

ICT CAPACITY BUILDING FOR KNOWLEDGE AND  
INFORMATION ACCESS IN DISADVANTAGED  
COMMUNITIES

By

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# ICT capacity building for knowledge and information access in disadvantaged communities

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## ABSTRACT

The thesis investigated Kenya public libraries involvement in provision of ICTs to the Public and how it mitigates in narrowing the digital divide in disadvantaged rural communities. Most of the countries adopt different approaches in implementing information technologies to build general knowledge and digital literacies among citizens. The initiatives are usually geared to hasten access to information infrastructures but often limited to urban areas. In the contemporary period, digital literacy is of equal important to allow all citizens' participation in socio-economic developments. Among the aspects studied are how the Library ICT initiatives are geared to enable and empower people in rural communities not just a matter of the provision of hardware and software resources but support in ICT access, skills training to reduce the existing disparity. Usually the disadvantaged (rural) communities are characterized by poor information infrastructures, low digital literacy rates that further limits access to information and participation in civil society. This study used public libraries case study, particularly evaluating its role in building and developing ICT capacity at the grassroots level. It includes understanding implementation paradigm, utilization, affordability, digital literacy training and community participation, which are fundamental to develop national strategy to enable the rural poor achieve economic development through access to information technologies.

**Keywords:** digital divide; information literacy; capacity building; digital inclusion; rural communities and development; public libraries; developing countries

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## LIST OF ABBREVIATIONS

CCK – Communication Commission of Kenya

ICT – Information Communication and Technology

EIFL- Electronic Information for libraries

FCC – Federal Communication Commission

KNLS- Kenya national Library services

OECD – Organization for Economic Co-operation and Development

PAT – Public Access Technologies

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## CHAPTER 1 INTRODUCTION

This thesis presents a study of Kenya's public library involvement in ICT capacity building in rural communities. It reflects on how libraries participate to narrow the inequality of digital skills, access to information and information technologies in rural places. Usually there is a direct correlation between poverty, affordability and accessibility of ICTs where most people are unlikely to afford or access basic ICT services in their homes, thus limiting them to public access places. The public access centres are important to the digital literacy building in the communities which are usually disadvantaged.

The inequality subjects people to lack of vital information and access to information infrastructure, which could have a significant contribution towards improving peoples' welfare (Gould & Gomez, 2009). Mukhopadhyay & Chatterjee (2012) adds that "people need information for both generic and specific purposes, regular and current updates to local information and knowledge that aids appropriate decision-making process for personal and economic well-being".

In the contemporary world, information is synonymous with technology, particularly internet and related digital technologies, (Harle and Tarrant, 2010) collectively refers it as Information and Communication Technologies (ICT). Many developing countries are increasingly integrating and adopting information technologies in everyday services delivery, though decades behind, compared to developed counterparts. This was certainly due to myriad of challenges among lack of basic ICT infrastructure, nevertheless in the recent time most of the developing countries have exponentially accelerated growth in Information and communication technologies take-up across the sectors.

According to Bar (2013) developments and spread of smart phones keep raising questions on the effectiveness, or long term relevance, of public access ICTs. But for the moment the public access serve as an intermediate step on the road to the ultimate goal of private (home) access to computers and the internet.

Particularly public libraries as newcomers in integrating ICTs (computers, internet, and digital resources) for instance in Kenya, community public libraries launched e-resources centres (PAT) services as from 2012(KNLS, 2013), making them part of the services in addition to books and other information services to their traditional services. Libraries, previously perceived as book or reading centres but with the computers and internet they have assumed new roles more especially in the rural communities. Just as many other institutions in the past, libraries focused on organizational change i.e. internal systems and functional efficiency, but then as much that is important, the technologies are essential and primary means to access information.

In the past, despite the efforts of implementing technologies, its adoption had been urban based particularly in many developing countries leading to marginalization of rural communities. Many countries adopted various strategies to digital inclusion projects for example South Africa launched internet kiosk, India hole in the wall; echouopal and Kenya digital villages, to support communities access vital information through ICTs in rural and low income areas.

In Kenya, an entrepreneurial model was thought to be more viable and feasible, funded by the government (through the ICT-Authority) to support entrepreneurs in setting up the digital villages in the rural communities. According to Obora et al (2014) the approach struggled and failed to achieve financial sustainability eventually closedown. The failure

leads to subjecting of the rural communities to further digital divide (on ICT) or digital exclusion. Mukhopadhyay & Chatterjee (2012) observed that for such models to attain financial success a variety of factors including good management, good locations, strong local demand, new service development and locally relevant services are necessary. With the models facing sustainability challenges (Chigona, 2007) proposed a sustainable way is through “cohabiting” ICTs centres in public libraries. Therefore as the model takes root in both urban and rural libraries world over, there is need to evaluate how well they fit and form the core part for information access in the communities.

The integration of ICTs needs a better implementation approach to achieve intended goals of reducing the digital divide as well as enable build knowledge and digital literacies in communities. Thus bringing and sustaining technology in rural communities should go beyond, provision of infrastructure; hardware and software. This study looked at the context of Kenya, one of the developing country with a widening ICT infrastructure but experiencing digital divide (low digital literacy rate and access to infrastructure) especially in rural communities. The research selected public libraries case study to illustrate its role in ICT and knowledge building in the disadvantaged communities.

## 1.1 CONCEPTUAL BACKGROUND

Gomez & Gould (2010) noted that “any technology advancement alone is insufficient if people do not understand how to put it to effective use as part of their lives or their work, either because they are not trained to use it, or they cannot imagine how they could use it”. Most people in rural communities in developing countries are economically challenged, making it hard for them to afford basic needs, let alone access to information, and communication tools.

The people depend on agriculture and other small-scale economic activities for sustenance thus need to access relevant information. Through ICT support initiatives it may enable them to gain knowledge and adopt modern practices to achieve development goals. Harle and Tarrant (2012) emphasize that if technology is not properly attuned to, it may not contribute considerably to better education, health and livelihoods. Thus if it's properly utilized it has the potential to open up new ways of meeting fundamental development needs. For example ICTs can offer improved access to the right information at the right time that can contribute significantly to the work of the farmers and farming, and reduce the ability of middlemen to exploit small producers, as it is often dependent on the farmers' ignorance of market prices and lack of market options but through access to ICTs more information is available to enlighten the farmers, for instance one of the practical example is e-choupal initiative in rural India (New Media and Development Communication, 2012) which support farmers with relevant information through access to ICTs.

Some of the fundamental concerns that need to be addressed for community ICT based initiatives are; how effective the communities are able to utilize the ICTs to access information (the staff and users ability and capacity/competencies to use the ICTs), how well rural libraries support training the staff and users on digital and information literacy, and the affordability of services. If these factors are adequately addressed certainly the digital divide, especially on digital literacy will be reduced. Gould and Gomez (2012) observed that "increased digital literacy eventually contribute to the ability of individuals to utilize information in ways that can help improve a one's quality of life". Thus it is

important to understand the public libraries' role in enhancing the digital literacy and capacity in rural communities.

The study was undertaken with the understanding of the raised issues on information technologies (digital literacy) utilization and support to communities as key concerns.

## 1.2 DEFINITION OF TERMS

The following terms are used throughout the study to further the concept of ICT capacity building in rural communities:

**ICT** - which can be broadly defined as a diverse set of technological tools and resources used to create and communicate, share, disseminate; store and manage information.

**Capacity Building** - is the process by which individuals, groups, organizations, institutions and societies increase abilities to: (a) perform core functions, solve problems, define and achieve objectives; (b) understand and deal with their development needs in a broad context and achieve it in a sustainable manner (UNDP, 1997). A well-trained, productive person needs access to, information, technology, infrastructure and other resources.

**Disadvantaged Communities** - This refers entities which lack essential infrastructures that may facilitate development growth.

**Infrastructure** - Is a term that encompasses all of the elements required to make electronic content and services available to the staff and public. Infrastructure includes the hardware, operating system software and workstation applications, networks, and telecommunications services that support the delivery of your technology-based service and electronic content”(Khosrow-Pour, 2012) .

**ICT capacity building** – can be defined as effort to efficiently provide computers, digital literacy skills and internet to promote access and use to information for community development in marginalized community segments.

**ICT policy** - policy put into place by the governments and stakeholders who are committed to the process of bringing digital technology to all individuals and communities so that they can have access to information (Khosrow-Pour, 2012)

**Public Library Funding** - Public libraries are funded through many mechanisms. The library can be funded directly out of the government consolidated funds, city or county's general fund collected through direct taxes or grants obtained from outside sources, or any of the combination (Mayo, 2005)

**Digital inclusion**- refers policies developed to close the digital divide and promote digital literacy. It includes high-speed Internet access and digital literacy in ways that reach various audiences, many of whom parallel those mentioned within the digital divide debate. To match the current policy language, digital inclusion will signify outreach to unserved and underserved populations (Real, Bertot, and Jaeger, 2013)

**Digital divide**- refers to one group that has effective and affluent access to skills, and information communication technology; while the other has none or only limited access (Chowdhury, 2012).

**Digital literacy**- this refers the ability on the use of digital technology for searching organizing, understanding, and creating information on digital devices (Agusti, Velasco, & serrano, 2011)

**Public Access Technologies (PATs)** - This refers places where general public can access



technologies including computers, internet and digital informational resources at an affordable cost.

**Digital villages** - This refers to villages connected with internet giving residents of that particular place access to range of information services provided by the web (Obora, et al, 2014).

Based on the above key concepts, the research examined public library as the primary public venue in the context of addressing the ICT infrastructure and skills issues in rural communities (low income areas). The ICTs are important in supporting development societies especially in areas of agriculture, education, health and commerce. For the ICT initiatives to achieve much, sufficient and proper alignment with the community's needs and priorities is inevitable or risk further marginalization (digital divide) of the rural communities.

### 1.3 SIGNIFICANCE OF THE RESEARCH

The research helps to understand implementation of ICTs in Kenya's rural community through public libraries and enables to identify key strategies in building digital and information literacies.

The research also informs and helps policy makers in understanding the importance of ICT for their constituents, and public ICT providers to communicate effectively with policy makers about the value of their work for more support.

The research also enables to understanding public libraries involvement in ICT capacity building especially in rural communities, given the various projects (digital villages and pasha initiatives) failures/inadequacy to tackle the digital divide issues effectively.

And finally the study contributes to the body of knowledge of information access for development which is essential in enabling developing societies to attain desirable development and support equal participation in information society.

#### 1.4 OBJECTIVES OF THE STUDY

In the light of the stated problems the overall objectives of this research are; first to determine and assess the rural public libraries roles in capacity building on ICTs /digital literacy beyond hardware provision in the libraries. Second, to understand issues regarding public library information technology enabled services, particularly as libraries take on an increasingly important role in supporting a range of technology services such hardware and software provision, digital literacy training among others, which have implications for health, education, agriculture, and e-government in community development.

#### 1.5 THE PROBLEM STATEMENT

Most communities are marginalized in terms of access to informational infrastructure and even to information access, for instance in Kenya, the internet connection in the rural communities was less than 3% in rural, 15% in urban (CCK, 2010). Other challenges include low digital literacy rate, high poverty rate and lack of information technologies among others. All these inhibit access to information increases the digital divide and exclusion is common in rural when comparing with urban counterparts.

In responding to these challenges, Kenya launched various digital divide reduction programs like digital villages/pasha centres initiatives under digital inclusion banner. The model did not achieve universal access to all communities as envisioned. These projects failed to achieve the set objectives (Obora et al., 2014). The digital villages'

implementation shortcomings informed the research to pursue and evaluate how the library are coping with the integrated ICTs. The following questions guided the research when evaluating the rural public libraries: how they build digital literacy in rural communities, the adequacy and sustainable of the library PAT model? To answers the questions we measured them through the existing ICTS and service to the communities through the eyes of users, on how well support ICT access and how library staff and ICT policy implementers support the development of infrastructure and digital literacy skill building. Usually if there is no proper capacity building for infrastructure and training to users, there is a likelihood of further marginalization and enlarging the digital divide creating a social exclusion.

## 1.7 ORGANIZATION OF THE THESIS

The thesis is divided into seven chapters. In this chapter 1, I discuss my research background, research problem, conceptual framework. The chapter gives a detailed background account under which the research is carried. In Chapter 2, I performed a comprehensive literature review of past research on ICTs, PATs and public libraries, Kenya's ICT penetration and economic landscape. In Chapter 3, I provide a description of the methods used in the study, the manner in which I collected data with the use of survey, observation and interviews, how the primary data collection tools which include questionnaires, interview and observation. Chapter 4 provides a detailed statistical and descriptive analysis of the survey responses, observation and interview data analysis indicating the general perceptions of the public on the raised questions in the research. Chapter 5, this chapter provides a walkthrough the research finding through discussion under the ACE framework with detailed findings that provide several explanations for the

research results.

Chapter 6, this chapter, examines and gives summary of the case studies and finally the gives some recommendation for further action to improve the ICT situation in the libraries.

Chapter 7, concludes though summaries of the findings as well as provides the potential contributions of the study to rural development through ICT in public access places if respective entities take action.

## 1.6 CONCEPTUAL FRAMEWORK

The primary argument is provision of ICT hardware to the public is not enough if the public cannot maximize the use of the available ICT infrastructures to access information. In figure1, we illustrate under which perspective I undertake the study. The key aspect of ICT capacity must be considered as vital for information society through knowledge and information access.

As ICTs become available, individuals and organizations adopt them at varying rates, this brings digital divide which results to inequality to information access. The lack of access to the technology and the ability to use the technology maybe as a results lack of skill to use, geographical location, economic challenges, among others reasons.

The digital divide bridging to disadvantaged people or marginalized areas requires a collaborative efforts from public policy makers, community development initiatives, educational institutions (referred here as enablers) and the disconnected themselves (technology users). Dewan (2005) elaborates that providing public access to PCs and the Internet through schools, public libraries, and community centers is considered one of the most relevant approaches to bridging the digital divide but more is needed within the same institutions to diffuse the digital literacy skills to the communities. In this framework I consider the public libraries as key contributor (enablers) to reducing the divide however, it is not clear how effective this approach is for actually overcoming many of the barriers for the disadvantaged. Therefore as the public library take part in bridging the gap it should be particularly clear how effective their approach and participation to solve the various types of information and technology access inequalities in rural and disadvantaged communities.

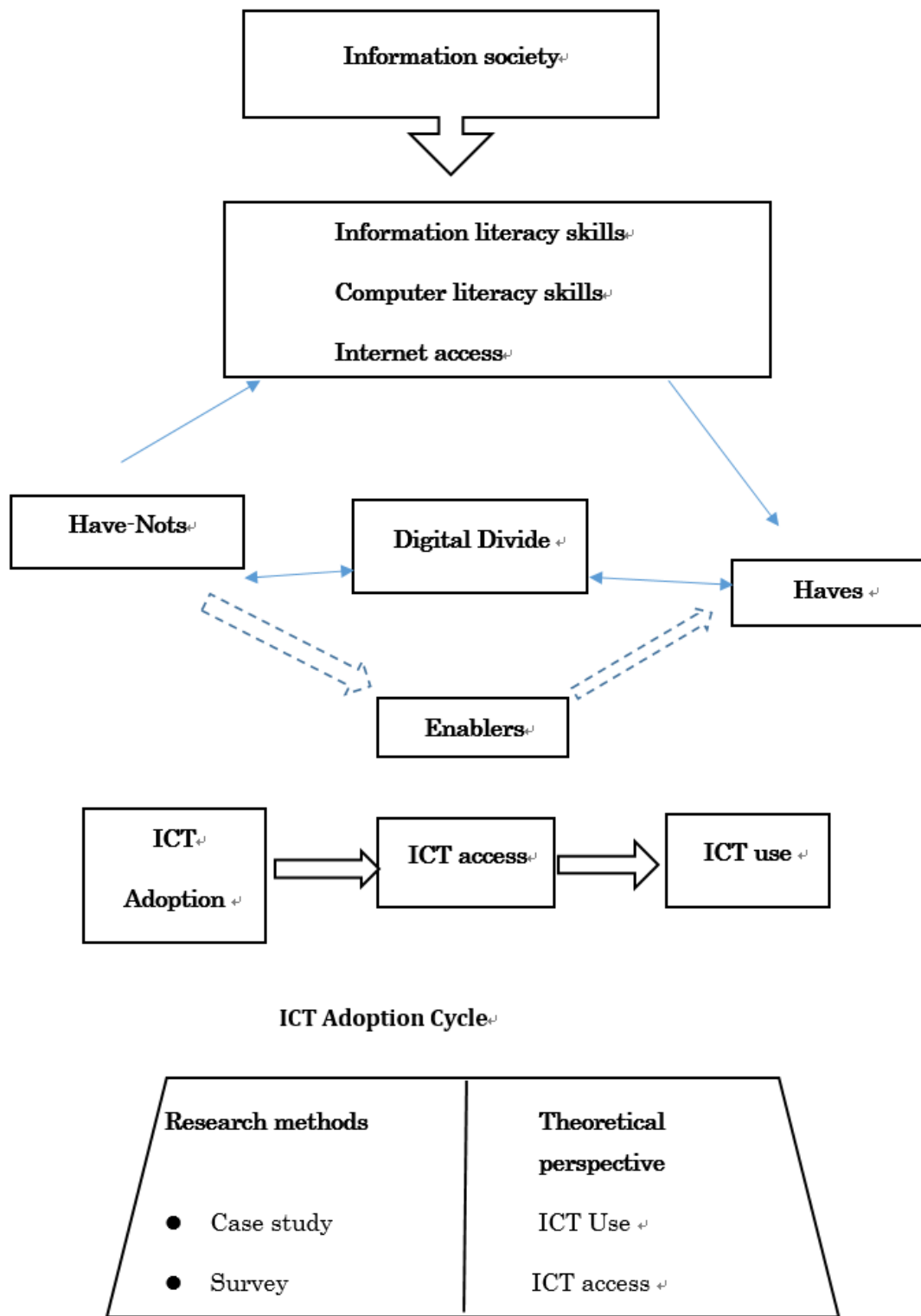


FIGURE 1 CONCEPTUAL FRAMEWORK

## CHAPTER 2 LITERATURE REVIEW

### 2.1 INTRODUCTION

I draw from three primary areas to provide the framework for this thesis. First, I performed a comprehensive review of the past research in ICT infrastructure landscape in Kenya. Second, in order to gain an understanding of the developing relationship of public libraries and technologies in rural communities, I reviewed literature from the recent work on the concepts of public access technologies (PATs) and digital literacy. Third, I carried out a review on reports to illustrate the ICT capacity and explore the trends surrounding the ICT integration.

The literature particularly relating to public access technologies, libraries, digital divide, and digital literacy abound. The literature includes recent research on, comparative studies on libraries, telecentres, cybercafés and public access to ICT in developing countries (Gomez, 2010; 2012), PATs in public libraries (Bertot, 2009), public libraries and digital inclusion (Real, Bertot and Jaeger, 2014), intersection of public policy and public access (Jaeger, Bertot, Thompson, Katz & DeCoster, 2012), internet, public libraries and digital divide (Kinney, 2010), Should communal computing facilities cohabit with public facilities ( Chigona, 2007).

The literatures provide much in examining the specific roles of PATs and libraries in ICT provision but the literature examining the role of libraries particularly on rural community libraries in developing countries is not sufficient. Real et.al (2013) noted that rural public libraries have been relatively understudied when compared to urban public libraries as a whole in relation to digital technologies. Gomez (2012) also notes that there is limited literature on the topic of public access to ICTs in public libraries in many

countries. The noted disparities between rural and non-rural libraries include weaker technological infrastructure, lower staffing, poor funding and lack of technology training to both users and staff. Nevertheless the continual information technological innovations and its ubiquitous presence has a significant influence on information access. For the Public access technologies to gain full support from stakeholder there is need for more research to advocate and publicize their importance to communities development. This research contributes through the study of rural public libraries as a PAT center in Kenya. The following sub-sections reviews and discusses various issues related to public libraries, information technologies infrastructural penetration patterns, economic situations and how they influence each other in the wake of the new information age in bridging the digital divide to enable exploitation of information resources and build knowledge in societies.

## 2.2. KENYAS' ICT INFRASTRUCTURAL LANDSCAPE

To understand the ICT infrastructure context in Kenya, it is imperative to look at basic ICT penetration levels (computers, mobile phones, Internet access penetration rate). The following sections provides various data from ICT gaps report (CCK, 2010) and national surveys on population and Housing Census (2009) to provide important national characteristics of use, access and ownership of the ICT infrastructure and equipment in Kenya. The reports reflect the ICTs access and penetration levels from a sample population of 6803, urban (5019 and rural 1696) and a national census respectively.

### 2.2.1. MAIN PLACE OF ACCESS TO THE INTERNET

In the two key surveys data indicated that access to Internet services is limited throughout Kenya and difference in access between rural and urban areas is high. While in most urban



areas the rate of access is above 15%, in some rural areas it is less than 3% by 2010.

Household ownership of Internet connectivity was also limited. This leads to the fact that the main form of access to the Internet is through public access centres for example in cybercafés, education and community centres. Thus, the main constraint on Internet use seems to be its availability and affordability (CCK, 2010). Though the trend has significantly improved due to cheaper internet and smart phones increase (Pew Research Center, 2014).

**TABLE 1: PLACE OF INTERNET ACCESS**

<b>PLACE OF ACCESS TO INTERNET</b>			
<b>Place</b>	<b>Rural</b>	<b>Urban</b>	<b>Total</b>
<b>Own house</b>	10.4%	19.8%	16.7%
<b>A friend's house</b>	3.5%	1.1%	1.9%
<b>Office/work</b>	15.8%	22.8%	20.5%
<b>Cybercafé</b>	39.4%	36.9	37.7%
<b>Community Centre</b>	2.7%	0.9%	1.5%
<b>Educational Centre</b>	5.8%	3.5%	4.3%
<b>Mobile phones</b>	19.9%	14.7%	16.45%
<b>Others</b>	2.4	0.3%	1.0%
<b>Total</b>	100%	100%	100%

Source: ICT survey, 2010

Most Kenyans accessed the Internet at the Internet cafe (38%). Others have access to the service at their workplace (21%), their home (17%) or via a mobile phone (16%). In the table above, it shows that cybercafés were the main public point of access to Internet in most areas, both at the rural and urban levels. As the statistics indicate people access Internet services through their mobile phones, cybercafés, office, community centers, educational centers among others but libraries are not featured prominently as main

access points and this could be attributed to the reason that there are very few libraries (60 public libraries) in the Kenya (EIFL, 2014), and the ones that existed had no internet and computers by the time. The main place of access differs by location depending on the available public access places and infrastructure.

### 2.2.2. ACCESS AND OWNERSHIP OF MOBILE TELEPHONES

The rate of access to mobile phones is over 80% in Kenya. As the table below shows, however access to mobile phones is high in urban than rural areas. In urban areas more than 95% of the population has access while in rural areas 79% respectively.

**TABLE 2 PEOPLE WITH MOBILE TELEPHONE (2010)**

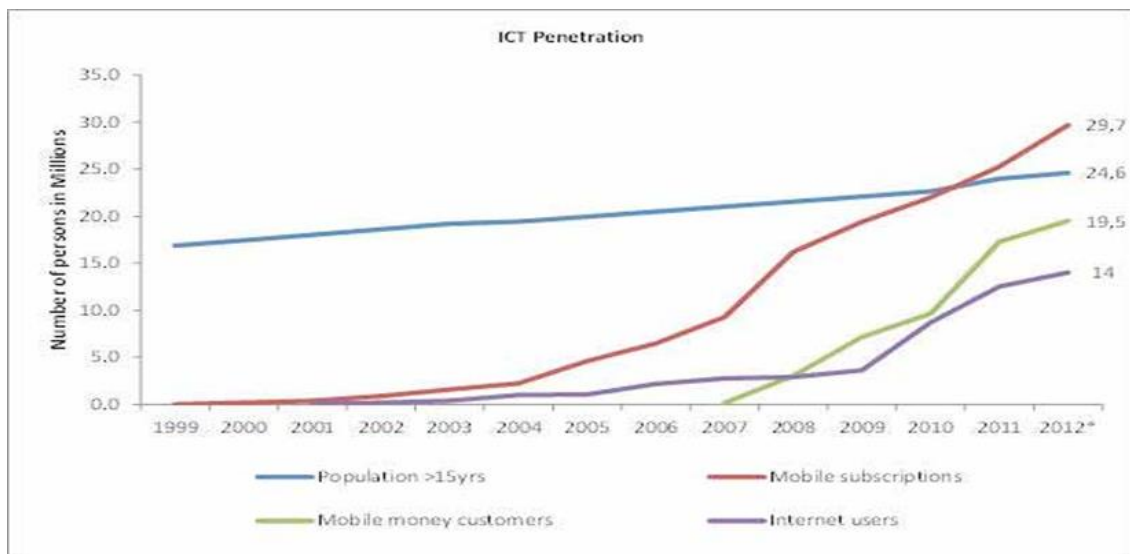
	<b>Rural</b>	<b>Urban</b>
<b>No</b>	21.2%	5.4%
<b>Yes</b>	78.8%	94.6%
<b>Total</b>	100.0%	100.0%

Source: ICT Survey (2010)

The data also reflect that more than half of the population in Kenya have access to own mobile phone. The pattern is quite similar in both rural and urban areas.

### 2.2.3. INTERNET SERVICES

In the recent times there is a huge demand on internet Services in Kenya. The existing services are delivered through various platforms that include mobile networks, fixed wireless access, satellite networks, fibre-optic and cable networks (CA, 2015).



**FIGURE 2: A SNAP-SHOOT OF ICT PENETRATION IN KENYA (1999-2012)**

Source: Communication Commission of Kenya (2013)

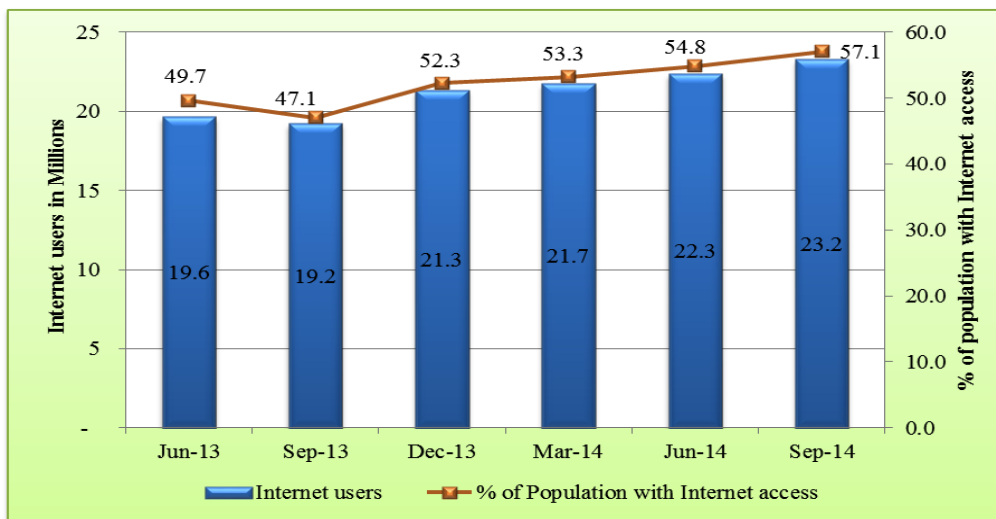
The Figure 2 indicate a growth of mobile phone subscriptions to 29.7 million with the number of Internet users standing at 14 million by 2012 (CCK, 2014). This is an indication of accelerated growth of ICT adoption in Kenya especially on mobile and internet use.

**TABLE 3: INTERNET USE AND MOBILE SUBSCRIPTION TREND IN KENYA (2000-11)**

Year	Number of subscribers	% of mobile phone subscription	% of internet usage
2000	127,404	0.41	0.32
2001	600,000	1.87	0.62
2002	1,187,122	3.6	1.21
2003	1,590,785	4.69	2.94
2004	2,546,157	7.31	3.02
2005	4,611,970	12.89	3.10
2006	7,340,317	19.97	7.53
2007	11,349,412	30.06	7.95
2008	16,303,573	42.05	8.67
2009	19,364,559	48.62	10.04
2010	24,080,891	61.03	14.00
2011	28,080,771	66.81	28.00

Source: (ITU, 2014)

Table 5 shows a snapshot from 2000-2011, we note a significant growth in mobile phone and internet usage uptake to 66.81% and 28% by 2011 nationally.



**FIGURE 3: ESTIMATED NUMBER OF INTERNET USERS AND INTERNET PENETRATION (2013-2014)**

Source: (Communication Authority 2014)

Figure 3 above illustrates, estimated number of internet users stood at 23.3 million users by September 2014. The population that had access to internet stands at 57.1 per cent nationally. The internet and mobile phones emerge as the most common technology (Communication Authority, 2015).

Overall the statistics reflect increased adoption of ICTs specifically mobile phones but the rural communities are disadvantaged in accessing ICT services especially computer and internet. Therefore there is a need for continued infrastructural support and skills support, for the rural communities through affordable public access initiatives. The public access places like libraries have a role to play in providing and promoting the importance

of digital technologies for information access and also in the provision of affordable access to the public.

### 2.3 ECONOMIC SITUATION AND ICT ACCESS IN KENYA

Poverty is a social problem characterized by low levels of income and inadequate access to basic need and services, which may be attributed to high income-inequality, high inflation, and unemployment (KNBS, 2014). Overall, the rural sub-set of the population indicates 50.5 percent, implying that of the 25.8 million people living in rural Kenya in 2009; about 13.1 million were living below the poverty line. Given that close to 70 per cent of Kenyans reside in rural areas; the results indicate that poverty is a more common phenomenon in rural Kenya than an urban.

**TABLE 4: POVERTY INCIDENCE IN URBAN AND RURAL KENYA**

	<b>Small Area estimation 1999(individuals)</b>	<b>KIHBS 2005/06 (individuals)</b>	<b>Small Area Estimation 2009 (Individuals)</b>
<b>Kenya</b>	52.6%	46.6%	45.2%
<b>Rural</b>	52.8%	49.7%	50.5%
<b>Urban</b>	49.5%	34.4%	33.5%

Source: KNBS (2014.p291)

In figure 3 it indicated mobile subscriptions stand at 29.7million however many people have more than one subscription with different providers to take advantage of lower prices (Freedom House, 2014). With high poverty rate a direct correlation can be drawn between poverty, affordability and accessibility of ICTs, for most people are unlikely to afford or access basic ICT services in their homes limiting then to public access.

According to Freedom House (2013) the cost of mobile devices and internet subscriptions remains a stumbling block for many impoverished Kenyans to access the web, and access to in-expensive internet remains far-reaching for many low-income earners while the internet cost in Kenya is considered among the cheapest in Africa.

The ICT gaps (CCK, 2011) indicate the greatest discrepancy exists between rural and urban communities when it comes to ownership of mobile phones, Internet connection, access to computer services, electricity connections, and other related services. While internet penetration continues to increase, there is still a large disparity in access between rural and urban areas. Internet use in Kenya is mainly concentrated in urban areas, and significant action is needed to address issues of access outside of the capital-Nairobi (David and Monica, 2012).

If we estimate average individuals' economic situation in the rural areas we can conclude that the rural people have challenges not only to afford ICTs but also do not have effective access to information through ICTs.

#### 2.4 PATRON TECHNOLOGY TRAINING IN PUBLIC LIBRARIES

In the research on USA public library technology landscape (Hoffman et al, 2012) they viewed that beyond Internet access, public libraries played an essential role in boosting their patrons' technology proficiency and digital literacy skills. Over 90.2 percent of public libraries offer some type of formal or informal technology training.

Gomez & Gould (2012) observed that "as the public access venues play a role in reducing the divide, it is still common that most people in the rural communities lack effective access to ICTs and digital literacy because they perceive such technologies are meant for

the well-educated, thus making them uncomfortable using ICTs available at their public access". Adams and Blandford (2005) points out that "some public organizations assume that placing free computers and making them available in the public places are removing several barriers to social inclusion, when in fact we could be leaving out an obvious one in place- absence of understanding the target users' in needs and lacks of guidance to them".

Bertot, et.al (2012) emphasize on Internet access services, training, and assistance in public libraries are vital to both serving the needs of individual patrons and their communities. According to Jaeger et al. (2012) digital literacy encompasses the skills and abilities necessary for access once the technology is available. These components of digital literacy are of equal significance, for without access, people cannot develop capacity, without which they cannot gain maximum benefit from ICTs and online resources. In general both technology access and training on may eventually lead to digitally literacy to help people find the information they seek, evaluate that information, and use that information effectively to gain knowledge (the skills include using e.g., computers, mobile devices, and sharing information online responsibly e.g. On Blogs, Twitter, Facebook, and YouTube).

In a study (Real, Bertot and Jaeger, 2014) technology training services in public libraries are an important component of the services they provide to the community. In a comparative study among 25 countries (Gomez, 2012) of public access venues, findings indicated that capacity and disposition of staff plays a larger role in driving the level of digital literacy among staff, as well as willingness to help users. Gomez & Gould (2010) also in study of "cool factor study" noted that the libraries tend to have high institutional reputations but library staff tend to have the lowest capacity and training to meet the need

of ICT users in public access venues: this is exacerbated by the fact that a high proportion of libraries which offer ICT do not necessarily have trained staff to help users with the ICT tools. Gomez (2011) recommends that libraries or public venues to encourage use of ICTs through increasing on their efforts on staff ICT literacy, overall skill capacity, and motivation to help users meet their information needs. EIFL (2011) in the perception of public libraries in Africa found that librarians are competent in the traditional roles of a librarian but have limitations in technology related services.

Considering situation in developing countries socio-economic issues leads to low literacy levels, lack of access to computers and digital skills which might prevent people, especially in rural areas from accessing, utilizing and taking advantage of digital technologies.

#### 2.5. ICT POLICY AND BROADBAND SUPPORT FOR PUBLIC ACCESS

Success of national ICT initiatives depends on the policies that support all aspects of ICT in a country. They include the aspects of availability of broadband infrastructure, policies to foster infrastructure development and budgetary provision to institutions that support accessibility and availability of the services to the public. To prioritize these key issues a basic understanding of underlying challenges of digital divide and inclusion is necessary and why they need urgent attention. Kim (2010) points out that one of the significant barriers to greater broadband use for many potential users is cost. In identifying demand-side barriers to broadband adoption, policymakers around the world have identified affordability as one of the main reasons that people do not use broadband services where they are available.

For example in Kenya broadband affordable costs are in large part the result of strong regulatory interventions that have led to the implementation of the lowest mobile



termination rates. Data bundles are available for prepaid mobile customers, while mobile broadband subscriptions on GPRS/EDGE and 3G networks have also continued to increase (Freedom House, 2013)

Seeing broadband as an enabling ICT platform does not contradict or exclude common understandings that define broadband in terms of speed, functionality, or technology. The OECD (2008) found the average wired line broadband penetration rate in the top five countries was over 36 subscribers per 100 people, with just 4.4 subscriptions per 100 people in developing countries compared to 24.6 in developed countries. In effect, wired line broadband deployments in many developing countries are a decade behind those in developed countries.

Many institutions concerned with ICT policy, play a key role in supporting PATs; like libraries, schools and community centres to provide technologies to the public. For example in the United States of America the FCC emphasizes in creating incentives to promote digital inclusion, with views of sufficient broadband service, affordable broadband service, and the availability of opportunities to develop the digital literacy needed to use broadband (FCC, 2014).

The competitive funds to school and libraries through 'schools and libraries' universal services program and discounts (E-rate program) for components needed for broadband connectivity within schools and libraries (FCC, 2014). An excerpt from the commissions policy indicate commitment to ensure support for library broadband to achieve a fast internet connection: "The Commission's goal in the E-rate Modernization Order is to ensure affordable access to high-speed broadband sufficient to support digital learning in schools and robust connectivity for all libraries"(FCC, 2014).Hence, to tackle the problems

of digital inclusion a multi-sectorial approach is necessary, where each specific stakeholder has roles to play, for example public libraries need to be supported to acquire affordable broadband connection given that they have funding challenges. The most common framework strategy is to streamline the policies to create an enabling environment to foster broadband availability and address development, economic market forces, policy reform creation and providing funds among others.

## 2.6. FUNDING OF TECHNOLOGIES IN PUBLIC LIBRARIES

Hoffman et al (2012) found out funding as the greatest challenges to continuing to provide free public access to computers and the Internet at public libraries. A majority of libraries (77.9 percent) report cost factors as one of the major challenges in maintaining, sustaining, and enhancing their public access technology infrastructure. In Kenya Public libraries are usually working on constrained budgets thus make it difficult to support technologies which need huge funding (KNLS, 2012). Bertot (2009) notes that most of the rural public libraries do not have a budget dedicated to technology and they that lack IT funds mostly rely on staff from other libraries to manage their technology. Due to budget inadequacies most libraries seek grants, conduct fund-raising and others establish foundations in order to seek for public access technologies (PATs) funding (Gomez, 2013). The indication is that libraries are relying on external funding support. For instance the schools and libraries universal service support program, commonly known as the E-rate program, helps schools and libraries to obtain affordable broadband (FCC, 2014).

For example in the USA, various foundations and funds are dedicated to help reduce the digital divide by supporting technologies in public libraries. They include Melinda & Gates foundation, E-Rate provided by FCC and Information Administration (Broadband

Technology Opportunity Program grant program). These are clear indications of how libraries are inadequately funded to provide technological support services in their communities. Additionally, the input of digital inclusion into the development of digital literacy programs would likely help them lobby for more support from policy makers to equip better them better to promote digital literacy and inclusion in marginalized communities.

## 2.7. BENEFITS OF ICT IN PUBLIC LIBRARIES

The importance of ICTs in Libraries cannot be overemphasized. Computers and the Internet have changed the public library's role in the community and society (Velasquez, 2007). Some studies confirmed the importance of Internet access to contemporary public libraries, their patrons, and their service communities, from being the only provider of free Internet access in their communities and has helped in improving the social perception of the public libraries (Bertot, J. C., McClure, C. R., & Jaeger, P. T. (2008).

The provision of internet, computers and other digital resources for free in libraries provides a cost-effective model for reaching the most marginalized communities (Pingo, 2015) because some of the people cannot afford buying computers, internet connection thus helping bridge the digital divide.

The new information technologies have gained inevitable prominence and cannot be ignored at any cost. According to Jaeger et al, (2011) "providing new avenues through which to access information and providing access to many materials that the library could not otherwise provide for the reasons of cost, space, or scarcity through ICTs (internet) can be considered a robust source of diverse and often unavailable information for patrons". For instance, the Global Impact Study on Public Access to ICTs, which covers five

developing countries, found that those using Public Access Computers reported positive impact related to communication, education, access to government information and health (Sey, et al, 2013). Baker and Evans (2011) finally add that libraries have a role to play in bridging the gap in both developed and developing countries in bridging the digital divide.

## 2.8. E-GOVERNMENT AND EMPLOYMENT SERVICES

E-government widely known as provision of government information and services via electronic means, most prominently through websites and e-mail. Increasingly current trends makes it almost all services are online based: e-commerce, e-learning/distance learning, and job advertisements and applications, and without access to ICTs people may lack opportunities to access these online services. The ICT availability in public access venues like public libraries opens opportunities for those who lack access. Becker, et al (2010) rightly puts it “Without access to computers and the Internet, people are excluded from many jobs, government services, educational opportunities, and social networks”.

Public libraries have come to be seen as centres of Internet access in society, with communities, patrons, and government relying on availability of internet access (Bertot, Jaeger, 2012). For example during an economic downturn in the U.S.A, public libraries provided affordable or free access to the Internet for job seeking activities, social services, email access, entertainment, and other purposes (CNN, 2009). Libraries play a significant role in providing universal access to various services through information technology. These new way of serving the public create extra responsibility and challenges for libraries in terms of support, training, cost and others issues related to patrons.

Bertot et al (2012) adds that education, employment, civic participation, social engagement, and many other foundational elements of an economically and socially

successful community require widespread access to the Internet. Digital literacy and digital inclusion among all members of the community, particularly those without access to mobile, personal, or at-work computers and Web access reveal the importance of the public library as the community anchor guaranteeing Internet access, services, training, and support continues to grow exponentially.

In 2010 “Opportunity for All study in the U.S.A” an estimated 30 million people had used library computers and Internet access to search for employment, with 3.7 million people actually being hired for a position they applied for through the library computers (Becker et al. 2010). Hence it is important to note that access to knowledge for various reasons including education; learning and research require a skilled staff, skilled in both ICTs and knowledge of information resources to provide essential support to library users.

The vision for setting up the PATs (digital villages) and e-resource centres, especially the government funded project is to provide mainly government services, allowing people to reduce the distance they needed to travel in search of government services and reduce the digital divide in the rural communities (Wanjiku, 2013).

## CHAPTER 3 METHODOLOGY

To collect both empirical and qualitative data for this study, mixed-method design both quantitative and qualitative methods were used. The combination of methods enabled a clear understanding of the research topic. On qualitative part, structured interviews (library ICT policy implementers and National ICT authority officials (digital inclusion implementers) and observations of the users and research sites .On quantitative; users and librarians were surveyed. This research focused at a case study (Public libraries) represented by 5 libraries in an effort to understand the phenomenon of rural communities, public libraries and ICTs.

**TABLE 5: RESEARCH DESIGN**

<b>Stratum</b>	<b>Method</b>	<b>Sampling method</b>	<b>Number of respondents /sample size</b>
<b>Public Library Users</b>	Survey questionnaires	Random sampling	100
<b>Public library Librarians</b>	Questionnaires	Purposive	10
<b>Qualitative research</b>			
<b>Public libraries (KNLS)</b>	Case studies	Purposive	5
<b>National ICT policy makers (KICT)</b>	Face to face interview	Purposive	2
<b>Library ICT managers</b>	Interviews	Random sampling	2

### 3.2 RESEARCH QUESTIONS

The main aim of the research is to evaluate the role of libraries for effective implementation and enhancement of ICT capacities at the rural communities. The main research question for the research is:

- 1). Does the public need public access technologies in libraries with increased and affordable access to mobile technologies?
- 2). what roles do public libraries play on ICT capacity building (includes technology training and infrastructure support) in rural communities to enable effective access to knowledge and information access for the disadvantaged rural communities?

These following additional questions were also explored in the study:

- 3) Do the public libraries provide free access to internet, Wi-Fi, and computers to the public?
- 4) How is access to new information and communication technologies (ICT) changing development landscape of the rural communities?
- 5) What is the current status of ICT infrastructure and application in public libraries, especially in disadvantaged rural settings in Kenya?
- 6) What level of ICT know-how exists in public libraries among librarians, users, and community?

#### 3.2.1 RESEARCH FRAMEWORK

The research was explored under a feasible framework of Access, Capacity and Environment (ACE). This is a research design was developed in South Africa by

Bridges.org (2009) and modified by Gomez (2009) to help in understanding the range of economic, infrastructural, organizational, and other factors that affect the way people use ICT in public access venues.

The three pillars of the ACE framework are: equitable access: physical access, suitability, and affordability of the venue, technology access; human capacity: human capacity and training (users and staff), meeting local needs, and enabling environment: socio-cultural factors, political will, and legal and regulatory framework, and popular support. This study focused particularly on the analysis of a subset of these variables, namely affordability of ICTs, applicability, utilization and staff/user capacity. And finally digital literacy training to local communities (Gomez, 2012).

**TABLE 6: SCHEMATIC REPRESENTATION OF ACE FRAMEWORK**

<b>Schematic Representation of ACE framework</b>		
<b>1. Access</b>	<b>2. Capacity building</b>	<b>3. Environment</b>
1.1. Physical access to venue <ul style="list-style-type: none"> <li>● Location of the library</li> <li>● Basic infrastructure (space)</li> </ul> 1.2. Sustainability of the public library <ul style="list-style-type: none"> <li>● Universal access</li> <li>● Meets local needs</li> <li>● Venue as a place where people want to visit</li> </ul> 1.3. Affordability of the venue <ul style="list-style-type: none"> <li>● Financial sustainability of the library</li> <li>● Sustainability of the ICT services</li> </ul>	2.1. Human capacity <ul style="list-style-type: none"> <li>2.1.1. staff               <ul style="list-style-type: none"> <li>● Training level</li> <li>● Digital literacy</li> <li>● Libraries attitude to support ICTs</li> </ul> </li> <li>2.1.2 Users               <ul style="list-style-type: none"> <li>● Libraries offers digital literacy training to users</li> <li>● programs for underserved communities</li> </ul> </li> </ul> 2.2. meeting local needs: relevant content and services <ul style="list-style-type: none"> <li>2.2.1. local needs</li> </ul>	3.1. Legal and regulatory frameworks <ul style="list-style-type: none"> <li>● National and regional economic policies supports libraries</li> <li>● Political will for the libraries</li> <li>● Long-term government strategies to support the public libraries</li> <li>● Coordination of national and local policies</li> <li>● Legal and regulatory framework particular to ICT</li> </ul>



<p>1.4. Technology access</p> <ul style="list-style-type: none"> <li>● Appropriateness of the technology</li> <li>● Availability of technology(hardware, software, internet services, telecommunication services</li> <li>● Physical access to technology</li> <li>● Basic infrastructure(electricity)</li> </ul>	<ul style="list-style-type: none"> <li>● local needs are met (resources, skills, and library capacity)</li> <li>● adapt venue to suit local needs (including ICTs)</li> </ul>	<p>3.2. popular support</p> <ul style="list-style-type: none"> <li>● Popular support to improve public library services(Including ICTs)</li> <li>● Involved stakeholders</li> </ul>
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Source: (Bridges.org 2009; Gomez, 2012)

The research focused on the following components of ACE framework:

**TABLE 7: RESEARCH FRAMEWORK**

	<b>Components</b>	<b>Public libraries</b>
<b>Access</b>	Location Affordability ICT access and use	Rural areas Affordability Access situation
<b>Capacity</b>	Staff capacity Users capacity	Digital literacy/training ICT usage
<b>Environment</b>	Socio-economic factors ICT Policy framework & support	Financial & policy support

(ADAPTED FROM ACE FRAMEWORK)

### 3.3.2 CASE SELECTION

In this research we applied purposive sampling, as the name suggests is about purposively selecting specific participant or case study for a study (Barbara, 2009). Representative case studies libraries were selected through a successive set of criteria, this was done through developing a strategy for selecting the sample. Given the focus was community public libraries existing in Kenya's public library system. The libraries in Kenya are categorized as follows: urban, sub-urban and community libraries. The urban libraries are located in urban centers while community libraries in semi-urban and rural areas.

In the research we listed all the 60 public libraries out of which 44 fall under community libraries (both in sub-urban and rural areas). We further listed all the community libraries under the sub-urban and rural areas. After the broad categorization a non-probability method was used to select the case studies. The Libraries were selected based on location and availability of ICTs services to the public. For the purpose of this research, public libraries that provide access to computers, Internet, and other related digital services met the conditions to be selected for the research, 5 representative libraries were selected

### 3.3.3 SAMPLE POPULATION

The study covered 3 sample groups:

- Users of public libraries (anyone who is in/has used the library at the time of the research);
- Public library staff and library officials (library managers, directors, professional librarians, assistant librarians and support staff, ICT officers);
- National ICT authority officials (formulators and implementers of ICT policies in Kenya).

- The 5 purposively selected community libraries

### 3.4 DATA COLLECTION TECHNIQUES AND PROCEDURES

The data for the thesis was collected from primary sources using a triangulation of methods; qualitative and quantitative paradigms to get a clear and in-depth understanding on how public libraries are enabling people in Kenya's rural communities to use and access ICTs to address digital literacy issues which may affect socio-economic developments. The field research for the study was conducted between the months of February to March 2015. During the two months period in Kenya, the field research focused on public library case studies namely: Narok, Dzitsoni, Werugha, Kwale, Laikipia community libraries, the Kenya National Library head office and ICT Authority office respectively. For the community or library to have qualified for the survey they must have been located in rural or sub-urban communities, be providing ICT services to communities and have internet connection.

This enabled to gather information on the trends of usage of ICTs, physical ICT equipment, how well the infrastructure is distributed to all the case study public libraries and usage of ICT services. The survey provide a random sample size of 100 library users among the 5 community libraries, 10 library staff and 2 interviews to library ICT policy makers and ICT-A officials. The following methods were used to collect data form the research subjects;

#### CASE STUDY

A case study may be termed as a description of a particular situation or event. The description of the event serves as a learning tool, providing a framework for discussion (Wildemuth, 2009 p.51). For this research we selected a set of cases to represent rural community public libraries that provide access to ICTs. To explore the research questions I

intensely examined, observed and analyzed these particular libraries. The case studies yielded both qualitative and quantitative data. Wildemuth (2009) suggests that there are four questions that should be asked to determine whether the case study is a good research approach:

- Does the phenomena of interest have to be studied in natural setting?
- Does the phenomena of interest focus on the contemporary events?
- Does the phenomena of interest include a variety of factors and relationships that can be directly be observed?
- Does the phenomenon of interest include a variety of factors and relationships that can be directly be observed?

Looking at the selected case studies they fulfilled all the suggested characteristics. Given the aim of using qualitative research is to understand the experiences and actions of people as they encounter, engage, and live through their situations. Thus the focus for the research is to understand the selected case studies and observation on how people in the communities access and use digital technologies to access information and gain knowledge (online services, video streaming, send emails, search for information, do assignments, among others) is vital. The following techniques were applied to collect data from the subjects:

## INTERVIEW

Gorman & Clayton (2005) suggest that interviewing can obtain detailed, in-depth information from subjects who know personal events, processes and environment. The researcher interviewed some respondents to understand the how the users and

community library staff interact and support ICT services. The researcher conducted face-to-face structured interviews to gather information mainly from library decision makers and ICT policy makers. The interviews lasted for around 30 minutes. Berg (2009) defines interviewing as “a conversation with purpose”. The interviews were specifically used to understand issues of policy relating to ICTs, digital literacy and funding of technologies in enhancing public ICT access.

## OBSERVATION

Observation is commonly used to as a mixed method approach within a study that uses other several methodologies to gather data on a topic. Observation share a common objective systematic and scientifically examining what people do in specific situations, as well as how and when they do them. It's part of a multistrategy approach where the researcher used many different methodologies to examine the problem and gather data on the topic (Beck & Manuel, 2008p.109).

As part of the fieldwork, observations provide a first-hand account of the phenomenon under study in the natural setting (Merriam, 1998). In this research I did observations during the fieldwork February-march especially on library building, ICT equipment and usage (See Appendix IV for photos observed phenomena). Patton (1990) rightly observes that, while interviews are considered to be a major source of data collection in qualitative research, there is a limit to how much information may be gathered from the interview.

Thus, observations provide further information not readily available. This method was triangulated with interviews to further support the findings in the study or to provide another avenue of investigation. This study incorporated informal observations to library users, photographed events such as how users interact with ICTs in computer rooms,

library computers space, state of buildings, notices, arrangement and users while using ICTs in the libraries.

### SURVEY QUESTIONNAIRE

A survey is a useful method, enabling statistical estimation of characteristics in the population (Hank, Jordan and Wildemuth, 2009). Finally to collect empirical data for this thesis, researcher deployed questionnaires survey targeting users and librarians in the community rural libraries. Respondents answered mostly closed-ended questions on their perceptions, demographics, background information, information technology use and access at the public community library. The questions gauged the level of support, perception and behavior of library staff and the value library users gain from use of technology in the library. For the five research sites, 100 questionnaires were deployed to 20 users per library and 2 questionnaires for library staff per library.

## CHAPTER 4 DATA ANALYSIS

This chapter provides description of both quantitative and qualitative data analysis for the study. Considering the research used mixed methods, the data analysis was done based on the data collection method. The primary goal of analysis is to use the data collected on the case studies to answer the research questions that drive the study. In this thesis, I defined ICT capacity building as efforts to efficiently provide computers, digital literacy skills and internet to promote access and use to information for community development in marginalized community segments. Thus the analysis is to provide data to evaluate the library case study. This chapter is divided into three analysis sections; first one with quantitative data, followed qualitative data analysis (observation and interview) respectively.

### 4.1 SURVEY DATA ANALYSIS

The survey questionnaires provided quantitative data. The data provided a series of descriptive statistics and Likert-scaled responses from the survey which provided a snapshot into the studied case studies. The different demographics based on variables including age, ICT use, access, education level, perceptions, among others. The responses determined how the community libraries support and enhance access to information, knowledge and ICTs in the rural communities.

#### **Data Analysis**

The data was analyzed using SPSS data analysis tool. The following data reflects the overall responses for users and library staff in the study.

### How important are the computer in the library?

**TABLE 8: IMPORTANCE OF PUBLIC LIBRARY COMPUTERS AND INTERNET**

<b>Importance of Library ICTs</b>	<b>N=100</b>	<b>Percent%</b>
<b>Essential</b>	40	40.0
<b>Very important</b>	58	58.0
<b>Fairly important</b>	2	2.0
<b>Total</b>	100	100.0

Table 8 indicates perception on public library ICTs. Most libraries users rate highly the importance of the computers and internet services with 40% as essential and 58% as very important. It is widely acknowledged the importance of ICTs services to communities. This is for reasons that most people in the rural communities can access services or facilities affordably to development computer skills and other information and knowledge support. Since the ease of access to ICTs in the library, the above responses are critical in reflecting peoples' expectations (in informational, educational and knowledge needs). The ICTs support to communities are essential, especially for those who do not have means to acquire or access free or affordable ICT services in their homes.

**TABLE 9 : ACCESSED SERVICES IN THE LIBRARIES**

<b>Type of Service</b>	<b>N=100</b>	<b>Percent</b>	<b>Valid Percent</b>
Connect internet with your laptop	20	20.0%	20.2
Take a class or workshop on computer skills course	32	32.0%	32.3
Use library for study	4	4.0%	4.0
Meet other people	5	5.0%	5.1
Use and borrow library	37	37.0%	37.4
Others	1	1.0%	1.0



Total	99	99.0%	100.0
Missing	1	1.0%	
Total	100	100.0%	

The most popular service in the library is borrowing of books 37%. Community users exhibit a growing demand for ICT related services. For instance in the table above 32% of users attend or participate in computer skills course, while 20% connect to internet with their laptop or mobile devices. In Kenya internet connection and cost is expensive in correlation to individuals' income earnings. This is a common phenomenon to students and unemployed people, thus the library free internet/Wi-Fi enable them to access the ICTs in an affordable way.

**When you use computer or internet in the library do you pay or free?**

**TABLE 10: INTERNET ACCESS AND AFFORDABILITY**

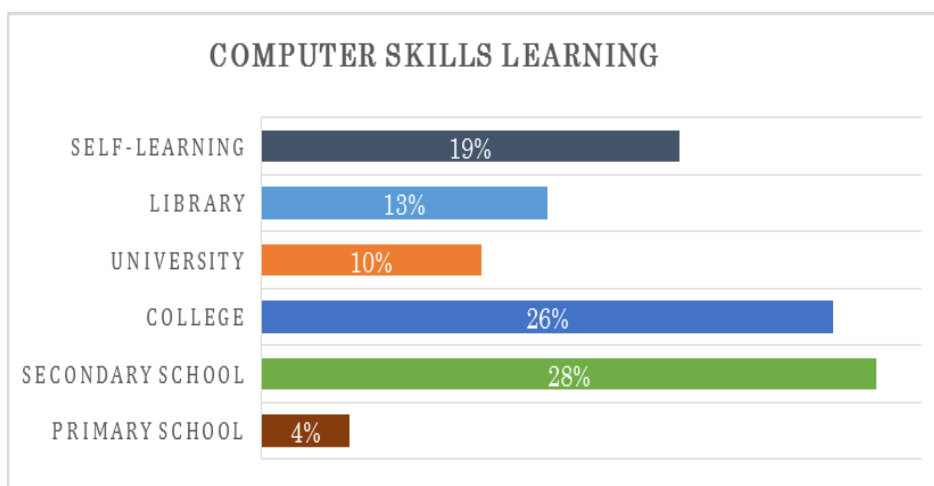
<b>Internet access and affordability</b>	<b>Frequency N=100</b>	<b>Percent</b>	<b>Valid Percent</b>
<b>No</b>	55	55.0%	57.3
<b>Yes</b>	41	41.0%	42.7
<b>Total</b>	96	96.0%	100.0
<b>System</b>	4	4.0%	
<b>Total</b>	100	100.0%	

The table above shows 55% of the user's do not pay, while 41% pay. The public libraries charge a library access fee for non-members (\$0.20) or annual membership registration fee of about (1.5\$). Therefore the 41% perceive the entrance fee as payment to access the service as sometimes they may only want to use the computers or connect their own laptop to the library Wi-Fi.

**Where did you learn or train/gain skills on how to use computers?**

**TABLE 11: COMPUTER SKILLS TRAINING /DIGITAL LITERACY SKILLS**

<b>Place trained computer skills</b>	<b>Frequency</b>	<b>Percent</b>
Primary school	4	4.0%
Secondary school	28	28.0%
College	26	26.0%
University	10	10.0%
Library	13	13.0%
Self-learning	19	19.0%
Total	100	100.0



**FIGURE 4 COMPUTER SKILLS LEARNING**

The library is one of the public outlet to access computers and IT services in rural communities. The respondents indicated have acquired computer use skills or digital literacy training in various places with 13% in the libraries. This is reflection how libraries are getting involved in ICT capacity building in the community. Most people gain computer skills as from high school onwards, with 28% in high school, 10% university level, and 19% through self-learning. While digital literacy is essential skill to acquire from early ages, most people in communities seem to learn at a later stage. This is an indicator that

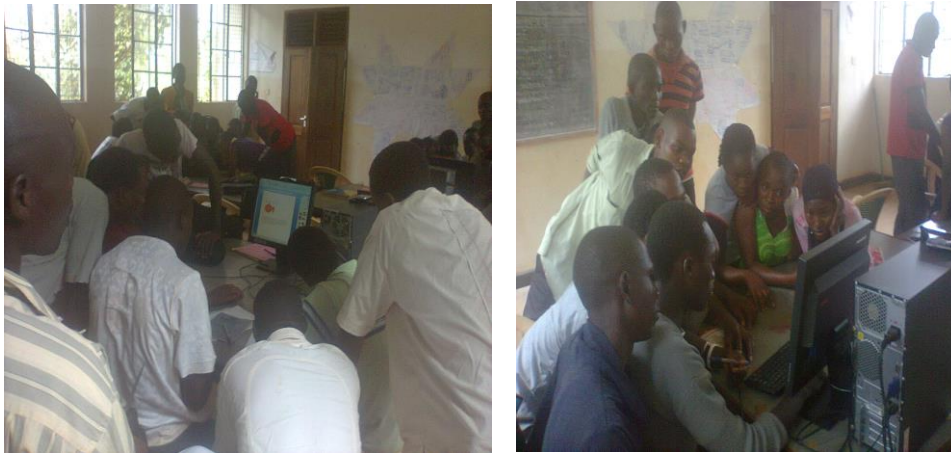
for those who never progressed beyond high school, they are likely to lack means of acquiring computers skills offered in a formal education institutions. The community public libraries are thus important to provide the opportunity for this population in building ICT capacities in the communities.

**Does the library offer IT training?**

**TABLE 12: DIGITAL LITERACY TRAINING IN LIBRARIES**

<b>Computer classes</b>		<b>N=100</b>	<b>Percent</b>	<b>Valid Percent</b>
Valid	No	52	52.0	53.6
	Yes	43	43.0	44.3
	2	2	2.0	2.1
	Total	97	97.0	100.0
Missing	System	3	3.0	
Total		100	100.0	

In the survey most respondents (52%) indicated that they have never attended computer skills training in the library while 42% had attended some form of computer skill training. During the research the public libraries staff were undertaking a two weeks computer skills training in readiness to start formal IT classes for users. The training program was sponsored by EIFL in one of the public libraries. The impeding factors was reported to be poor internet connection and slow speed that delayed the start of training programmes which will be majorly online-based focusing on basic and advanced computer skills. The digital literacy program was a collaboration between libraries and the Microsoft IT academy. The responses reflect that some community libraries offer formal digital literacy training classes but not all among the case studies.



**FIGURE 5: STUDENTS IN COMPUTER CLASS AT DZITSONI COMMUNITY LIBRARY**

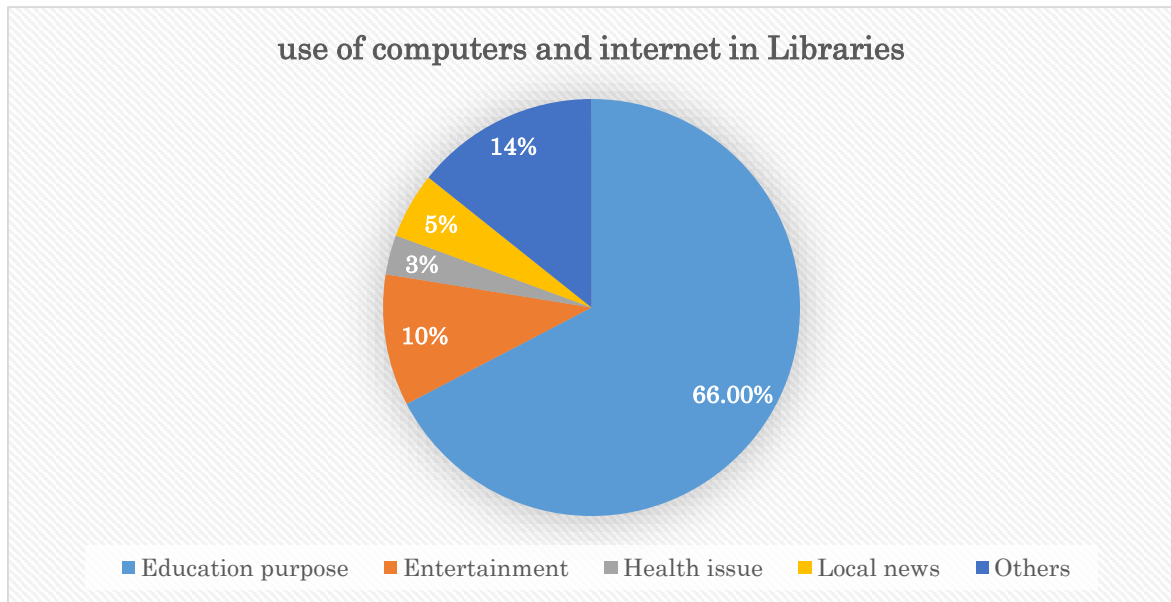
**What purposes have you most frequently used the computers in the public library for?**

**TABLE 13: USE AND ACCESSED INFORMATION ON LIBRARY COMPUTERS**

<b>Information use and access in library ICT</b>		
	<b>N=100</b>	<b>Percent</b>
Education purpose	66	66.0%
Entertainment	10	10.0%
Health issue	3	3.0%
Local news	5	5.0%
Others (checking email, typing, etc.)	14	14.0%
Total	98	98.0%
Missing System	2	2.0
Total	100	100.0%

Understanding the usage characteristics, help to make key decisions either to supports some services or encourage users to exploit the ICTs resources effectively. In the survey it turned out that ICTs are mostly used for education purposes 66%, entertainment 10%, to access local news 5%, while 3% for health issues and 14% for other purposes like typing

documents, checking email, playing online and offline games. Most of the library users are students thus they use to do research, entertainment or in doing assignments.



**FIGURE 6: MOST ACCESSED SERVICES IN THE LIBRARY COMPUTERS AND INTERNET**

**Which areas have you benefited most from visiting the library in the following areas?**

**TABLE 14: BENEFIT OF LIBRARY ICT SERVICES**

Benefits of library		N=100	Percent	Valid Percent
	Have developed new skills	41	41.0	42.3
	Have you obtained new idea	50	50.0	50.0
	Helps find jobs	3	3.0	3.1
	help with information on business	3	3.0	3.1
	Total	97	97.0	100.0
	System	3	3.0	
Total		100	100.0	

The benefits for the available ICT support services abound. Table 14 indicate that 41% of the people developed new skills in various areas of interest, while 50% benefit in obtaining new ideas and 3% to find job and business information respectively. Most ICTs users in the library seem to look for information to acquire general knowledge more than find a job or look for entrepreneurial information. For instance in the case of searching for a job related information the common practice in Kenya it is through newspaper advertisements the popularity of online job searching or application online is still low, making many people prefer to lookout for information through the traditional means (newspapers). Through this finding people can be encouraged to do more online job searching and applications.

### **What are most important benefits?**

**TABLE 15: MOST ACCESSED ICT SERVICES**

<b>Three most important</b>	<b>N=100</b>	<b>Percent</b>
Education	69	69.0%
Entertainment	14	14.0%
health information	6	6.0%
Agricultural issues	4	4.0%
Local news	3	3.0%
National news	2	2.0%
Total	98	98.0%
Missing	2	2.0%
Total	100	100.0%

As indicated earlier in table 14, access of ICTs for educational purposes remain the most common use, given the fact that students account for most library users in the community libraries. The computers and internet are most commonly used for the purposes of education (69%), entertainment 14%, health information 6%, agriculture information 4%,

local and international news at 3% and 2% respectively. While both rural and urban communities need access to ICTs for educational purposes the libraries need to take cognizance of the need to promote access to relevant information to respective communities. For instance most of the studied communities are located in the sub-urban and rural communities but no libraries provides dedicated services for farming or have any collaboration with health centres to promote public health information access and agricultural information access. This indicates that there is need to provide and promote Information services customized to the local needs i.e. e-resources, online demonstrations.

**How often do you seek library staff help on computers and internet support?**

**TABLE 16: ICT SUPPORT TO USERS**

<b>How often do you turn for help from the staff</b>		<b>N=100</b>	<b>Percent</b>
Valid	Rarely	45	45.0%
	Sometimes	30	30.0%
	Often	13	13.0%
	Always	10	10.0%
	Total	98	98.0%
Missing	System	2	2.0%
Total		100	100.0%

The table 17 above reflects user perceptions on the ICT support services and library staff. Since some users have computers skills, 45% indicated that they never consult library staff for help, 30% sometimes ask for help while 13% often consult and 10% always ask for help. Most people who have computer skills tend to ask for traditional libraries services for instance; using library study place while others request to connect library Wi-Fi password and power connection, for the one who consult usually seek help on computer

troubleshooting, how to use computers, Wi-Fi password, sign-up for emails, printing services. Staff skills form an integral part in fostering and promotions of ICT use in the communities.

**How satisfied are you with the library staff help in use of computers?**

**TABLE 17: USER SATISFACTION**

	<b>Frequency</b>	<b>Percent</b>
Extremely satisfied	12	12.0%
Very satisfied	50	50.0%
Only a little satisfied	14	14.0%
Not at all satisfied	13	13.0%
Don't know	9	9.0%
Total	98	98.0%
Missing System	2	2.0%
Total	100	100.0%

For most users who request for help, 62% are usually satisfied with the assistance, 27% are not satisfied with the help. The dissatisfaction may perhaps for library staff do not have good expertise on computer more especially on some internet connection trouble shootings and other skills.

**How frequent do you use internet and computers?**

**TABLE 18: INDIVIDUALS INTERNET USE**

How often do you use internet	N=100	Percent
Every day	22	22.0%
1-2 days	28	28.0%
Once a week	21	21.05%
once a month	11	11.0%



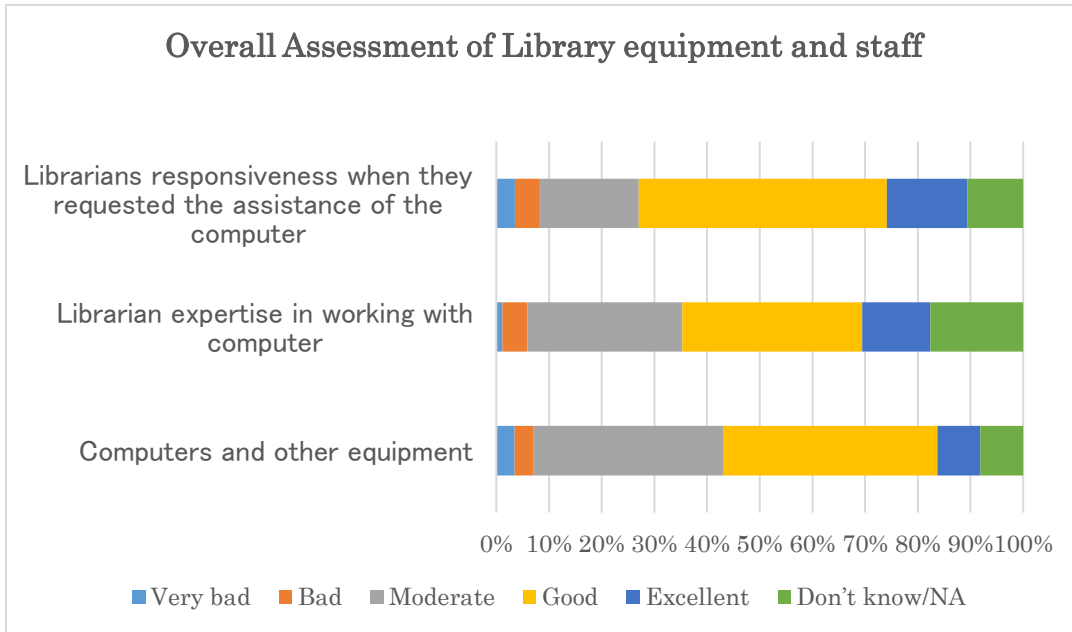
Not at all	14	14.0%
Total	96	96.0%
System	4	4.0%
Total	100	100.0%

In the research we sought to understand how often people use internet, either on their mobile gadgets, library computers, or in others places. At least 22% use every day, 28% every 1-2 days, 21% once a week, 11% once a month and 11% not at all. The responses reveals a lot in terms of internet usage pattern. The internet connection or subscription cost usually limits internet usage. Therefore free or affordable connection in the public library helps them to access the internet services. For instance in Kenya the mobile bandwidth connection have varies tariff for data bundle subscriptions, the economic challenges among the unemployed people makes internet access unaffordable. Therefore the libraries provision is the key to affordable internet and computer access in the rural communities.

### **How do you assess the library ICTs and library staff?**

**TABLE 19: ASSESSMENT OF LIBRARY ICT INFRASTRUCTURE AND STAFF**

	Very bad	Bad	Moderate	Good	Excellent	Don't know/NA
Computers and other equipment	3%	3%	31%	35%	7%	7%
Librarian expertise in working with computer	1%	4%	25%	29%	11%	15%
Librarians responsiveness when they requested the assistance of the computer	3%	4%	16%	40%	13%	9%



**FIGURE 7: ASSESSMENT OF LIBRARY STAFF AND ICT EQUIPMENT**

The general response on the library staff and ICT equipment indicate that librarians promptly respond in assisting the users with computer issues whenever requested to help. When it comes to staff expertise in working with computers 25% were rated to be moderate 29% good, 4% bad and 11% excellent. The respondents also rated the library ICT equipment with as good (35%) while other said they are moderate (31%), only few thought the ICTs are not enough or not in good condition while others said they have excellent equipment respectively.

**How satisfied or dissatisfied are you with the current library computer and related services?**

**TABLE 20: USER PERCEPTION TO LIBRARY ICTS**

<b>Responses</b>	<b>N=100</b>	<b>Percent</b>
Very satisfied	22	22.0%
Fairly satisfied	27	27.0%
Neither nor satisfied	11	11.0%
Fairly dissatisfied	19	19.0%
Very dissatisfied	10	10.0%
Don't know	5	5.0%
Total	94	94.0%
Missing System	6	6.0%
Total	100	100.0%

The public ICT access facilities play an important role in the rural communities. The above statistics indicate level of user satisfaction to the provided services, 47% respondents indicated are satisfied with the current services while 11% are neither nor satisfied, and 29% are dissatisfied. This is a key indicator for libraries to take step further to understand the reasons for satisfaction or dissatisfaction in the provided ICT services. In the following tables we set out to understand better by using various indicator including affordability of services, staff, internet speed, number of computers, etc.

**Why do you say this?**

**TABLE 21: USER SATISFACTION WITH LIBRARY ICTS SERVICES**

	<b>N=100</b>	<b>Percent</b>	<b>Valid Percent</b>	<b>Cumulative Percent</b>
My library is convenient and affordable	31	31.0%	37.3	37.3
Helpful staff	17	17.0%	20.5	57.8
Not expensive to use	10	10.0%	12.0	69.9

Good for community	11	11.0%	13.3	83.1
Others	14	14.0%	16.9	100.0
Total	83	83.0%	100.0	
Missing System	17	17.0%		
Total	100	100.0%		

Upon further probing on the reasons for satisfaction or dissatisfaction. Among the satisfied respondents 31% indicated that the library is convenient and affordable, 17% library staff are helpful and 11% expressed that the library is good for community while 10% indicated the library is not expensive perhaps due to free computer and internet access for members and non-members.

### Why are you dissatisfied?

**TABLE 22: DISSATISFACTION ON LIBRARY ICT SERVICES**

Dissatisfied individuals	N=100	Percent
Expensive services	8	8.0%
Internet is too slow	58	58.0%
not enough space	8	8.0%
less computers	24	24.0%
Total	98	96.0%
Missing system	2	2.0%
Total	100	100.0%

For the dissatisfied respondents, among the key reasons are expensive services 8% though the all the libraries services are free for registered members non-members are required to pay for daily library entry fee which in the long run could be expensive. Most of respondents indicated slow internet connections 56% as a major dissatisfaction. In all the

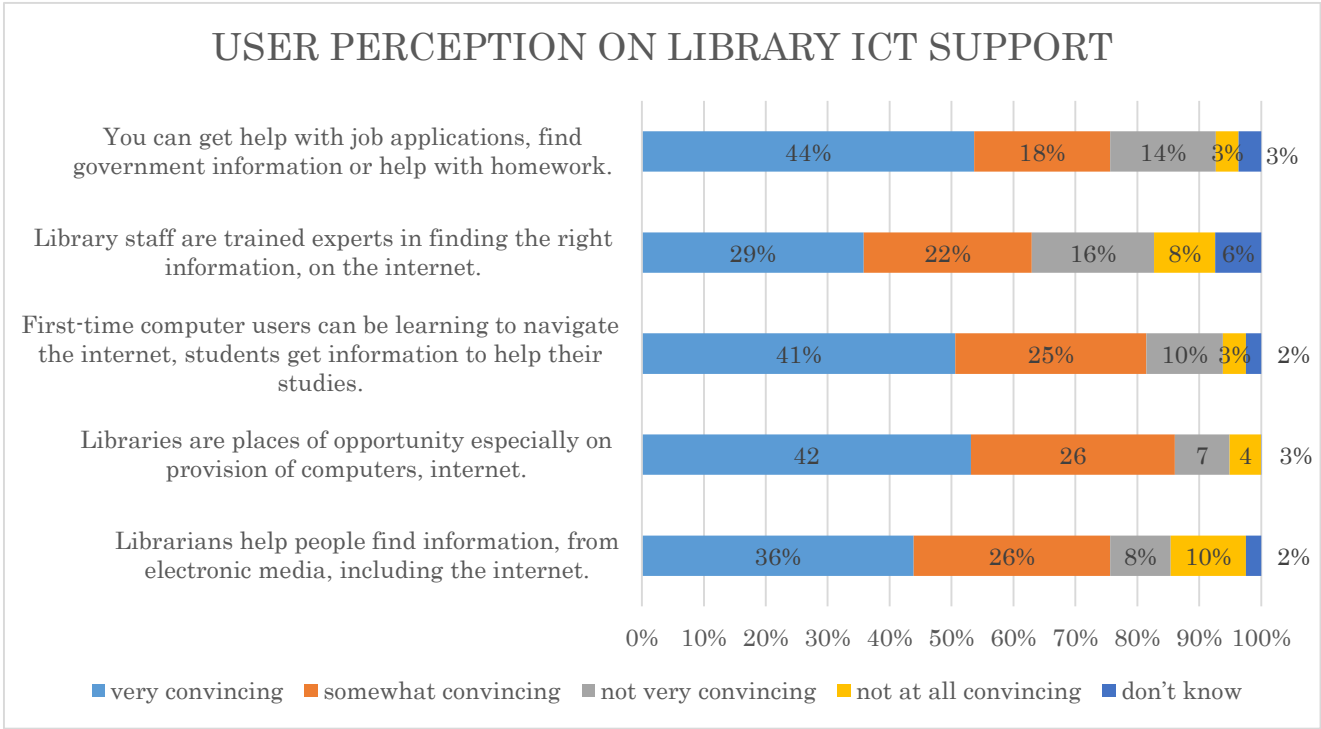
studied libraries this was a major concern due to unstable internet. Other key concerns were less computers 24% which cannot serve both users who want to use internet and for those who need to learn on basic computer skills.

**What do you think about library, staff and ICT support?**

**TABLE 23: USER’S PERCEPTION ON LIBRARY STAFF ICT SUPPORT**

Statement	very convincing	somewhat convincing	not very convincing	not at all convincing	don't know
Library staff help people find information, from electronic media, including the internet.	36%	26%	8%	10%	2%
Libraries are places of opportunity especially on provision of computers, internet.	42%	26%	7%	4%	3%
First-time computer users can be learning to navigate the internet, students get information to help their studies.	41%	25%	10%	3%	2%
Library staff are trained experts in finding the right information, on the internet.	29%	22%	16%	8%	6%
You can get help with job applications, find government information or help with homework.	44%	18%	14%	3%	3%

Generally most people are convinced that the library is a place of plenty opportunities. They can benefit through exploiting the available resources including internet and computer use, learn how to use the computers, gain digital literacy skills, and make a job application among others benefits.



**FIGURE 8: USER PERCEPTION ON LIBRARY ICT**

**TABLE 24: USERS’ OPINION ON COMMUNITY LIBRARY FUNDING**

Statement relating your opinion on the current funding for public libraries	N=100	Percent
They deserve more financial support	47	46.5
They require less financial support	3	3.0
They have adequate funding	5	5.0
Don't Know	1	1.0
Total	56	55.4
Missing System	45	44.6
Total	100	100.0

Funding is usually an administrative issue but for better budgetary support, community opinion is important in lobbying for more financial support. The following are the

responses on funding, 47% expressed their opinion that public libraries deserve more financial support to improve on service delivery, 44.6% of the respondents did not express their opinion on current library funding based on their perception of the available resources in the library. This could be as a result of either lack of knowledge on how the public libraries are funded. The opinion of public is very vital in determining funding of public institutions.

**TABLE 25: INSTITUTION THAT PROVIDE AFFORDABLE ICT SERVICES**

<b>Institutions providing affordable internet</b>	<b>N= 100</b>	<b>Percent</b>
Community center	16	15.8%
Public library	65	64.4%
Cybercafé	13	12.9%
Digital villages	3	3.0%
Total	97	96.0%
Missing	3	3.0%
Total	100	100.0%

In the research the public library was ranked the most affordable provider of internet services (65%) compared to community centres (16%), cybercafés (13%) and digital villages (3%). while the public library is ranked the most affordable, their services are usually coupled with challenges of poor internet connection, low internet speed, restriction

**Does the library allow use social networking services in the library computers?**

**TABLE 26: RESPONSES ON SOCIAL NETWORK USE IN LIBRARIES**

<b>Does library allow use of social media</b>	<b>N=100</b>	<b>Percent</b>
No	54	54.0%
Yes	28	28.0%
2	6	6.0%
Total	88	88.0%
Missing	12	12.0%
Total	100	100.0%

The library administration seems to restrict the use of social network sites in the library. Among the respondents majority (52%) confirmed that they were not allowed to use on the library computers or internet network while minority (28%) can access the social networks either through their mobile devices while connected to the library Wi-Fi. Upon interviewing the library managers revealed that most users log-in to the Wi-Fi leading to network congestion therefore they filter connection to all SNS. This results to slower internet connection. Among the surveyed libraries almost all the libraries restrict use of SNS. The other key reason is limited number of terminals thus they encourage for educational purposes rather than entertainment or SNS chatting. Out of the 5 case studies none of them has a social network account for instance (Facebook, twitter or google+) to communicate with community people. The libraries rely on headquarter website which is not usually effective to communicate with community members. There is need for use of SNS to communicate with users to pass information and engage community people.

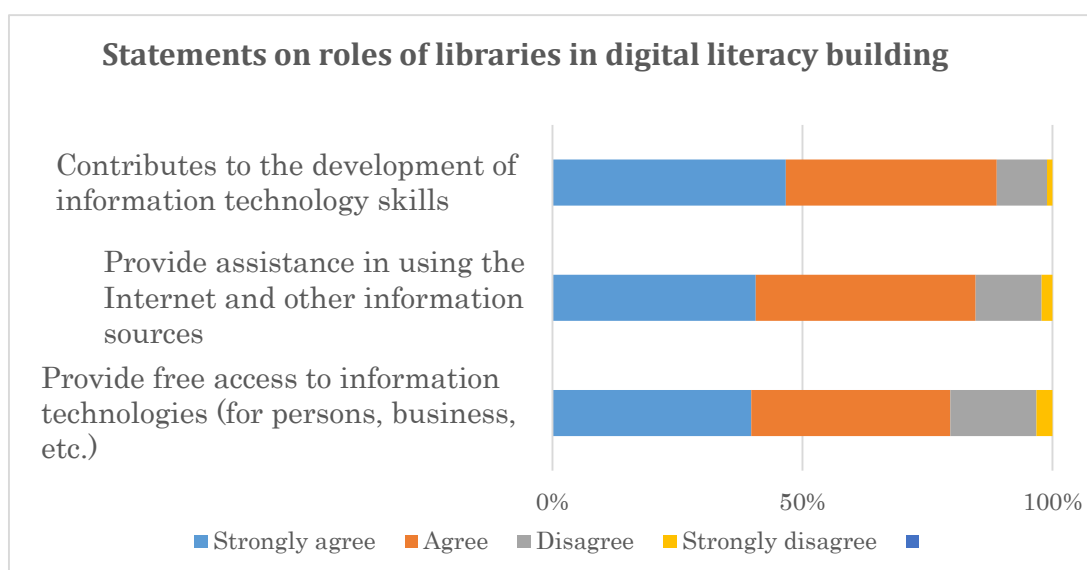


## CONTRIBUTION OF PUBLIC LIBRARIES TO RURAL DEVELOPMENT

TABLE 27: CONTRIBUTION TO DIGITAL DIVIDE REDUCTION

DIGITAL DIVIDE				
Statements	Strongly agree	Agree	Disagree	Strongly disagree
Provide free access to information technologies (for persons, business, etc.)	37%	37%	16%	3%
Provide assistance in using the Internet and other information sources	37%	40%	12%	2%
Contributes to the development of information technology skills	42%	38%	9%	1%

Majority of the respondents agree (74%) that the community ICTs centres help in providing free access to technologies and development of digital literacy skills, only few doubt the effects of library ICTs contribution on reduction to the existing digital divide in the rural communities.



**FIGURE 9: PERCEPTION OF LIBRARIES ROLES ON DIGITAL LITERACY TRAINING**

**What is your response on the following statements?**

**TABLE 28: CONTRIBUTION TO EDUCATION**

Statement	Strongly agree	Agree	Disagree	Strongly disagree
Contribute to the development of literacy	55%	36%	4%	-
Contribute to children' learning through available digital technology resources	43%	38%	11%	1%
Contribute to adults' employment opportunities	36%	35%	18%	2%

The libraries are very integral tertiary institutions which support education in both urban and rural communities. Most people agree that the library ICT can contribute to improving their educating and increase chances of employment especially on adults. For the children they can access and acquire knowledge and digital literacy skills.

**TABLE 29: CONTRIBUTION TO ECONOMIC DEVELOPMENT**

<b>Contribution to enhance Economic development</b>				
Statements	Strongly agree	Agree	Disagree	Strongly disagree
Provide access to information and new ideas through available digital resources	28%	55%	7%	1%
Contribute to the development of economic knowledge of the community	32%	51%	7%	-
Provide entrepreneurs job related training in the areas of computer and information literacy skills	27%	40%	19%	2%

Majority of the population are highly convinced that the ICTs in the community can significantly contribute to improve their respective economic status through access to relevant information and improve their entrepreneurial skills. One library among the surveyed had integrated ICT training and entrepreneurial training. The active involvement of libraries in training community members in acquiring vital skills, has a long term economic effect to the rural development.

**TABLE 30: ICT CONTRIBUTION TO HEALTH**

Statements	Strongly agree	Agree	Disagree	Strongly disagree
Provide access to health information online	33%	49%	10%	1%
Disseminate health related online information	25%	45%	13%	5%
Collaborates with health facilities to offer health related information support services	25%	40%	22%	2%

The libraries are only information centres in the communities. Most people agree that the library ICTs can enable the community people access health information in the libraries. Since some libraries have collaborated with health centres and set-up health corners in the libraries hence ICTs can enhance access to more health information resources.

**TABLE 31: CONTRIBUTION TO E-GOVERNMENT SERVICES**

Statements	Strongly agree	Agree	Disagree		Don't know
Help users to do online job applications	37%	41%	10%		1%

Serve as a channel for accessing government information	32%	39%	12%		-
Provide access to e-government services	26%	49%	12%		-

E-government services are common online services which allow citizens access government services. Most respondents agree with the need to the access 3 key areas on job applications, government information source and services. Most people need access to e-government services. There is need for the libraries to introduce more support to E-government services as a core service to the communities. There is no specific service in the community libraries dedicated on the E-services. While this could be an important service the community member especially on applications for essential government services like national Identification application, downloading various application forms, job application, renewal of driving license and so forth.

**TABLE 32: CONTRIBUTION TO AGRICULTURAL DEVELOPMENT THROUGH ICTS**

Statements	Strongly agree	Agree	Disagree	Strongly disagree
Provide farmers with understandable information about developing, through E-resources	20%	36%	22%	2%
Provide farmers with information about caring for and marketing their produce through online services	17%	42%	13%	2%
Provide farmers with information about services available to them from government and other agencies	19%	46%	12%	2%

Community people strongly agree that ICTs can support agricultural in the community.

Among the surveyed libraries all are located where agriculture is a key economic activity.

Though in the research there was no notable ICTs related support service dedicated to agricultural activities in the communities.

## **LIBRARY STAFF RESPONSES**

**TABLE 33: STAFF EDUCATION LEVELS**

<b>EDUCATION LEVEL</b>		
<b>Academic Qualifications</b>	<b>N=10</b>	<b>Percent</b>
Bachelor's degree in library and information science	3	30
Diploma in librarianship/Information technology	5	50
librarianship certificate	2	20
Total	10	100

Among the studied libraries, the education level of the staff ranged from librarianship certificate to bachelor degree level. This signifies that the libraries are managed by professional with various academic qualities. The staff have also participated in 2 weeks digital literacy training organized by the national library and other partners. The qualification portrays a picture of a workforce that can manage the ICTs services in the communities sufficiently. However the common challenges cited by the library managers was most of the staff lack enough staff with advanced IT skills to support and maintain the ICTs in the libraries.

**Does library have digital training classes?**

**TABLE 34: STAFF RESPONSES ON FORMAL LITERACY CLASSES**

<b>RESPONSES</b>	<b>N=10</b>	<b>Percent</b>	<b>Valid Percent</b>
<b>Yes</b>	2	2.0	20.0
<b>No</b>	8	8.0	80.0
<b>Total</b>	10	10.0	100.0
<b>Total</b>	100	100.0	

Most libraries do not offer digital training. In all the libraries case studies only one library emerged to be offering formal ICTs training. This is indicated by 2 staff from one of the libraries which offers the services to the public. Other only offer guidance in-case the users are experiencing some difficulty in using or troubleshooting.

**Table Does your library provide the following ICT services?**

**TABLE 35: STAFF RESPONSES ON ICT SERVICES**

<b>Type of Service</b>	<b>Responses</b>		
	Yes	No	Don't know
Possibility to hear a speaker, see a movie or attend an event	8	2	-
Public internet access	10	-	-
Connection to the internet with personal laptops	10	-	-

In addition to computers the libraries have TV and DVDs to show educative programs that makes it possible for people to watch a movie in the libraries. All the libraries have internet and all allow individual to connect the library free Wi-Fi use on their laptops.

### What do you think of decision making level on library ICTs issues?

**TABLE 36: DECISION MAKING ON ICT SERVICES**

Responses	N=10	Percent
ultimately responsible for decision making	2	20.0
partly responsible for decision making	8	80.0
Total	10	100.0

Decision making is an important aspect in deciding the services to offer to the public. In the libraries it seems most decision are made in the management level (from Libraries management at head office) with 20% admitting be having authority while 80% have a partial decision making responsibility. This seems to affect decision making at the branch level in the community libraries or the staff are not sure on their level of decision making. However the decision of acquisition or maintenance are made at a high level the decision for utilization and service should be at the community library level. This seems to be the main problems when it comes to which ICTs program to initiate at the grass root level. The top-down good services and decisions may be hampering the service provision at one level.

### How do you assess staff general digital literacy skills?

**TABLE 37: ASSESSMENT ON LIBRARY STAFF DIGITAL LITERACY SKILLS**

Responses	Frequency	Percent	Valid Percent
Insufficient	3	3.0	30.0
moderate	7	7.0	70.0
Excellent	0	0.0	0.00
Total	10	10.0	100.0
System	90	90.0	
Total	100	100.0	

The staff technology skills are integral in ensuring the support to the library and community computer skills training. The respondents assessed the general library staff digital literacy skills highly and 30% insufficient. Though the interviewed staffed have attended (table 33) digital literacy courses, but other staff have not attended thus making the general library staff lack excellent technology skills.

**Have you been trained on general computers skills?**

**TABLE 38: COMPUTERS SKILLS TRAINING**

<b>Computers skills Training</b>				
	Frequency	Percent	Valid Percent	Cumulative Percent
yes	8	8.0	80.0	80.0
No	2	2.0	20.0	100.0
Total	10	10.0	100.0	

Staff technology skill are essential to enable users learn and exploit the digital resources profitably. Most librarians expressed that they have been trained on basic digital literacy skills while 20% had not. In above table 36 they also acknowledge the general library staff ICTs competence to handle the digital services adequately.

**How do you rate the following aspects of your library?**

**TABLE 39: ASSESSMENT OF GENERAL LIBRARY ICT ATMOSPHERE**

<b>Assessment</b>	<b>Bad</b>	<b>Moderate</b>	<b>Good</b>	<b>Don't know</b>
Range of databases	10%	70%	10%	10%
Computers and other equipment	20%	50%	30%	-
Librarian expertise in working with computer	20%	60%	20%	-
The overall atmosphere of a library	10%	60%	30%	-

In provision of computer and internet services, digital information resources (database), equipment, staff and patron skills and overall institutional atmosphere are important.



Most of library staff rated the overall ICT environment highly together with the databases and the computers and related equipment.

## 4.2 QUALITATIVE DATA ANALYSIS

In this section data was collected through observation and semi-structured interview. The data gave rich qualitative data. The qualitative data was analyzed using qualitative content analysis to provide descriptive analysis to the collected data from observation and interviews. According to Berg (2009), content analysis is a careful detailed systematic examination and interpretation of a particular body of material in an efforts to identify patterns, themes, biases, and meaning. I combined the qualitative data from all the respondents to develop the insights for the research results.

### 4.2.1 OBSERVATION

Most of the observable phenomena range from library building set-up, equipment, application and utilization of the available internet and computers in the community libraries.

#### **Library buildings and space**

The following are the observations on the visited library building, some need either a new buildings (small or old) or an expansion of the existing one. There was one building that I visited that did need a new building but others need rethinking the use of their space.

There is one library whose manager suggested they need a new library because the library inherited a condemned building and renovated it (refer Appendix IV-Kwale Library).

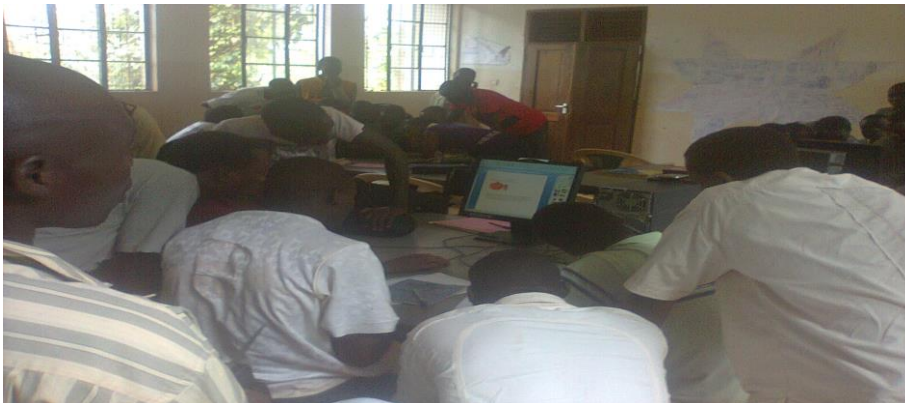
Usually the community libraries are built through collaborative effort of communities and government (through the national libraries). Some of the libraries were purpose build libraries and others not. At the time of the building, some of them did not factors ICTs

installation in the plan, thus making it difficult to have enough space for the computers.

Due to limited space libraries are forced to fit the terminals in the reading areas which are rather overcrowded. But newly build libraries have provided cyber rooms, which provide enough space, good environment for the computer usage and for users training without necessarily interfering with other library users or space.



**FIGURE 10: COMPUTERS TERMINALS IN LIBRARIES**



**FIGURE 11: CROWDED COMPUTER ROOM IN THE LIBRARY**

## Location

This deals with the physical location of the library building. Since the focus was sub-urban and rural communities, location formed an essential for the research. The libraries are located within the precincts of community 1-3 kilometres of the community business centres, making them accessible to all people.

## Internet access and support

In all the visited libraries have internet and Wi-Fi connections. Some libraries have openly displayed Wi-Fi passwords to the general public use while other have restricted to the registered library members only. The most common noticeable common problem to all the libraries is Internet speed and connection which experience regular breakdowns.

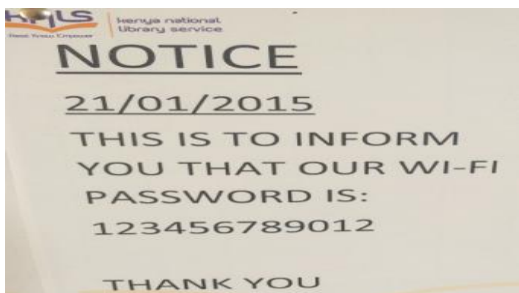


FIGURE 12: WI-FI PASSWORD DISPLAY IN ONE OF THE LIBRARY

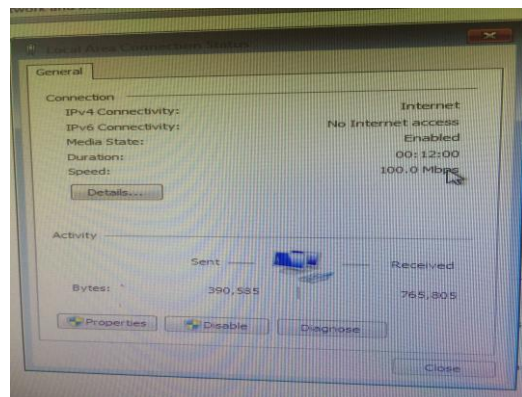
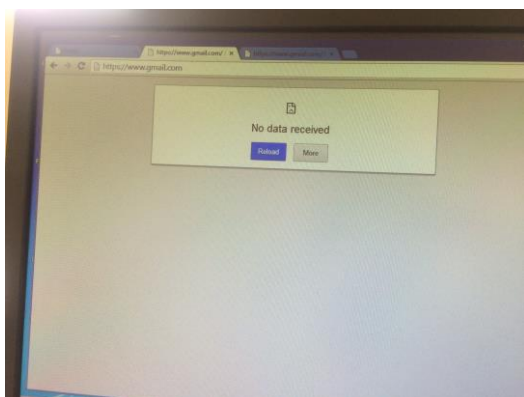


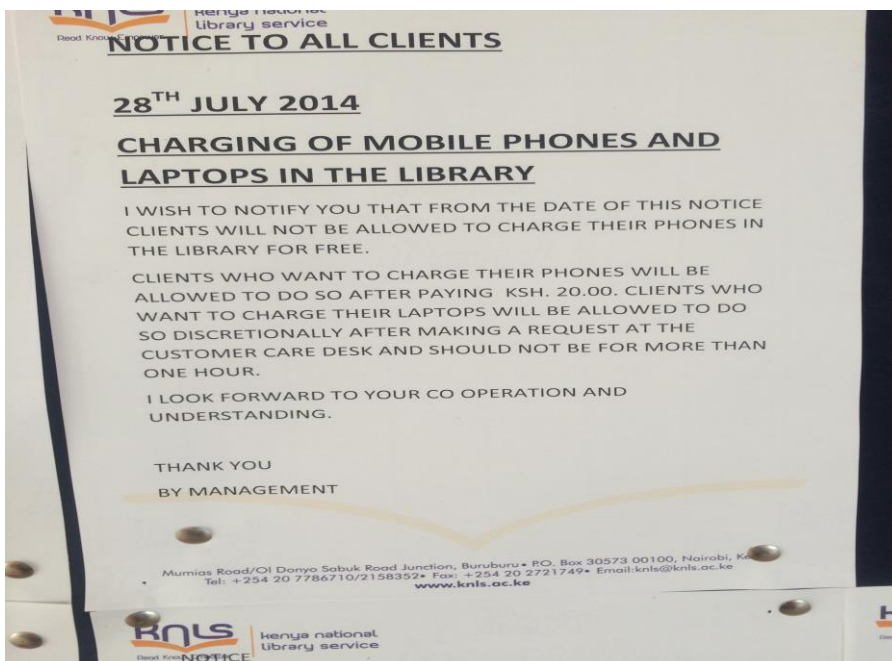
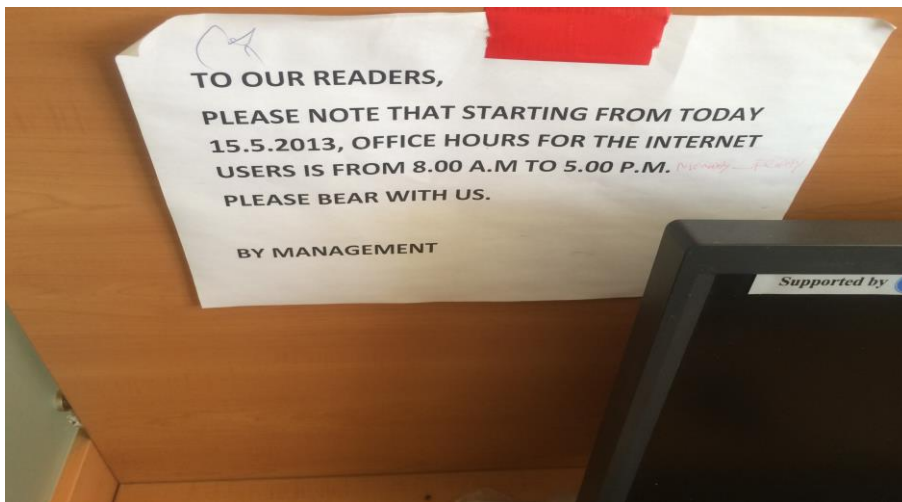
FIGURE 13: SCREENSHOT OF POOR INTERNET CONNECTION IN THE LIBRARY COMPUTERS

### **Utilization pattern of ICTs in libraries**

The computers have allocated to two groups. One dedicated for adult users and other for children. The utilization of the computers and internet seems is mostly for general internet browsing, learning basic computers skills, and used for the library digital literacy training classes in specific libraries which offer the training.

### **Staff attitudes on ICTs**

During the research I could see some policies that restricts ICT utilization. The fact that national libraries ICT policy gives the core guideline, every library seems to impose its own rules on computer and internet use. With others promoting usage and other restrict. For instance in some libraries limit internet usage up to 5:00 pm and only on week day while the library is open to the public till 6:30 pm and on Saturdays. There was no clear policy reason to justify the restriction of the internet services (refer the notice in the figures14). Other libraries restrict individual from charging or plugging in their laptops to power while in the library.



**FIGURE 14 LIBRARY NOTICES ON COMPUTER USE**

### **ICT equipment in libraries**

In terms of ICT services, the CCK - Program has had a significant impact on the provision of equipment in libraries, donating 10 computers, networking the computers

However this program is only in 10 libraries in the rural communities. Computer access is currently available in around 40% of public libraries in Kenya. The community libraries

implementing the E-resource centres have between 10-20 terminals, however the one for users are limited (refer table 38 below)

**TABLE 40: ICT EQUIPMENT IN COMMUNITY LIBRARIES**

Public Libraries case study libraries	Number of Computer terminals	Terminal for users	Printer	TV and audio-visuals	Internet
Werugha	10	8	1	1	Connected
Kwale	10	8	1	1	Connected
Dzitsoni	10	6	1	1	Connected
Narok	10	4	1		Connected
Laikipia	20	8	1	1	Connected

Given that the ICT equipment in the community libraries were donated almost all the libraries have the same numbers of computers, internet connection, printers. The difference is at the number of the computers which have been dedicated to users and staff. The libraries have allocated between 4-8 computers for users. Due to the computers skills/digital literacy classes and general usage, the number of terminals are not adequate to serve both staff and community members sufficiently.

#### 4.2.2 INTERVIEWS

The interview data was transcribed by me. The interviews were analyzed with no intention to code the data. When using content analysis, the goal is to find discrete ideas within the interviews in order to interpret them and organize them into categories of actions through open coding (Bohm, 2004). For this study, I wanted to discover what phenomena comes out of the data from the subjects' point-of-view. What the library and

the ICT- authority were doing to enhance public access computers in the bid for digital inclusion for all population. In the interview I gathered the views of the library and ICT- Authority officers through a set of questions. The interviews focused on 5 key areas including ICT policy, funding, collaborations, training and infrastructure.

### **ICT support and Collaborations**

In the interview key partner/ collaborators emerged to be supporting ICT adoption in public libraries in Kenya. The identified partners in ICT projects include Book Aid international, EIFL (Electronic Information for Libraries) and CCK. Through the partnerships they have launched ICT initiatives in both urban and rural places respectively to build ICT infrastructural and skills capacity for staff to help meet community needs.

These initiative targets all public libraries across the divide to offer public access to computers and internet. Other support aspects, focus on training staff in information and communication technology (ICT), planning, and advocacy and awareness raising skills. The target for the training is to make the public libraries a key ICT hubs in the communities.

The other important investigated services was e-government services which is a key component for government service delivery. In the research we understood though users access the e-government services there was no partnership with stakeholders like ICT- Authority and other government departments (local and central governments) and libraries to promote the e-governments initiatives/services to the rural communities.

### **Funding ICTs in community libraries**

In the interview we sought to understand the funding situation especially on the policy governing the structure and financing of the ICT in the community libraries. The library ICTs officers informed the library policy dedicates 10% of total organizational budget to purchase and maintenance of ICT equipment but due to constraints in allocated budget the ICTs do not get prioritized. The policy also does not stipulate how often the computer or ICT equipment should be replaced in case of breakdown or out of date.

The most common strategy for the libraries to raise additional funds to support ICT infrastructure is through donations and partnerships. Despite the provisions in ICT authority mandate, it emerged in the research that libraries have not collaborated/benefited from any infrastructural funding or any other than working together on advisory and standards setting collaborations.

### **ICT Training in Community libraries**

In the research, understanding library involvement in training supports to staff and communities was important. In the interview we found some plans to roll out a digital training program to all communities through a partnership effort with Microsoft IT Academy were underway. The delay in training program was due to unreliable internet connections challenges given the training was to be online based. The digital training program has different modules which would be self-taught or guided by the library staff. The libraries have ICT training manuals for training users on computer and internet use, but they do the training on demand basis. On the side to foster a workforce that is information and computer literate there were regular training, workshops and seminars sponsored by partners and sometimes based to availability of funds from the library ICT



budget allocations. So far 2 staff from all community libraries had undergone 2 week digital literacy program at Nakuru and Kisumu libraries.

### **Technology Training to communities**

One community libraries among the case studies had a collaborative digital literacy training program. The program was unique to one community library. This was through a collaborative partnership between a community NPO-Digital Opportunity Trust (DOT) and the Dzitsoni Community Library. The programs offered opportunities to youths and general community people to utilize ICT skills in establishing small scale sustainable livelihoods opportunities.

Through the program they envision to eradicate poverty, vulnerability and inequality by giving all people the skills and knowledge to use technology to achieve educational, social and economic opportunities in rural areas. The program introduced various ICT training modules: Reach-Up Program (6 week) - structured to deliver ICT, life skills and financial literacy services to youths (18yrs and above). The Participants gain fundamental skills in entrepreneurship to identify unique investment opportunities within their immediate community and develop a mechanism to establish livelihoods by utilizing ICT skills learnt.

Work-Up (Employment readiness foundation) Program is one the build-up program after Reach-Up Where participants pursuing employment are taught skills in networking, cv writing and interviewing skills through intensive 3 weeks facilitation and coaching sessions.

Start-Up Program is a 10 week program where participants build-up on their business opportunities they have developed in Reach-Up By incorporating basic fundamental

entrepreneurial skills into their ideas while assessing their feasibility in terms of practicality and profitability. The 2014-2015 DOT training cycle at KNLS Dzitsoni commenced on May 2014 and was scheduled to end in April 2015. A total of 113 participants had completed the training program (77male, 36 female-statistics obtained from the official records provide by the program trainer)

### **Infrastructure support**

ICT Infrastructure in Libraries are vital to communities. I sought to understand how the various stakeholder take part in supporting PATs. In the interviews of two ICT stakeholders (KNLS and ICTA), the latter with the mandate to promote digital inclusion in Kenya, it emerged that they have not supported ICTs initiatives in libraries. For the libraries it emerged due to limited of funding they acquired the ICTs through donations of CCK, but the libraries do are responsible for maintenance and ensure maximum utilization. The library ICT official revealed that not all the libraries across the network provide ICT services to the public. When it comes determination of allocation of ICTs equipment to network libraries, it's done on need basis.

### **National ICT Policy**

In Kenya the institutions involved in ICT policy making process includes the Communication Authority of Kenya, ICT Authority, and the Ministry of ICT. Though these institutions are involved in various measures to improve the broadband and digital inclusion in the country, still the efforts are coupled with challenges of not providing enough incentives and support to the public institutions for affordable broadband services and adequately supporting public institutions like schools and libraries to acquire ICTs infrastructures. The CCK stands out as one of the institutions which has actively involved

itself in supporting digital inclusion through supporting public access centers like libraries. Through partnership with CCK the libraries have established e-resource centres on 10 rural libraries other plans are underway to include 46 more libraries.

## CHAPTER 5 DISCUSSION AND FINDINGS

The study findings are discussed under the ACE framework. Specifically focusing on key areas of the community libraries ICTs. These are vital indicators to determine sustainability and benefit of the integrated digital technologies for the marginalized rural communities. The research results indicate the Internet and computers services provided are fairly well utilized in the respective communities amidst the existing challenges.

The following section provide an insights into the research results based on ACE framework and the challenges of the libraries in its roles in ICT capacity building.

### 5.1 ACCESS

In the research access was one of the key components to determine the location, use, access and affordability of the ICT services in the libraries.

#### 5.1.1 LOCATION

In Kenya a developing country, there are close to 60 public libraries located both in urban, sub-urban and rural places. Among them, 44 are community based libraries. In the research I focused on sub-urban and rural public libraries. All the visited libraries were located in sub-urban and rural. All the libraries provide ICT services to the communities however with varied degree of services.

#### 5.1.2 AFFORDABILITY

According to the provisional library policy, the internet services in the community libraries is free. Since the public libraries are centrally managed there is uniformity in internet access in the libraries. The library service access fee was introduced for adult users, to supplement the library budget. The fee is considered as minimal or affordable

more especially when considering paying a 1.2\$ (keS50-100) for annual membership but it is expensive for non-members who need to pay 0.2\$ (keS20) for every entry or access to any service in the library. But generally ICT access is free to all users through in future the library intends to introduce some minimal internet access charges which at his stage could not be confirmed.

### 5.1.3 ICT USAGE PATTERN

The study revealed that ICTs utilization pattern in the libraries varies among the age groups forma student and general adult users. The most adults used to access various information to satisfy varied informational needs, for example I observed one user whose interest was finding information on body building, and therefore searching information on diet professional body builders' use, other users to accomplish homework mostly for the university and college students.

While on the other young users (children) used the computers to play cards games, checkers, and search famous movies actors among other entertainment sites. Thus the two groups have distinct of ICT usage pattern. The usage is imperative to build skills, but guidance to young users on how to utilize the computers and internet profitable is necessary. The other interesting thing was some children with basic skill teach others on how to search and hold mouse and type on the computer keyboards.



**FIGURE 15 CHILDREN AND ADULTS USING COMPUTERS IN THE LIBRARY**

## 5.2 ICT TRAINING FOR COMMUNITIES

This is an important role which libraries should participate in or take-up more especially in the rural communities. In rural communities there are few or none formal ICT training institutions to enable locals learn how to use the ICT profitably. In the research we understood the patrons and library staff technology skills. The following are the insights;

### 5.2.1 STAFF CAPACITY

The library staff skills form an integral part in training the locals to acquire basic computer and internet usage skills. The research indicate that most of library staff had moderate computer skills but lacked skills on systems management and related trouble shootings.

For instance in the visited libraries some computers could not access internet due to some set-up problems. This problem could only to be solved by ICT staff from the head office which is miles away and it takes time for them to respond due to office bureaucracy. This limits internet service access to users.

In all the visited libraries the staff in-charge of the ICTs have undergone two weeks training on basic computer skills. During the research one staff from 29 libraries were undertaking the digital literacy training course in one of the library branches

### 5.2.2 PATRON TECHNOLOGY TRAINING

In the 5 case studies only one offered (Dzitsoni community library) formal IT support and entrepreneurial classes in collaboration with a Not-For Profit organization. The other libraries were having plans to start a digital literacy training program in partnership with Microsoft IT academy, which was yet to start.

### 5.3 ENVIRONMENT

This involves the atmosphere under which the ICT are adopted. It includes aspects of national policy framework, infrastructure building, key stakeholder support in the integration and adoption of ICT in a country. Through these we can determine the countries commitment to reduce the level existing digital divide. For these research we focused on policy framework (national and library ICT policy framework), and financing of PATs. Overall the studied libraries have been sufficiently supported in terms of computer and internet connection. Generally the broadband connection in Kenya is cheap but in the rural most of the infrastructure is still under-developed. All the libraries internet connection through satellite connection, which seems outdated compared to current

technologies (through fibre-optic, wireless access, cable networks) which provide faster data transmission.

### 5.3.1 ICT FINANCIAL & POLICY SUPPORT

The community libraries work under the national library ICT policy which guides most of ICTs issues in the libraries (use, distribution and maintained). With analysis to the ICT policy and practices the libraries have many challenges in implementing the policies. For instance the policy does not indicate how frequent the computers should be replaced, how many computers per library.

There is an indication that libraries struggle to fund the public access ICT in libraries given that all the computers, internet connections, networking, were sponsored through external donations from CCK and other stakeholders. In the interview with the library ICT officers indicated that according to the national library policy 10% of the overall organizational budget should be dedicated to ICTs which is considerably enough but due to budgetary constraints the policy is not practicable to implement. The 10% should support ICT equipment purchase, maintenance, replacement and services in the library but due to budgetary constraints this is not practicable. Mostly the library relies on donation from stakeholders to provide the ICTs services. For instance we found in the research that libraries received the ICT equipment through a donation from the Communication Authority of Kenya (CAK), Electronic Information for Libraries (EIFL), Computer for school Kenya (CFSK) and Book Aid International (BAI).

The other key stakeholder is ICT- authority (ICTA) whose mandate is to promote ICT literacy and capacity; promote e-Government services; facilitate equipment use in public service; promote ICT Innovation and enterprise; in Kenya, but in our research we found



out they have only collaborate with libraries in evaluation of ICT implementation levels but not on financial support or collaboration to implement any of the digital inclusion programs as per their mandate.

Analysis of the Kenya Public library ICT policy indicates inadequacies in addressing ICT adoption in public Libraries. There is a need to streamline the policy to match with the country's public needs. For example the policy does not indicate public library's involvement in reducing the digital divide, or in training the public on using ICTs. The Public Library ICT policy also is not comprehensive enough, more especially in addressing problems of training the public to foster information literacy, foster e-learning services (distance learning), and e-government, among other concerns.

## OTHER KEY FINDINGS

Generally we understand to build a digital literate citizenry, especially in a disadvantaged rural communities, we need a sustainable model of adopting the ICT services in well managed public institutions and free/affordable for locals to access. In the research we found out the libraries enable people to access the ICT resources affordably, but the quality of service need to be improved to be commensurate with the current ICT infrastructural investment. Continual services improvement will enable the communities deal with the socio-economic development challenges in the rural i.e. digital divide, poverty, education, health, and farming information support.

The research results indicate both young and old have embraced modern information technologies like using ICT infrastructures. The national government and private ISP have significantly improved basic ICT infrastructure i.e. internet availability but access remains

a challenge for the groups in rural and sub-urban areas due to the high cost compared to most rural people economic status.

The following are key findings specific to the case studies in this research:

First, though the library had collaboration with many institution on acquiring ICTs facilities there was less collaboration on services delivery for instance on e-government services or agriculture information services. While the government is offering e-services online i.e. passport application, driving licence renewal, birth certificate application. The e-service centres are limited to urban centres thus an opportunity for libraries to take-up this function to facilitate more e-services access to rural people.

Second, I had an informal visit to e-services centres (commonly referred as huduma centres in Kenya) to compare with the Libraries ICT services, I found out “Huduma centres” charge high service fees of approximately 2\$ to access internet compared with the free services at public libraries. For the government to avail e-government services through such model of using entrepreneurial model to access the services might limit access to the services. Compared to library, though one need to be a library member or pay entrance fee, one can access computer and internet without limit to available services for instance online e-government services. The computers and internet in libraries enables students and general community to access services for free or affordable cost, hence forms an affordable model for rural people to access information services and knowledge.

Generally developing countries, specifically in resource-poor rural areas, have many benefits in accessing and learn in the use of ICT in everyday life to enable and empower them through access to information resources and other channels. The provision of

internet, computers and other digital resources for free in libraries provides a cost-effective model for reaching the most marginalized communities because most people cannot afford to buy computers or internet connection to cross the digital divide. Some libraries are providing free computer training to users.

Third, I found that organizational structure (library centralized system) limits innovations in community libraries. This also causes a digital divide within the organization. For example no single community library has its own website, thus limiting community libraries and its staff from innovating and communicating to its users directly. This inhibits their ability to address the specific contextual needs of their community. For example, one community may need information mainly about agriculture, while another mainly about fishing, tourism, health or other areas. Currently they all rely on the main organization's webpage, which does not meet specific community needs. This also limits decision making and prevents innovation among the network institutions in community libraries. The top down organizational structure also hampers basic decision making on programs to starts at local levels (digital literacy programs more especially due to financial allocations and challenges.

Fifth, I found there is good collaboration of public libraries with stakeholders Communication authority of Kenya, EIFL and the national library with support to networking and 10 computer terminals which are currently used to provide access to information and training community members on digital literacy.

The ICT Authority do not provide of infrastructural/equipment support to libraries in support of despite its mandate on rural digital inclusion programmes initiatives

I also found that most of the libraries staff do not have adequate ICT skills/training thus a major hindrance to ICTs utilization in both the ICT resource centres.

Mostly the libraries help school students to acquire basic computer skills as they are the only institutions in the local communities which provides access to ICT. At the same time the some libraries provide very friendly environment for them to learn especially for children.

The librarians have a negative perception towards the use of SNS. This is due to limited internet bandwidth. In the contemporary period social networking services serve as a means of reaching out/engaging the clients (community people) for various purposes including offering services to the public or making important communication to the communities.

The community library receive a monthly ICT stipends from the parent organization (KNLS) to cater for maintenance and payment of internet services , but the funds are not enough to purchase any new ICT equipment like computers or any other accessory.

The internet speed is slow in most libraries thus hampering use of some applications, which are vital for enabling the rural communities to access information resources in videos i.e. On YouTube,

### **Challenges of public Libraries in ICT capacity building in rural communities**

- The major challenge currently experienced in library e-resource centres is lack of reliable computer networking system: the library's computers are networked and becomes a major challenge especially if the serve is not functioning properly, this causes regular network breakdowns thus affecting internet services.

- Some libraries reported faulty ICT equipment especially accessories like the keyboards and mouse leaving only a handful of operational computers.
- Lack of an enhanced ICT Policy: the library doesn't guide the staff effectively on utilization of ICTs i.e. thus leads to confusion on restriction on social media and visual media resources. Though this is due to internet speed and bandwidth a better solution is necessary to encourage users to undertake any activities through the available ICTs within an enhanced ICT policy framework.
- The other key challenge is delayed response from ICT office from the parent organization. One staff cited "lack of responsiveness from management on repairs of the broken-down or non-functional computers" while this is a challenge it also portrays how most staff are not well trained and over-dependency on the ICT officers, however sometimes the problems could be solved locally by the staff themselves given the set of skill and qualifications. This indicates the staff lack necessary skills to repair or deal with any computer trouble shootings.
- Although the library has now a fair internet connect, the speed seemed to be a problem and others reported contractual disputes with the service provider lead to disruption of internet connection in sometimes, where they are forced to pay monthly subscription fee while the internet was not functional
- Some libraries computers lacked power back up and protection in case of power failure which is very rampant may lead to breakdown which may result to costly repair in-case of there is a power surge.

- The library endeavor to train community people on computer and internet use, in library a volunteer computer skills trainer cited laxity on library staff in recruiting, training ICT participants. This can be attributed with the traditional librarian mindset, expecting users to ask for services rather than promoting the available services and opportunities to the communities.
- In some libraries the computer/ cyber room are fairly small and can't accommodate more than 10 persons or less hence in the library which offers computer skills training to community people are forced to move to a larger hall which lacks sufficient socket outlets and desks.

## LIMITATIONS OF THE STUDY

As with any research endeavor whether it is done through using quantitative or qualitative methods, it shows a snapshot in time and cannot be easily generalized to all situations. To conduct a qualitative research one need more time to observe and understand the phenomena in detail, due to the time limit, I could not spend more time in respective case studies. Given the sample size (number of respondents and number of libraries) studied, the data will be considered valid only for the public libraries were involved in the study.

The choice of concentrating on officials as key informants, the rationale behind this focus was to obtain their perception of collaborations on ICTs and digital inclusion efforts to support rural communities. The main challenge with using mainly those in authority as key informants is that they may give only the information that is favorable to their organization. However, the use of other sources of data such as observation, and review of official documents complements information derived from the oral interviews.

## CHAPTER 6 SUMMARIES AND RECOMMENDATIONS

### Case studies summary

- Among the selected libraries or other KNLS branches no single library has a home page to provide unique or local based services to communities
- Among the observable phenomenon there is no multimedia support hardware like headphones for use to communicate or access audio or video information sources.
- Organizational cultures limits growth by limiting decision making at the community library level limiting maximum utilization of availed ICTs in the libraries.

### Recommendations

The researchers recommends that there is a strong need for better coordination among the government departments and agencies regarding ICT roll out to ensure the optimal adoption of ICT in efforts of digital inclusion. For the libraries to effectively contribute to ICT capacity building they should endeavor not only to provide internet and computer access but initiate digital literacy training as central role to their mission in the communities among the following recommendations:

- There is need for the national library to revise or implement the ICT policy strategy especially on budget, staff training, taking-up the digital literacy and inclusion as core role to enable lobby for funding in a more proactive way rather than waiting for inadequate annual budget allocation. The visibility to the local community and government is important to solicit for more ICT funding and support.

- More collaboration with other key government departments to enhance e-government service delivery to the rural communities. With government emphasizing on e-government participation the libraries should be focal centres to enable local communities members access essential services like job applications, application forms downloads, rather than travelling for long distance to access the services.
- Enable staff acquire broad-based education in technology that will assist them to confidently demonstrate their digital and information literacy competence through which they can facilitate community member access and acquire the skills and abilities
- In this era of ICT, librarians who are not information literate pose a potential risks to hamper ICT adoption in respective communities in the wake of digital age. Additional strategies apart from education required to be advanced by all stakeholders, including continuous organizing practical seminars on webpage development, fund raising and systems management to enable library staff to provide practical based services for the communities.
- As reflected in the research the libraries depends on the stakeholders for ICT training and equipment from external donations though the same phenomenon repeats itself when it comes to funding technologies in the libraries. The governments especially in the newly devolved county government should recognize these factors and help library to provide desired services to encourage increased local funding to avoid endemic dependency on external aid or donation especially on the adoption of ICTs in the communities and promotion of digital literacy.



- The library should focus on more local partnership and collaborations more especially with local county governments to enhance and encourage local capacity building rather than depend on donor funded projects which are usually time bound or limited for short time. Before the ICTs were adopted the KNLS dependent on book aids.
- There is need for community libraries to establish library websites and SNS (Facebook, twitter or google +) to promote the activities of the libraries to users and general public rather than relying on the central website which does not address need of the respective communities.
- Updating of the existing computers and networking in the libraries to curb regular internet connection problems.
- Replace of damaged keyboards and mouse
- Formulation of a user friendly ICT policy with set times to ensure service to all
- Upgrading of the existing internet connection to a higher bandwidth
- Provision of a power back up or emergency generator to mitigate power interruptions
- Streamlining contraction issue to ensure service delivery is not interrupted
- Community awareness by the library on ICT services available and other services
- Dedication of a larger room as an ICT room / Cyber
- Since the libraries are devolving to the county unit there needs for a library authority just to guide on key development on policy and more especially on ICT adoption to community libraries rather than providing .

- Though the primary role of public libraries is to provide access to information integration of e-service delivery platform needs to be given priority not only to save the public the agony of travelling far while they can access the service in the community in an easy and simplified processes.
- Finally the government had designated that all of its 210 constituency throughout country should have a digital village or e-resource Centre equipped with ICTs. The program kicked-off 5 years ago with a little success to date they should consider funding libraries adequately to help to achieve the vision.

#### **Further research considerations**

More qualitative research to understand utilization of the technologies in the libraries and other public PATs in the rural communities to enable develop an appropriate digital literacy program for rural community people.

## CHAPTER 7 CONCLUSIONS

In this thesis, I explored the libraries contribution to infrastructural and skills support to rural communities. The primary goal was to understand whether the available ICTs are effective, and if so, determine how they enable people to access knowledge and digital skills required for participation in the information society. The integration of digital technologies and skills rural communities is inevitable in the current information society.

The contribution of the thesis helps in understanding various aspects of PATs and information access in several ways. First it contributes to the work on PATs activities and illustrates how libraries are taking part in the reducing digital divide in disadvantaged areas. Based on the findings of the research, indeed the public libraries play a role in enhancing ICT access, knowledge and digital literacies building in the surveyed communities. The provision of ICT equipment to the communities is a huge step to enable the communities not only access but to acquire basic computers skills which could be meaningful if fully utilized to access information and enhance their knowledge.

As the challenges of technical training of staff, space problem, internet connection, power shortage, and technology funding situations exist, these are key areas to address in order to facilitate visibility of libraries roles in digital literacy training. However the libraries provides computers and limited internet services to the public, it plays significant role in helping communities especially in education.

The research emphasises is on the importance of initiating more digital literacy programs in rural communities to enhance access to information, knowledge and e-governments

services. The libraries ICTs could play a major stakeholder in providing the e-services to general public. Considering the national ICT penetration it is certain that any small venture to narrow the national gap has a significant effect to narrowing the overall digital divide in rural and disadvantaged communities.

In the research we identified in-effective collaboration between libraries and governments departments (through the leadership of ICT Authority) which needs to be strengthened to enable and support different approaches on improving and implementation of digital inclusion projects and increase the digital literacy rate for economic development and e-government services uptake in all areas.

The other contributions of the library ICTs, they provide opportunity for children to build ICT use skills through active learning by helping each other through learning together in a relaxed environments. For instance children teach each other on how to use computer mouse, typing on keyboard, menu bar navigation, simple searches on the internet, and playing games among other skills.

There is need to take cognizance of existing challenges on low digital literacy levels among library staff who are ICTs trainers in the communities, this call for more support to enable build and promote a capable workforce that fosters ICT adoption and uptake in the rural communities. The impact of offering digital and information literacy training has a long-standing benefits to communities and government programs such as in reduction of corruption cases in government service delivery, increased access to information services, digital participation, thus making libraries ideally positioned to support the implementation in rural communities.

Libraries as newcomers in implementing public ICTs in communities form a core part in the communities, with the increased use of the facilities for study purposes and other related use the government support is much needed to support more initiatives in underserved rural. It is also important to note that much of information is shifting to electronic platform thus if rural communities lack the services there are chances of them missing out in sharing their knowledge more especially when it comes to political participation, knowledge sharing and social and economic development. The increase in digital technologies provide an efficient platform for people to share and participate to raise their voices on local governance issues.

As the case with Kenya, ICTs are of importance more so with the devolved governance, rural people need to engage the government locally for improved service delivery. The funding system is bound to shift from the consolidated government funds to the decentralized system of governance. For more funding support to be achieved the opinion of the local community people should have voice in determining on budget allocation to location community development. There is need for more intense lobbying from local communities for more technology support P.A.Ts.

Finally the persistent public library budget constraints should make libraries more proactive to advocate for financial or technology equipment support. Mostly the libraries perhaps do not sufficiently articulate the message of their activities in this area to policy makers and budget providers. More especially on using the developing technologically driven services (e-services) and digital literacy training platform. Promoting digital inclusion and empowering people through training and access to digital information is inevitable in this new technology era.

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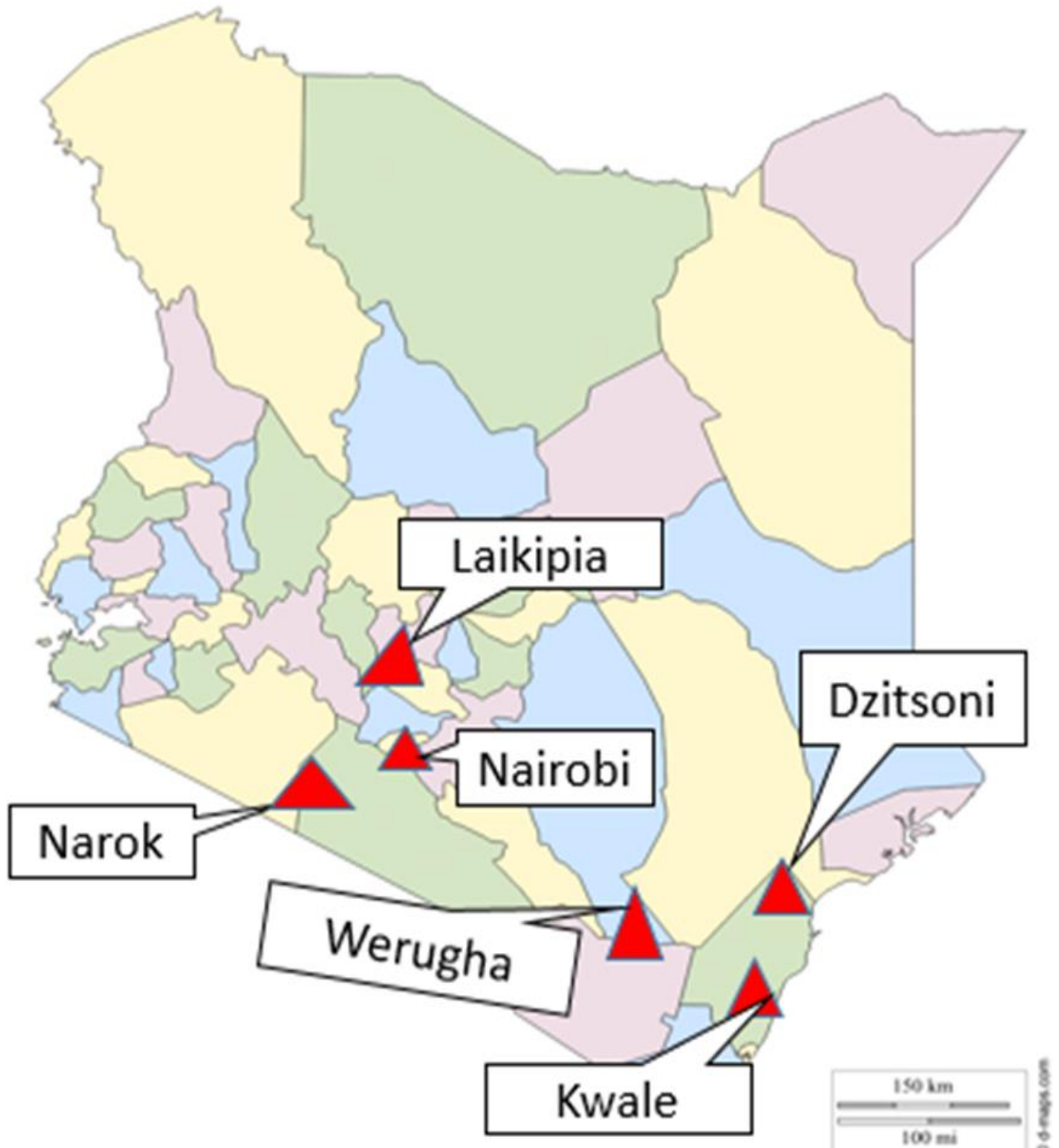
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## APPENDICES

### Appendix I-Research site: Kenya (5 community libraries)



## **Appendix II – Interview Questions for ICT Authority Officials**

The following is a list of questions designed to gather information relating to roles of ICTA in facilitating ICT capacity building in rural Kenya.

### **Policy**

1. Which institutions do you support in your nationwide strategies to reduce the digital divide in Kenya?
2. Given that the rural communities have limited ICT infrastructure, what framework do you have to facilitate access to internet and computers?
3. Does the ICTA have any policy guidelines to support e-government initiatives to support rural population access services?

### **A. Funding**

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4. The public institutions are rapidly adopting ICTs as part of services to the public but usually faced with budget challenges. In your current mandate how can you support/work together to facilitate public access to ICTs in rural communities?
5. Do you provide any competitive funding opportunities to support public access to technologies in Kenya?

### **B. Collaborations**

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6. Do you work together with other key stakeholder to ensure increased access to ICT?
  - a) Who are the key stakeholders in public ICTs support?
7. The public libraries in Kenya are among the public institutions that provide access to computers to the public, do you have any collaborative projects?

### **C. Implementation and sustainability approaches**

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8. How does the policies ensure economic feasibility for long-term sustainability of public

access to Informational infrastructure?

#### **D. Digital Literacy Capacity building**

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9. In your opinion what do you think about the general digital literacy rate in Kenya and how do you compare urban and rural communities?

- How do you intend to build digital literacy for general population, more especially for those not enrolled in formal educational institutions?

#### **Appendix III - Interview questions for National library ICT policy makers**

The following is a list of questions designed to gather information relating to roles of National Library policy in facilitating ICT capacity building in rural Kenya.

##### **1. Funding**

- Do you have any policy governing the structure and financing of the ICT in the libraries?
- In the Library ICT policy does it stipulate how often the computer or ICT equipment should be replaced?
- Do you consider the ICT funding situation sufficient or inadequate in the library?
- How do you raise additional funds to support ICT infrastructure?
- Have the libraries benefited from any of ICT support funds from the ICT authority?
- With public Libraries taking up the role of providing digital literacy to communities what strategies do you use in promoting these efforts to budget providers?

##### **2. Training**

- Do the libraries under the KNLS network offer formal digital literacy training to users?

- Do you think the library has a role in training users on computer and internet use?
- How do you the foster a workforce that is information and computer literate?
- Do you have any specific regulation to limit some applications use in the libraries?
- How frequent do you support training of library staff on ICT?

### **3. Infrastructure support**

- Do all public libraries under the KNLS network provide ICT access to public?
- How do you determine allocate ICTs equipment to network libraries?
- Do you provide free internet access to the public?
- Do the libraries provide free internet to those with laptops/mobile devices?
- Does the library have digital library services?

### **4. Collaborations**

- Do you have any collaboration with ICT authority or any other stakeholders to promote Public ICT implementation?
- Do you have any partnership with stakeholders like ICT board and other government departments (local and central governments) for e-governments initiatives for the rural areas?

### **5. ICT Policy**

- In the Library ICT policy do you have any guidelines on digital literacy and inclusion for rural communities?
- Given the organizational structures is top-down model do you think it promotes ICT innovations at the community libraries given that all rely decision making from the central unit?



**Appendix IV- Library Building**



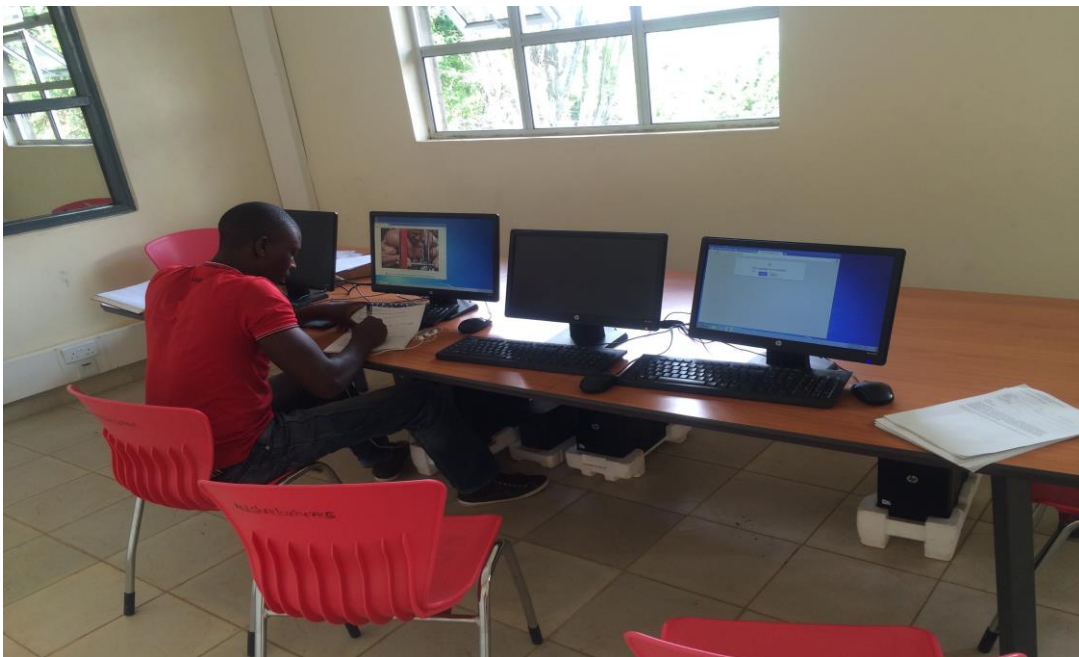
**Photo1: Old Building Kwale Community Library**



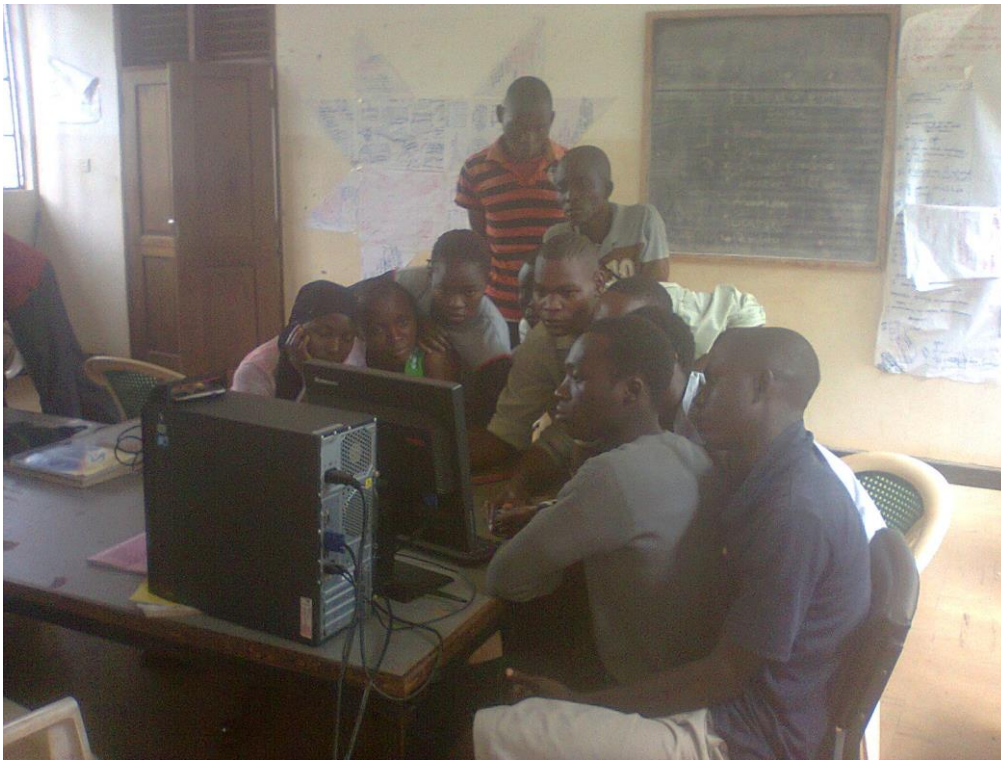
**PHOTO 2: Laikipia community library internet satellite**



**Photo 3: Narok Library building**



**Photo 4: Narok community library computer room**



**Photo 5: students at Dzitsoni Community library taking computer lessons**



**PHOTO 6: Book placed on the PC in the library**



**PHOTO 7: Laikipia community library computer in reading area**



**Photo8: computers in reading area at Werugha Library**



**Photo 9: students in a computer room at Dzitsoni community library**

#### **Appendix v: Questionnaire for public library librarians**

Good morning/afternoon. My name is Zablun Pingo a master student at the University of Tsukuba, Japan. I am currently conducting a research on ICT capacity building in rural communities. The sample consists of 15 interviews selected at random from 5 libraries in the country. The interview will take about 30 minutes. The data will solely be used for the purpose of this research. Your name will not be used at any part of this research. The information you provide is confidential. Thank you.

Several questions about you

P1. Your gender?

01      Male.....1

02      Female..... 2

P3. What is your level of decision making on library ICT issues?

- 01 I am ultimately responsible for the decision making
- 02 I am partly responsible for the decision making
- 03 I am not responsible for the decision making

P4. Please, characterize your education:

- 01 Master's degree in the library/information science field
- 02 Bachelor's degree in the library/information science field
- 03 Professional librarian's education
- 04 Master's degree in another field
- 05 Bachelor's degree in another field
- 06 Professional education in another field
- 07 Diploma in librarianship/Information technology
- 08 Secondary education
- 09 Other (please specify) \_\_\_\_\_

1. Do people need to pay to use your ICTs services:

a) Yes, they must pay for certain services (e.g. internet access, printing, scanning, etc.)

[write in what services]

- 1..... 3 .....
- 2..... 4.....

b) No, it's free of charge.....4

2. Do you think internet user fee has any impact on use of library ICT services?

3. Please indicate, how many such pieces of equipment in the library:

Equipment	Number
Computers (in total)	
Computers for users	
Printers	

Scanners	
Copier	
Tablets(i-Pads)	
TV or other audiovisual equipment	
Multifunctional equipment (several machines combined, for example, a printer, scanner, copier have been combined in one equipment)	

4. Please could you give daily or monthly average statistics on number of Computer and Internet users in the library? [you can provide statistics from your records if possible]

5. Does your library provide the following services?

Service	Yes	No	Don't know
Public internet access			
Connection to the internet with personal laptops			
Possibility to hear a speaker, see a movie or attend an event			
Opportunity to take a class or workshop on ICTs			
Other (please specify)			
None			
don't know			

6. How do you rate the following aspects of your library? Please make an assessment on a 4-point scale, where 1 - very bad, 4 - excellent.

	Bad	Good	Excellent	Don't know/NA
Range of databases	2	3	4	5
Librarian expertise in working with computer	2	3	4	5
The overall atmosphere of a library	2	3	4	5

7. Does the library have a formal training course for users on internet, e-government and general computers usage?

Yes	
No	

a) If yes? Please explain \_\_\_\_\_

\_\_\_\_\_

a) Have you been trained how to train users on ICTs usage?

If yes

What strategies to you use given the libraries uniqueness in the type users who use the services.

\_\_\_\_\_

8. what other ICT services would you like to provide (please list)?

.....

.....

.....

.....

9. Are the building specially built to accommodate computers and technology or you modified? What are the challenges?

10. What are the biggest challenges in managing the ICT equipment? (Multiple answers allowed. Please rank the top 3 challenges in order of severity).

1.
2.
3.
4.
5.
6.

11. What other main challenges that affect effective ICT implementation in the libraries?



**12.** How do you rate the funding situation of following technologies in the libraries?

	Very bad	Bad	Good	Excellent	Don't know/NA
Purchase/replacement of computers					
Internet subscriptions					
IT staff					
Servicing of ICT equipment					

**13.** If your library had more funding, to which of the following areas would you give your priority (please rank the areas in order of importance, starting from the most important).

**14.** Please elaborate on each of the priorities marked, what needs to be done?

01	Start computers training for users	
02	Acquire High speed broadband	
03	Staff training on ICTs	
04	Activities/Programs	
05	Purchase/replacement of computers	

**15.** Please provide an assessment of your/other staff skills to provide technology related library services

Highly insufficient	1
Insufficient	2
Sufficient	3

Absolutely sufficient	4
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**16. Have you been trained on computer skills?**

Please give some specific areas you are highly experienced

1	
2	
3	
4	
5	

**Appendix VI: Questionnaire for public library users**

Good morning/afternoon. My name is Zablon Pingo, I am a Master student at the University of Tsukuba, Japan. I am currently conducting a survey on public library roles on ICT provision and support to communities. The sample consists of 100 interviews selected at random. You have been selected at random. The interview will take about 30 minutes. The information you provide will be used only for the purpose of this research. The information you provide will be treated with confidentiality and for the purpose of this study.

You can use any of the following marks to indicate your answers [please follow instruction for each question ○, ✕ or ✓

**What is do you think of the computers and internet in the public libraries? Please give your thoughts?**

1	
2	
3	

1. **Generally speaking, how important or unimportant do you think public libraries computer and internet services are to the community? (TICK ONLY ONE BOX)**

Essential	1
Very important	2
Fairly important	3
Not very important	4
Not important at all	5
Don't know	6

2. **Think about how many times during the last 12 months (last year) you have visited the public library or used public library services. And how many times have you used public library computers, internet or website, databases?**

	Wi-Fi	internet	computer
one to five times (1-5)	1	2	3
six to ten times (6-10)	1	2	3
eleven to twenty times (11-20)	1	2	3
over twenty times (21>)	1	2	3
not at all	1	2	3
don't know	1	2	3

3. **While using the Library services which of the following services have you used most frequently? [MULTIPLE RESPONSES ACCEPTED]**

connect to the internet with your laptop	1
Use computers	2
Take a class or workshop on computers skill course	4
Use library for study	5
Meet other people	6
Use and borrow library books	7
Others (please specify)	8
None	9
Don't know (don't remember)	10

4. **When you use computer or internet in the library do you pay for it or is it free?**

	Yes	No
Computer	1	2
Internet	1	2

**5-1. if you pay for the computer or internet use, in your opinion is it affordable or expensive?**

	Expensive	Affordable
Computer	1	2
Internet	1	2

**5-2. please explain the reason**

**5. a) Where did you learn or train/gain skills on how to use computers? [Multiple responses accepted]**

Primary school	1
Secondary school	2
College	3
University	4
Library	5
Self-learning	6

**b) How do you evaluate your computer literacy level? [Please check the corresponding skill level]**

Highly skilled	Well skilled	Intermediary level	Beginner level	starter	No skills
1	2	3	4	5	6

**6. Do you think they need to offer the computer and internet usage courses in the library? Explain**

**7. Please thinking over which three of the following purposes have you most frequently used the computers in the public library for?**

	Choose top 3 services
educational purposes (for homework or to take a class)	1
entertainment	2
information on health issues	3
information on agriculture	4
information and use of electronic government services	5
local news or information	6
national news or information	7
other	14
don't know	15
None	16

**8. Have you benefited from visiting the library in the following areas? [MULTIPLE RESPONSES ACCEPTED]**

Have you developed new skills on how to search information on the internet?	1
Have you obtained new ideas, new interests in using computers and internet?	2
have you got helpful information for school/ learning	3
have you got helpful information for health and well being	4
have you got helpful information for business and commerce	5
have you got helpful information about your community	6
has the library helped you to find a job(advertisement) online	7
has the library helped you to be better in your job	8

	Choose 3
educational purposes (for homework or to take a class)	1
entertainment	2
information on health issues	3
information on agriculture	4
information and use of electronic government services	5
local news or information	6
national news or information	7
financial or investment news or information	8
international news or information	9

9. a) How often do you turn to a librarian/library staff for help, advice or consultation on how to use the computers or access internet or online resources in the library?

Frequency	Never	Rarely	sometimes	often	Always
	1	2	3	4	5

Depending on your answer please explain why,

b). How satisfied are you with the librarian's help to use the computers?

Extremely satisfied	Very Satisfied	Somewhat satisfied	Only a little satisfied	Not at all satisfied	Don't Know
1	2	3	4	5	6

11. How often do you use internet to search for information in the library? (TICK ONLY ONE BOX)

Everyday	1-2days a week	Once a week	Once a month	Not at all
1	2	3	4	5

If not at all, please give reasons

12. How do you rate the following aspects of the local library? Please make an assessment on a 4-point scale, where 1 - very bad, 4 - excellent.

	Very bad	Bad	Moderate	Good	Excellent	Don't know /NA
Range of databases/online resources/e-books, etc	1	2	3	4	5	6
Computers and other equipment	1	2	3	4	5	6
Librarian expertise in working with computer	1	2	3	4	5	6
Librarians responsiveness when they requested the assistance of the computer	1	2	3	4	5	6

**13. a. How satisfied or dissatisfied are you with the current library computer, internet and related services? Choose one**

Very satisfied	Fairly satisfied	Neither satisfied or dissatisfied	Fairly dissatisfied	Very dissatisfied	Don't Know
1	2	3	4	5	6

**b. what makes you say this? (MULTI-ANSWER POSSIBLE**

My library is convenient and offer affordable computer related services	1
Plenty of computers	2
The staff are helpful in computer and internet usage training	3
The internet usage fee is expensive	4
It's a good focal point for the community (e.g. for meetings and events)	5
Plenty of activities or computer training courses going on	6
Other (enter verbatim)	7
Nothing	8
Don't know	9

**c. THOSE WHO ARE DISSATISFIED AT Q13a [3, 4, 5], OTHERS SKIP TO Q14c.**

**What are the main reasons, if any, for your dissatisfaction?**

The service fee is too expensive	1
The internet speed is too slow	2
Not enough seats available	3
Opening hours aren't long enough	4
The computers are too old	5
They don't have the any online-books/free resources I like/need	6
Not enough computers	7
The staff aren't helpful in assisting to utilize the computers and internet	8
Too noisy	9
Not enough activities or courses going on	10
I don't feel welcome there	11
Other (enter verbatim)	12
Nothing	13
Don't know	14

**14. Which of the following institutions provide affordable access to internet, computers and other information resources? [Multiple answer possible]**

Community centres	
Public libraries	
Cybercafés	
Digital villages	
Schools	
Any other	

Which one of the above do you rank overall the best in offering the ICTs services? Please explain

16. Next questions are about the areas in which libraries can impact on development of users and communities through use of available ICTs. Could you please indicate the areas the library has innovated to support the communities. What is your opinion on each of these areas?

**Area 1: Information Society and Digital Divide**

Statements	Strongly agree	Agree	Disagree	Strongly disagree
1. Libraries provide access to universal, objectives, timely information and knowledge from a variety of sources				
1-1. Provide access to professionally processed(collected,analysed, classified, etc.) information	1	2	3	4
1-2. Provide free access to information technologies (for persons, business, etc.)	1	2	3	4
1-3. Provide assistance in using the Internet and other information sources	1	2	3	4
1-4. Contributes to the development of information technology skills	1	2	3	4



Area 2: Education

Statements	Strongly agree	Agree	Disagree	Strongly disagree
Contribute to the development of literacy	1	2	3	4
Contribute to children' learning through available digital technology resources	1	2	3	4
Contribute to adults' employment opportunities	1	2	3	4

Area 3: Economic Development

Statements	Strongly agree	Agree	Disagree	Strongly disagree
Provide access to information and new ideas through available digital resources(e.g. start-up business) for entrepreneurs	1	2	3	4
Provide access to and professional support in search for business information resources	1	2	3	4
Contribute to the development of economic knowledge of the community	1	2	3	4
Enhance productivity of individuals and organizations	1	2	3	4
Provide entrepreneurs job related training in the areas of computer and information literacy skills and good business practices	1	2	3	4

Area 4: Health

Statements	Strongly agree	Agree	Disagree	Strongly disagree
Provide access to health information online	1	2	3	4
Provide space for health related events	1	2	3	4
Disseminate health related information	1	2	3	4
Collaborates with health facilities to offer health related information support services	1	2	3	4
Provide public lectures on health related issues	1	2	3	4
Recommend important online health information sites	1	2	3	4

Does the library allow use social networking services in the library computers?

No	1
Yes	2

Does the library use Social networking services (Facebook, twitter, etc) to inform or communication with you?

If no, what do you suggest?

Area 5: E-Government and Employment services

Statements	Strongly agree	Agree	Disagree	Strongly disagree
Help users to do online job applications	1	2	3	4
Serve as a channel for dissemination of information of the government	1	2	3	4
Provide access to e-government services	1	2	3	4

Area 6: Agriculture

Statements	Strongly agree	Agree	Disagree	Strongly disagree
Provide farmers with understandable information about developing, scheduling, planting and maintaining their crops through E-resources	1	2	3	4
Provide farmers with information about caring for and marketing their produce	1	2	3	4
Provide farmers with information about services available to them from government or other agencies	1	2	3	4
Provide access to agriculture relevant daily information (for example weather or pricing information)	1	2	3	4

Information about respondent

P1.

GENDER	
FEMALE	1
MALE	2

P2. In which age range do you fall?

Age	16-20yrs	21-30yrs	31-40yrs	41-50yrs	51-60yrs	61-70yrs
	1	2	3	4	5	6

P3. Educational level

elementary or less	1
Completed primary	2
Some secondary	3
Completed secondary	4
Some post-secondary (university or technical)	5
Completed vocational/technical institute	6
Completed university or more	7
Don't know	8

P4. What is your current occupational status? Please indicate your specific job or profession in the box below.

	Occupation	
Part time		1
Work full time		2
Self employed		3
Unemployed not looking for a job		4
Unemployed looking for a job		5
Retired		6
Student		7
Recently graduated from school (not employed)		8
Other _____		9

I acknowledge to have modified and used the questionnaire from EIFL to suit my study. I notified through an email to EIFL to obtain the permission.