whether they are privately owned, NGO supported or government supported telecenters. However, Roman & Cole (2002) report that one thing that is common in all the different classifications is that telecenters offer shared access to information and communication technologies (ICT) and that the basic objective of a telecenter is to provide demand-driven communication and information services for community development (Roman, 2003). Telecentres have the potential to increase access to the new technologies and make them useful to improve education, foster citizens’ participation and open new economic opportunities (Go’mez & Ospina, 2001). Telecenters provide information for the survival and growth of the community or simply put, information which is required by the member of the community to make effective use of the available resources around them (Islam & Tsuji, 2011).

According to Parkinson (2005) many African countries were exposed to the telecenter concept in the mid-1990s through international symposia, where the International Telecommunication Union (ITU) championed them as valuable development tools. A number of international donor agencies then set up pilot telecentre projects in Africa. However Rodriguez (2007) reports, not much progress has been made which he attributes to low levels of literacy, infrastructure development, factors of physical, economic and social access as well as linguistic barriers still impede the spread of ICTs in Africa. Proenza (2001) also
acknowledges the daunting challenges associated with establishing telecenters particularly in rural areas where the landscape is irregular and the population is scattered.

But many people in academic and non-academic circles agree that telecenters remain an effective model for reaching rural people in rural Africa and in fact Go´mez & Ospina (2001) reckon that telecenters constitute the only way in which large sectors of the population can access and use ICT resources and appropriate them to improve their living conditions. That is why various initiatives from different stakeholders, mainly non-governmental organizations (NGOs) and private sectors are geared towards establishing telecenters in rural communities. It is expected that these telecenters will decrease the digital divide among the rural communities in upcoming years (Islam & Mezbah-ul-Islam, 2008).

This research has uncovered some anecdotal evidences from telecenter projects around the world. In Canada, Downer (1998) reported that telecentres played a key role in the development of local skills, as they related to software applications, electronic mail, online databases, the internet and the World Wide Web. The telecentres helped the local business community by providing them with information and assistance with the preparation of business plans and securing of funds from the government. Many local businesses came to the telecentres to learn how to develop brochures, Web pages, business cards, newsletters, posters and sales flyers. This type of service led to a much more professional image of local businesses and formed the basis of the area’s privately owned desktop publishing business (Downer 1998). While in Sweden, a case study research by Bernhardson (1998) found that the objective of the Faergelanda telecottage, which was the first telecenter to be established in Sweden in 1987, was to educate staff for the industry and the local government, to increase work opportunities and to supply ICT services to small and medium enterprises.

Another research conducted in Spain by Obra, Cámara & Meléndez (2002) reported that telecenters introduced in 1991 to aid socio-economic development and to increase
employment opportunities in deprived rural and urban areas mainly benefitted workers from the rural areas to enable them to work at a distance for companies in urban areas. While a research done by Buller et al., (2001) uncovered that 35 telecenters established in libraries, health clinics, community centers, schools, and other public sites in Taos County in New Mexico which is a low-income, rural, and remote area have trained the natives in computer and Internet use, and they can access the Internet for health and other information.

From available literature, it’s evident that one country that has had vast experiences and is actively championing the use of telecenters for community development is India. Evidence uncovered by a UNDP (2001) research suggests that villagers use information accessed from telecenters to make important decisions that affect their lives and wellbeing. This information includes items like commodity prices, weather, daily news, government announcements, methods for dealing with crop diseases and the location of schools of fish which the telecenter staff translates into local Tamil language (UNDP, 2001).

Closer home in East Africa, a review of the limited available literature document the relationship between telecenters and development and some even highlight some successes. In their research on the role of ICT for agricultural development in Tanzania, Lwoga & Ngulube (2008) found out that farmers accessed agricultural knowledge and information through ICTs (such as, telecenters, cell phones and radio) which enabled them to improve their production, linkages to profitable markets, and reduce poverty. Another study conducted in the same country by Lwoga (2010) to assess how public access to information supported farming activities of small-scale farmers, found out that effective public access ICTs through telecenters can bridge the knowledge and information divide and contribute to agricultural growth. And yet another study, still in Tanzania, by Chilimo (2008) concluded that public access areas of such as telecenters have positive influence on rural livelihood with
implications extending to human issues such as ICTs literacy, improved farming techniques and information on new cash crops.

Telecenters thus can become the bridge through which to provide not only access to government information, but an effective channel through which the poor and marginalized can express their opinions, voice their needs and solutions, participate in the public debate and in the decision making process. Telecenters may also generate significant social benefits, particularly if they have clear objectives and strong institutional frameworks, enabling community members to acquire computer skills, increase their employability, and gain access to markets (Batchelor, Norrish, Scott, & Webb, 2003). The evidence that this literature review has unearthed clearly shows that telecenters could potentially change the way rural Africa relate to the outside world and develop their communities.

It is therefore imperative that as we move into the information age, the notion of a telecenter, its characteristics and more importantly its actual effects should continue to be a subject of considerable discussion and this current study is contributing to that body of knowledge by looking at the Kenyan experience.

Theoretical Framework

Anfara & Mertz (2006) define theoretical frameworks as any empirical or quasi-empirical theory of social and/or psychological process at a variety of levels (e.g. grand, mid-range and explanatory) that can be applied as a ‘lens’ to the understanding of a phenomenon. This present study draws its theoretical foundation from the theory of information and development as proposed by Richard Heeks based on his information inflow chain model which explains the relationship between ICTs and development.

According to Cohen, Manion & Morrison, (2000) a theory is used to gather together all the isolated bits of empirical data into a coherent conceptual framework of wider
applicability. A model on the other hand is a simplified representation of a real situation; including the main features of the real situation it represents (Kousoyiannis, 1979). Models are representations of the phenomena they model and have the purpose of generating a better understanding of the phenomenon (Kebede, 2002). Some researchers have suggested that there is really a thin line between a theory and a model. Case (2002) in establishing a link between theories and models, argued that a model provides a framework for thinking about a problem and may evolve into a statement of the relationship among theoretical propositions.

The Information Inflow Chain Model

In the information chain model, Heeks proposed that the contribution of ICTs to development must be founded on an understanding of information in development and the information chain (Heeks, 2005). According to him, technology must be understood in its surrounding context of economic, social, data and action resources which assist human beings to transform data into information. To ensure this process and achieve successful implementation of ICT projects, Heeks’ Information Inflow Chain model provides a mechanism to; 1) access data from the appropriate sources, 2) assess the data relevance, 3) apply the relevant data to a specific decision, and 4) act upon the decision. He goes ahead to suggest four different types of resources that are essential for humans to process information. These are data resources (relevant data), economic resources (money, skills, technology), social resources (motivation from social setting, confidence as to the data source, knowledge for access), and action resources (skills and empowerment to act on decisions).
Figure 1: Information chain model. Adapted from Heeks (2005).

The information inflow chain model is ideal for studying how rural communities use information from ICT projects such as telecenters in activities that can improve their well-being. The following conceptual framework is derived from the information inflow theory.

Conceptual Framework

Ashraf, Swatman & Hanisch (2008) say that access to information via the Internet or telecommunication is not a very difficult task. A greater challenge is the assessment and transformation of that data to meaningful knowledge, as well as the availability of the social resources. The conceptual framework adopted for this study (Figure 2) sets to map out how rural community development initiatives such as in agriculture, health, education, governance facilitated by telecenters translate into a rural community’s improved livelihood. It is important to note that a telecenter can be seen as a bridge between the rural community and the outside world. In other words, telecenters can facilitate the exchange of knowledge and practices, leading to improved livelihood. For instance, telecenters can facilitate the development of better agricultural practices, improved health care, higher quality of education, and active engagement of citizens in governance issues.
Evaluating Telecenter Effectiveness

In discussing the value of access to ICTs Warschauer (2002) and Gurstein (2003) state that the focus should not simply be on access but rather on meaningful access. In fact, Gurstein (2003) stresses on the term “effective use” to ICTs. Both authors further assert that the most important aspect of ICTs is the ability to make use of the technology and engage in meaningful social practices. Another scholar, Proenza (2001) also says that focus should be on how they improve the welfare and living conditions of large numbers of low-income users (scope of outreach), and the benefits to the very poor segments of the population (depth of outreach). That is why Hedberg (2010) suggests that in order to understand if a telecenter is
providing meaningful services to a community, an evaluation carried out needs to be locally grounded, context sensitive and consider local practices, world views and priorities.

Available telecenter literature offer different frameworks for evaluating telecenters. Hedberg (2010) say most of these frameworks overlap but each also give prominence to individual objectives of the research such as telecenter sustainability (Ernberg 1998; Hudson, 2001; Harris, 1999), telecenter need assessment (Roman & Blattman, 2001), telecentre performance and impact assessment (Wakelin & Shadrach, 2001; Earl & Carden, 1999; Whyte, 1999, Whyte 2000) among many others.

This study proposes to use the approach proposed by Whyte (2000) who presents a list of indicators for evaluating the role of community telecentres in development. Whyte’s evaluation model has been adopted by various researchers (Hedberg, 2010) and international organisations including International Development Research Centre (IDRC) one of the leading proponents of community telecenters for rural development. IDRC uses Whyte’s approach to evaluate its Acacia telecenter projects located in various African countries including Uganda, Senegal, Mali, Mozambique, and South Africa (Whyte, 2000).

In her model, Whyte (2000) proposes some characteristics for evaluating community telecenter effectiveness. This research proposes to adopt the basic performance indicators of a telecenter as put forth by Whyte (2000) which includes telecenter parameters, demand for services, service performance, user and behaviour perceptions. It will also adopt content indicators (content demand, information online, sector-specific information) and finally impact indicators (economic impacts on the community and individuals, social impacts, impacts on organizations such as schools, hospitals, government administration).

Some of the underlying hypotheses for Whyte’s evaluation framework include: Telecenters that are started by community-based actors are more likely to be effective in
serving the community and are more likely to be financially viable; the degree of community involvement in, and commitment to, a telecenter, is often assumed to be a success factor; telecenters that distribute local information to their communities, telecenters that distribute relevant information to their communities and telecenters that distribute information that is usable by their communities will induce more desirable development outcomes than telecenters that do not.

Whyte’s model has therefore been chosen to guide the evaluation for this current study as well to form a template for interpreting results. The motivation for choosing this model is that it takes into account different aspects that should be considered if one is to evaluate how telecenters play a role in community development. These include the social aspect, economic aspect, sustainability, community participation and relevance of content provided to the community. These aspects perfectly mirror the objectives of this study and were reflected in the questionnaire and focus group discussions.

Summary

This section has delved into existing body of research on the subject of study, and in particular, the status of ICT in Kenya, ICTs and rural development, impact of public access to ICT and the telecenter as a model of introducing the benefits of ICT to rural areas. In this section, the researcher has also discussed the theoretical foundation and conceptual framework upon which this study is based as well as an evaluation approach that will be adopted to measure if telecenters are effective in rural development. In the following chapter, the researcher proposes the methodology that was used in this study.
CHAPTER THREE
RESEARCH DESIGN AND METHODOLOGY

Introduction

This chapter describes the design and the methodology that the research used to obtain data to investigate whether telecenters can be catalysts for rural community development. Specific areas that are covered in this chapter include, the research design; research population and sampling; data sources and collection techniques; data analysis and presentation and the very important issue of research ethics.

Research Design

Kumar (2008) defines a research design as the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure. It constitutes the blue prints for the collections, measurements and analysis of data. The function of a research design is to ensure that the evidence obtained enables the researcher to answer the initial question as unambiguously as possible.

This study used a multi-method approach i.e. triangulation to effectively study whether telecenters can be used as instruments of rural development. Cohen, Manion, & Morrison (2007) define triangulation as the use of more than one approach to the investigation of a research question in order to enhance confidence in the ensuing findings. Triangulation is a powerful way of demonstrating concurrent validity, particularly in qualitative research (Campbell & Fiske, 1959). The benefits of using triangulation in social research include increasing confidence in study data, expanding the understanding of a phenomenon, revealing unique data, and integrating theories (Boswell & Cannon, 2007).
Triangulation assists researchers in increasing their understanding of complex subject matter and can vary data collection by time, location, respondents, and the information being accumulated (Denzin, 1970).

This study was based on a field work carried out in Sega Silicon Valley through evaluative and descriptive research designs and using both quantitative and qualitative methodologies, effectively combining them to understand the effectiveness of telecenters in rural development.

**Evaluation Research Design**

Silver (2004) defines evaluative research as the systematic assessment of the worth or merit of some object. Evaluative research asks about the *kind* of change desired, the *means* by which this change is to be brought about, and the signs according to which such change can be recognised (Suchman, 1967). The generic goal of most evaluations is to provide "useful feedback" to a variety of audiences including sponsors, donors, client-groups, administrators, staff, and other relevant constituencies. Most often, feedback is perceived as "useful" if it aids in decision-making (Silver, 2004).

Silver (2004) goes on to say that there is an increasing use of evaluation research development in order to consider the ‘effectiveness’ of new and existing programmes, procedures and/or interventions at producing some form of ‘outcome’ or ‘change’. The findings from evaluations focus on the strengths and weaknesses of various aspects of innovations as well of their overall ‘outcome’. This information is, in turn, used to consider how such interventions might be modified, enhanced or even eliminated in the effort to provide a better service, fulfil a particular need or meet a specific challenge. Evaluative research method enabled the researcher understand how an existing telecenter project, Sega Silicon Valley, is being used as an intervention to enhance community development through the provision of information access. Evaluative research was used to uncover the
‘effectiveness or non-effectiveness’ of using telecenters as ICT instruments for speeding up the development of the rural communities. The research used both process evaluation and impact evaluation to assess how telecenters are set up, community role and participation and their impact on the overall community development.

According to Linnan, and Steckler (2002) process evaluation is targeted on implementation, how the programme’s intentions are being interpreted and the experience of conducting the activity, together with the continuing or changing perceptions of the various constituencies involved. Process evaluation will thus effectively answer the research question “in what ways are the community members involved in the telecenter project?” Impact evaluation assesses the changes in individuals’ well-being that can be attributed to a particular program or policy. It is aimed at providing feedback and helping improve the effectiveness of programs and policies (Khandker, Koolwal, & Samad, 2010) and thus in this study, was aimed at finding out the impact on the users as well as answering the research question “in what ways does the telecenter lead to other community development initiatives?”

Descriptive Research

Chandran, (2004) defines descriptive research design as a structured inquiry covering personal, social, and economic characteristics of informants. Descriptive research includes surveys and fact-finding enquiries of different kinds, whose major purpose is to describe the state of affairs as it exists at present (Kothari, 2008). Descriptive research enabled the researcher to study the impacts, including of economic and social in nature, on the lives of telecenter users as a result of access to information.

The combination of quantitative and qualitative methods of research enabled the researcher to better understand the flow of information in and out of telecenters as well as their impacts on people’s development. As Strauss and Corbin (1990) stated, qualitative
research is any kind of research that produces findings not arrived at by means of statistical procedures or other means of quantification, e.g how does the information accessed through the telecenter add value to the developmental needs of community members? Qualitative research is seen as especially important because it is useful in exploring real goals, processes, failures, and links (Skinner, Tagg, & Holloway, 2000), focusing on “understanding particulars” rather than “generalizing to universals,” as quantitative research is said to do (Maxwell, 1996, p.296).

On the other hand, Creswell (1994) says that quantitative methods measure a phenomenon using numbers in conjunction with statistical procedures, to process data and summarise results. In this study quantitative method was used to describe telecenter user characteristics such actual numbers, age and information seeking patterns.

Research Population

According to Chisnall (1981) a population refers to any group of people or objects which are similar in one or more ways, and which form the subject of study in a particular survey. They have characteristics which can be estimated and classified according to the requirements of individual surveys. This research focused on Sega Silicon Valley (SSV), a telecenter that serves about 7,836 inhabitants of Sega community (Kenya National Bureau of Statistics, 2009). The study surveyed the population of Sega community accessing various services of the telecenter including the local community members, students, teachers, health officials and administrative officials. The researcher also surveyed the management and staff of SSV as well as gained the perspective of non-users.
Sampling Techniques

Mugenda & Mugenda (2003, p. 11) defines sampling as “the process of selecting a number of individuals for a study in such a way that the individuals selected represent the large group from which they were selected.” The population in Sega is given at 7,836 inhabitants (Kenya National Bureau of Statistics, 2009). For practical and economic reasons, it was convenient to interview a sample of the population representative of the estimated 7,836 inhabitants to obtain conclusions for the entire population. This research used both simple random and purposive sampling techniques.

In simple random sampling subjects in the population are sampled by a random process, using either a random number generator or a random number table, so that each person remaining in the population has the same probability of being selected for the sample (Frerichs, 2008). A sampling frame was obtained from the Telecenter which has a list of all its users.

The purposive sampling technique, also called judgment sampling, is the deliberate choice of an informant due to the qualities the informant possesses (Tongco, 2007). In purposive sampling the researcher decides what needs to be known and sets out to find people who can and are willing to provide the information by virtue of knowledge or experience (Bernard, 2002). This method of sampling was used to select other categories of respondents such as healthcare officials, extension officers and non users of the telecenter to gain a different perspective.

Sample Size

The sample size was drawn from the accessible population who actively use the telecenter as a source of information. Of the 7,836 potential respondents and with a confidence level of 95 % and a margin error of 5%, 366 - respondents were eligible to be sampled and considered to be representative of the whole population in Sega village.
However, for practicality and due to constraints in resources, the researcher targeted to sample 200 but only 167 respondents responses were recorded after a response pattern was observed. 50 of those respondents were students, 30 service providers (e.g. teachers, healthcare workers, extension workers). The remaining 120 respondents came from the general population of Sega village who were users and non-users of the telecenter. According to the UK National Audit Office, a population size does not normally affect sample size and argue that the larger the population size the lower the proportion of that population that needs to be sampled to be representative. Also, practical limitations will often be the chief determinant of the sample size (NAO, 1999).

Data Sources and Collection Techniques
This research used both primary and secondary sources of data.

Primary Sources of Data
The researcher used questionnaires, interviews and focus group discussions (FGDs) as the main data collection instruments. Each data instrument was specifically chosen to collect relevant information and to correspond to the demographic of a specific sample within Sega community.

Questionnaires
The questionnaire was one of the key tools for collecting data. Respondents with literacy capabilities such as teachers, healthcare workers, agricultural extension workers, government administration officials were self-administered while those with literacy challenges were administered by the researcher and research assistants after translation. The questionnaires featured both open and close-ended questions to capture in-depth information.
about the telecenter effectiveness. Some of the data obtained through questionnaires included demographic characteristics, telecenter usage, opinions of respondents on telecenter issues or management, general information on benefits or lack thereof, access to ICTs in the village.

Focus Group Discussions (FGDs).

The researcher conducted two focus group discussions comprising of between 15-25 participants each with some respondents in order to enrich and complement data and information generated through questionnaires and interviews. The FGDs were purposed to provide a better understanding of how the establishment of a telecenter and access to information changes the development dynamics of a community. The FGDs also provided detailed insights on the strengths and weaknesses of telecenter projects thereby enabling the respondents to envision the usefulness of a telecenter for the village while allowing the researcher to make appropriate recommendations.

In determining the composition of the FGDs, the researcher took into consideration the issue of compatibility of the participants. Cohen, Manion & Morrison (2007) point out that extreme care should be taken with composition of focus groups, such that every participant is the bearer of the particular characteristic required, or that the group has homogeneity of background in the particular areas, otherwise the discussion will lose focus or become unrepresentative. The FGDs were conducted in appropriate language that the respondents were comfortable with. The languages used were English for the students and youth groups. While the researcher used Dholuo or Swahili for the older generation. All the discussions were tape-recorded to assist the researcher with data analysis.
Interviews

Personal interviews allowed the researchers to collect additional in-depth data through face-face interactions with the Telecenter Manager, ex-manager and other staff.

Secondary Sources of Data

The researcher also used secondary data from the telecenter. Data regarding use of telecenter services, equipment available and information services provided, user statistics and other facilities available at the telecenter were collected from the telecenter. Secondary data provided insights on the nature of access to information from the telecenter as well as enabled the researcher to understand the setup of a telecenter.

Pre-testing of Data Collection Tools

According to McCormack and Hill (1997) the purpose of pretesting is to test the effectiveness of a questionnaire on a limited number of people from the population of interest before the cost of full-scale survey is incurred. Pre-testing enables a researcher decide whether any changes in the question content or the wording of the questions are called for (Crisp, 2006). This, Crisp (2006) notes would improve and help collect informed data appropriate to the research objectives. The researcher pre-tested questionnaire and the focus group discussion guide on seven telecenter users comprising of two students, two service providers, one telecenter staff and two opinion leaders users from the community who were not part of the actual study. The participants were selected on the basis of their ability to provide a professional opinion concerning the instruments and their availability and convenience.
Data Analysis Techniques

Data analysis was based on the responses from the questionnaires and statements from the face-to-face interviews and Focus Group Discussions (FGDs). Raw data was subjected to cleaning for accurate data and then analyzed using Statistical Package for the Social Sciences (SPSS) software. Quantitative data collected through structured questionnaires was analyzed for emerging trends. The researcher also used a comparative method to analyze some of the qualitative data. Data from personal interviews and FGDs were subjected to thematic analysis described by (Marshall & Rossman, 1995) as entailing the systematic examination of forms of communication to document patterns objectively. Any patterned responses from the interviewees that capture relevant information were treated as a theme and a step by step analysis was done. Both the quantitative and qualitative data generated relevant research findings on the study.

Data Presentation

Data that has been systematically analyzed has been presented in both descriptive and visual methods of data presentation such as graphs, charts and tables. According to the Southwest Center for Education and the Natural Environment (SCENE), the purpose of putting results into graphs, charts and tables is two-fold. First, it is a visual way to look at the data and see what happened and make interpretations. Second, it is usually the best way to show that data to others (SCENE, u.d).

Ethical Considerations

Orb, Eisenhauer & Wynaden (2000) observe that ethical issues are present in any kind of research and that the researcher should seek to strike a balance between the aims of research to make generalizations for the good of others, and the rights of participants in the study. There are certain ethical considerations that the researcher put in place for this study.
First and foremost, the researcher demonstrated utmost academic honesty during the period of this study and avoided the major pitfalls such as plagiarism, poor data collection, falsification of data and manipulation of results.

The researcher sought informed consent and ensured voluntary participation by all the potential participants. The researcher reported the facts as they were and did not misrepresent the views of the respondents to meet researcher’s own expectations. All information gathered was treated with utmost confidentiality while demonstrating respect for all respondents within the study.

And lastly, upon conclusion of the study, the researcher will communicate the results back to the subjects of study so that the whole community can learn from it. A copy of the research shall be made available at Sega Silicon Valley telecenter for reference by community members.

Summary

In a nutshell, chapter three has delved into the design and methodology proposed for this study. Specific areas that have been covered include; the research design; research population and sampling; data sources and collection techniques; data analysis and presentation and research ethics.
CHAPTER FOUR
DATA ANALYSIS AND INTERPRATION

Introduction
This chapter focuses on the analysis and interpretation of primary and secondary data that was gathered during the data collection period in the month of September 2012. Both quantitative and qualitative methods are employed in the data analysis and more so in answering the research questions raised in the previous chapters. This chapter will first present descriptive data that was collected based on the survey carried out in the Sega Silicon Valley. Moreover analysis from the focus group discussions and the in-depth interviews will help support the data gathered from the questionnaires. Inferential data analysis will then be made and followed by a presentation and discussion of the findings.

Background Information
Various research instruments were employed in collecting data from the field, these included:

Survey: A questionnaire was designed to provide both quantitative and qualitative overview of the Sega Silicon Valley telecenter information sources, priorities, information access, information flow, impact of the telecenter to the community and use patterns. The questionnaire included sections on basic demographic data, access to ICTs, information needs of the respondents, benefits of the telecenter to the respondents and the community in general, and suggestion on future improvement of the telecenter. In-depth interviews were conducted with the telecenter manager and staff as key informants intended to gather data pertaining to telecenter use, available services, characteristics of users, benefits of the telecenter to the community and challenges facing the telecenter among others as will be discussed later in this chapter.
Focus groups: two focus group discussions comprising of both males and females were held each representing a key user or stakeholder of the Telecenter with emphasis on exploring the diversity of viewpoints rather than pushing towards consensus. In this chapter information collected from the focus group discussions is presented and discussed.

Interviews: Face to face interviews were conducted with key respondents such as the Telecenter staff. These interviews were tape-recorded.

Sample characteristics

The target number of the respondent was 200 of which 167 responses were recorded. 162 of the responses were complete and usable, with an overall response rate of 162/167. This sample size satisfies the requirement of social science research as stated by Pinsonneault & Kraemer (1993). The survey responses from the participants were in general more complete than the researcher had initially anticipated with some respondents giving their own experience with the Telecenter and how the Telecenter has brought change to the residents of Sega community. Only five participants did not answer one or two items in the questionnaire, with the rest of the items answered.

Table 1: Summary of Respondents

<table>
<thead>
<tr>
<th>Response Type</th>
<th>No. of Respondents</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid Responses</td>
<td>162</td>
<td>97%</td>
</tr>
<tr>
<td>Ineligible Responses</td>
<td>5</td>
<td>3%</td>
</tr>
<tr>
<td>Total Responses</td>
<td>167</td>
<td>100%</td>
</tr>
</tbody>
</table>

Composition of survey participants
Altogether 162 valid responses were collected. 104 of them were from masculine and 58 from feminine participants, making a ratio of 64% male compared to 36% female participants. The largest group of survey participants, judged by occupation, was that of peasant farmers (53%), followed by the students’ category (30%), teachers’ category (10%) and other category at (7%). The usage of the Telecenter by occupation of the respondents is shown below:

*Figure 3: Respondents by Profession*

The largest group of survey participants according to the age was that of 16 - 25 years old at 37%. This group was followed by age group 26 – 35 years and only 3% were aged above 60 years old as shown in the figure below:

*Figure 4: Telecenter users by age group*
The figure above shows that the most active users of the telecenter are in the age group 16 – 25, this is significantly skewed towards young people which includes students in either secondary (36%) or technical colleges (25%) pursuing post secondary education such as Early Childhood Development (ECD) and community health workers as indicated below. They also appeared to be the most technologically savvy age group making them active online.

*Figure 5: Education level of telecenter users*
The above composition of the telecenter users by education level was supported by a respondent in FGD1 who was quick to note that:

“There was demand for information online especially from the students, researchers and other community members who wanted that information. There were a number of people who enrolled to the universities and other tertiary colleges especially teachers, who wanted to conduct online research which is not possible via mobile phones.”

The undergraduates and postgraduates are also a major consumer of the Telecenter services as noted by one of the respondent also in FGD1 as follows:

“Access to information through the Telecenter has been made possible. For example when we want to conduct on-line research for our class assignments, we just go to the
telecenter and do that on the computers available. We can also type our assignments and print them neatly making it easier for our teachers to read. The university hopefuls also use the computers to access the Joint Admissions Board (JAB) website and change their courses and book their hostel accommodation online instead of travelling to Nairobi.”

Interestingly, according to the respondents surveyed, 34% of them have an income level of less the Kshs 1,000 perhaps revealing that users’ income level has very minimal influence on the usage of the Sega Silicon Valley telecenter. This is because services at the Telecenter are extremely subsidized such that majority of the users can afford. Factors such as services offered, content, trust and preference of friends seem more determinant in the community’s choice to visit the Telecenter. Cost is one of the factors known for pulling users away from accessing ICT services.

The above analysis is supported by Ideacorp who states that “the telecenter users belong to the low- to-medium-income range and possess intermediate education. They are below 25-years-old and live in rural areas... These students take the most advantage of accessing information through ICT while women, farm workers, the elderly and other underserved may have some difficulty finding time to access” (Ideacorp, 2008, p. 98). Part of the Ideacorp views will be discussed in the sections to follow.

Access to the Telecenter

Most of the users access the telecenter most frequently with about 2-3 visits a month (35%) which underpins the importance attached to the Sega Silicon Valley. Interestingly 20% of the users had visited the telecenter once, the reasons for having been highlighted by one of the respondent in FGD1 as follows:
“Some people still travel many kilometres to come here. It would be easier if they opened satellite centres to meet the needs of the whole community. It would also be easier if they had boarding facilities for ECD students who come from far.”

Yet another one, also from FGD1 responded:

“The Telecenter still doesn’t have all the services we would like to have e.g., local banking, M-Pesa, photocopying services. It should be our information hub but it is only fulfilling part of our needs, not all. For example we can’t photocopy our training models here; we have to go to the market center to do that. We would also benefit more if they added more training options e.g. accounting, community development, social work.”

Only 9% of the respondents were not aware of the existence of the telecenter as indicated in the figure below:

*Figure 6: Frequency of visit to the Telecenter*
The type and relevance of information accessed by users from Sega Silicon Valley Telecenter

Most of the users visit Sega Silicon Valley telecenter for educational purposes 86% followed by health at 65% while government and employment information seekers at 45%. Education was ranked high as Sega Silicon Valley Telecenter has made possible to equip several institution in the community with basic ICT hardware, software and connectivity.

Figure 7: Users information seeking patterns

One of the respondents in FGD2 was quick to point out that:

“The Sega Silicon Valley is a one-stop centre of knowledge that provides IT hardware, services, training and connectivity to other residents of Siaya County.”

Notably, 18% of the respondents seek information related to agriculture; Sega is located in remote area where agriculture is a common source of livelihood. As noted by a respondent in FGD1:
“When I log into the Ministry of Agriculture through the Telecenter, I get advice on the seeds and fertilizers and therefore I have slightly been able to increase my yield.”

65% of the respondents seek information related to health; FGD2 was mainly comprised of health workers where it was revealed that Sega Silicon Valley telecenter works with a group of community health workers to reduce infant mortality in the region. The health centres in the community have been linked to central servers that store their data centrally. This data is normally accessed by government and non-government organizations on demand to chart health related development programs in the community.

*Other ICT services at the Telecenter*

*Figure 8: Other ICT activities users undertake while at the Telecenter*

<table>
<thead>
<tr>
<th>ICT Activities</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Email</td>
<td>97%</td>
</tr>
<tr>
<td>Chat</td>
<td>90%</td>
</tr>
<tr>
<td>Internet</td>
<td>87%</td>
</tr>
<tr>
<td>Blog</td>
<td>60%</td>
</tr>
<tr>
<td>Conduct Business</td>
<td>10%</td>
</tr>
<tr>
<td>Games</td>
<td>15%</td>
</tr>
</tbody>
</table>

In the figure above 97% of the users visit the centre to send emails ranging from official to personal emails. 90% of the users engage in social media such as chatting via popular social networking sites Facebook and Twitter hence keeping in touch with their friends and families. 87% of the users were mostly interested in the Internet, this included those who visited purposely for research, agriculture, education, to seek health related
information or for other official related activities. Interestingly, business was ranked the lowest with only 10% visiting the centre to engage in business related activities. This is supported by the fact that Sega Silicon Valley is located in predominantly agricultural area hence few users will be interested in visiting the centre to engage in business related activities. The key informant Mr Lawrence Odongo, the immediate ex-telescenter manager identified other ICT activities available to the users such as flip cameras for taking videos and posting online, scanning, digital cameras, networking, projector hire and printing services.

Other services

Sega also provides other services beyond ICT. The FGD1 and the interviews conducted outlined a number of services that have also been of benefit to the community as a result of the telecenter as follows: The Telecenter owns a tractor which is hired to community members during ploughing seasons at subsidized rates ranging from 850 shillings per quarter acre to 3000 shillings per acre. They have also built a police post within the community and equipped it with a computer to record criminal offences. Tree planting is another service which is an annual undertaking by SSV telecenter to create awareness on environment protection amongst the community members. The community members receive free seedlings for planting in their homes and farms. Sega street lighting is another service that was mentioned. So far the project is at its initial stage and only a few street lamp posts exist but the respondents in FGD2 mentioned that once complete, it will have a major impact on reducing crime in the area. Training in business entrepreneurship and meeting rooms for hire at Kshs 1,000 per day were other services that were mentioned. However one service that was popular with the community is the Early Childhood Development (ECD) course that was introduced by the Telecenter in 2011. So far there are about 50 students who are undergoing the course at both diploma and certificate levels.
A number of organizations in their corporate social responsibility have also partnered with the Sega Silicon Valley telecenter to provide some services to the community. **Safaricom**, the major mobile operating company in Kenya is providing free internet connectivity to the Telecenter which has in turn highly subsidized it to the users at one shilling per minute instead of five shillings per minute being offered by commercial cyber cafes within the community. **Cisco**, an IT giant company based in the United States is partnering with the Telecenter to provide training on networking and also provide IT certification to the trainees who have undergone the program. The Cisco IT Certification Program is a widely respected program worldwide (CISCO, 2011). **Inveneo** is another company which has provided services to the Telecenter. The key informant Mr. Lawrence Odongo said that the company has trained the Telecenter’s technical team on managing rural ICT developments. Through the telecenter, Inveneo has also provided a satellite computer center located a few kilometers away from the main Telecenter to purposely serve primary school children. The satellite center includes a wireless network, 20 ultra-low power computers and a low power server, Linux operating system and a collection of softwares for use by the local community including an education software for primary and secondary education from a South African company called **Learnthings**, which specializes in licensing and producing interactive learning materials for children in Africa. Another US non-for-profit organization, **One Global Economy** has previously trained marketing skills to the local entrepreneurs. **Goal4.org**, a U.S. non–profit corporation focused on reducing infant and child mortality is working with the Telecenter to train community health workers on computers and maintain the health database.

All these initiatives have helped in changing people lives, their decision making and improved their welfare as for example, outlined by a respondent in FGD1:
“I will now have a diploma in Early Childhood Development due to SSV. If the course was not brought near to us, I probably would not have taken it because of distance and time constraints.” Another respondent was quick to note that: “The ECD course has made me become a better teacher, understand my students better. It has equipped me with knowledge and skills to handle my students”.

**Satisfaction with the Telecenter services**

Encouragingly 81% of the respondents were satisfied with the services offered by the Telecenter to the community, this perhaps cementing the fact that Sega residents have benefited immensely by the presence of the Telecenter.

**Figure 9: User satisfaction with information at the Telecenter**

<table>
<thead>
<tr>
<th>Are you satisfied with the information? Was it helpful?</th>
</tr>
</thead>
<tbody>
<tr>
<td>90%</td>
</tr>
<tr>
<td>80%</td>
</tr>
<tr>
<td>70%</td>
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<tr>
<td>60%</td>
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<td>50%</td>
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<td>40%</td>
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<tr>
<td>30%</td>
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<tr>
<td>20%</td>
</tr>
<tr>
<td>10%</td>
</tr>
<tr>
<td>0%</td>
</tr>
</tbody>
</table>

**Perceived impact**

The services offered by the Telecenter have helped develop the region both socially and economically. When asked, in your opinion what has been the impact of the telecenter on the
people? Both respondents in FGD1 and FGD2, unanimously agreed on the elements of impact to the community including:

i. the tractor services have improved agricultural productivity hence money in the pockets on many Sega residents
ii. the cost of accessing ICT related services has greatly reduced with means money is being diverted to other ventures
iii. children in schools have access to computers and therefore are better placed to compete in the job market in future.
iv. information on agriculture, health have greatly improved people’s lives; having access to newer information has lead to productivity in agriculture whilst health information has improved the way people take care of their health and that of their children.

v. people are connected to old friends through social networks, it has reawakened dead relationships
vi. it has created employment and training opportunities (ECD, ICT etc)

vii. young people socialize at the centre, it is their meeting place and reduces idleness associated with criminal activities

viii. exposure of the community to the outside world. Through the telecenter’s website, the community has been exposed to the outside audience.
ix. Security has increased as a result of the police post built by the Telecenter.

One of the key informant Mr George Ojode who is the current manager of the telecenter was quick to point out that the centre has generally been used to support health, education, governance, agriculture and other applications that contribute to development agendas of the community.

The respondents in the survey questionnaires also pointed out a number of reasons as to why they considered the telecenter has had an impact to the community as follows: students at schools have access to computers, increase in computer literacy, created awareness for
youth empowerment, community can access government services, the community is more informed and the Telecenter has brought services closer to the people.

When asked whether the information was helpful, 74% of the recipients were positive giving a number of reasons such as:

i. All requirements are met at the centre easily
ii. Helps young people in job searches and applications
iii. People are able to access KRA pins easily
iv. Agricultural information improve farming
v. People are able to get tips to manage their businesses
vi. Doing research, downloads notes for teaching
vii. Able to organise HIV/AIDS awareness campaigns

The above response stress the fact that the Telecenter has enabled the community to change their lives since they can easily undertake ICT related functions they could not have done before the establishment of the Telecenter leading to improved decision making.

However, 26% of the respondent thought the information at the telecenter was not helpful citing reasons such as: limited time; the operating hours for the Telecenter is from 8 am to 5.30 pm when majority of the users, especially teachers are still at work. Respondents also cited other factors such as lack of information in local language which elderly people can understand, some services such as ECD course is expensive and others attributed information not being helpful to not being able to get the right kind of information. Furthermore in FGD2, respondents also cited a number of negative effects of the telecenter that could be keeping the community away from the telecenter such as exposure to pornography especially to young people, young people wasting a lot of time chatting, playing games instead of being constructive and helpful to parents, among others. Though, the respondents noted that the positives outweigh the negatives as many people have benefited from and by the existence of the telecenter as pointed out by a respondent in FGD1.
“Four years down the line and the Telecenter has been able to provide seven institutions around Sega with basic ICT hardware, software and connectivity. It has also changed the agricultural and healthcare systems in the area by developing applications based on the agricultural and community healthcare needs.”

In order to measure whether the telecenter can lead to improved livelihoods for the people in the Sega community and other rural communities, interestingly, 91% of the respondents were in total agreement that the telecenter can lead improved livelihoods for people in the community as depicted in the pie chart below. Among the reasons cited are as follows: source of employment for the youths, health of people has improved due to the various health related programs that have been initiated, has changed the face of the community and the students can research online.

*Figure 10: Telecenter can lead to improved livelihoods*

Community involvement in the Telecenter

When asked whether the community was actively involved in the Telecenter project 53% of the respondents indicated that they were very involved in day to day activities and programs run by the Telecenter, perhaps an indication of how the telecenter is helping the community
achieve their varied needs. 32% of the respondents said they were interested but not involved in the project. This is a big percentage that cannot be ignored indicating that the telecenter can still do more to involve more community members. A number of the respondents indicated that the initial perception of the community was that the Telecenter was an individual project and this contributed to their lack of interest in being involved in its activities. Notably, only 15% of the respondents are either not interested or are not aware of the telecenter at all. This could be as a result of the illiteracy level in the community that keep users away from accessing the services offered by the Telecenter.

Figure 11: Community members involvement in the Telecenter project.

One of the key informants Mr Lawrence Odongo pointed out that:

“The first thing we did was ensure that the high schools, polytechnic and hospitals we were working with had ICT equipment and with the help from Inveneo and Cisco we managed to equip them with 20 computers each.”

Information flow at the Telecenter

The information is normally disseminated in a number of ways mostly through what the Telecenter call Community Connectors. These are a group of young people who have
been trained by the Telecenter and help to disseminate information to the community, especially the illiterate population. They also collect information from the community to feed back into the Telecenter. Other channels for disseminating information to the community include the use of community health workers or extension officers, chiefs, village elders, priests and through online channels such as the Telecenter website. These channels complement each other to ensure that information reaches the intended audience on time and in the format they can understand. Both the literate and the illiterate community member needs are targeted through barazas, churches, and women groups among others.

**Barriers to access of ICT services at the Telecenter**

A number of barriers were cited as being the impediment to users accessing ICT services and information at the Telecenter. Difficulty in using the computer topped the list of challenges with 92% of them feeling they are not fully equipped with ICT knowledge to use the computer services. 89% of the users cited cost with the majority feeling that the services are expensive and need to be reduced or subsidized further. Not enough services at the Telecenter also scored highly in this category with respondents stating that the Telecenter could provide more services and become a hub for all information needed by the community and other ad-on services such as money transfer, more youth activities and introduce more courses including online exchange programs. Interestingly, only 12% of the users mentioned Internet/connection speed and quality as being a challenge since Safaricom one of the major Internet service provider (ISP) in Kenya is providing the Internet connection to the Telecenter. Most respondent felt that the Telecenter has the best (in terms of speed) and reliable internet connection within the community.

*Figure 11: Barriers to accessing ICT services at the Telecenter*
Telecenter accomplishments

The Telecenter prides itself for having accomplished a number of their objectives. The immediate ex-manager Lawrence was quick to mention the following:

i. the community is well informed in ICT, agriculture, health and sanitation
ii. development in infrastructure such as schools, computers in hospitals, police post (built a police post)
iii. improved security
iv. improved farming including through the tractor project
v. knowledge centre now available to the community
vi. ECD college established having trained over 50 students
vii. Sponsorship of needy students through Imani Educational Fund

Challenges faced by the Telecenter in providing services

The telecenter faces a number of challenges in its attempt to serve the people of Sega community. One of the key challenges is power connection. According to key informant Lawrence Odongo, constant power black outs are major impediments to the operations of the Telecenter. Only the satellite center at Kogere has a back-up generator but the main
Telecenter does not have a back-up generator. Another respondent, a headmaster of Kogere Primary School that uses Sega Silicon Valley as a technology hub notes that:

“We have had to use solar energy to operate our systems because Kenya Power is yet to connect us to the grid despite several applications.”

In FGD2, one respondent was also quick to point out that:

“One of the challenges that the centre has had to deal with, however, is the fact that electricity supply to greater parts of Ugenya District remains sporadic and it hampers the spread of technology to other regions”

According to key respondent George Ojode, another big challenge was the community perception to the project. The community perception was initially negative due to individual/political reasons. This was attributed to the fact the project was the brainchild of an individual Mr James Ofwona who even though is a member of that community, was seen as well-off and so people thought that the project was an individual business.

Lack of trained personnel was also listed as a key challenge. Currently the Telecenter has only one qualified trainer for the computer packages it is offering. Most of the trained personnel leave for well paying jobs in the supermarkets nearby and cities.

Insecurity was also cited as a major challenge. The idea of having computers in the community has increased theft cases as some people feel they can sell the computers at high prices. One staff member said that the Telecenter recently lost 10 computers and two laptops to theft.

Other challenges that the Telecenter faces include: limited funding to undertake community development activities and high expectations from the community to offer more development projects.
CHAPTER 5
DISCUSSIONS, CONCLUSION AND RECOMMENDATIONS

This study was undertaken with a main objective of finding out whether telecenters are effective in rural development as a result of bringing ICT closer to the rural community. Four objectives guided this study including: to find out the type and relevance of information being accessed by users from Sega Silicon Valley Telecenter; to find out whether information obtained from the Telecenter lead to changes in decision making, to improve people’s welfare; to investigate the flow of information from telecenters to community networks and finally to study the prospects of telecenters in rural development in order to make appropriate recommendations for telecenter development in Kenya. This chapter discusses the key findings of the study from which conclusions are drawn and subsequently, recommendations made. Interpretation of the data is also made based on a model by Whyte (2000) of evaluating telecenter effectiveness using the following parameters: basic performance parameters of (demand for services, service performance, user and behaviour perceptions); content indicators (content demand, sector-specific information) and impact indicators (economic impacts on the community and individuals, social impacts, impacts on organizations such as schools, hospitals, government administration).

The type of information users were seeking at the Telecenter

From the data presented in chapter four, the most notably type of personal ICT services accessed at the Telecenter were email services. As the world become more connected, online communication is becoming increasingly important and many of the respondents surveyed indicated that the email is their only way of feeling connected to the world around them. One participant indicated that the email helps her to connect to her colleagues at school, friends and family members who live in different parts of the world.
Some respondents especially those who worked in NGOs within the community used the Telecenter to access and respond to official e-mails with co-workers in mother organizations outside the country or in major cities within the country. One respondent called the Telecenter, the village e-mail post office where you can get letters from abroad.

Email and social networking seemed to go hand in hand, with 90% of the participants saying they engaged in social networking while at the Telecenter. Facebook was the popular social networking site of choice with many participants saying it was easy to use and many of their friends were on Facebook. Perhaps the most surprising observation was that social networking was not restricted to the younger population but even the older population had Facebook accounts. Many participants responded that the Telecenter provided reliable network for social networking activities such as Skype. One participant said that he had participated in a Skype job interview at the Telecenter because internet connectivity was excellent. Participants also used online chat rooms to connect to their friends and family. This was mainly done while participants were performing other tasks at the computer and so it ranked highly at 90%. Another respondent who writes a weekly blog said that using the Telecenter was cost effective as blogging takes a long time on the computer and he would probably pay a lot more if he was blogging at the commercial cyber cafes. Very few participants admitted to using the Telecenter to conduct business. Most business transactions such as buying products were done via mobile money transfer.

Education was another highly ranked type of information that users were actively seeking while at the Telecenter. A number of users surveyed indicated that they were using or had used the Telecenter to learn basic ICT courses to enable them become computer literate. As the rural population catch up with the digital world, the rural economy is expanding and there is considerable demand for ICT training which is seen as increasing employment opportunities. Many young respondents surveyed said they were taking computer classes so
as to get better paying jobs for example in the supermarkets nearby as cashiers. Teachers also regularly used the Telecenter to conduct research on school curriculums, while head-teachers around the Telecenter used it mainly to register examination candidates online, a requirement by the Kenya National Examination Council. Perhaps the biggest contributor to education being the highest sought after type of information is related to the fact that a number of respondents surveyed were enrolled in higher education learning institutions such as middle level colleges and universities. This category of respondents included young people, students and those who are employed in the formal sector who want to further their education. Some public universities have opened branches nearby and many of the working population are taking evening classes and so use the Telecenter to conduct online researches or to do class assignments on the available computers. In FGD1 participants mostly consisting of students undertaking the early childhood development (ECD) course at the Telecenter revealed that the Telecenter was a main resource for their class assignments as they used the internet to conduct researches, the computers to type their assignments and then print at the Telecenter.

A number of respondents who are in universities in major cities also used the internet at the Telecenter to register for online classes and book hostel rooms, saving them from the making the long journey to the cities to perform these activities in person. Some respondents applying for higher education in Western universities also use the Telecenter for this purpose. These responses suggest the Telecenter is very resourceful for educational information and especially in the rural areas where access to personal computers is still a challenge. While some of the rural population’s technological needs are being addressed by the mobile phone, access to other ICT services still remain a big challenge, especially those that cannot be accessed through the mobile phone as revealed by this study. Having a central place where community members can access these services is proving to be an advantage. However, cost still remains a big barrier to access. Since the Telecenter’s operational cost is mostly funded
through its services, especially internet access, many of the respondents still felt that the subsidized one shilling per minute was still too high. The cost of basic computer training was also a big challenge for a number of people who would like to attend the classes.

Health related information also ranked high in the type of information sought after, at 65%. In FGD2, participants, some of who were community health workers responded that they used the Telecenter to conduct online research on health issues so they can use the information to teach community members. Many of these community health workers said they have been trained at the Telecenter on online health resources. According to key informant George Ojode, the training on health issues is a continuous process resulting from a partnership with local health officials and non-governmental organizations such as Goal4.org which is a rural health initiative housed by Sega Silicon Valley. The Telecenter also provides on its website, a section known as the Beehive tool, which has online health resources such as tips on caring for patients with particular ailments at home which some respondents said they used to learn new information about various ailments and how to live a healthy life.

Many of the respondents also used the Telecenter to access government services. The popular services were the Kenya Revenue Authority online services such as registering for PIN numbers and downloading tax return forms.

Job seeking was also popular with the users with a number of respondents revealing that they have used the computers at the Telecenter to apply for a job or to conduct employment searches. Some respondents said they used the Telecenter facilities to apply for the Independent Electoral and Boundaries Commission (IEBC) jobs for the voter registration process that required online applications. A participant in FGD1 said that since most employers these days only accept online application for job vacancies, facilities at the Telecenter are very useful when applying for a job online.
Only 18% of the respondent reported that they went to the Telecenter to seek agricultural-related information. This was surprising as agriculture is the predominant source of livelihood for Sega community as reported by participants in FGD2. Some participants revealed that they usually accessed information on seeds and fertilizers from the computers. Others said they used the computers to find out new types of efficient farming methods.

Entertainment and news were other types of information that users were seeking. Entertainment-related information was popular with the younger population between the ages of 15-25 years. However there were instances of children especially on holidays visiting the Telecenter to play computer games to keep busy. But this was observed among the population with higher income such as NGO workers and teachers around Sega. Games and downloading of music were the major source of entertainment, especially for the young population of between the ages 15-25 years old. Participants also responded that they read online newspapers to know what is happening in other parts of the world. A participant indicated in the survey questionnaire that he had keenly followed the 2012 American elections and it was easy to do that that using the internet at the Telecenter as opposed to a mobile phone.

The type of information that telecenter users at Sega were seeking for were therefore varied and needs-dependant. A larger percentage of older users were accessing internet for work related purposes or to specifically seek information on a particular subject, education and health services ranking high. Majority of the younger population were using the internet for social networking and Facebook proved to be the popular social networking tool that attracted many of the respondents to the Telecenter.

In her evaluation model, Whyte (2000) says that content, both online and sector-specific information available at is a key determinant to type of information users are likely to seek for at the telecenter. While the SSV’s online resources are very detailed and varied
sectorally, many of the respondents were not aware of their existence. The online interactive learning tools are so far only available with internet access and since the schools around the Telecenter do not have internet access, these interactive online tools are not being used. The possible solution is to have off-line versions of the software in the schools so that students can benefit from them. Similarly, other sector specific information should be made available through popular media such as mobile phones, radio and visual channels. This way, information from the internet is combined with more familiar and easy to access media for many people to benefit.

Relevance of information available at the Telecenter

81% of participants using the computers at the telecenter responded that they were satisfied with information they were seeking, that the information was relevant to their needs. This category of respondents included those who used the computers for internet services. Reliability of the internet was cited as a major contributor to this factor. Downtime in internet connection is very rare at the Telecenter making users experience relatively uneventful.

The Telecenter’s efforts to introduce computer literacy through the distribution of computers to schools and offering courses on basic computer packages i.e. Microsoft Office was cited as relevant and timely. Many respondents indicated that being computer literate is a prerequisite for getting good employment in the formal sector. Many students on hiatus waiting to join universities or intermediary colleges enrol at the Telecenter to study basic computer programmes. And the fact that the courses are offered at relatively low cost means that majority of students get to attend these courses and at least have an introduction to computers.

The Early Childhood Development (ECD) course offered at the Telecenter was viewed by many respondents as very relevant. Majority of the respondents who have either
trained or are currently undertaking the course said it has been useful in getting employment as early childhood teachers or social workers. This course was particularly popular with teachers and NGO workers who want to sharpen their skills in working with children.

However, beyond the basic computer packages i.e. Microsoft Office and the ECD course, many respondents admitted to lacking awareness of other educational information available online through the Telecenter’s website including Christian Religious Education which targetet primary school level students, principles of Microeconomics, Java programming, web design and writing courses. Even though the Telecenter’s website has a wealth of information, many respondents said they don’t use the website as a source of information. Responses from FGD1 indicated that many were not aware that the Telecenter has a website and this was due to lack of marketing of the services available on the website by the Telecenter staff. Respondents agreed that information available through the Telecenter’s website is relevant but not many people are aware of them. Key informant George Ojode who is the Telecenter manager said that the Telecenter has limited capacity to deal with all the education courses being offered online and that is why many respondents are not aware of them.

Health information at the Telcenter provides simple how-to instructions of avoiding, recognizing symptoms and first aid treatment for common ailments including diarrhoea, vomiting, stomach cramps, fever, flu, sore throat and headaches. Information is also available on HIV/AIDS and family planning. The Telecenter also has a basic database of health care workers within the community. The main outlet for health information at the Telecenter is through the Beehive Toolbox, available on its website. This means that members of the community who are computer illiterate or do not read and understand English are not able to access this type of information. This leaves out the most vulnerable members of the community such as illiterate mothers who need this information. However, key informant
Lawrence Odongo indicated that the Telecenter works mainly with health care providers who are then expected to train community members on health issues. Indeed participants in FGD2 admitted to having undergone various training on health issues and how to use the online information available, but responses from the general population indicated that this type of information though very relevant, rarely reaches the household level.

Agricultural information available include resources on crop farming, livestock and fish farming, soil and water management, agricultural financing, loans and cooperatives. These useful resources were cited by respondents as relevant as it helped them to improve their yields. Majority of the respondents who were seeking agricultural information relied both on the Telecenter’s and the Ministry of Agriculture websites which are the main outlet for this type of information, again limiting those who are computer illiterate. However, most respondents who don’t use computers at the Telecenter said they are continuously trained by extension workers who use the Telecenter as a source of information. The agricultural service provide at the Telecenter that respondents said was most beneficial to the community, both literate and illiterate was the tractor service which is hired out on a subsidized rate for ploughing. Many respondents agreed to having used the tractor, some even without knowing it belonged to the Telecenter.

Government services that people found relevant included access to the online application of Personal Identification Number (PIN) and tax return forms from the Kenya Revenue Authority (KRA) website. The Telecenter also has information regarding how to register for birth certificates which many respondents in FGD2 agreed had been helpful, especially since the government announced the new policy on registration for national examinations which require birth certificates.
Other services that respondents found relevant were the e-mail and social networking services through the internet which they said has kept them in touch with family members and friends outside the community.

In her evaluation model, Whyte (2000) say that demand for services is a basis for evaluating whether a telecenter is effective or not in order to determine if such a programme is feasible in the rural communities. To create demand for services, the telecenter has to provide relevant services to its users. In Sega, the local demand for information and communication is just evolving and this means that the telecenter model is also evolving to meet the demands of the community members. Many respondents who took part in the present study pointed that services offered at the Telecenter were very limited although there was demand for other services that the Telecenter could provide. Part of the solution for this problem, is for the Telecenter to have creative services which are designed to meet the specific needs of specific groups of users. In this way, many more people may benefit from the Telecenter. Not everyone in the rural community can learn to use computers and surf the internet on their own, but when internet use is combined with other simple technologies such as community radio, mobile phones or print media many more users will benefit from the services of the Telecentre. As the digital age catch up with rural communities, demand for telecenter services will only increase, the challenge is how to implement such projects in such a way that community members maximize their benefits. The increase use of mobile phones in rural communities is creating avenues for demand of other ICT related services especially the internet. However, the mobile phone does not provide all the required services that a telecenter provides and most respondents interviewed said that they still needed actual computers to be able to execute some of their ICT needs.
Using information obtained from the Telecenter to aid in decision making thereby improving the people’s welfare

Objective two of this study set out to find out whether information obtained from Sega Silicon Valley lead to changes in decision making thereby improving the user’s quality of life.

Data from the focus group discussions indicated that many of the respondents use the information from the Telecenter to improve their lives in one way or another. In terms of education, respondents who had undergone computer training at the Telecenter admitted that being computer literate opened other avenues for them and led to decisions on the type of careers to pursue or furthering their education to increase their chances of getting formal employment. As noted in one questionnaire, a respondent indicated that having undergone computer training at the Telecenter made him to apply for a job as a cashier in a nearby supermarket, a decision which has improved his quality of life and the people who depend on him. In FGD1, many of the respondents who are undertaking the ECD course said they were improving their skills so that they may get employed in the early childhood sector or apply for a promotion in their current employment to increase their remunerations. This was observed with teachers who were undertaking the course.

Agricultural and health information were more likely to influence the respondents decision on whether to change a practice that can lead to improving one’s life. Evidence from some respondents indicated that advice received either through information acquired from the internet at the Telecenter or through the extension workers who have been trained and equipped with agricultural information has enabled them to make decisions on better farming methods or how to control certain plant diseases and pest thereby enabling them to get better yields from their farms.
Respondents from FGD2 said that through leaflets supplied to them from the Telecenter, they have learned how to cultivate mushrooms and more productive ways of raising indigenous chickens. This information complemented their traditional livelihoods strategies and improved markets for their products. The agricultural resources available at the Telecenter was also being used by both government employed and private extension workers to access information that they can then pass on to the community members, including those who are computer illiterate.

Similarly, evidence from FGD2 indicates that health information accessed either through the internet at the Telecenter or through the community health workers resulted in some respondents making the decision to avoid certain unhealthy practices or seek medical attention for certain ailments. The Telecenter, through the community health workers and in partnership with other health NGO’s in the area regularly conduct health campaigns such as hand-washing campaigns in schools within the area. Respondents in FGD2 noted that this has greatly reduced the number of infectious diseases such as diarrhoea. Information on various vaccinations also available at the Telecenter has led to an increase in the number of children being vaccinated against certain diseases. Most respondents also indicated that the database of health workers available within the Telecenter has been useful in locating the nearest health worker such as a midwife. Information and campaigns on HIV/AIDs was also cited as very useful and led some respondents to make the right decision on taking care of their health.

Even though there was evidence that information accessed though the Telecenter lead to changes in life, majority of the people within the community are still not aware that they can access various types of information that can improve their decision making from the Telecenter, especially through its rich online resources. This was blamed on lack of marketing on the part of the Telecenter and also limited resources, both financial and personnel. User
behaviour and perception which Whyte (2000), recommends should be evaluated can also be a contributing factor. Even though many respondents indicated they were satisfied with the kind of services they are currently getting from the Telecenter, this observation was made on the computer literate segment of the study population including students, teachers and NGO workers who use the Telecenter to access the internet for emails, work and social networking. Other respondents who do not know how to use computers or the internet relied on second hand information either from community connectors, extension workers or community health workers. This type of arrangement was not very effective as the information arrived either too late or sometimes was delivered in meetings where not everybody attended. Combining internet with audio and visual media seems to be a better solution. This way, many people could take part in trainings such as health or farming practices training.

*The flow of information from telecenters to community members*

Another objective of the study set out to find how information available at the Telecenter reaches all community members, including those that are illiterate and unable to use the computers and internet. From the survey undertaken, majority of the users of the Telecenter were able to physically go to the Telecenter and use the computers to access the information they needed. This was the case with those who were computer literate. However, many community members, especially the older generation who participated in the study admitted that they were computer illiterate and therefore relied on second hand information from those who are able to use the computers. According to Whyte (2000) telecenter parameters including its location is key in ensuring access and seamless flow of information to users. While Sega Silicon Valley can be fairly considered to be in a central place, it is not located in the main market area where a lot of businesses are situated and where most activities take place. However, the Telecenter is a merely 600 meters from the main market
and therefore while it may not be visible to first time users, many of the respondents felt that location was not an issue to access and having the Telecenter located in the outskirts of the market provided a tranquil and conducive atmosphere to the users without the interruption of noise from the main market.

The Telecenter has devised a number of ways to connect members of the community who do not physically go to the Telecenter for information. One of the main ways of disseminating information is through ‘community connectors’. Community connectors are young women and men who have been trained on ICT services and other subjects who are then deployed to the community to disseminate information. Apart from disseminating information, the community connectors also regularly do needs assessment and conduct surveys on the services the Telecenter such as what educational courses to introduce at the Telecenter. The Early Childhood Development course was introduced as a result of a survey undertaken by the community connectors.

Other than the community connectors, the Telecenter also disseminates information through community health workers and government and private extension officers who extensively use their resources and pass on the information to the community members through regular trainings and campaigns. In FGD2 which consisted of a number of community health workers, respondents indicated that they regularly get updates from the Telecenter staff on new tools and resources available which can help them in educating community members on health matters.

The use of mobile phones to communicate to the community was very limited. Many respondents indicated that they rarely receive information through their mobile phones, instead relying on the community connectors and meetings. The use of mobile phones as a means of communication in the rural areas has been widely documented with many rural community members such as farmers relying on their mobile phones for updates on
information such as market prices (Lwoga, 2010). However, the Telecenter has not taken advantage of mobile phones to disseminate information to community members.

The Telecenter also used to a limited extent, opinion leaders like the local administrators to disseminate information to community members. This included calling for meetings or trainings when the Telecenter hosts a subject matter specialist to educate the community members. According to key informant George Ojode, a number of the Telecenter’s alumni also acts as ambassadors and volunteer on a needs basis to conduct trainings on various subject matters, especially ICT related.

The Effectiveness of Sega Silicon Valley Telecenter in Developing the Rural Community

The overarching research question of this present study was to investigate how effective telecenters are in rural development using Sega Silicon Valley telecenter as a case study. Past researches have indicated that telecenters can be effective in not only bridging the rural digital divide, but also bring about positive changes in the rural economy (Roman & Colle, 2002). In the context of such researches, telecenters are seen as the tools of bringing new technology and information to the rural community members who will in turn use the new information to improve their practices and better their livelihoods. Impact to the community was measured in terms of economic and social impacts to the community and individuals as well as impacts on schools, hospitals and government administration as recommended by Whyte (2000). The study found out that the Telecenter supports health, education, governance, agriculture and other applications that contribute to development agendas of the community. The introduction of computer classes to the community was cited as contributing to economic and social impacts because not only are young people keeping out of trouble but they are also working towards getting better jobs. The early childhood development course has been an avenue for promotions into higher levels of the job for some
respondents. Many of the respondents also indicated that they saved money from the subsidized costs at the Telecenter which they used on other ventures. Having the Telecenter in Sega also saved them transportation costs to other centers and towns with reliable internet to conduct their business.

Improved health and agricultural practices were partly attributed to the constant information and trainings that the community health workers and extension officers within the community are offering to the community members. Some respondents attributed high yields to information sourced from the internet on how to control pest and diseases.

By distributing computers to schools and polytechnics, the Telecenter has enabled the students to interact with computers. Some of the students who took part in the survey indicated that they interacted with the computers for the first time after the Telecenter distributed them to their schools. This, they said helped to de-mystify the ICT concept in the rural area. However, the study also found out that although initially received with much enthusiasm, the computers are rarely being used by the students. Some of the reasons given for this is that the lack of electricity. Many of the schools are using solar generators to power the computers. Lack of computer skills by the teachers was also a contributing only a few students have the opportunity to interact with the computers. For majority, the close they came to contact with the computers was while cleaning them on a daily basis. Developing the skills of teachers on computers is an important aspect in scaling up ICT projects in rural communities.

Similarly, the local health centers and administration have been provided with computers. The health centers have benefitted from the central database of health services which is housed by the Telecenter. The health care officials also use the internet at the Telecenter to research on various ailments. However, the computers provided to the local police station which were meant to electronically document offenses and offenders, were not
being used. Lack of computer skills and limited personnel was attributed to this, as well as unreliable electricity. Security wise, the impact that many respondents cited resulting from the Telecenter was the establishment of two police posts to the center. The Telecenter lobbied the local government to establish the police posts initially, as a way of dealing with thefts of its computers and those distributed in various institutions but they now serve the community to reduce all types of insecurities.

The study, thus found out that the Telecenter has made various contributions to the development of the local community even though much still needs to be done for the community to fully benefit from its services.

Conclusions

The overall aim of this study was to found out the effectiveness of telecenters in rural development. The following conclusions can be drawn from the present study.

First, the study found out that majority of telecenter users are more likely to be younger people than the older generation. The study also found that the rural middle class such as teachers and NGO workers are more likely to use telecenters than other segments of the population. This is because they have disposable income and can afford to spend time on the internet at a cost.

E-mail and social networking were the main reasons people visited the Telecenter. Even though most respondents indicated that they could access e-mails and social network sites via their mobiles, the computers at the Telecenter were more enabled the users to perform multiple activities to a lower cost. Many of the users also indicated that they conducted on-line researches on the computers which is difficult to do on mobile phones.

Even though the Telecenter’s primary reason for being set up in the community was to disseminate development related information to the poor community members such as
farmers with an aim of improving their decision-making, this study found out that few in that
demographic used telecenter services, such as email and internet services due to lack of
awareness, skills, high costs, and language barriers. Instead, they relied on representatives
such as community connectors, government extension officers, community health workers
and local NGO staff who were more likely to have the skills to access information from the
Telecenter and repackage that information for their use in a different format.

The Telecenter also faced problems in the provision of services, which were related to
funds, content, electricity and security of their infrastructure.

The manner in which many respondents used the information they received seem to
support both the theoretical and conceptual frameworks adopted for this study which indicate
that if people have access to data resources, in this case the Telecenter, and if the information
is relevant to their needs, they are likely to make decisions based on the information received
to act accordingly towards that decision, thereby improving their ways of doing things.

In general, the study found that the telecenters can bridge knowledge gaps in the rural
communities if they are facilitated with adequate resources, in terms of skills, facilities,
finances, and policies. The study found out that telecenters have enormous potential to enrich
the lives of people everywhere and help bring ideas and experiences to them, exposing them
to the outside world and connecting them to family members and friends who live far away.
In a world where written letters and postcards are fast disappearing, the telecenter is
becoming the village post office where people can still get e-mails as demonstrated by this
case study. Telecenters also enable people to access newer technologies thereby contributing
to their development.
Recommendations

Based on the data presented, this present study recommends the following: First, the study has found out that telecenters can lead to rural development and bridge the digital divide, but they are instruments of limited reach and for telecenters to be effective, they need to be part of the Government’s comprehensive economic and rural development strategy. This will ensure that they support the various components such as education, health, transport and energy to speed the process of development and ensure access to the population. A telecenter development program will, if properly conceived, increase access to information and communications technologies. The concept of access needs to be comprehensive and include critical elements such as connectivity, training, and the development of local content.

Secondly, ICT training interventions especially towards the young people in rural areas should be scaled up. Lack of computer skills came up as major constraint in accessing ICTs. However, the starting point for this training should be at the lower primary schools so that children are introduced to computers at an early age. This will not only ensure that they benefit from these ICT instruments such as telecenters which can improve their productivity but also put them on a level playing field in the current technology driven world, where start-up business are mainly technology oriented. Continuous training of telecenter managers and staff is necessary for them to be able to keep up with new technologies. A training program for novice adult users may be essential in enabling them to benefit from the telecenters.

The third recommendation is on awareness. Telecentres, especially in the rural areas should raise awareness, not only of the available resources, but also of the use of ICTs and how they can help people in their day-to-day lives. It is important to raise awareness about information and ICTs as a valuable resource for individuals, families, organisations and communities (Roman & Colle, 2002). By so doing, the telecentres could stimulate demand for their services and ensure their sustainability. Telecenters should also continuously
improve and renew their services by conducting regular information needs in order to provide demand led services.

Telecenters should creatively use computer-based sources of information alongside other sources of information that respondents use most. The use of multiple ICTs such as mobile cinema, outdoor media, television, radio, mobile phones in combination with indigenous communication approaches such as storytelling, dance and drama specific to a local context can be used to improve learning and sharing of knowledge in the communities.

The study also recommends that telecentre staff should develop a mindset that is much more customer-focused. One resounding feedback from the respondents of this present study was that the staff at the Sega Telecenter were rude to customers and lacked customer care skills. Telecenter staff should be trained to understand the needs of their customers, especially those that have difficulties in using ICT. Failure to do this could limit telecenters to benefiting only the middle class professionals and alienating the poor and the illiterate in the rural community.

Community buy-in and participation is very important in the survival of telecenters. This study found that some people did not visit the SSV telecenter because they believed it was a private business venture set up an individual without their consultation. The community should take the initiative and be responsible for maintaining the telecenter. Other actors such as NGOs can only help expand the telecenter services otherwise there is the risk of spending a lot of money by NGOs and the Government on unsustainable ICT projects.

Suggestions for further research

One of the suggestions for further research is on how telecenters can facilitate the transfer of local content as well as using the telecenters to collect and store local content and knowledge. Another recommendation is to study the convergence of other information
sources such as community radios and telecenters to provide information to the rural communities.
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Appendix A: Telecenter User Questionnaire

Introduction

My name is Beatrice Ouma, a student at Daystar University in Nairobi is undertaking a study at Sega Silicon Valley (SSV) to find out if telecenters are effective instruments of rural development. This research is in partial fulfilment of a Masters Degree course in Communication and will contribute to the general knowledge on telecenters and rural development which is increasingly being used by the government, non-governmental organisations, private sector actors and donor community to strengthen ICT for development initiatives in rural Kenya.

I am kindly requesting you to take a few minutes to help fill in the questionnaire. All information provided will be treated with utmost confidentiality and therefore you are urged to answer each question truthfully.

1. Name: ________________________________________________________________

2. Telephone number _______________________________________________________

3. Occupation: ____________________________________________________________

4. Gender:   [ ] Male   [ ] Female

5. Age bracket (please tick appropriately)
   15 and below  □
   16-25  □
   26-35  □
   36-45  □
   46-60  □
   Above 60 □

6. Education level- What formal education if any do you have (please tick appropriately)
   No formal education  □
   Primary level □
Secondary level

Technical/college

Undergraduate

Postgraduate

7. What is your approximate income per month? (please tick appropriately)
   
   100,000 and above
   
   Between 50,000-100,000
   
   Between 10,000-50,000
   
   Between 1000-10,000
   
   Less than 1000
   
   None
   
   Don’t Know

8. How often do you visit Sega Silicon Valley telecenter? (please tick appropriately)
   
   Not aware of telecenter
   
   First visit
   
   Rarely (less than monthly)
   
   Occasionally (about once a month)
   
   Regularly (about 2-3 visits a month)
   
   Frequently (about once a week)
   
   Daily

9. Do you pay for using the telecenter?
   
   Yes☐
   
   No☐
10. If yes, how much per session?

____________________________________________________________________

11. What kind of information do you seek? *(check all that apply)*

- Education related  □
- Agriculture related  □
- Health related  □
- Government Servicers (e.g KRA )  □
- Entertainment  □
- Employment  □
- News  □
- Personal  □
- Others (please specify) ____________________________________________________________________

12. What other ICT activities do you most frequently do while at the telecenter? *(check most frequent)*?

- Email  □
- Chat with friends and family  □
- Internet browsing  □
- Blogging/social networking  □
- Conduct Business  □
- Games  □
13. Are you satisfied with the kind of information you get above? Is the information helpful?

Yes ☐ No ☐ A little ☐

14. Please explain your answer above

____________________________________________________________________
____________________________________________________________________
____________________________________________________________________

15. How do you apply information obtained from telecenter to your needs?

____________________________________________________________________
____________________________________________________________________
____________________________________________________________________

16. What other services at the telecenter do you find most helpful and why?

____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________

17. What was your source of information before the telecenter?

____________________________________________________________________
____________________________________________________________________

18. How do you compare that source to the telecenter (briefly describe your experience)

____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
19. How has access to information at the telecenter changed your life personally? (please describe briefly)

____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________

20. How has the telecenter been useful to the general community? What kind of improvements do you see as a result of the telecenter? (Please describe briefly)

____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________

21. How well does this statements agree with your expectations of the telecentre?

The telecenter can lead improved livelihoods for people in this community

☐ Totally agree
☐ Partially agree
☐ Neutral
☐ Partially disagree
☐ Totally disagree

Give reasons for your answer please

____________________________________________________________________
____________________________________________________________________

99
22. What do you feel are the biggest barriers for users accessing ICT services and information at the telecenter? *(check all that apply)*

Lack of awareness about the telecenter/services

Location/distance

Hours of operation

Cost of services

Difficulty in using ICT services

Not enough computers

Not enough services

Information not relevant

Information not in right language

Not enough speed and quality of Internet connection

Others (please specify)

Don’t know

23. What are the areas or services do you think need to be improved in order to provide you with better services?

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
24. Please describe the relationship of the community to the telecenter

Very involved □
Interested but not involved □
Not interested or involved □
Not aware of the telecenter at all □

*Please explain your answer above*
______________________________________________________________________
______________________________________________________________________
______________________________________________________________________
______________________________________________________________________

25. In your opinion, how well is the telecenter run?

Poorly run □
Somewhat well run □
Well run □
Very well run □

26. If you were to make a change in the way the telecenter is set up or operated, what would it be?
______________________________________________________________________
______________________________________________________________________

101
Thank you for your participation.
Appendix B: Questionnaire for Telecenter Manager and Staff

My name is Beatrice Ouma, a student at Daystar University in Nairobi is undertaking a study at Sega Silicon Valley (SSV) to find out if telecenters are effective instruments of rural development. This research is in partial fulfilment of a Masters Degree course in Communication and will contribute to the general knowledge on telecenters and rural development which is increasingly being used by the government, non-governmental organisations, private sector actors and donor community to strengthen ICT for development initiatives in rural Kenya.

I am kindly requesting you to take a few minutes to help fill in the questionnaire. All information provided will be treated with utmost confidentiality and therefore you are urged to answer each question truthfully.

1. How many computers are available (and in working order) for users?

2. What other technology services are available?

3. What other services are offered?

Questions about users.

4. Approximately how many people use the telecenter each day (on average)?

<table>
<thead>
<tr>
<th>Number of users per day</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

5. List the type of users served by the telecenter (for example students, business people, farmers, civil servants, teachers)

6. Approximately what percentage of users are male or female?

<table>
<thead>
<tr>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>%</td>
<td>%</td>
</tr>
</tbody>
</table>

7. Age-What is the approximate percentage of users from each of these age brackets (estimate)

<table>
<thead>
<tr>
<th>Children Under 15</th>
<th>Youth (16-25)</th>
<th>Young adults (26-35)</th>
<th>Adults (36-45)</th>
<th>Mature adults (46-60)</th>
<th>Above 60</th>
</tr>
</thead>
<tbody>
<tr>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
</tr>
</tbody>
</table>
8. Education level- What formal education completed by users (your best estimate)

<table>
<thead>
<tr>
<th>No formal education</th>
<th>Primary level</th>
<th>Secondary level</th>
<th>Technical/college</th>
<th>Undergraduate</th>
<th>Post-graduate</th>
</tr>
</thead>
<tbody>
<tr>
<td>____%</td>
<td>____%</td>
<td>____%</td>
<td>____%</td>
<td>____%</td>
<td>____%</td>
</tr>
</tbody>
</table>

9. Income level- What is the approximate percentage of users that are from high/med/low income brackets (estimate, relative to general population within Sega community)?

<table>
<thead>
<tr>
<th>High</th>
<th>Medium</th>
<th>Low</th>
<th>Don't know</th>
</tr>
</thead>
<tbody>
<tr>
<td>____%</td>
<td>____%</td>
<td>____%</td>
<td>____%</td>
</tr>
</tbody>
</table>

Questions about information and content

10. What is your perception of information people seek most at the telecenter (estimate)?

<table>
<thead>
<tr>
<th>Educative information on any of the above</th>
<th>Email</th>
<th>Web browsing</th>
<th>Chat (e.g. Skype)</th>
<th>Blogging/social networking</th>
<th>Games</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>____%</td>
<td>____%</td>
<td>____%</td>
<td>____%</td>
<td>____%</td>
<td>____%</td>
<td>____%</td>
</tr>
</tbody>
</table>

11. What is your estimate of ICT activities users most frequently at the telecenter?

<table>
<thead>
<tr>
<th>First time</th>
<th>Rarely (less than a month)</th>
<th>Occasional (about once a month)</th>
<th>Regular (about 2-3 times a month)</th>
<th>Frequent (about once a week)</th>
<th>Daily</th>
</tr>
</thead>
<tbody>
<tr>
<td>____%</td>
<td>____%</td>
<td>____%</td>
<td>____%</td>
<td>____%</td>
<td>____%</td>
</tr>
</tbody>
</table>

12. What is your assessment of the frequency of use at the telecenter (approximate estimate)?
13. What do you feel are the biggest barriers for users accessing information at the telecenter? *You can select more than one choice.*

- Location
- Hours of operation
- Cost of services
- User’s lack of ICT knowledge
- Not enough computers
- Not enough services
- Irrelevant information
- Information not in the right language
- Not enough speed and quality of internet connectivity
- User’s lack awareness about the telecenter and related services

*Questions about Telecenter operations and infomediary role*

14. What sources of support currently contribute to the telecenter operations *(please include cash and in-kind)*

15. Describe the organisation structure and personnel that manage the day-to-day running of the telecenter. Do you have a Management Committee?

16. How do you learn about the information needs of users in the community?

17. How do you respond to those needs?

18. How do you source for expert information for your users apart from the Internet?
19. What strategies are you using to ensure that users get access to information which is relevant to their needs? (e.g. Locally produced information)

20. How do you target both the literate and illiterate population’s needs?

21. What is the flow of information from telecenter to community and vice versa?

22. List some of the accomplishments of your telecenter?

23. List some of the greatest challenges that the telecenter faces?

24. How have/are these challenges been/being addressed?

25. What areas or services need to be improved in order to provide better services to the community members?

26. What other activities could you do in this venue to better serve the information needs of the users?

Questions about perceived impact

27. In your experience and observation, how has SSV changed people’s lives?

28. How does the telecenter help in other community development initiatives?

Question about future

29. In your opinion, what do you think is the future of this telecenter within the community?
Appendix C: Guide for Focus Group Discussions

Process

The facilitator will encourage discussion among participants, ensuring that everyone can talk, prompt with questions and clarifications as needed, and help participants by writing down notes on a flipchart as needed.

Materials required

Flipchart paper, masking tape, markers

Date of the discussion________________________________________________

Number of participants_______________________________________________

*Description of study, voluntary participation, verbal consent.*

Questions

1. In your opinion, what were the biggest community-related problems faced before Sega Silicon Valley telecenter project was established?

2. In your personal opinion, have these problems been solved since the telecenter was established? Give some concrete examples? How about negative effects of the telecenter?

3. In what ways has the telecenter fulfilled your personal information needs? In what ways has it not fulfilled those needs?

4. In your opinion what has been the impact of the telecenter on the people:

   *In acquiring new knowledge:*
Socially:

Economically:

5. Do you think the telecenter is a valuable addition to the community? Would you have preferred that the money spent to establish the telecenter was spent on another project instead? If yes, what would you have preferred?

6. What are the major problems that people in this community face in accessing/using computers/Internet?

7. How does the telecenter address some of those problems?

Other comments:

Thanks, Closure

Facilitator remarks: