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THE ROLE OF TELECENTRES IN PROMOTING SOCIO-ECONOMIC DEVELOPMENT IN RWANDA

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Abstract

Telecentres are an important tool for promoting socio-economic development in areas with very low levels of e-access. They have the potential to offer benefits to rural communities in education, health, agriculture and business. The purpose of this study was to explore the strengths and weaknesses of telecentres in promoting specific socio-economic objectives set in Rwanda's National Information and Communication Infrastructure (NICI II) plan 2006 - 2010. The findings were that telecentres have been effective in contributing to community development through access to information, skills development, job creation, study opportunities, low cost in telecentre services and increased income. The three main challenges that hinder rural communities from advanced e-access were found to be literacy and level of education, language barriers, and lack of skills and awareness. Future policy requires comprehensive guidelines to guide the deployment of rich local content in telecentres that will enable more effective use of these facilities to promote socio-economic development through e-Soko type projects, *Umuganda* activities and other community or e-government initiatives.

Declaration

I declare that this research report is my own, unaided work. It is submitted in partial fulfilment for the degree of Master of Management (in the field of Information Communication Technology, Policy and Regulation) at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination at any other university.

_____

Seth BUHIGIRO

31, January,2012.

Dedication

This work is dedicated to my family. Thank you for your support and encouragements, love and understanding.

Acknowledgements

I would like to thank in particular the almighty God for having given me the opportunity and strength to finish this research report. I take this opportunity also to acknowledge my family for their support and fruitful guidance, my grateful thanks to the Government of Rwanda for funding of my studies at University of the Witwatersrand.

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List of Abbreviations

AfDB	African Development Bank
GDP	Gross Domestic Product
APEC	Asia-Pacific Economic Cooperation
BDC	Business Development Centre
CABECA	Capacity Building for Electronic Communication in Africa
CEO	Chief Executive Officer
COMESA	Common Market for Eastern and Southern Africa
CSOs	Community Services Obligations
EDPRS	Economic Development and Poverty Reduction Strategy
ESCAP	Economic and Social Commission for Asia and the Pacific
EWSA	Energy and Water Sanitation Agency
ICT	Information and Communication Technology
IDRC	International Development Research Centre
ITU	International Telecommunication Union
MINAGRI	Ministry of Agriculture and Animal Resources
MINALOC	Ministry of Local Government
MINECOFIN	Ministry of Finance and Economic Planning
MSSRF	M.S.Swaminathan Research Foundation
NGOs	Non- Government Organisations

NICI	National Information Communication Infrastructure
OECD	Organisation for Economic Co-operation and Development
PADIS	Pan African Development Information System
RDB	Rwanda Development Board
RITA	Rwanda Information Technology Authority
TIGA	Technology in Government in Africa
TRAC	Treatment and Research AIDS Centre
UASF	Universal Access and Universal Service Funds
UNECA	United Nation Economic Commission for Africa
UNESCO	United Nation Education Science and Culture Organisation
VSAT	Very Small Aperture Terminal

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CHAPTER ONE: ICT ACCESS AND USAGE FOR RURAL COMMUNITIES

1 Introduction

This research report is a qualitative study on the role of telecentres in promoting socio-economic development in Rwanda viewed through the lens of case studies of six telecentres. The research considers the NICI Plan II which covers the period 2006 - 2010 and the data collection on the telecentres was conducted in January 2011, at the end of this period. A telecentre can be defined as "a physical space that provides access to information and communication technologies (ICTs) for educational, personal, social and economic development" (Gómez & Hunt, 1999:17). Telecentres play an important role in promoting socio-economic development. Indeed, telecentres offer opportunities and benefits to rural communities to develop in different areas such as health, education, agriculture, trade and commerce, because there are very low levels of e- access at household.

Over 90% of the population in Rwanda lives in rural areas depending on subsistence farming with close to 60% of the population living below the poverty line and almost 40% extremely poor (Siegel, Gatsinzi & Kettlewell, 2011). The illiteracy rate is estimated to be 50% among adults living in rural areas (Nsengiyumva & Baingana, 2007) and about 70-90 % of the population speak only Kinyarwanda (Samuelson & Freedman, 2010). In response to the above highlighted challenges, the government of Rwanda has adopted policy for ICT for development (ICT4D). Santhi & Kumaran (2006:180) says that "ICTs play an important role in the world's societies, and have the potential to help disadvantaged groups increase their participation in the civil, social, political, and economic processes critical to achieving change". Yet telecentres are important access point to rural communities.

1.2 Background to the Study

The Republic of Rwanda is a small landlocked country located in East-Central Africa's Great Lakes region. Its closest neighbours include Uganda, Burundi, the Democratic Republic of the Congo and Tanzania. Its fertile and hilly terrain has appropriately earned

for itself the title of "Land of a Thousand Hills" or "Igihugu cy'Imisozi Igihumbi" in local language Kinyarwanda. English and French are the official languages for business and commerce, and English is the language used in the schooling system. Rwanda has an area of 26,338 km^2 and is constituted by four provinces and the capital city, Kigali According to MINALOC (2011) the four provinces and Kigali city have administrative subdivisions of 30 districts; 416 sectors; 2,148 cells with varying populations and economic strengths:

The economy of the Northern Province is largely based on agriculture and animal husbandry. The service sectors found in this province are education sector with one higher institution of learning and one professional training school; energy sector hosting two most important hydroelectric dams of the country known as Mukungwa and Ntaruka hydroelectric dams; and culture and tourism sector like Volcanoes national park (Republic of Rwanda Northern Province, 2007).

The economy of the Southern Province is largely based on agriculture and animal husbandry while commerce, mines and services are other economic domains. The services sector found in this province include the nation's leading teaching and research institution, the University of Rwanda, the National Museum, the King's Court which continues to attract numbers of tourists from around the globe and the world-famous Maraba Bourbon Coffee Co-operative. Besides that the province has numerous industries like brick making, matchbox and mineral water factories (Republic of Rwanda Southern Province, 2007).

The economy of Eastern Province is largely based on livestock keeping and agriculture. This province is mainly affected by seasonal drought. The services sector found in this province includes tourism services such as the Akagera National Park (Republic of Rwanda Eastern Province, 2007). The economy of Western Province is largely based on agriculture, fishery and animal husbandry and tourism, which includes Nyungwe National Park, the Kivu Lake, the Cyamudogo natural forest and Bukunzi hot springs which have attracted many tourists around the world (Republic of Rwanda Western Province, 2007).

Kigali City is situated almost in the centre of the country and its economy is based on commercial activities. The map of Rwanda (see Figure 1.1 below) indicates the provinces, the capital city Kigali and other major cities.

Figure1. 1: Map of Republic of Rwanda



Source: Mapsofworld.com

1.2.1 **Economic perspective in Rwanda**

The country's economy is primarily a subsistence agriculture economy where tea and coffee are mostly produced for export. Other industries include fishing, flowers and sugar for export. According to the African Statistical Yearbook 2010 (AfDB, 2010) Rwanda has a population of 9,998 million, of which 4,586 are economically active and 51.6% are female. The economy of Rwanda is dominated by agriculture. GDP at current prices for 2008 was USD4, 691million and GDP per capita was USD483. Between 2001 and 2008, Rwanda's GDP growth rate showed high and low levels of annual increase, rising to 11.2% in 2008. Despite this relatively high growth rate, GDP per capita shows that household income is low and therefore Rwanda's population is relatively poor. The main contributors to GDP and thus to the Rwandan economy are the services sector (48.5%) and the agricultural sector (37.3%), with smaller contributions from industry (14.2%) and manufacturing (6.9%).

In the year 2008, government revenue constituted 27.1% of GDP, being USD1.271million or Rwf741.145million, but in 2009 government revenue constituted only 21.4% of GDP, leaving a small deficit. This shows that government has limited revenue to address the wide range of needs for public expenditure, including telecentres. Yet, telecentres are important access points to the Internet for small businesses and offers rural, remote, and urban communities the chance to adopt information and communication technologies (ICTs) to their benefit, thus strengthening social ties within the community and economic ties with the outside world.

According to the United States Bureau of African Affairs (2009), the Rwanda agribusiness accounts for 36.2% of Rwanda GDP and 45% of export, the minerals in 2009 accounted 28% of export earnings, followed by tourism, tea and coffee, and pyrethrum in the year 2007. The mountain gorillas and arts and crafts are other increasing important sources of tourism revenue in Rwanda. Rwanda is a member state of the Common Market for Eastern and Southern Africa (COMESA) and the East African Community (EAC), 94.2% of Rwanda's imports originate from COMESA

countries and some 5.8% of Rwanda's imports originate in Africa (COMSTAT Database, 2007).

Rwanda's unique traditional arts and crafts (known as *Imitako*) play an important role in the contribution to the economy of the country. A wide range of traditional arts and crafts are produced in rural Rwanda such as ceramics and basketry, traditional woodcarvings and contemporary paintings. Below (see Figure 1.2) are some of the arts and crafts that attract tourists in the country and add to the country's economic growth.

Figure1. 2: Examples of modern handcrafts produced in rural areas of Rwanda



Source: Rwanda Office of Tourism & National Parks

The handicrafts shown above are produced in the rural areas of Rwanda and are locally made by local co-operatives within the village. These handicrafts are being exported to countries in Europe and USA and others are being sold in Kigali the capital city. Telecentres have an important role to play in facilitating access to information which can

boost the sale of these handicrafts and provide market information for the products, hence improving the rural community income.

1.2.2 **Information society perspective in Rwanda**

Before 1994, Rwanda was a deeply divided society along ethnic, social class and regional lines, leading up to the 1994 genocide in which over a million of people lost their lives and leaving the basic infrastructure such as roads, water, telecommunication and electricity in disrepair. It has been argued that there are "certain enabling factors for the development of a civil society - security of a person, political freedom, acceptance of diversity and difference, as well as time" (Kelly, 1999:66). Indeed, to my knowledge it is fair to say that, 17 years after these events, Rwanda is doing well in fulfilling these factors.

In reconstructing the country, the government of Rwanda turned to information and communications technology (ICT) as a key tool for future information society emergence. Telecentres are believed to have a role to play in national development as they help communities to enter into the information age through information sharing. The term 'information society' has been defined as "a new form of social existence in which the storage, production, flow, etc. of networked information plays the central role" (Karvalics, 2007:23). Indeed, Rwanda's initiative to create an information society began in 1996, when the country began formulating and developing a comprehensive ICT-led Integrated Socio-Economic Development Framework for Rwanda with the support of Economic Commission for Africa (ECA) and through the African Information Society Initiative (AISI) (Mensah, 2005).

As a result of attention given to ICTs as a tool for promoting socio-economic development, many governments in developing countries have restructured the telecom sector and broken the monopoly in the telecoms market so as to allow new entrants into the market, and to increase universal affordable access to telecommunication in the interests of socio-economic development. Rwanda is one of the countries that have taken the initiative to liberalise its telecom sector and this has led to an increase in the

number of telecommunication operators such as Rwandatel, Tigo, and MTN Rwandacell, with the network coverage being more than 90%. The competition has provided the consumers with reduced costs of telecommunication services as of the year 2003 to 2008, as the calling rate reduced from 147 to 100Rwf. The penetration of mobile telephone coverage is 92% of the total population, and the number of internet subscribers has increased (MINECOFIN, 2010).

1.3 **History and Evolution of NICI Plan**

The National Information and Communication Infrastructure (NICI) plan was formed in 1996 through the partnership of UNECA and AISI to ensure that the people of Africa should not be left behind in the global information age. The ECA objective was to have an African information infrastructure through access to the global information infrastructure for developmental needs and to build their own NICI plan to speed up the continent's entry into the information and knowledge global economy (AISI, 2008).

In 1958, the UNECA was established with the mandate to support the economic and social development of 53 member states, foster regional integration and promote international cooperation for Africa's development. In 1979, its information and development programme came into existence with the Pan African Development Information System (PADIS). The PADIS concept involved the establishment of a centralized development information database at ECA in Addis Ababa, Ethiopia with national development information databases at national participating centres in African countries (ECA, 2003).

In 1992, ECA initiated the Capacity Building for Electronic Communication in Africa (CABECA) project, which resulted in the establishment of electronic communication nodes in 24 African countries. In 1995, PADIS was absorbed into the broader sub-programme Information Technology for Development as a result of the restructuring of ECA. In 1996, ECA's work was transformed with the conception and adoption of the AISI. AISI calls for among others, development of NICI plans in Africa (ECA, 2003).

UNECA (2009) defines NICI plan as an instrument for the implementation of the global objectives of AISI of developing the infrastructure, human resources and electronic content for the information society at national level; as Africa's response for facilitating its integration in the digital world and in the globalisation process; and as an exercise aimed at developing national policies, strategies, and plans in the field of ICT, which are supposed to serve as the road map for the countries' participation in the economy of knowledge.

The Rwandan ICT for Development (ICT4D) or NICI process began in 1998 under the support and approval of the AISI of the UNECA. The UNECA mission to Rwanda was initiated on August 2-29, 1999 during which the process of a national dialogue with national leaders and stakeholders on the role of ICTs to support the socio-economic development took place (Esselaar, 2001). According to Rwanda Information Technology Agency (2006:18) Rwanda's NICI plan was structured into different phases, the 1st NICI Plan (2001 to 2005); the 2nd NICI Plan (2006 to 2010); the 3rd NICI Plan (2011 to 2015); and the 4th NICI Plan (2016 to 2020). Rwanda is in the final stages of second phase of the NICI II plan (2006-2010) which includes the implementation of thirty telecentres among others in order to achieve its goals.

1.4 **NICI II Plan Socio-Economic Development Objectives**

1.4.1 **ICT in education**

ICT in education is one of the core pillars of the country's NICI plan and policy, adopted in the year 2000 and tremendous progress has been made since then, for example Farrell (2007) pointed out that, in year 2000 just one school in the country had a computer. Six years later over half of primary and secondary schools had been equipped with hardware, over 2,000 teachers had received ICT training, while out of 400 secondary schools that had been fully equipped, 39 of them had wireless Internet access. ICT has improved the quality of education in Rwanda by supporting teacher professional development, improving the access to the quality of educational materials and providing on-going pedagogical support.

The government of Rwanda, in its effort to infuse ICT into its administration, used e-Education as one of the key instruments in promoting socio-economic development. e-Education is an initiative, within the broader framework of Rwanda's Vision 2020 for reaching its Millennium Development Goals (MDGs), that will seek to move from the use of traditional textbooks to an advanced format of electronic access to information and curriculum content. The main purpose of e-education is to provide the citizens of Rwanda with expedited access to knowledge through ICT (Gutterman, Rahman, Supelano, Thies & Yang, 2009). A significant progress has been embarked on to promote ICT in education in Rwanda. Gutterman *et al*. (2009:6) pointed out that the Environmental Systems Research Institute (ESRI) Germany "has granted to provide geographic information system (GIS) software to every secondary school, including the sponsorship of well trained professionals who will help bring GIS software to students and teachers" in Rwanda.

Another significant step that the government of Rwanda has taken in its target to reach its MDGs, set out in the NICI plan pillar of ICT in education, is through a program of One Laptop per Child (OLPC). Gutterman *et al*. (2009:6) indicated that:

> the program has five principles geared towards (1) allowing children to have ownership of their own education and build ICT skills; (2) children having the ability to become the best teachers if educated with the right tools and in this day and age ICT is considered a most valuable tool; (3) exposure to ICT should begin at an early age (6-12 years old); (4) connection to the internet, and thus the outside world, should be readily available, and (5) this connection should be provided by free and open source software that allows computer usage to grow according to the needs of the child.

Gakwaya (2010) pointed out that 10,000 laptops have been given to pupils in a piloting of the programme and have already made a positive impact. "The impact is clear for example one of the students has distinguished himself by programming the design of a house while using a basic programme called scratch without any training" (Gakwaya, 2010:1). In addition, Gakwaya (2010) stated that more 65,000 laptops have been distributed to 150 primary schools across the country with a target of providing laptops to one million children by year 2015.

1.4.2 **Human resource development**

Human resources development is seen throughout the world as crucial to the development of information-based economies and the achievement of global competitiveness. To be effective, a learning framework needs to be ‘‘championed’’ at senior level and to have sufficient resources made available to support it. Training budgets are often the first item to be ‘‘squeezed’’ when financial resources are tight. However, the old training adage ‘‘If you think training is expensive, think of the cost of ignorance’’ (Goulden, 2005:7) is very true, even when applied to government policy objectives other than regulatory effectiveness.

The use of ICT is becoming a crucial component of the global economy and key enabler of today’s development according to UN ICT Task Force Report (2004). Hence, the need for qualified human resources is a key requirement. Human resource development with respect to ICT should be the role of governments, the educational establishment and the private sector in developing the necessary capabilities, to bring about greater use of ICT and support achievement of the goals of ICT policy for economic development. The government of Rwanda, as a part of its broad human resource development plan, established public institutions of higher learning. These institutions’ main objectives are to fill the gaps in the labour force by producing skilled and professional graduates, the Kigali Institute of Science, Technology and Management (KIST) being one of the institutions established purposely for science and technology development. Currently Rwanda has eleven universities and five technical colleges. The Tumba College of Technology (TCT) was established to train a number of ICT technicians in skills that will be much in demand as the NICI plan is implemented.

In its education policy on human resource development, the government has introduced free education for all citizens in primary schools and has also established an institution called Student Financing Agency for Rwanda (SFAR), responsible for bursaries and loans for higher education studies within the country and abroad. Despite these efforts,

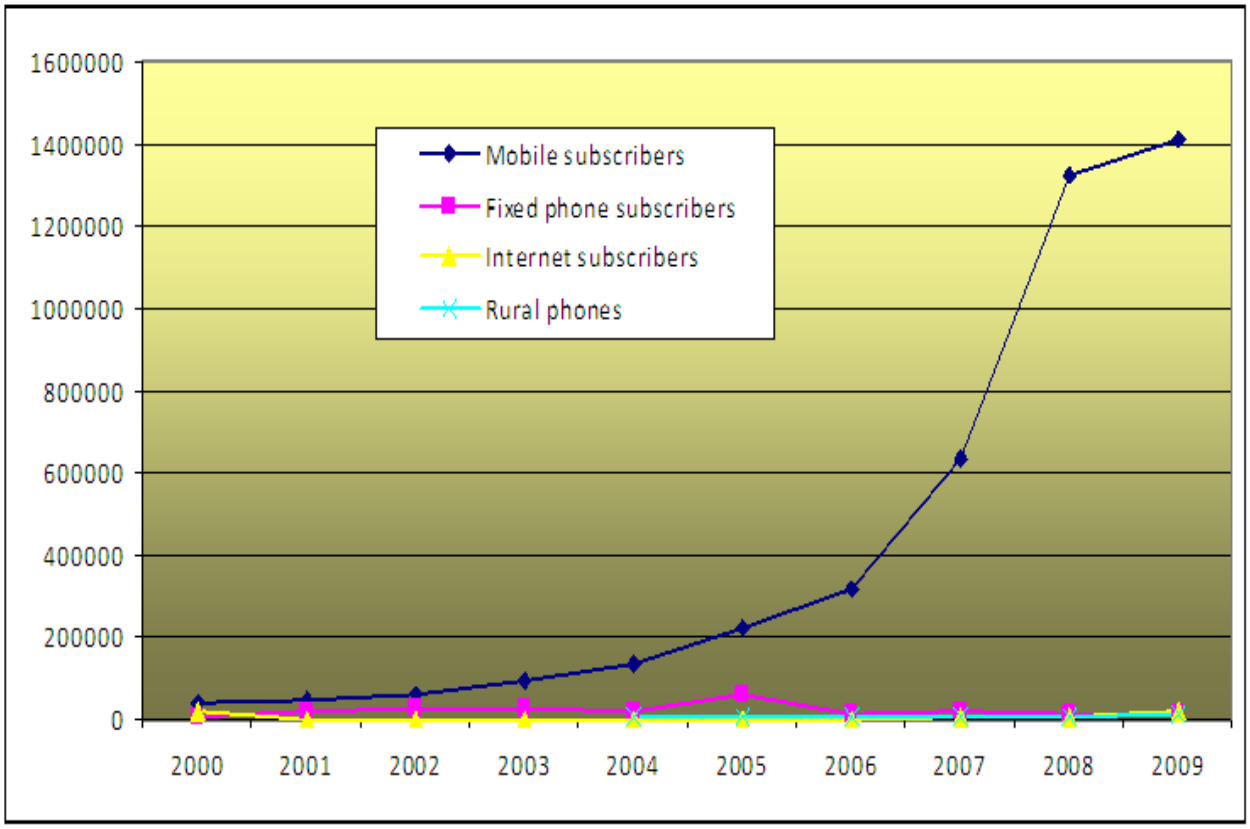
the government of Rwanda still needs to build human resource capacity to meet the challenges of the information society, because there is still a significant shortage of technical experts in the field of information and communication technology.

1.4.3 **Deployment and spread of ICTs in the community**

Rwanda is using the experience from the continent and beyond for its establishment of a variety of ICT community telecentres that endeavor to bring some of the benefits of ICT to rural communities. The government of Rwanda is therefore committed to ensure that ICT services are available throughout the country and supports the universal services availability through support from the Universal Access Fund (UAF). In the formulation of universal access policy, governments ought to ensure that the ICT policy and regulation objectives are implemented for the effectiveness of social development of the population. When regulating ICT services, one fundamental issue is to provide the foundation upon which markets can function more effectively and its paramount importance is "to ensure that everyone has access to reasonable service at reasonable prices" (Melody, 1997:13). This calls for the governments to subsidise ICT access and usage in order to make ICT service effective and affordable to many people.

Rwanda's universal access to telecommunications services means, in accordance with the telecommunications law number 44/2001, the widest possible access on affordable terms and with minimum subsidy to public telephone service, by the general public in all parts of the Republic of Rwanda. It is within this context that the Rwandan government has initiated a programme of rural connectivity, which aims to provide telecommunication access to all rural administrative and commercial centres. Rwanda has a relatively high level of mobile penetration and the number of subscribers in all telecommunication services has increased as shown in the graph below (see Figure 1.3).

Figure1. 3: ICT penetration in Rwanda (2000-2009)



Source: Usengumukiza, 2009, institute of policy analysis and research, Rwanda

The Government of Rwanda, in its commitment to speed up ICT to the community, has deployed thirty multi-purpose community telecentres (MCTs) all over the country, with the addition of two ICT buses that act as mobile telecentres. It intends to deploy more telecentres over time. It would therefore be useful to understand the strengths and weaknesses of existing telecentres in order to inform future telecentre deployment. Furthermore, "the government has decreased the average distance to a public phone from fifteen kilometres to two kilometres as part of its contribution to universal access obligations. In addition, it has decided that all ICT equipment (including electrical equipment/generators and solar panels) will be exempted from import taxes" (Nsengiyumva & Habumuremyi, 2009:18). Nsengiyumva and Habumuremyi (2009) pointed out that the new Airtel, Rwanda's sole licensed satellite operator, was amongst the beneficiaries of the country's universal access fund that received money to provide

telecom services. By year 2008, it had connected more than 130 sites, mainly targeting decentralised public entities such as hospitals and health centres, as well as schools across the country. However, low level of ICT services penetration to rural areas still exists in Rwanda.

In order for the government of Rwanda to promote investments in the areas that are un-economic, especially rural areas, the government considers giving the necessary incentives to investors in order to meet the universal access targets. Although the government of Rwanda is putting efforts into addressing the challenge of universal access, still Rwanda has challenges, such as limited telecommunications infrastructure and access, especially in rural areas, as well as inadequate financial resources.

1.4.4 **Facilitating government administration and service delivery**

The government of Rwanda recognises the role of ICT in facilitating government administration and service delivery through deployment and utilisation of ICTs, as well as in accelerating socio-economic development of the community. The implementation of the programmes and initiatives of government administration and service delivery has allowed inter-networked systems linking the government ministries and the public service organisations since the start of NICI plan implementation in the year 2001. Previously, the government ministries and the public service organisations were not computerised. Though they had computers in their offices, computers were used for basic applications such as MS-office applications.

The implementation of the NICI plan has allowed the majority of the government ministries and the public service organisations to have institutional networks, with some like the ministry of justice having a country-wide network linking the courts and other judicial agencies. In the case of the government-wide network (Gov-Net) system, seventeen government ministries and ten public service organisations are connected to the fiber backbone network (Dzidonu, 2005).

1.5 **Policy context: The objectives of telecentres set in NICI II plan**

The NICI II plan policy covers a wider context of socio-economic development objectives including telecentres objectives: promote rural community access to information; contribute towards socio-economic development; improve the delivery of public and private sector services; and ensure effective e-government and e-governance. Such objectives offer opportunities to bridge developmental divide and digital divide in rural, remote and urban areas. The highlighted objectives are discussed below:

1.5.1 **Promote rural community access to information**

The facilities used in telecentres play a major role in promoting community access to information for social activities, commercial/business growth, and research purposes, and access can mean internet, computing, and telecommunications tools provided to the communities (Fontaine, 2002). For telecentres to promote community access to information there must be some essential technological facilities. Jensen (2001) pointed out some of these technologies as: telecommunication network to provide voice and internet connection; service management system; computer system, which provides the user with access to the internet and other computer-based applications; and power supply.

Nevertheless, Fontaine (2002) argued that ICT access involves more than making equipment available though it is important. Fontaine further highlights some of the complements to access as reliable hardware; appropriate software; awareness of ICT functions and benefits; effective training in use; equitable/affordable opportunities for use; sufficient literacy/language skills or access to information mediators; ability to synthesize, organise, and apply information; and ability to produce and disseminate information as well as receive it. Gómez & Ospina (2001:1) reinforced this view with a statement that:

> The emphasis on access to the technology, though important, has shifted to the far more important issues of its meaningful use and social appropriation. Much of the effort to

date has been dedicated to providing public and community access to the Internet through telecentres and related activities.

From the discussion highlighted above, it is possible that telecentres can play an important role in promoting rural community access to information in Rwanda and in other developing countries where active telecentres have been set up with the support of governments, donors, or non-government organisations (NGOs). While telecentres have been effectively used in developed countries, research conducted on developing countries reveals that long-term economic sustainability of most telecentres becomes a major challenge and stumbling block to broader societal development (Conradie, Morris & Jacobs, 2003) especially in rural areas.

1.5.2 **Contribute towards socio-economic development**

A telecentre provides the community with access to internet and other ICT applications that enable them to explore, create, learn and communicate information for socio-economic development. The availability and use of ICT through telecentres provides an opportunity to communities for accessing and using appropriate technologies to solve problems and help in developmental activities, for example, in supporting the community socio-economic development in areas of health, educational, agriculture, and e-commerce, so as to bridge the developmental divide and digital divide.

It has been highlighted that “the deployment of telecentres, will seek to contribute to social and economic development, particularly in rural, low-income or marginalised communities, is a key component of ICT for development initiatives” (Bailey & Ngwenyama, 2010:3).To bridge the developmental divide and digital divide the government of Rwanda has greatly emphasised the establishment of telecentres to the community among other ICT projects. The purpose of this policy intervention has been to stimulate ICT usage for social appropriation such as ICT competency, innovation and collaboration of civil society, government and business sectors.

1.5.3 **Improve the delivery of public and private sector services**

The government of Rwanda is committed in promoting the delivery of public and private sector services through the NICI plan projects. Projects like e-soko, TRACnet, Energy and Water Sanitation Agency (EWSA) and telecentres, among others, are used for promoting rural community access to information. The effectiveness of such projects has been seen partly through the international awards that the government of Rwanda has won. It has been pointed out that since 2007 Rwanda has won three awards from the Technology in Government in Africa (TIGA) programme of the UNECA, with e-soko, TRACnet, Energy and Water Sanitation Agency (EWSA). The "TIGA awards recognise African governments' effective use of ICT for public service delivery, as part of fulfilling ECA's African Information Society Initiative (AISI) and the government of Finland's Development Cooperation Strategy on ICTs for development in Africa" (Kanyesigye, 2011:1). However, a research-based assessment will shed more light on the strengths and weaknesses of the telecentre programme and its achievement of policy goals than recognition through international awards.

Telecentres are also used to upgrade the community ICT literacy level through basic ICT training, and providing access to information via internet or other ICT based services. As a matter of fact, telecentre can improve the delivery of public and private services through e-participation, e-government, e-commerce, and other online activities. This empowers the community socially and economically when there is interactive use of ICTs. The role of government in supporting national telecentre development is important as Bloome (2002) pointed out that government policy can supplant regulatory and administrative obstacles by, for example, reducing duty tax, clearance for computer hardware and software donated or purchased, and through e-rate initiatives. Rwanda has adopted such mechanisms in order to attract foreign investors into the country and to promote the use of ICT.

1.5.4 **Ensure effective e-government and e-governance**

Telecentres have a great potential in facilitating e-government and e-governance initiatives. The technologies driven through the use of ICTs at telecentres have

increasingly becoming innovative in promoting the effectiveness and efficiency in delivery of public service. The governments use e-government and e-governance to strengthen good governance. The best practice to do that in many countries was through creating e-government portals which provide citizens access to different electronic services. Telecentres have been identified by many countries of the developing world, including Rwanda, as the best channel for the communities to have access to the e-government portal.

As a particular example, a case study conducted in Philippine revealed that "in the last few years, e-governance has become a priority of many Asian governments resulting in the implementations of various programs that apply ICT in delivering government services and promoting transparency and accountability" (Ramilo, 2002:6). Ramilo (2002) described e-government as process through which governments use to deliver government services and information to the public by means of electronic delivery. Many governments in their desire for success have adopted the use telecentres as a delivery points for e-government services. Rwanda in particular, the effective use of e-government portal have empowered local communities through access to information for example e-soko web-based system for crop price tracker for local farmers and TRACnet that link together clinics in the country providing anti-retroviral treatment to people with HIV/AIDS.

1.6 **Policy context: Telecentre usage and socio-economic development in Rwanda**

Rwanda's program to establish telecentres was launched in the year 2005 as a way to promote socio-economic development for communities. In support of telecentres, the government of Rwanda earmarked "a total amount of one billion U.S. dollars to be invested in establishing and promoting telecentres in the country" (Ochuodho, 2006:1). Ochuodho (2006) outlined that the money would be used in accelerating the establishment of telecentres and providing necessary operating equipment, as a move to enable people in rural areas access to information vital for their development.

In regard to this, the government of Rwanda has deployed thirty multi-purpose community telecentres (MCTs) throughout the country, as well as two ICT buses known as mobile telecentres, to facilitate the spread of ICTs in the community. These telecentres offer different services such as training the community on different computer applications (Ms-word, power point, internet technology); providing space for the community workshops and training on developmental studies; internet facilities to the local communities; photocopying, printing and scanning services (Burera, 2010). The two telecentres presented below (Figure 1.4) illustrates rural community telecentres in Rwanda.

Figure1. 4: Sample of telecentres in Rwanda





Rwanda ICT bus known as mobile telecentre

Telecentres offer developed and developing economies enormous opportunities to develop in different areas. Technologies offered by telecentres play a major role to socio- economic development to the community through health, education, agriculture, and e-commerce. In this regard they have become more and more important to bridge developmental divide and digital divide in rural, remote and urban areas. The discussion for the usage of telecentres in the above highlighted areas is shown bellow:

1.6.1 **Education**

Telecentres play an important role in education delivery in developed and developing countries. For example, education and training can be facilitated through tele-learning or distance education, training in ICTs, videoconferencing, and internet libraries. Oestmann & Dymond (2001:4) argued that telecentres provide educational information to the community by "providing access to databases and receiving and posting information of general interest to local people for example government notices, information on the spread of diseases, weather information, prices of farm products, educational opportunities". In line with this scholar's argument, Rwanda like any other

developing country acknowledges the key role that ICTs play in educational delivery and training in schools, colleges and universities. According to Gómez & Ospina (2001:6) statement:

> Telecentres offer students and the public new sources of information, and constitute important tools for doing research and to facilitate the learning process with the help of trainers. …students become telecentre users to do school assignments and research, and, in their wake, other users may end up doing likewise.

In the Rwanda telecentre context, ICT has played an important role in improving the quality of education. Gutterman *et al.* (2009) provides an example where the Centre of Geographic Information Systems (CGIS) at the University of Rwanda uses the snowball dispersion model in which schools train other schools and teachers support each other in teaching subjects like geography and physics. This has led to the effectiveness of the use of ICT as a teaching tool to be used in the classroom and has allowed teachers to gain knowledge and skills in the use of ICTs in their respective institutions. Karara (2010) pointed out that the establishment of telecentres and ICT mobile buses in Rwanda has made a positive impact on education through providing training in areas of computer and business usage and on university students for research purposes.

Another significant role that these telecentres have played in education according to Karara (2010:1) is that, "telecentres offer a certificate in International Certified Driving Licence, an internationally acknowledged IT certificate, making their graduates capable of competing both in the county, region and beyond". This aligns with the study conducted on rural business process outsourcing through telecentres in India which revealed that "ICT applications have played an important role and have been instrumental in providing education and training, job and income opportunities, access to markets, information related to economic activities, and a range of citizen services" (Datta, 2009:9).

1.6.2 **Health**

Through telecentres, ICT has been an essential component in providing services such as full internet connectivity for e-mails, Ms-Office applications, and faxing. These

services can facilitate in extending specialised healthcare applications like tele-medicine and tele-health education to remote areas. According to the UN ICT Task Force Report (2004:24) "... ICTs can provide an effective and cost-effective channel for the distribution of healthcare and disease prevention information to the general public". Telecentres have become more effective channel to access a variety of information and communication covering a variety of social aspects of health.

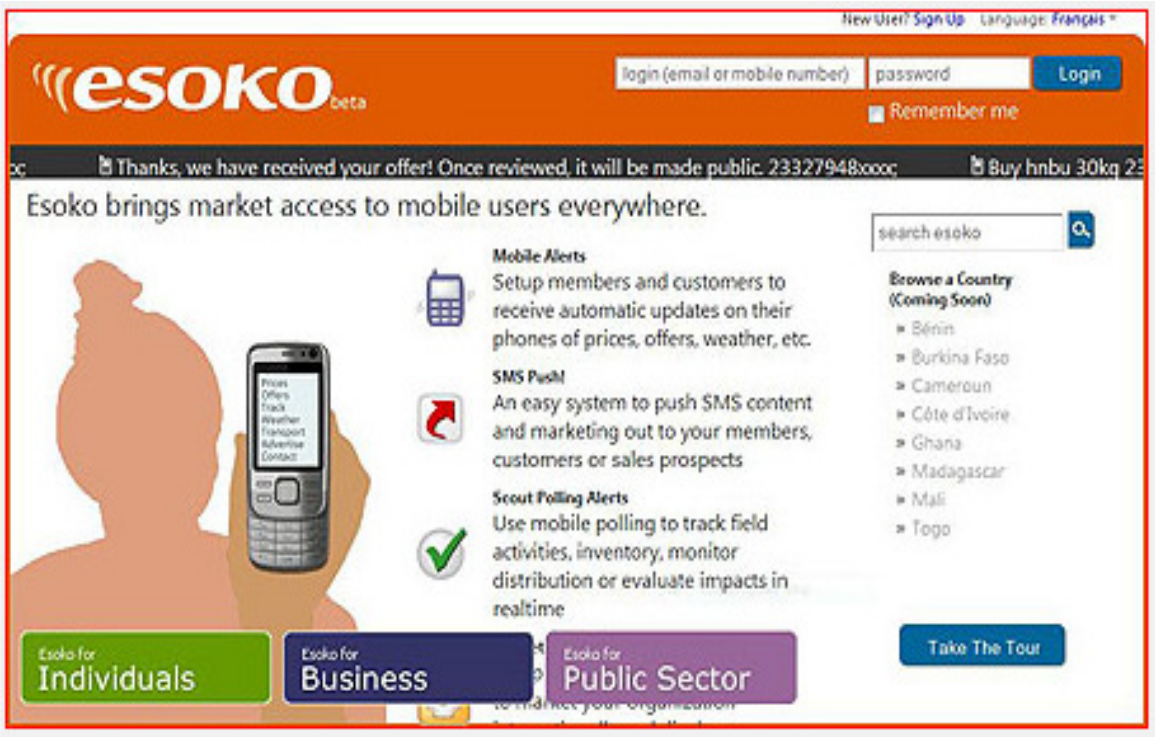
In Rwanda, through the collaboration with the US Centre for Disease Control and Prevention and the Treatment and Research AIDS Centre (TRAC) in the Ministry of Health, Rwanda have deployed a system called TRACnet to link together clinics in the country providing anti-retroviral treatment to people with HIV/AIDS (Sood, 2005). According to Naidu (2007) Rwanda's Treatment and Research AIDS Centre (TRAC) 2007 won an award and was internationally recognised for ensuring real time access for information on HIV/AIDS and anti-retroviral drugs (ARVs) nationwide through the use of ICTs. Indeed, telecentres play an important role in supporting the health system since the system uses a combination of web access and telephone access for those clinics with only a mobile phone or landline and the system can support voicemail and other messaging functions.

1.6.3 **Agriculture**

Agriculture is an important sector in most of the developing world including Rwanda, with the majority of the population living in rural areas and commonly depends on agriculture subsistence farming. According to the Ministry of Agriculture and Animal Resources (MINAGRI) pointed out that "…more than 75% of Rwanda's economically active population earns their living, directly or indirectly from agriculture and mostly through subsistence farming". However, the ministry suggested that the limited success of farmers has been greatly influenced by the lack of access to pricing information. Information has become a significant factor of production in agriculture and through the use of telecentre ICTs can accelerate agricultural development.

In response to the above highlighted challenge, the government of Rwanda through the support of World Bank that funds the ICT for Development projects to bridge the information gap within the use of ICT, the e-soko project was introduced to empower farmers to get informed on market price information. An illustration of the e-soko database (Figure 1.5) is shown below:

Figure1. 5: The e-soko database system in Rwanda



Source: Majyambere, 2010, e-agriculture

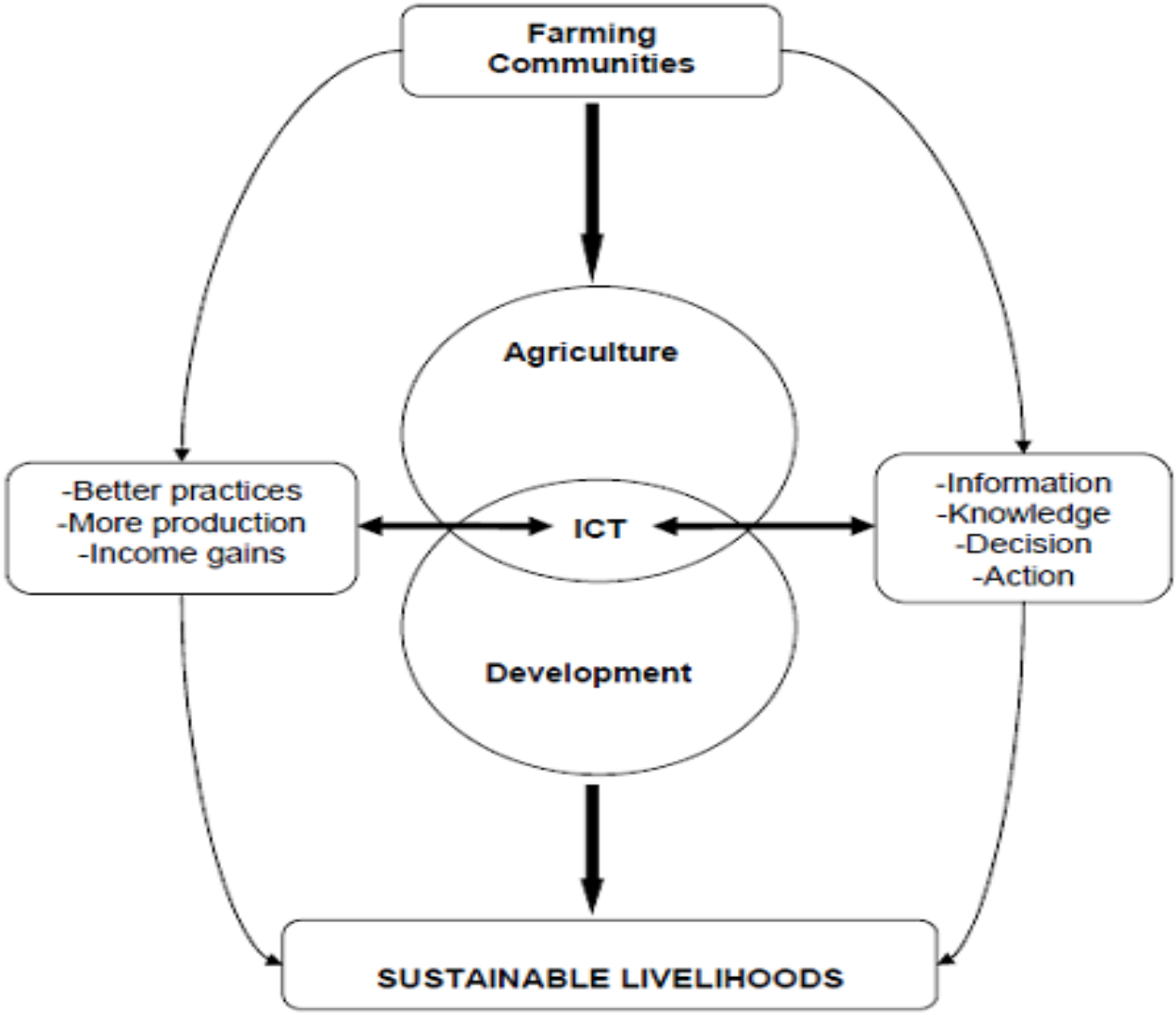
The government of Rwanda has consistently earmarked the use of telecentres for ICTs in promoting socio-economic development of the communities, in this regard government have deployed nationally a web-based crop price tracker and other tools like mobile phones under the e-soko project. The project is run through the partnership of telecom operator MTN and ministry of agriculture. Majyambere (2010:1), argued that currently, “farmers have been accessing market prices, through SMS (text messages)

where farmers would request for prices from a particular market and for a specific commodity". This aligns with Mulozi's (2008:24) argument that internet has provided an opportunity to local farmers to access information that enables them to improve farm practices, access market price information, linking agricultural products to market, and increase income levels. A specific example was made of Zambia, where local farmers use www.iconnect.zm which enables them to access local price information via mobile SMS. ECA (2011:5) indicated that:

> The e-Soko enables farmers to have access to information more effectively at lower costs and it provides wider opportunities in commodity trading in the country. Latest figures show that approximately 7,100 farmers, traders and consumers in the country are using the service. There are currently 31,156 users who use the system to check prices on the markets and 4567 users who use the web for the same purpose. In addition, there are 78 commodities in the system, with 50 markets visited all over the country.

Furthermore, access to information is a key to rural community farmers to engage in better farming practices, increase in production, income gains and knowledge sharing among communities. Thirumavalavan & Garforth (2009:3) model provides clear evidence which "shows that farming communities indulged in agriculture are facilitated by ICT/ telecentres for development with the expectation that they will lead to sustainable livelihoods formation". The below (Figure 1.6) illustrates farming communities and ICT/Telecentre for development.

Figure1. 6: Farming communities and ICT/Telecentre for development



Source: Thirumavalavan & Garforth, 2009

ICT applications can provide farmers with information, knowledge, decision, action, better practices, more production and income gains. All these categorise are necessary in agriculture for sustainable development of rural community farmers. ICTs empower local farmers through training, proving access up to date agricultural information and create employment opportunities.

1.6.4 **Commerce**

The use of internet for commercial connections linking customers, business partners and information resources via the network has significantly contributed to socio-economic development in developing countries and Rwanda in particular. Mulozi (2008:24) supported the idea that:

> A telecentre supports rural businesses through a variety of services. Local business uses shared ICT infrastructure to access and link with urban markets. Rural entrepreneurs utilise the services to communicate and access business information resources to expand their businesses. They use a local centre as a communication platform for products and services.

Electronic commerce or e-commerce has been defined in different ways, Zwass (1996:3) defined electronic commerce or e-Commerce as "the sharing business information, maintaining business relationships, and conducting business transactions by means of telecommunications networks. …e-Commerce includes the sell-buy relationships and transactions between companies, as well as the corporate processes that support the commerce within individual firms".

1.7 **Identification of the problem and significance of the study**

A significant investment has been made by the government to deploy thirty telecentres and with a target of deploying more telecentres by the year 2015. However, the strengths and weaknesses of the existing telecentres in providing advanced e-access to services and socio-economic opportunities such as those discussed above is unknown. It has been observed that many telecentres are not geared to achieve the socio-economic objectives set in government policy and plans. This study is of significance to Rwanda ICT policy plan to extend knowledge sharing to communities in order to promote socio-economic development. The concept of public e-access through telecentres has been widespread all over the world due to its significance to overcome the wide disparities of access in the global information society. Rwanda can learn from the experiences of other countries, but can also learn from its own experiences and environment. Thus, data from Rwandan telecentres will be valuable for ICT policy-makers and regulators, as well as institutions responsible for implementation of ICT

programmes. The research results can be made available to stakeholders such as the Rwanda Development Board (RDB) for future policy implementation with respect to telecentres.

1.8 **Chapter Outline**

Chapter One: This chapter includes background on Rwandan socio-economic context, establishment of NICI plan that forms the basis for the telecentres project in Rwanda and key aspects of socio-economic development. The chapter provides the identification of the problem and significance of the study as well as an overview of the research and the focus of the enquiry.

Chapter Two: Provides a review of the relevant literature that explores the definition of concept of e-access and telecentre, the history and purpose of telecentres to development, rural community development, the role of ICT in rural development, factors affecting the use of telecentres, challenges of telecentres to the community, and universal access / universal, universal services. The chapter provides the reader with ongoing discourse about the topic and reports on what the scholars have already said on themes of the subject. It also provides the conceptual framework which was generated from the review of literature themes.

Chapter Three: Provides an overview of the research methods that were used in the study so as to come up with the research results. The chapter also provides the problem statement, purpose of the research, and research questions. Areas covered include research design, case study approach, sampling methodology, research instrument of data collection, reliability and validity of the study, and data analysis.

Chapter Four: Reports data from interviews from the informant groups of telecentres, Rwanda, as well as the findings from document analysis.

Chapter Five: Provides an analytical overview of the findings of the research as reported in chapter 4

Chapter Six: Provides final conclusions, presenting recommendations for further research of telecentres. The theories through which the findings of the research project were analyse

CHAPTER TWO: E-ACCESS CONCEPT AND REVIEW OF LITERATURE ON RURAL TELECENTRES

2 Introduction

This chapter considers the literature gathered on the research subject. The review focused on key themes that explore the definition of concept of e-access and telecentres; the history and purpose of telecentres in promoting socio-economic development; rural community development; the role of ICT in rural development; factors affecting the use of telecentres; challenges of telecentres to the community; and universal access and universal service.

2.1 Definition of concepts of e-access and telecentres

Telecentres are a major tool for the global information society which provides e-access to communities in respect to material access, skills access, and usage access. Indeed, a telecentre has been defined as "a facility that offers the public access to advanced information technology and telecommunications equipment, together with some degree of support and training, and a range of information-based services" (Conradie, 1998:98). Ariyabandu (2009:4) provides a broader definition of a telecentre as "a mechanism which uses ICT to support a community's economic, social and educational development, reduce isolation, bridging the digital divide, promoting health issue and empower women". Most importantly, telecentre give rural communities an opportunity to adapt to new technologies and use those technologies to suit their real needs. Indeed, telecentre has been defined differently by different scholars Colle (2001:4).pointed out that telecentres are a channel which "tend to be in the public sector, operated by government bodies or non- government organisations (NGOs), serve a low-income clientele, and have a community development mission".

Fuchs (1998) defined a telecentre as typically a building or a room with computers, a telephone line, Internet connection and other office automation equipment such as photocopier and fax. It is a common meeting place where people are exposed to tools, skills, attitudes and value of ICTs. Harris (2001:73) defines a telecentre "a physical space that provides public community based access to ICTs for educational, personal,

social and economic development". In Colle's summary, a telecentre is a "shared facility that provides public access to information and communication technologies" (Colle, 1999 cited in Benjamin, 2001:3).

Telecentres have been an attractive model due to their cost-effectiveness in giving large numbers of people access to ICT at lower cost than household access. As it has been mentioned telecentres can "deliver the simple interface between ICTs and internet, and offers basic communication services such as telephone, fax, typing, photocopying, printing, and training in the use of various ICTs, e-mail, and electronic networking" (Ibrahim & Ainin, 2009:77). It is in this context that telecentres have become an accessible facility that provides computer access for people who are unable to meet the expense of a computer where by telecentres become centres for the delivery of rural development support services for their community catchment areas (Ibrahim & Ainin, 2009).

The concept of e-Access does not relate to telecentres alone, but to any form of access to electronic media, whether at home, at work or at a public access centre. e-Access is necessary for socio-economic development, because it can enable access to government services, access to information, access to markets for small and micro-businesses, access to healthcare, access to education, access to transport, and access to job opportunities etc under conditions where such access has not been possible without ICT, such as in rural Rwanda.

e-Access has been described as "a critical dimension of the ways in which information and communication technologies develop and become part of people's lives" (Liff & Steward, 2003:314). Dutton (1999:8) as well described e-access as "multifaceted interactions available through information and communication technologies and how they shape access to information, people, services and technology". e-Access has become essential because it provide greater range of access to information any time anywhere the user is allocated depending up on the identified needs earlier mentioned.

2.2 History and purpose of telecentres to development

In the early 1980s the first telecentres were established in Scandinavia and Denmark as 'social experiments' in promoting the use of advanced information and communications technology (Cronberg, Jensen, Duelund, Tarja, & Qvortrup (eds.), 1991 cited by Benjamin, 2001). Emberg (1996) cited by Benjamin (2001:44) refers the Scandinavia telecentres “as a means of improving access to telematics in rural and isolated areas”. Telecentres came with a variety of names, such as telecottages, multipurpose community centres, community technology centres, digital clubhouses, cabinas publicas, infocentros, telestugen, community access centres, electronic village halls, telehaus, televillages, etcetera, and no single definition serves to satisfy all of them (Colle,1999 cited in Benjamin, 2001:3).

In 1983, the first ‘community technical centre’ was established in Harlem in the United States. According to Mark, Cornebise & Wahl (1997) the primary strategic objective of the community technical centres, was to reduce the unfavourable effects of the digital gap between the upper and lower layers of the American society in the access to, and use of, basic technological and communicational devices for example telephones.

In 1985, the first “telecentres” were opened in the villages of Vemdalen and Harjedalen in Northern Sweden and the establisher saw the main aim of telecentres as the provision of basic telecommunications services for the local, isolated population (Cronberg, Jensen, Duelund, Tarja, & Qvortrup (eds.), 1991 cited by Benjamin, 2001). Benjamin (2001:34) also added that soon after these Scandinavia telecentres, similar projects were established in other parts of Europe (including the Manchester Host in the UK) and North America. The main aim of establishing centres in these developed countries was to bring access to ICTs for people who normally do not have access to them, and their main intended purpose was the use of computer and online application and less use of telephony. Benjamin (2001) further pointed out that more than 230 telecentres were established in Australia, Austria, Canada, Denmark, Finland, Germany, Ireland, Japan, Norway, Sweden, the UK and the USA and there after, the idea has been spread to other countries in the world.

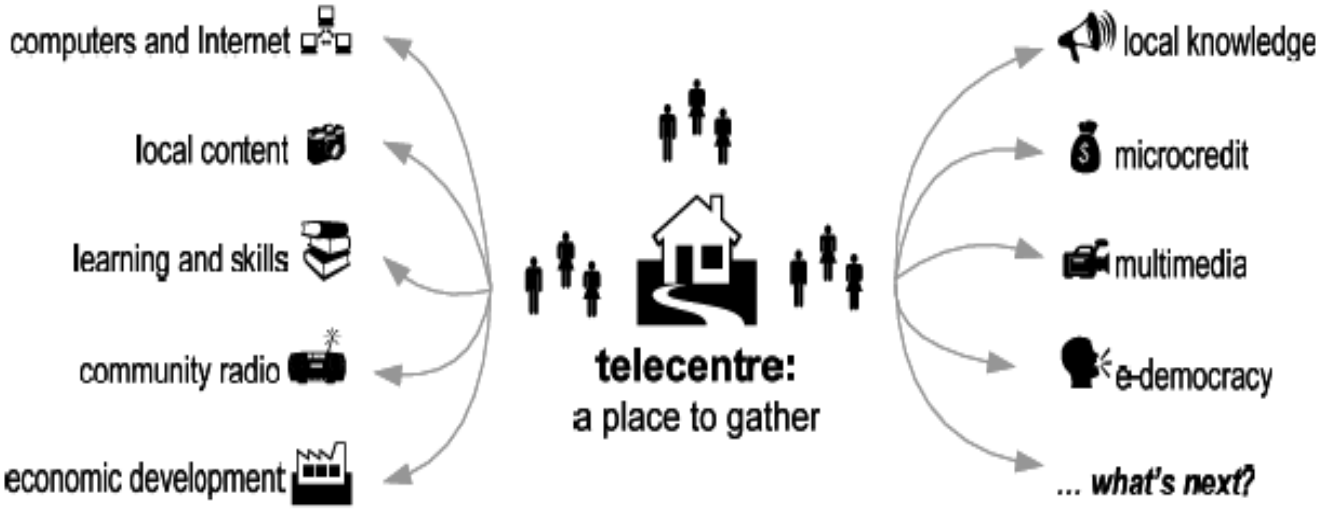
In the mid-1990s telecentres started spreading among developing countries (Roman & Colle, 2002). Norton, Tetelman, Brosnan, Kendro, Brian, Bacon & Lohmeyer (2000) revealed that telecentres in middle-income countries offer basic and advanced services such as business training and support as well as distance learning and telemedicine while telecentres in lower income countries offer basic services such as telephone services and word processing. Whatever case might be telecentres still believed to be an important tool to rural communities. This aligns with Latchem & Walker (2001) argument that international and national development agencies recognise the potential of telecentres and are supporting initiatives in various parts of the globe. The most important reason why telecentres have been attractive the governments and agencies other community based ICT initiatives. Telecentres can support the use of ICT for a wide range of purposes and people can learn from and support each other.

In an effort to classify telecentres and their purpose Graham (1992:4) identified five development paths in which telecentres can contribute in to social and economic development. *Adult education:* aimed primarily at delivering ICT courses to local adults (individuals and community groups); *Community service*: aim to deliver a variety of community services, including communications services (e.g. fax etc.), office services (word processing), training and occasionally information services and advice; *Special interest group:* aimed at addressing the needs of a specific group in the community, for example, women, ethnic minorities, disabled people; *Local economic development:* primarily concerned with provision of services to local (small) businesses with the aim of regenerating the local economy. They may also provide accommodation for new companies. *Private business services:* set up by private sector companies to provide services on a commercial basis.

Telecentres have gone much further than the above development paths due to the advancement in technology. Telecentres are now used in library service and distance learning courses, internet and voicemail, repair for IT equipments, advertising, health information and telemedicine, e-government and e-governance, assistance and facilities

for production of trade and community information such as: web page development and hosting, production of radio and video programmes. Telecentre.org (2006) provides an illustration of telecentres specifications that focus on the use of technology to strengthen communities (see Figure 2.1 below).

Figure2. 1: Telecentres specifications that focus on the use of technology to strengthen communities



Source:Telecentre.org (2006) business plan

The figure above indicates that telecentres have ability to offer people "a first place to learn about computers, provide villages access to government services, allow isolated communities to bridge the education and health gap and open up economic opportunity for small entrepreneurs" (Telecentre.org, 2006:7). Norton *et al*. (2000:45) added that telecentres in early stages focus on providing basic services such as photocopying and computer use and training, and after certain period they start "focusing on developing more advanced services and training programs for core users and developing value-added activities such as small business support to enlarge its reach in the community".
Relating this discussion to Rwanda, it is noted that the Rwanda ICT for Development (ICT4D) or NICI planning began in 1998 and the programme to establish telecentres was launched in 2005. In 2006 the programme of rolling out telecentres started with

thirty telecentres to be rolled out countrywide by the year 2010, with one telecentre in each district. The main objective of these telecentres was to uplift the socio-economic development in rural communities. However, despite this effort from the government, it is observed that with one telecentre in each district estimating thirty telecentres in the whole country, the number is still too small to meet the demands of information access in the rural areas. But Rwandan telecentres have gone much better than what was expected of them during the time of establishment 2006. As earlier mentioned they currently used as business development centres (BDC) but not limited to the following: entrepreneurial development services; business registration; business advice and counselling; IT services; business information services; export development services / trade point; tourism information; tax advisory services; and environment compliance.

2.3 Rural Community Development

Rural communities have been identified as people living in disadvantaged communities and poverty reduction is the name of the game in international development (Ashley & Maxwell, 2001:395). As per the experience from telecentre programs, telecentres make a significant contribution to rural community development. As per Singh (1999:217) rural development is described as “a process leading to sustainable improvement in the quality of life of rural people, especially the poor”. Sustainable rural community development can make an influence to four critical goals: poverty reduction; wider shared growth; household, natural, and global food security; and sustainable natural resource management (World Bank, 2000).

Rural community development requires consolidated policy and regulatory strategies developed to create opportunities for development. Ashley & Maxwell (2001:418) describe five principles typically for the success of rural development strategies (i) recognise the great diversity of rural situations; (ii) respond to the past and future changes in rural areas; (iii) be consistent with wider poverty reduction policy; (iv) reflect wider moves to democratic decentralisation; (v) make the case for the productive sector grow and to reduce poverty.

Rural community development has a number of challenges both socially and economically. Fink & Kenny (2003:2) described these challenges in four categories: (i) a gap in access to ICTs - this is measured by the number and spread of telephones and web-enabled computers; (ii) a gap in the ability to use ICTs - measure by the skills base and the presence of numerous complementary assets; (iii) a gap in actual use the minutes of telecommunication for various purpose, the number of time used, the number of internet hosts, and the level of e-commerce; (iv) a gap in the impact of use measured by financial and economic returns.

In the light of the aforementioned, it is necessary to examine the commitment that the government of Rwanda has made to engage in socio-economic development projects using telecentres and other ICT projects to close the gaps experienced by rural communities (Ojiwah, 2009). Furthermore, Rwanda Development Board (RDB) has appointed community development facilitators (known as business development centre managers) within thirty telecentres nationwide and given them the responsibility of ensuring that government and the community engage adequately in activities aligned to development plans and programs of vision 2020 and Economic Development and Poverty Reduction Strategy (EDPRS).

Many scholars indicate that ICT has played an important role in rural community development including “to translate into benefits in education and health, reducing social distance, better connections between government and individuals, marketing advantages and overall, improved opportunities for information sharing” (Colle, 2003:3). The government of Rwanda has “recognised the role that Information and Communication Technologies (ICTs) can play in accelerating socio-economic development towards information and knowledge based economy” (RITA, 2006:17), but this is not sufficiently specific to rural development needs. Knowledge and skills are fundamental factors in any economic success and it helps people to improve their well-being, but such knowledge and skills needs to be specific to the urban or rural context.

Today the term knowledge based economy or k-economy or knowledge economy has been spread all over the world. The significance of this concept has been of interest to

many international organisations and institutions for the support of rural community development and telecentres were chosen as approach among many ICTs for development in creating knowledge based economy. The knowledge based economy "results from fuller recognition of the role of knowledge and technology in economic growth" (OECD, 1999:3). Knowledge is recognised as "a driver of productivity and economic growth, leading to a new focus on the role of information, technology and learning in economic performance" (OECD, 1999:3).

The Asia Pacific Economic Co-operation (APEC) executive committee expanded the definition and considers "the production, distribution and use of knowledge in the main driver of growth, wealth creation and employment across all industries" (APEC, 2000:2). The APEC executive committee pointed out that "knowledge required by a knowledge based society is wider than purely technological knowledge; for example it includes cultural, social and managerial knowledge" (APEC, 2000:2).

2.4 The role of ICT in rural development

This section explores the role that e-access approaches, such as telecentres can play in relation to the development of rural communities socially and economically. Ojo (2005) emphasized that telecentres play an important role in use of ICTs for community development through providing training in use of computers, communication services, and administration services. This is reinforced with Sey & Fellows' (2009) study which indicated that telecentres impact in communities is high in a variety of areas such as development of ICT skills, job creation, and civic engagement. Indeed, Jacobs & Herselman (2005) pointed out some of the developmental areas in which telecentre felicities have contributed to the community. These include: improving computer literacy and knowledge in the community, creating employment opportunities, provide internet access, providing services that are not too expensive, and friendliness towards the consumers.

Hudson (2001:170) also pointed out that "the ability to access and share information can contribute to the development process by improving effectiveness, equity, and efficiency". This can be done through different channels of new technology such as

telecentres, internet services, and mobile cellular among others, as well as old technology such as radio and television. These technologies have the potential to assist in achieving socio-economic development outcomes such as increased availability of good governance, health, education, agriculture, trade and commerce within the country.

Over the past decade, 2001-2010, the role of ICTs in developing countries has been contributing more towards the information society as greater e-access and penetration of internet, especially broadband internet reaches into rural areas. The term ICTs has been defined differently and in different contexts, "... Information and Communication are fundaments whereas Technology is but a means to an end. An ICT is a tool for poverty reduction when it is applied to meet the information and communication needs of the poor" (Mathison, 2005:14). A report from UNDP (2003:3) provides a broader definition of the term as "a variety of tools, all of which make it possible to improve the management of information and improve dialogue between individuals and groups. What is most important is not the tools themselves, but the way in which people use them to increase the quality, quantity and speed of access to and distribution of information".

ICT for development has been a useful tool for information and knowledge sharing to rural communities. The creation of rural telecentres provides access to ICT technologies. In the context of national development ICT provide support for development management and activities through e-government and e-governance. Kelles - Viitanen (2005:3) pointed out that "there are many examples about the role of ICT in strengthening rural livelihoods, providing market information and lowering transaction costs of poor farmers and traders". The practical example is the Grameen village phone that has pioneered ICT related activities with the rural communities. Islam (2005:7) pointed out that "Grameen Bank, Grameen Phone, and Grameen Telecom jointly launched the village phone programme to provide mobile telephony to rural Bangladesh". The village phone programme is "a multi stakeholder partnership (MSP) between private sector, microfinance institutions, non-profit organisation and local

women entrepreneurs to address the problem of low teledensity in Bangladesh" (Islam, 2005:4). Sey (2008:6) provides summary of interaction:

> the system works as follows: the micro finance institution (i.e., Grameen Bank) provides a loan to a qualifying bank member who uses it to buy the village phone kit (including mobile phone, external antenna, signage and other marketing materials, and a car battery for recharging phones) from the village phone company (i.e., Grameen Telecom), and set up as a village phone operator. The village phone company also negotiates wholesale airtime rates from the telecom service provider on whose network the payphone service is provided (i.e., Grameen Phone). The system runs on a postpaid basis, with the Grameen Bank providing an accounting and billing system (Grameen Telecom prepares bills at the end of the month, which is passed on to operators by Grameen Bank, which also collects the payments).

ICTs have proved to be a force of democratisation in some communities and countries of developing nation such as Bangladesh women on Grameen village phone. Grameen foundation village phone programme started in Bangladesh and later spread to other developing countries "with a vision to use the telephone as a weapon against poverty" (Islam, 2005:10).

Furthermore, ICT plays an important role in major aspects of rural development. Kelles-Viitanen (2005) pointed out that ICT can be catalytic in solving complex problems for poverty reduction, by strengthening and facilitating good governance and by promoting efficient and effective interaction between the public, citizens, business and other agencies. Indeed, ICT facilitates effective provision of public services and local communities can reap advantages from ICTs to improve the speed, quality, and responsiveness of governments to their citizens, and enhance accessibility of government service (UNDP, 2001). It has been pointed out that "telecentres are an orgnisational form that can provide access to ICTs that can offer development services in a number of areas that can assist in the development process" (Benjamin, 2001:42). It is therefore necessary to investigate what kinds of development services and processes are facilitated by the telecentre programme in Rwanda.

e-Access for rural development has been promoted through ICT developmental agencies such as government initiatives, organisations such as IDRC: Acacia Initiative for open- access, community models such as telecentres; UNESCO programme for multi-purpose community telecentres; and MSSRF for knowledge centres (Chapman & Slaymaker, 2002). Chapman & Slaymaker (2002) also highlighted that knowledge gaps and information problems are the main barriers that contribute to underdevelopment in rural communities and ICT has played an important role in addressing these barriers through facilitating improved knowledge sharing and information exchange using ICTs such as telecentres, world space radio, VSAT telephony, internet telephone calls, and distance learning. In support of this view, Marker, McNamara & Wallace (2002) argued that ICTs have enabled poor people to share knowledge and seek solutions to their problems.

Furthermore, Marker *et al*. (2002) provides key examples of the role ICTs play in achieving rural development: Increase access to market information and lower transaction costs for poor farmers and traders; improve efficiency and effectiveness; enhance ability of developing countries to participate in global economy and to exploit comparative advantages in factor costs example skilled labour. Many governments in developing countries have appreciated the positive role of ICTs for socio-economic development and sustainable livelihoods to the rural communities. It is in this regard that ICTs has boosted the local communities in agricultural production, access to education, health and hence promoting their economic growth.

ICT has played an important role in development of the rural community hence increasingly becoming a driving force for information society as well as a model of success in the global economy. The world has become an age of information technology where the computer and communication technologies together play a vital role in all sorts of human life. Indeed, ICTs have the ability to “enhance human capabilities such as healthy life, knowledge, creativity, and participation in the social, economic, and political life of a community and impact on economic growth through

productivity gains" (Chrisanthi, 2003:4). Furthermore, ICT has enabled complex business transactions to be performed effectively through the use of online operations such as e-commerce or e-business, e-banking etc. This has made ICTs to be regarded as a powerful tool for socio-economic development in developed and developing countries. Practical examples include the Naushad Trading Company in Kenya which sells local wood-carvings, pottery, and baskets online. Kenney, Navas- Sabater & Qiang (2001) noted that the company has generated revenue growth from USD 10,000 to over USD 2 million over the two years since it went online, and that consumers and shopkeepers can constantly access the updated company information on the product line, place orders, and make inquiries on other types of handicrafts. Another example is the Uganda National Vanilla Association (UNVA) which developed a web site for selling vanilla making it possible to order vanilla with a credit card through online orders (Oestmann & Dymond, 2001). ICT is regarded as a means for communicating market/demand information (Duncombe & Heeks, 2002). The e-soko project that facilitates Rwandan farmers to access market prices has played a significant role in improving socio-economic development and for this it has won a 2011 Technology in Government in Africa (TIGA) award, recognised as a model innovative project in Africa (Kanyesigye, 2011).

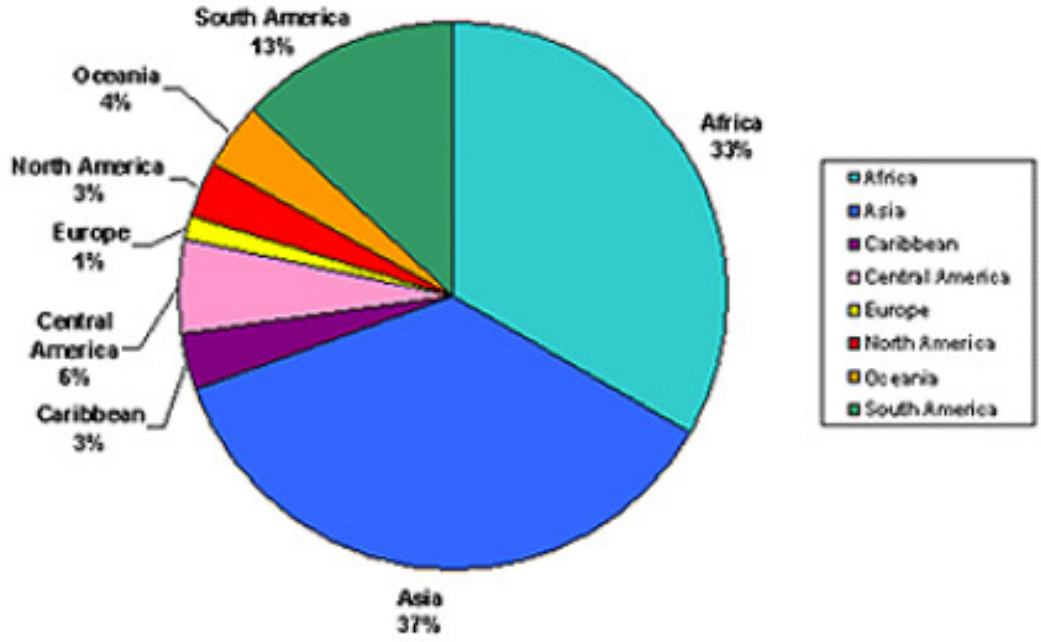
2.5 The effectiveness of telecentres to community development

The establishment of telecentres has been seen as a highly visible and powerful tool in doing the right things for the communities, offering shared access through a variety of ICTs for specific socio-economic development purposes. This has found in an early study conducted by Murray, Murray & Brooks (2001:198). The ACTCNet (1998) survey revealed that "…most respondents reported that telecentres had helped them overcome their fear of computers and increased their self-confidence and skills in using them. The training programs range from the most basic to the more advanced computer skills". Indeed, Mulozi (2008:24) reinforced this as follows "through skills training services, telecentres help to build a skill base for local business".

Bailey & Ngwenyama (2009:1) argued that “telecentres have been established in many countries as a means of providing access to Information and Communication Technologies (ICTs) in order to enhance community development”. This has been observed through the work of a number of developmental bodies involved in supporting telecentre projects around the world. These bodies include governments and international organisations such as International Development Research Centre (IDRC) Acacia Initiative promoting access to ICTs by African countries, as well as International Telecommunication Union (ITU) assisting telecentre development in all regions, United Nation Education Science and Culture Organisation (UNESCO) support to telecentre pilot projects worldwide, and World Info/Mott Foundation promoting private sector led model for telecentre development (Grameen Cyber Society, 2004).

The pie- chart below (Figure 2.2) illustrates the telecentre initiatives by region initiated by international organisations worldwide.

Figure2. 2: Telecentre initiatives by region initiated by international organisations worldwide



Source: Grameen Cyber Society, 2004

There is limited recent statistical data available for telecentres at a global level. However, there is a large volume of qualitative research published by scholarly researchers and in magazines pertaining epistemic community, for example the publication by telecentre.org which is linked to the ITU. The published telecentre magazine indicates the current continuum of change on telecentre world (Aggarwal, Chadha, Fuchs, Webb, Harmon, Skogen & Smith, 2010).

The effectiveness of telecentres is reported in existing literature of individual studies (Latchem & Walker, 2001; Pade, Mallinson & Sewry, 2006; Madden, Savage & Simpson, 1997). Telecentres perform an important role in community development through generation of business enterprise and employment; empowering people through access to knowledge and information; and facilitation of technology and diffusion (Madden *et al*., 1997). Mukerji (2008:2) added that "telecentres as delivery points for e-government services can lead to better local administration and improved government/citizen/business interface leading to increased reach, transparency, responsiveness, accountability, efficiency, effectiveness, citizen's empowerment and participation". The idea aligns with Rwanda's telecentres agenda of deploying telecentres to rural communities.

Rwanda has several facilities in place to promote community development, such as telecentres and ICT buses among others, giving access to fibre optic cable and wireless service. The thirty telecentres and ICT buses which are currently in place under the NICI II plan are operating in the rural areas of Rwanda. According to Karara (2010:1) these telecentres "enhance efficiency and effectiveness of local government processes using ICT and improve the delivery of government services to the rural population, empowering people in rural areas in ICT, computer training, and create services based on ICT and facilitating access and connectivity".

The ICT buses which are equipped with internet connected laptops and other ICT services move around the country providing access to information to rural communities- where even electricity is a luxury. It has been noted that the two ICT buses are being used for a pilot phase which is expected to last for a year, during which the service will

be offered freely to the citizen. Thereafter more buses will be imported and a reasonable fee charged to beneficiaries (Ndikubwayezu & Gahene, 2009).

Telecentres have been an important tool for the effectiveness of community development, indeed, as indicated, “it is well recognised in the international literature that public access points, such as community telecentres, can be effective interim mechanisms for fulfilling an extended range of USOs when ICT infrastructure is not available” (Madden *et al.*,1997:280). In the study conducted by Hunt (2001) in various countries across Latin America and the Caribbean, telecentres and ICTs bring about significant positive change in communities such as increased e-access, skills development and employment opportunities.

Another important aspect of telecentre effectiveness with respect to community development is that telecentres have helped in reduction of travel costs and have created energy savings, access to better price information, as well as timely delivery of products to market (Hudson cited in Whyte, 1999). Colle (2001) added that telecentre facilities offer significant opportunities to communities like information sharing and benefits through access to education, health, marketing advantages, and better connection between government and individuals. Kaiser, 2005; Parkinson & Ramírez, 2006; Parkinson & Lauzon, 2008 cited by Sey & Fellows (2009:8) argued that “the use of public access venues for computer skills development is linked to users’ perception that exposure to computers and the internet will enhance their current and/or future employability”. Ariyanandu (2009:15) added that “one of the greatest impacts of the telecentre network has been the opportunity given to poor people to improve their knowledge on computer education. In many telecentres, computer literacy is one of the most popular activities”.

2.6 Factors affecting use of telecentres

In this section the factors affecting the use of telecentres will be discussed both from the positive and negative point of view. Telecentres have been one of the most common and relevant solutions to barriers to e-access in developing countries. Indeed, Whyte (2000) argued that the most popular way of introducing ICT to rural communities in

developing countries has been through telecentres. This argument has been supported by Clark (2001:2) who argued that telecentre users are driven to the telecentre "for quality, competitively priced and timely products, accessibility, customer service, new learning opportunities, social and work opportunities, less travelling, new and maintained services, and services to make them more efficient and competitive". Achimugu *et al*. (2009) also indicated that telecentres have offered rural, remote, and urban communities the chance to adopt ICTs to their benefit, thus strengthening social ties within the community and economic ties with the outside world.

In some environments, the use of ICT is increasing in bridging the digital divide, sometimes resulting in the narrowing of the developmental divide in rural communities. To better understand the role of ICT in community development, it is necessary to explore the factors that influence the use of telecentres, often categorised as socio-economic factors and socio-personal factors. Various scholars have discussed these factors for example Foley, Alfonso & Ghani (2002) described socio-economic factors as low-income, low level of education and lack of technology skills. On the other hand, socio-personal factors include attitudinal and behavioural issues such as low level of awareness, interest and acceptance of ICT usage. Madden *et al*. (1997:284) revealed that "telecentre users suggest that there is a lack of awareness about telecentre service offering and their benefits…problem arises from a lack of resources for promotional activities".

Akinsola, Herselman & Jacobs (2005) also added other factors that influence the use of ICTs by rural communities: These include low literacy rates; lack of awareness/understanding of ICT; scattered population in rural areas; the cost of financing and the availability of funds; technology adaptation; lack of technical capacity/maintenance; and lack of infrastructure and social amenities (roads, water, energy, health, etc.). In most developing countries, lack of interest and acceptance of ICT usage in rural communities arises from seeing ICT as a luxury and not a necessity and this influences the use of telecentre facilities

2.7 Challenges of telecentres to the community

The challenges of telecentres to the community can be viewed from the perspective of the sustainability of telecentres and from the user perspective. Although telecentres have been effectively utilised in developed countries, studies for developing countries indicate that long-term economic sustainability becomes a major challenge and stumbling block for most telecentres (Conradie, Morris & Jacobs, 2003). Mayanjya (2002:7) describes telecentre sustainability in terms of "sustainability of infrastructure, services and relevancy, human resources and finances". For telecentres to be in a sustainable operating environment there should be support from government, the private sector and NGOs. This is important because the funds that telecentres raise through user fees is not enough to meet telecentres daily operating budget requirements for activities such as repair of equipment, power bills, communication costs, salaries of employees, etc. This view is reinforced by Rose (1999) who pointed out that the total expenditure incurred by the telecentre exceeds the revenue generated, it is difficult for the sustainability of the telecentre, and therefore there is a need for government and private sector support.

The telecentre users in rural areas in developing countries face challenges such as language problems and affordability. Most case studies conducted on telecentres in developing countries indicate that lack of knowledge of the English language, which is the predominant language on the internet, is found to be a substantial challenge to the effective use of telecentres in rural areas (Huerta & Sandoval-Almazan, 2007). This is due to the fact that the applications of ICTs are programmed in foreign languages such as English. Most people in rural areas in developing countries are un-educated and they use local languages, hence this becomes a major challenge to the use of telecentres by the community.

Other challenges are the affordability of services and capabilities of users in getting access to information in rural areas. The majority of people in developing countries living in rural areas depends on subsistence farming such as agriculture and livestock farming, and has insufficient funds to pay for the information services offered in

telecentres. In support of this view, Falch & Anyimadu (2003:34) pointed out that "although there is an obvious need for access to telecommunication facilities in rural areas, it may not be possible to provide the service at prices affordable to the local community". Therefore, affordability still remains a challenge in rural areas in developing countries.

Conradie *et al*. (2003) pointed out six typical challenges of telecentres to the community. These include: reconciling the tension between technology push and local development needs; the lack of electric power in some rural areas; the lack of supporting communication infrastructure in the rural area; lack of personal computer-related skills in the local rural community; lack of personal computer-related applications and lack of sustainable career path opportunities in the rural area involved. Other social challenges specific to the rural area involved, for example, local power relationships and political divisions

2.8 Universal Access and Universal Service

The concepts of universal access and universal service are closely related, though their definition can vary from one country to another. According Oestmann & Dymond, (2008), universal access refers to a publicly shared level of service, that is through public payphone or internet telecentres and universal service refers to service at the individual or household level, example is typically a telephone in each home. In a broader definition according to InfoDev ICT Regulatory Toolkit universal access "is when everyone access the service somewhere, at a public place, thus also called public, community or shared access" (InfoDev, 2009:6) while universal service "describes when every individual or household can have service, using it privately, either at home or increasingly carried with the individual through wireless devices" (InfoDev, 2009:7). Telecentres have become a part of universal access and universal services programs, run primarily for community benefit as non-profit entities.

2.8.1 Universal access and Universal service objectives

The aim of universal access and universal service according to the report of COMESA (2004:2) is to provide ICT service in un-served and underserved areas where operators

are reluctant to provide service, due to the uncertainty of recovering their investment; reduce the digital divide between urban and rural areas, ensuring a more balanced distribution of ICT services to the population; promote the development of local ICT-based businesses and contribute to the expansion of ICT network coverage; stimulate the development of local private business communities by providing suitable communication tools to facilitate interaction and exchange of goods and services with remote business communities; promote the use of ICT applications in social, cultural and economic orientated programs to improve the standard of life of local communities; and to assist in improving the efficiency and accessibility to markets for rural people in their day to day economic and social activities, in agriculture, crafts, natural resources and with respect to self-employment and financial transactions.

The principle guidelines for achieving universal access and universal service according to Msimang (1996) should include but not be limited to universal service funds; exclusivity periods for incumbent services providers; and mandatory service obligations imposed on licencees, such as community services obligations (CSOs).

It has been noted that universal access and universal service in terms of ICTs can largely be characterised by the availability, accessibility, and affordability of telephony and the internet, with increasing consideration of the inclusion of broadband and broadcasting (Oestmann & Dymond, 2008). Also in the same line of argument, Falch & Anyimadu (2003) pointed out that the number of phone lines and wireless connections to rural communities in many developing countries has grown at a high rate in the past few years. Some countries, in ensuring effective universal access and universal service, have established universal service funds in support of socio-economic development to communities.

Nevertheless, the availability, accessibility, and affordability are barriers to implementation of universal services to many developing countries including Rwanda. As a solution most governments in developing countries have adopted the concept of community-based telecentres as the best approach to deal with the challenge. In fact, Falch & Anyimadu (2003:22) pointed out that amongst the developed and developing

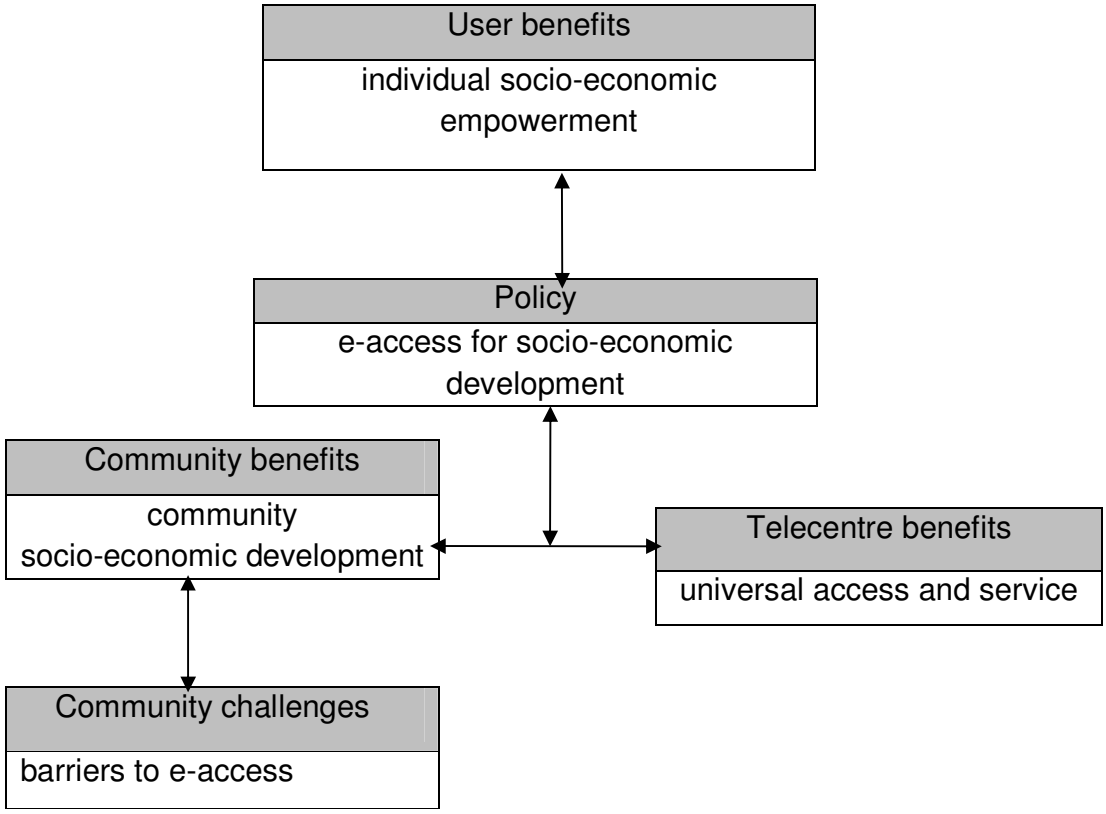
nations that have adapted the use of ICT applications for rural communications, telecentres have played an important role in promoting universal access and universal services to rural communities. Although according to Oyedemi (2003), achieving universal access and universal service would be a continuous and dynamic process, it varies from region to region.

Many developing countries have set goals for universal access and universal service to telephony, internet and broadband internet due to the potential influence in utilizing the ICT services for promoting socio-economic development for the rural communities. In many developing countries the universal access and universal service funds (UASF) have been used in support of infrastructure development in underserved community areas considered as un-commercial. The universal service funds (UASF) may be constituted through various sources such as government allocations, non-government organisations (NGOs), donors and sometimes ICT company operators.

2.9 Conceptual framework

This study is based on rural communities and the role of policy in promoting e-access. The literature review described a variety of approaches for policy on the role of telecentres in promoting socio-economic development. The review of literature focused on the key themes such as the concept of e-access and telecentres; rural community development; the role of ICT in rural development; factors affecting the use of telecentres; challenges of telecentres to the community, as well as universal access and service. The argument presented in the literature review is summarised as follows: Telecentres can play an important role in promoting rural community development, as e-access can create opportunities and benefits for communities through the social appropriation of e-access for socio-economic development and reducing the barriers to e-access. This results in the conceptual framework presented below (see Figure 2.3) which gives a summarised description to focus on in the qualitative component of the study, in particular with respect to the interviews with the key informants in telecentres.

Figure2. 3: Research conceptual framework



The review of literature indicated that telecentres are critical tools for rural community development through providing e-access. There are also social inequalities and barriers that hinder local rural communities to participate in developmental activities. The next chapter will describe the methodology used to explore the actual role of telecentres in promoting socio-economic development in rural Rwanda.

CHAPTER THREE: RESEARCH DESIGN AND MEHTODOLOGY

3 Introduction

This chapter describes the methodology used to explore the role of telecentres in promoting socio-economic development in Rwanda viewed through the lens of case studies of six telecentres. The chapter also sets out the problem statement, purpose of the research, research questions and detailed information on how the research was carried out from its conception to the end. The areas covered include research design, case study approach, sampling methodology, research instrument of data collection, reliability and validity of the study, and data analysis. The data collection was conducted in January 2011.

3.1 Problem statement

The government of Rwanda through its Vision 2020 recognises the development and use of new ICTs as a cross-cutting and enabling tool for the country's development. NICI II plan has identified telecentres as the main vehicle for providing access to ICTs to the community areas and as an essential agent of change in remote areas to promote socio-economic development to communities. The Rwanda Development Board (RDB) is a government agency which emerged with various institutions including RITA. RITA was previously responsible for the NICI II plan and policy implementation of telecentres in achieving the earlier mentioned objectives.

A significant investment has been made by the government to deploy thirty telecentres, with a target of deploying more telecentres by the year 2015. However, the strengths and weaknesses of the existing telecentres are unknown, though it has been observed that many telecentres are not geared to achieve the socio-economic objectives set in government policy and plans (Ariyabandu, 2009). Very little research has been conducted to assess the status or contribution of telecentres at rural community level in Rwanda, so as to measure the attainment of policy objectives of telecentres based on NICI II Plan, thus providing a basis for understanding the future requirements of policy for NICI Plans III - IV.

3.2 **Purpose of the research**

The purpose of this research is to explore the strengths and weaknesses of NICI II Plan policy formulation from the perspective of the role of telecentres in socio-economic development. This will be done by reviewing the actions of six out of thirty government telecentres in promoting socio-economic objectives set in NICI II plan. The study will examine the following aspects of the role of telecentres: telecentre contributions to community socio-economic development; opportunities and benefits of telecentre to users; and challenges in the use of telecentres. Analysis of the results of the study will be used to analyse the strengths and weaknesses with respect to policy objectives and policy statements set out in the NICI II Plan and thus to inform policy implementation for establishment of more telecentres. These objectives include: promoting community access to information, contribution towards socio-economic development, improving the delivery of public and private sector services, and ensuring effective e-government and e-governance.

3.3 **Research questions**

The central question is:

How do the lessons from telecentres provide guidance for strengthening future policy on telecentre activity for socio-economic development?

In order to explore the main research question, the following are the guiding questions that will frame the research:

1. To what extent are telecentres effective in promoting socio-economic development in rural communities?
2. What are the trends in the use of telecentres in improving delivery of services to local communities?
3. What challenges affect access and use of telecentres for access to information and e-governance?

4. To what extent does the Rwandan government telecentres implementation programme support the socio-economic development objectives specified in policy?

3.4 **Research design**

This study uses a qualitative research method to review the role of telecentres in promoting socio-economic development in Rwanda, because it is concerned with understanding strengths and weaknesses rather than reporting statistics. This approach is supported by Ulmer & Wilson, cited in Gerhardt, 2004:11, argued that "qualitative research has advantage over quantitative research because quantitative research cannot accurately quantify abstract concepts-emotions, culture, social organization, social relationships… with validity". This research is an exploratory case study of six telecentres, which will utilise key informant interviews based on open-ended questions, participant observation. The research also uses policy review with respect to relevant policies.

Whyte (2000:30) proposed "a number of qualitative and quantitative parameters together describe a telecentre: its location, origin, ownership and management, facilities and equipments, services and staff". Based on the literature review provided in chapter two of the research on telecentres, the qualitative approach would be the best approach in conducting this research, because it is effective in identifying intangible factors such as social norms and socio-economic development.

Putting into consideration the purpose of the research and attempting to answer the research questions, the study will employ a qualitative research design to enable access to respondent's experiences from their own perspectives. In this study qualitative methodologies contributed to offer a more thorough vision of the role of telecentres in contribution to the community, opportunities and benefits, and challenges of telecentres use. The qualitative study helped to find out the strengths and weaknesses of the telecentres towards the community development and the way in which communities adopt ICT in their daily activities, hence promoting socio-economic development.

3.5 **Case study approach**

The case study approach is considered to be exploratory, explanatory and descriptive (Tellis, 1997). It is a way of doing research which involves empirical inquiries that investigate contemporary phenomena within real life context using multiple sources of evidence (VanWynsberghe & Khan, 2007). The current research is an exploratory case study conducted in six rural communities in six different districts of Rwanda. The study seeks to explore in-depth the role of telecentres in promoting socio-economic development in Rwanda. The researcher considers this study to be exploratory because the precise nature and characteristics of the problem are unknown. Exploratory research is used to obtain greater understanding of a concept or to help crystallize the definition of a problem (McKenzie & Danforth, 2009). In this research, the concept being explored is the contribution of telecentres to socio-economic development.

3.6 **Sampling methodology**

There are a number of approaches in selecting a sample for a qualitative study. A purposeful sampling technique was used in this study for the selection of telecentres and the selection of users. In a purposive sample:

> A purposeful sampling is the deliberate choice of an informant due to the qualities the informant possesses. It is a non-random technique that does not need underlying theories or a set number of informants. Simply put, the researcher decides what needs to be known and sets out to find people who can and are willing to provide the information by virtue of knowledge or experience (Bernard 2002, Lewis & Sheppard 2006 cited in Ma.Dolores, 2007:147).

3.6.1 **Telecentres sample**

In this study telecentre samples were selected based on the purposive sampling. The researcher conducted interviews in six out of thirty government telecentres deployed in rural districts of Rwanda. The criteria for the selection of this telecentres sample were based on the latest evaluation report done by RITA (RITA, 2009). The researcher selected the three best performing telecentres and the three least well-performing telecentres. The three well performing telecentres were Gicumbi community telecentre,

Nyabihu community telecentre and Rulindo community telecentre. The three least well-performing were Kayonza community telecentre, Huye community telecentre and Nyanza community telecentre.

3.6.2 **Participant sample**

A total of eighteen participants took part in this study in six telecentres. One manager from each telecentre (total six participants), two users in each telecentre (total twelve participants).The researcher arrived early morning before the telecentre opened and included in his study the two first arrivals.

3.7 **Research instrument of data collection**

This research relied on various instruments of data collection for qualitative research. The instruments comprised of open-ended questionnaires for in-depth interviews and document analysis, as well as establishing the procedure for recording the data (Creswell, 1994). This approach increases the reliability of the study (Yin, 2003). Mason (2002:3) argued that qualitative data collection "requires a data collection instrument that is sensitive to underlying meaning when gathering and interpreting". Qualitative researchers often use multiple forms of data collection in a single study. Mills (2003:4) pointed out that "qualitative research uses narrative and descriptive approaches for data collection to understand the way things are and what they mean from the perspective of the research respondents". In this study, interview approach was used because interviews "can yield a great deal of useful information" (Leedy & Ormrod, 2001:146) and it is the most important sources of case study information (Yin, 2003). The research instruments used in data collection are discussed below:

3.7.1 **Interviews**

The researcher used interviews to obtain more in-depth responses. The interview reflects the social constructivist stance towards regarding knowledge as generated between humans, often through conversations (Cohen, Levy & Ruppin, 2000). A major advantage of the interview is its adaptability (Bell, 2005), whereby the researcher can follow up ideas, probe responses and investigate motives and feelings. Fontana & Frey

(2005) stated that interviews can be divided into three categories: structured interviews, semi-structured interviews, and unstructured interviews.

The researcher considered semi-structured interview guide with open-ended questions as the most appropriate and effective method for addressing the topic under study. Brown & Dowling (1998) talking specifically on semi-structured interviews state that they allow opportunities for the participants to answer freely the questions provided by the interviewer. Indeed, semi-structured or unstructured interviews encourage informants to narrate the story in their own terms which is useful for the researcher to explore in-depth issues related to the research topic. Denzin & Lincoln (2000) emphasize that semi-structured interviews lead to the generation of insightful stories rather than statistical information and permit a better understanding of organization complexity.

Furthermore, qualitative research interviews proceeds with stages, as Neuman (2003: 306) described such stages as: "beginning with an introduction and entry; the interviewer gets in the door shows authorization; and reassures and secures cooperation from the respondents". Besides that Neuman (2003) described the main part in an interview in research as 'asking questions and recording answers'. In the same line of argument Neuman (2003) further highlighted that the interviewer should be cooperative with the respondents' so as to avoid embarrassment, fear, and suspicion. When the researcher avoid such situations then the respondents feel comfortable in revealing proper information that would benefit the researcher.

With such notice, data for this study was gathered through in-depth Interviews with two key informant groups: telecentre managers and telecentre users. In-depth interviews used open-ended questions, few in number and intended to provide information on how individuals conceive their world, how they explain and make sense on the important events in their life (Creswell, 2003; McMillan & Schumacher, 2006). Indeed, McMillan & Schumacher (2001:42) pointed out that "in-depth interview merely extends and formalises conversation and is often characterised as a conversation with a goal".

In-depth interviews were conducted face-to-face with interviewees using a tape recorder and each interview was estimated to take one hour for each telecentre manager and thirty to sixty minutes for each telecentre user.

The interviews were informed by a semi- structured interview guidelines or protocol (see appendix 1) within a given time framework for generating primary data and was supported by policy analysis. The interviews focused on the main themes of this study namely, telecentre contributions to community development; Opportunities and benefits of telecentre to the community; and challenges in the use of telecentres.
Before starting the process of interviewing the key informant groups of telecentres, a letter of request for authorisation to carry out research was sent to Chief Executive Officer (CEO) Rwanda Development Board (RDB). Upon the approval, the researcher had to start carrying out the research, furthermore, a letter requesting the informant consent was provide to the key informant groups with the explanations over the objectives of the research.

The informants have been informed over a key number of issues: The participation was voluntarily and participants might withdraw their consent and participation during the time of this study at any time without prejudice. Participants were ensured that the information given would be treated confidentially and processed anonymously in this research.The information regarding the advantages of the audio-tape recording interviews over the taking notes during the interview was also provided.

3.7.2 **Policy analysis**

Analysis of policy documents was also an important part of this research. An integrated ICT-led socio-economic development for Rwanda 2006-2010 (NICI-2010 Plan) policy document was analysed. Henning, Gravette & Rensburg (2004) explain that documents are considered as the main source of data in qualitative research. Henning *et al*., further add that the analytical procedures that are implemented to capture the data from the documents are also the main analytical tool in the research process.

3.8 **The reliability and validity of the data of the study**

The value of scientific research is partially dependent on the ability of individual researchers to demonstrate the credibility of their findings (McMillan & Schumacher, 2006). Neuman (2003:194) states that "most qualitative researchers accept the basic principles of reliability and validity, but rarely use the terms because of their association with the quantitative measurement. …qualitative researchers apply the principles differently". Silverman (2004:286) described "reliability and validity as two important concepts to keep in mind when doing research, because in them the objectivity and credibility of research are at stake". To understand the relationship between the reliability and validity in a qualitative research, different definitions are given by many qualitative researchers from different perspectives.

According to Neuman (2003:196) states that reliability "means dependability or consistency. Qualitative researchers use a variety of techniques (e.g., interviews, participation, photographs, document studies, etc.) to record their observations consistently". To endorse the concepts of dependability and consistency Golafshani (2003:602) pointed out that "to ensure reliability in qualitative research, examination of trustworthiness is crucial". McMillan & Schumacher (2006:183) argued that another way to conceptualize reliability is to determine the extent to which measures are free from error, and if an instrument has little error, then it is reliable.

Bush (2007:92) supports Scott & Morrison's (2006:208) definition, which states that a measure is reliable if it provides the same results on two or more occasions, when the assumption is made that the object being measured has not changed. Validity is used to judge whether the research accurately describes the phenomenon that it is intended to describe (Bush, 2007). McMillan & Schumacher (2006) pointed out that validity has the ability to address the question whether the researcher captures what he/she thinks is valid. Therefore, to enhance the validity of this study, the researcher, using semi–structured interviews, and conducted the research in a natural setting to promote the reality of the respondents' experiences more accurately.

To get valid information from the interviewees or respondents the researcher has to establish good relationship with the interviewees. Indeed, McMillan & Schumacher (2006) describes the positive relationship between the research and respondents. In this research, good relationship was created between the researcher and the interviewees, in addition, the interviews has been phrased in the common language used in Rwanda known as Kinyarwanda. This has allowed the interviewees to tell the researcher the whole story about themselves and their telecentre usage, the interviews were tape-recorded, and after the interview, the recorded information were re-played to the respondent so that if possible to modify any information from the participant data.

3.9 **Data analysis**

Qualitative analysis is a systematic process of selecting, categorising, comparing, synthesising and interpreting data to provide explanations of the single phenomenon of interest (White, 2005). Creswell (2002) added that, in qualitative research, the researcher takes a voluminous amount of information and reduces it to meaningful categories, patterns, or themes, and then interprets the information.

The researcher also agrees with Creswell (2002) that qualitative data analysis is primarily an inductive process of organising the data into categories and identifying patterns (relationships) among the categories. The researcher opted to use thematic analysis. Thematic analysis is used to identify, analyse and report patterns themes within data (Braun & Clarke, 2006). Braun & Clarke (2006) suggested that thematic analysis can provide a useful detailed analysis on data being collected, relating them to the research question and be able to fit them into a pre-defined coding framework. Braun & Clarke (2006) suggested that data gathered through in-depth interviews should be transcribed into written form in order to conduct thematic analysis.

As pointed out by Creswell (2003), qualitative researchers 'plan their approach to data recording'. In this study, Interviews which were taken from respondents were audio-recorded interviews on tape-recorder. Primary data was analysed by listening to the recorded interviews, listening carefully several times through interview responses and looking for patterns or themes among the participants, then conceptualise the data by

noting down the relevant concepts, textual phrases and quotes, similarities and differences which are related to the major components of the research framework.

The data was simultaneously transcribed and translated from Kinyarwanda language to English language. The researcher transcribed interviews word for word even though he was aware that the transcription of the interviews is a time consuming process that can place a considerable burden on one person (Smith & Dunworth, 2003). Miles & Huberman (1994) advise that interviews need to be transcribed by the researcher him/herself in order to familiarise with them.

The researcher read transcripts and data several times to create themes or categories for common responses. The process involves the identification of themes through careful reading and re-reading of the data (Rice & Ezzy, 1999). After reading and familiarising with the data, the researcher started to generate an initial list of ideas about what is in the data and what is interesting about them.

3.10 **Limitations of the study**

The present study has certain limitations such as geographical location of these thirty telecentres being scattered all over the country and due to the limited time of this research the sample chosen for interviews also represents a limitation as the study does not include a larger sample of government telecentres. More so, all the interviews were conducted in local language Kinyarwanda due to the fact that majority of the rural communities do not speak English and because the researcher needed in-depth information the interviewee were encouraged to use local language so as tell the whole story about themselves and their telecentre usage for the validity and reliability research information. The data was simultaneously transcribed and translated from Kinyarwanda language to English language which was time consuming process so to make sure of not missing out important information's. The transcription into English is a limitation because it may in some cases fail to capture the specific meaning in the local language.

3.11 **Summary**

This chapter described the methodology used in the study of government telecentres in Rwanda, in promoting socio-economic development viewed through the lens of case studies of six telecentres. It provides detailed information on how the research was carried out from its conception to the end. The areas covered include the research design; case study approach; sampling methodology; research instrument; data collection; validity and reliability of the study; data analysis; and limitations of the study.

CHAPTER FOUR: RURAL TELECENTRES E-ACCESS CASE STUDY

4 Introduction

This chapter presents the findings from a case study of six telecentres. Data was mainly derived from semi-structured interviews with key informant groups from telecentres in Rwanda, namely telecentre managers and telecentre users. The chapter also presents data derived from observations. The study was conducted in six telecentres that are in second phase of National Information Communication Infrastructure (NICI) II Plan. These telecentres are located in different rural districts of Rwanda, namely Gicumbi district (Gicumbi community Telecentre); Rulindo district (Rulindo community telecentre); Nyabihu District (Nyabihu community telecentre); Kayonza district (Kayonza community telecentre); Huye District (Huye community telecentre); and Nyanza district (Nyaza community telecentre).

A total number of eighteen (18) interviews were conducted in the selected telecentre sites. The data was sorted in relation to the key themes and categories set out in the interview guidelines and questions (see appendix 4.1). The table below (Table4.1) illustrates the number of respondents who participated in the study.

Table4.1: Respondents interviewed

№	Telecentres with their respective districts	Number of interviews
1	Gicumbi community telecentre, Gicumbi district	3
2	Rulindo community telecentre, Rulindo district	3
3	Nyabihu community telecentre, Nyabihu district	3
4	Kayonza community telecentre, Kayonza district	3
5	Huye community telecentre, Huye district	3
7	Nyanza community telecentre, Nyanza district	3
Total		**18**

In line with research ethics, the researcher used pseudonyms for all eighteen (18) respondents who participated in the study in order to comply with anonymity and confidentiality agreements. The pseudonyms are coded to represent the respondents in place of their real names throughout this chapter.

Before going further into findings presentation per se, the researcher felt that there was a need to give a brief overview of telecentres selected in this study. Each case was dealt with separately, while telecentre managers' and users' responses from each telecentre were presented simultaneously for each theme as the questions asked to both participants had approximately the same objectives.

4.1 **Telecentres overview**

Telecentre project is an ongoing initiative of the government of Rwanda. The program to establish telecentres was launched in the year 2005 as a way to promote socio-economic development to the rural community. In the year 2006 twelve (12) telecentres were established and in the year 2008 eighteen (18) telecentres were established as well. Currently there are thirty government telecentres operating in different rural areas of Rwanda. The six telecentres which was selected in this study was based on criteria explained in the research methodology. Each of these community telecentres selected in the study constitute of three professional employees the telecentre operator (manager), IT technician and adviser plus one cleaner and two security personnel all being paid by the Rwanda Development Board (RDB). The RDB is independent and influential. It reports directly to the president.

All six telecentres have equal number of equipments. The reason is that all telecentres belongs to the government, and the government supplies the same quantity of equipments to all. The below (Table4.2) illustrates the number and kind of equipments available at telecentres.

Table4.2: Number and kind of equipment available

	Telecentres					
Equipment	**Gicumbi**	**Rulindo**	**Nyabihu**	**Kayonza**	**Huye**	**Nyanza**
Desk top(Computers)	42	42	42	42	42	42
Scanners	1	1	1	1	1	1
Printers	2	2	2	2	2	2
TV sets	1	1	1	1	1	1
Projectors	1	1	1	1	1	1
Photocopying Machine	1	1	1	1	1	1
Fax machine	1	1	1	1	1	1
Digital camera	1	1	1	1	1	1

Source: Rwanda Development Board, 2010

The next section presents the data from the interviews.

In order to explore and illustrate the results obtained, the researcher chose to include as many quotations as possible that were extracted from the raw data in the research to show the similarities and differences in participants' comments and to illustrate a particular understanding or perception of participants. The researcher has attempted to provide a balance of selections, so that no participant was over-quoted or omitted.

Informants were asked a series of questions designed to give the opportunity to explore in-depth the role of telecentres in promoting socio-economic development. Findings presented in this section are organised and discussed according to the following

themes: telecentre contributions to community development; opportunities and benefits of telecentre to users; and challenges in the use of telecentres. Each of these themes is discussed according to each telecentre.

4.2 Gicumbi community telecentre

Gicumbi community telecentre is located in Gicumbi district in the Northern Province of Rwanda. It is one and a half hours drive from the capital, Kigali. Its capital city is Byumba which is also the provincial capital. Telecentre serves a population from 21sectors made up of 109 cells. That population is estimated at 364,000 on area of 829 km^2 most of which is mountains, with rainfall distribution of over 1600mm annually. This geography means that local residents confront significant challenges in accessing basic services such as postal and other communications services. Gicumbi community telecentre and the district in which it is situated are shown below (Figure 4.1) as follows:

Figure4.1: Gicumbi Community Telecentre



The telecentre is the only public facility that offers a range of communication services, including internet access, e-mail, and fax etc as well as administrative services such as photocopying, printing, scanning, typing service, word processing, spreadsheet, and database service etc . Historically, there were no post offices, banks or other facilities for these administrative and communications services.

The respondents from Gicumbi telecentre were identified below (Table 4.3) as follows:

Table4.3: Codes given to participants in place of their real names from Gicumbi telecentre

Telecentre / Respondents	**Code**
Gicumbi community telecentre	TA
Manager Gicumbi community telecentre	MTA
Gicumbi community telecentre User 1	UTA1
Gicumbi community telecentre User 2	UTA 2

4.2.1 Telecentre contributions to community development

Respondent MTA explained that the telecentre offers services such as internet, basic computer training, photocopying, printing, and scanning. Telecentres have also introduced additional services, such as free training to entrepreneurs on how to start and grow businesses; and to advertise/promote the coaching program to the local business community in various areas. These areas include entrepreneurial development services, business registration, and business advice and counseling, IT services, business information services, export development services, tourism information, tax advisory services, environment compliance and cleaner production services. She said that the additional services are the most priority because it is in the government agenda to eradicate poverty and promote development to rural communities and telecentre is a

key for the success. The manager pointed out that entrepreneur development service and IT services as the most common services among others used at the telecentre:

> "…so far four cooperatives came with their draft business plan proposal and we have trained them on entrepreneur development service such as how to start and manage a business, and six more are currently on training. Their businesses focus on co-operatives in different areas such as handicrafts, coffee, tea, Irish potatoes, horticulture, and livestock. …But we do not stop from training, we also continue to make follow up on their business progress, giving them advices and try to guide them on securing loans from bank and provide other necessary support that would make their business success" *(*MTA*).*

Apart from the general services offered by the telecentre, the manager added that they also provide computer training programs to the beginners (such as introduction to computer, Microsoft word, excel, PowerPoint, and access) and internet. She further said that they also offer Cisco system networking for those who are advanced in computer. She disclosed that many have joined these courses and have been awarded certificates and now they have secured jobs in the district administration and they are able to support themselves and their families.

Telecentre user (UTA1) expressed how the telecentre courses have contributed to his well-being:

> "As for me, I'm a local farmer residency of Gicumbi village, before coming of this telecentre I had no knowledge about computer and internet, so when the telecentre came here, I registered for computer training course for beginners and internet. To a sure you I'm now a computer literacy. For example I now use internet to get information on my agricultural products such as Irish potatoes, rice etc through the Rwandan e-soko project. I just visit www.esoko.gov.rw and access all information regarding the situation of agricultural products at the market in terms selling and buying within the country. I also use internet to communicate to other farmers in regard to issues of new methods of farming through e-mail. … To me this is a great achievement because it has increased my income productivity".

Two telecentre users (UTA1 and UTA 2) had similar expressions on how telecentre had promoted their standard of living:

> "…since I started coming to TA, so many things have changed in my life, for sure I do not know how I can express this to you, but in brief, what I can tell you is that the most important thing I have gained above all is knowledge, I can now use this knowledge to improve my well-being be socially or economically. … Having computer knowledge is the most important thing in your life. …and telecentre is all about computer among other services" (UTA1).

> "…I'm a civil servant, …, by the time TA came in, I was already computer literate, but I could not get anywhere to access information due to the fact that there was no telecentre, nor any other technologies available in this areas apart from mobile phone which was used for calling and receiving calls only, but after the coming of TA, many things has improved (such as easy meanings of communication, time saving etc). … I managed to upgrade in computer knowledge with the course of Cisco system networking at TA. …Though I'm still looking for a better job so as to apply my newly acquired skills" (UTA 2).

Asked about the level of ability to use computer and internet whether has improved their socio-economic development as a result of using telecentre; two respondents expressed it in this way:

> "of course, looking back in the year 2000 where technologies were not in existence not only here in our rural areas but almost in our entire nation and compare it to the current situation where technology is available everywhere definitely things has been changed, I can estimate a change on myself to be approximately from 5% to 65% in terms of improvement socially and economically. …5% is about information I used to get through old technology like radio" (UTA1).

> "… I can say that I have gained many things after my coming to this telecentre, most important is the certificate obtained in Cisco system networking which will help to get better job, secondly I make research though internet, and acquire more skills" (UTA 2).

4.2.2 Opportunities and benefits of telecentre to users

Respondent MTA pointed out that telecentre plays an important role in support to rural community through different services as earlier mentioned. She said that the establishment of TA have made some change in well-being of the communities who use telecentre. The majority of the people coming to this telecentre come without computer knowledge and after they have acquired computer skills they go outside and manage to communicate with others in the region and beyond.

The respondent further said that through the use of telecentre facilities have created learning opportunities and benefits to the teachers and students of Gicumbi district, for example teachers and students use internet to access learning materials such as school curriculum, teacher's guide, and text books etc. She mentioned that before the establishment of TA, the teachers had to travel to the national curriculum development centre (NCDC), NCDC is the government institution responsible for developing learning materials for pre-primary, primary and secondary schools in Rwanda located in Kigali the capital city to collect school learning materials earlier mentioned, but now they access them via internet, downloading the materials and where necessary print them and carry them to the respective schools. She further highlighted that students have been using telecentre ICTs such as internet to apply for university admissions and scholarships instead of travelling to universities campus.

Telecentre user (UTA1) described the opportunities and benefits acquired from telecentre:

> "In terms of opportunities, I managed to learn computer and now I can type a letter and save it on my computer hard disk, but as of before I could use a pen and a paper to write a letter, regarding benefits there many, …With the use of ICTs at telecentre my work became easy, I Google every information I need and get it very easily, let it be information on agriculture, business, health, and education etc".
>
> "…I got an opportunity to study a program of Cisco system networking and I was awarded certificate this is one opportunity to me, but there many learning opportunities such as informal education using internet libraries …for benefits unbelievable, socially

telecentre has been easy means of communication whereby I use internet to send e-mail and chat, etc" (UTA 2).

4.2.3 Challenges in use of telecentres

The manager revealed that at present the most challenge they face is the size of the building that telecentre is operating in, it is small compared to the number of people that is intended to provide service. But she mentioned that she had communicated this challenge to the authority.

The researcher sought to understand from manager's perspective the user's challenges in familiarising oneself with new technologies especially in rural area. The manager response was that:

> "…yeah users have challenges such as language problem, most of the people here speak Kinyarwanda and French language, and yet to use internet and learn computer programs the user must have basic knowledge of English. Secondly adult people are not skilled with computers and they find it difficult in adopting to the use of ICTs such as internet, and other administrative services such as word processing, excel, and PowerPoint to assist them in their day to day activities. Thirdly, telecentre cost of charge to some services such as internet, scanning, and fax is a challenges to some of the users especially those who are unemployed and local farmers".

The researcher also sought to indentify challenges that respondents face in regard to the use of telecentre: two users expressed their thoughts as shown below:

> "…learning new technologies is not easy personally my first challenge was to use keyboard for typing and handling mouse secondly getting used to software's such as word processing and spreadsheet " (UTA1).

> "As for me, I did not find any challenge in using telecentre…I had computer knowledge before and I know English, but most of my friends do find language challenges because to use computer one must have knowledge in English language". (UTA 2)

> "…even though I do not find any challenge in use of computers …but I do encounter other challenges such as cost of charge in using internet for example (300 Rwf per hour

> approximately 0.506$) …though it is a bit low compared to charges in Kigali the capital city (600 Rwf per hour) but it is still a challenge to me and I think this applies to others as well living in rural areas. If you look at what one earns per months, and you pay 300 Rwf per hour and yet you need like 2 hours a day. …you find it as a challenge" (UTA 2).

The respondent's (UTA1 and UTA2) in their remarks, they said that though there are challenges, the opportunities and benefits are more. They also expressed their appreciation for the basic services such as photocopying, fax, printing, scanning, internet, and computer training programs offered by telecentre to the community.

4.3 **Rulindo community telecentre**

Rulindo community telecentre is located in Rulindo district in the Northern Province of Rwanda. Tare which is also known as Bushoki is the capital city. Telecentre serves a population from 17sectors made up of 494 villages (known locally as *imidugudu*). That population is estimated at 264,854 on area of 567 km^2 most of which is mountains, with abundant rainfall. This geography means that local residents confront significant challenges in accessing basic services such as postal and other communications services like local residents of Gicumbi district since two districts belong to one province and share most of characteristics geographically. Rulindo community telecentre and the district in which it is situated are shown below (Figure 4.2) as follows:

Figure4.2: Rulindo Community Telecentre



Telecentre is the only public facility that offers a range of communications services, including internet access, e-mail, and fax etc as well as administrative services such as photocopying, printing, scanning, typing service, word processing, spreadsheet, and database service etc . Basically rural district of Rulindo has never been in its history with such public nor private facilities offered to the community. The respondents from Rulindo telecentre were identified below (Table 4.4) as follows:

Table4.4: Codes given to participants in place of their real names from Rulindo telecentre

Telecentre / Respondents	**Code**
Rulindo community telecentre	TB
Manager Rulindo community telecentre	MTB
Rulindo community telecentre User 1	UTB1
Rulindo community telecentre User 2	UTB 2

4.3.1 Telecentre contributions to community development

Respondent MTB explained that telecentre has played an important role in contributing to community development. Telecentre provided the community with access to various ICT services such as public internet access, computer training programs, photocopying, scanning, binding, CD-writer, and printing. The respondent continues to say that above all, telecentre provides free training to the entrepreneurs on how to start and manage a business.

MTB also said that they advertise/promote the coaching program to the local business community in areas of entrepreneurial development services; business registration; business advice and counseling; IT services; business information services; export development services; tourism information; tax advisory services; environment compliance and cleaner production services. According to the MTB this is the newly service and most focused service of telecentre in promoting community.

Furthermore, MTB pointed out some of the achievement and what they intend to achieve in the near future and had to say in this way:

> "…So far telecentre have trained all employees of Rulindo district in various ICT courses such as introduction to computers, word processing, spreadsheet, database, publisher and internet. This has also improved their efficiency at their workplace…Telecentre is now in the phase of training all Rulindo district community local leaders starting from level of village (known as *Imidugudu*), cell (known *as Akagari*), and sector (known *as Umurenge)…*this will help the local leaders to manage to communicate especially in sending day-to-day report to the district mayor via internet (e-mail) instead of travelling again to the district headquarters to submit the report".

Respondent (UTB1) expressed her views in terms of telecentre contributions to the community development and she said in this way: I'm a secondary school student telecentre has helped me and my fellow students to acquire knowledge through the use of internet to do research in different areas of study such as physics, geography, and economics etc, she explained that they use internet search engines such as Google, yahoo, and MSN to access information by typing in words like 'Introduction to economics' and a lot of information comes and they have to select those that are relevant to the subject. She further said that telecentre have helped them to study advanced of what is being taught in classroom by teachers and this has increased their knowledge skills.

She highlighted that through telecentre offered services such as internet, students have managed to check their national examination results from telecentre using internet. Whereas before the establishment of telecentre students had travel to the Rwanda national examination council (RNEC) located in Kigali capital city to check their examination results which was time consuming, expenditure in terms of transport, and so on. She further noted that:

> *"*...English language has been problem to many students and teachers in Rwanda because many schools used to teach in French language and now that the government has changed the system to as compulsory in education students and teachers have challenges in teaching and learning in English. Telecentres have contributed to the development our language communication skills through the use of its facilities. Everything you explorer is in English and this has helped us to improve on our

language...one can read and write when using telecentre facilities such as internet, and computer training program" (UTB1).

Respondent (UTB 2) response on telecentre contributions to community development said: Personally, telecentre has ability to improve socio-economic development to rural community by the use of ICTs such as internet, which is used as a means of connecting different aspects of societies together within a country and worldwide via e-mail, chat, facebook, and twitter etc.

> "… through the use telecentre ICTs such as internet has helped me to get connected to other farmers in the country …before set up of this telecentre I used to sell my agricultural vegetables such as tomato, onion, and potato anyhow to the degree of lowest price to buyers from Kigali without considering prices on market …but now I use telecentre facilities such as internet to know the current market price in the country and elsewhere in the region. This has improved my economic income due to the profits earned from selling at right price" (UTB 2).

4.3.2 Opportunities and benefits of telecentre to users

The manager explained that with the opening of TB among several facilities such as ICT bus mobile, fibre optic cable, and wireless broadband services have created opportunities and benefits to the community of different categories such as students, civil servants, small and medium enterprises (SMEs), farmers, and even foreign tourists who visit the district. Telecentre provides access to information with variety of services as earlier mentioned at a low cost. He further highlighted that community have benefited from telecentre through the removal of expenditure and time consuming that people of Rulindo district used to incur in traveling to the Kigali the capital city to get access to internet and other services like binding, CD- writer, printing, scanning, photocopying, and other administrative services such as word processing spreadsheet, and database etc

Respondent (UTB 1) expressed the way in which telecentre has helped personally:

> "…my well-being has changed since I started using telecentre facilities such as internet and computer training, before I did not know how to use computer nor internet, but now I

> know computer programs like MS Office (Microsoft word, Microsoft excel, Microsoft PowerPoint, Microsoft access) and internet, I use internet to study different subjects like economics and geography etc and use internet also to communicate to other people via e-mail, chat and learn more other things like social welfare and so on".

The respondent also pointed out that with the use of telecentre ICTs such as internet she was be able to communicate via e-mail and chat to her cousin in USA who provides her school fees and pocket money. She said that she could not communicate with her cousin before the establishment of telecentre. She had to wait and communicate to her when the cousin comes to Rwanda. But telecentre has helped her to be in touch with her cousin always. She expressed some of her benefit when she started using telecentre, that her cousin used to send her money via someone in Kigali to bring it to her in Rulindo district and she could not get this money on time because she could not be in touch with neither of them. When the money is being sent to that person in Kigali he could first use it in his business and bring it to her towards the end of school closing. But now due to telecentre facilities such as internet things have changed. When her cousin sends the money she e-mails her and copy the person, and that person fear to stay with the money because the information have already linked to student. Since the last two years she is able to receive her money on time.

> "As I said before that I'm a farmer, all my interest is on agriculture and other related areas, with the help of telecentre, I got an opportunity to use internet to get information on various methods of growing vegetables (seeds), effective fertilization and up to date weather information. Such information has provided me knowledge on how to increase in product production hence generating more income …I now try to mobilise my fellow farmers in this area to take the opportunity of using telecentre" (UTB2).

4.3.3 Challenges in use of telecentres

Respondent MTB said that the only challenge telecentre face is the size of the building telecentre is operating in, it is too small, but I think it is common to all government telecentres, and the government is aware of this challenge, and is working to words getting solution for it.

Asked about challenges that telecentre users encounter in the use of telecentres, MTB responded in this way:

> "…yeah, most of the users come here without computer knowledge and this affects their use of facilities at telecentre. Another challenge is language issue most local residents do not read or write nor speak English hence becoming a challenge to them in the use of telecentre"

Asked the respondents what challenges they encounter in the use of telecentre and ICTs in general. The respondent (UTB1) described her challenge in this way: Using computer for her very first time was a challenge to her that she straggled in getting used to keyboard as well as handling mouse. She pointed out another challenge to her as lack of practice to get used to computer, she only use her school holidays and weekend only Saturday because Sunday telecentre is closed to use computer and to her this is not enough to make her gain more skills as required. She added that there are no computers at school.

While respondent (UTB2) said that as of him, he did not encounter any challenges in the use of telecentre facilities.

4.4 **Nyabihu community telecentre**

Nyabihu community telecentre is located in Nyabihu district in the Western Province of Rwanda, its capital city is Buhoma which is also known as Karago. Telecentre serves a population from 12 sectors made up of 73 cells. That population is estimated at 298, 386 on area of 567 km^2 and population density of 558 inhabitant's km^2. Nyabihu community telecentre and the district in which it is situated are shown below (Figure 4.3) as follows:

Figure4.3: Nyabihu Community Telecentre



The telecentre is the only public facility that offers a range of communications services, including internet access, e-mail, and fax etc. telecentre also offers administrative services such as photocopying, printing, scanning, typing service, word processing, spreadsheet, and database service etc. But currently there are also individual businesses in Nyabihu that offer these administrative services but at high cost compared to telecentre charges, so local communities prefer to use services offered by the telecentre. Telecentre also offers Cisco system networking program.

The respondents from Nyabihu telecentre were identified below (Table 4.5) as follows:

Table4.5: Codes given to participants in place of their real names from Nyabihu Telecentre

Telecentre / Respondents	Code
Nyabihu community telecentre	TC
Manager Nyabihu community telecentre	MTC
Nyabihu community telecentre User 1	UTC1
Nyabihu community telecentre User 2	UTC 2

4.4.1 Telecentre contributions to community development

Respondent (MTC) revealed that TC like any other telecentres deployed by the government have same mission of promoting rural communities through various services such as providing access to information, offering free training to the entrepreneurs to start and grow businesses, to advertise/promote the coaching program to the local business community in various areas. These areas include entrepreneurial development services, business registration, and business advice and counseling, IT services, business information services, export development services, tourism information, tax advisory services, environment compliance and cleaner production services.

He further provides examples on how telecentre have supported the community in different areas. He said that telecentre has played an important role in support to rural community in areas of health (through internet local community access information on HIV/AIDS, malaria, diarrhea etc, the information helps them to prevent from attack on such diseases), education (through internet students applying online university admissions and scholarships), and agriculture (market price information gathered from internet (websites) gave farmers capacity to negotiate in selling their products such as maize, beans, rice, and bananas etc and this has somehow increased their production

incomes). However, he said that the number of local community participating in getting information in areas of health and agriculture is quite small.

He further explained that:

> "…people in Nyabihu district have gained from the use of telecentre facilities such as internet and computer trainings. People use internet to access government information's such as job advertisements, government tender information. …There is one community co-operative organisation dealing with supply of agriculture food crops such as rice, beans, and maize. One of their member comes to telecentre at least five times a week to check information advertised on government and private websites for tendering and other information…The information revealed by the head member of the community co-operative organisation was that the co-operative have managed to secure eight tenders in two years".

Respondent (UTC1) in his response on telecentre contributions to community development she said that:

> "… I have completed computer training program which includes introduction to computer, MS office program and internet offered at telecentre and I have gain knowledge on computer skills and now I manage to teach other new learners who comes to telecentre, as well as upgrading to Cisco system networking program...this telecentre have contributed to my academic development through acquisition of computer skills and exploitation of new ideas through learning".

> "...Truly speaking to my understanding telecentre can add contribution to the community development by providing different services such as internet, trainings, creating awareness (meetings, word of mouth, and leaflets) etc. But one telecentre is not in position to make change in terms of socio-economic development to the community for the entire district" (UTC2).

4.4.2 Opportunities and benefits of telecentre to users

In response to the opportunities and benefits, the MTC expressed by saying that through the use of telecentre ICT services such as computer training and internet has provided skills to the community. Telecentre is the only public facility that offers those

services in Nyabihu district. The manager further highlighted that the most popular services that the community engage within telecentre that create opportunities and benefits to them include: e-mails, job advertisement, research purposes, reading newspapers online, accessing government and private tenders information online, computer trainings, business registration, and business advice and counseling.

The other respondents demonstrated their level of satisfaction in respect to the opportunities and benefits. Telecentre user (UTC1) said that:

> "…I can say that when I started using this telecentre I got an opportunity to use computer and internet. I use internet to communicate to my friends within the country and abroad through e-mail and chat. I also use internet to read information about my country vision 2020, Rwanda genocide, the president's speeches, and Rwanda cabinet resolutions etc and more important I gain new skills through the interaction with the system. I benefit from having access to such information at lower cost" (UTC1).

Telecentre user (UTC2) expressed his view that telecentre have provide them an opportunity to get access to information more wide than any other means of communication such as radio and TV.

> "A telecentre facility such as internet has provided me an opportunity to improve on knowledge skills to get informed on what is happening around the world rather than depending on radio information alone which is mostly focused on local information" (UTC 2).

4.4.3 Challenges in use of telecentres

Respondent MTC said that the only challenge telecentre face is the size of the building telecentre is operating in, it is too small. Asked about challenges that telecentre users encounter in the use of telecentres, MTC responded in this way:

> "…this is a rural area most of people are not educated they do not know how to read and write and using telecentre is a challenge to them. Language is another issue for those who can read and write the majority speaks Kinyarwanda (national language) and some

> speak French and yet the content is in English. This has been the major challenges to the user point of view".

Asked other respondents what challenges they encounter in the use of telecentre and ICTs in general. The respondent (UTC1) described challenges in this way:

> "To me I do not get any challenge in using telecentre but sometimes there are technical problems like when power is off there is no generator to backup so that the customers can continue working".

The respondent (UTC2) described his challenges in this way:

> "Basically on my behalf challenges are there such as language issue, I know how to read and write but in Kinyarwanda and yet all information on computer (*mudasobwa*) is in English. So now I'm learning computer as well as English but it is a challenge to me and this happens to many of the users here especially old people who have never gone to school. Examples are the villages (*imidugudu*) local leaders they know how to read and write in Kinyarwanda only".

4.5 **Kayonza community telecentre**

Kayonza community telecentre is located in Kayonza district in the Eastern Province of Rwanda. Telecentre serves a population from 12 sectors made up of 422 villages (known locally as *imidugudu*). That population is estimated at 234,106 on area of 1,954 km^2. The district is composed of hills and slopes whose altitude varies between 1000mm and 1200mm with average annual temperature of 18 to 26ºC and more 90% depend on subsistence agriculture and livestock keeping for their living. Kayonza community telecentre and the district in which it is situated are shown below (Figure 4.4) as follows:

Figure4.4: Kayonza Community Telecentre



Kayonza community telecentre is the only telecentre facility that offers a range of communications services, including internet access, e-mail, and fax etc. as well as administrative services such as photocopying, printing, scanning, typing service, word processing, spreadsheet, and database service etc . Historically, there were no post offices, banks or other facilities for these administrative and communications services. Telecentre also offers Cisco system networking program.

The respondents from Kayonza telecentre were identified below (Table4.6) as follows:

Table4.6: Codes given to participants in place of their real names from Kayonza Telecentre

Telecentre / Respondents	Code
Kayonza community telecentre	TD
Manager Kayonza community telecentre	MTD
Kayonza community telecentre User 1	UTD1
Kayonza community telecentre User 2	UTD 2

4.5.1 Telecentre contributions to community development

The respondent (MTD) explained that TD is a government owned telecentre established to promote the use of ICTs such as internet as a tool for building knowledge and create opportunities and benefits for the people of Kayonza district. He said that telecentre offers different services that would enable communities get improved socially and economically. Some of these services include entrepreneurial development services, business registration, and business advice and counseling, IT services, business information services, export development services, tourism information, tax advisory services, environment compliance and cleaner production services. He further highlighted that through services offered by telecentre such as computer training and internet have provided computer knowledge skills to the community telecentre users.

Telecentre user (UTD1) pointed out that telecentre contribution to community development in Kayonza district is requisite because this is the only telecentre that the community can get services such as computer training programs, internet, and free trainings on how to start and manage a business etc and such services promote socio-economic development.

She further expressed her change of life since she started using telecentre, she said that after her failure to go get marks or points to take her to university and she did not

have money to sponsor herself to private universities she started a boutique shop of 100,000Rwf(USA170$) at Kayonza town in the year 2007. She continued her business earning little profit as she manages to progress in her business. She said that it was in January 2009 when she had that TD provide free training on how to start and manage business. She further narrates that she registered for the training and after her completion she was able to think higher how to do business, she learnt how to secure loan and how to manage it. Thereafter, she applied for a loan from banque populaire du Rwanda (BPR) (Known as People's bank of Rwanda) of 1,000,000Rwf. She started using it perfect and she managed to re-pay back in installment monthly to the bank. She also continue to say that her business has increased making more profits and she is planning to resume her studies on self sponsor for part-time study at university possibly in the year 2012. She further said that to her understanding:

> "…through telecentre training programs earlier mentioned and its continuing advice and counseling offered to communities can promote community development…"

Another respondent provided comment instead of expressing telecentre contributions to his personally development and his comments are as follows:

> *"*To me the coming of this telecentre is an advantage to the community, but the contribution is too little and it is with those people who live near by telecentre (Kayonza town)…To be honest how can one telecentre in a district of an estimated population of 234,106 with an area of 1,954 km^2 can someone expect to see an impact on community development? …as of me I would suggest that in order to see community development socially and economically, there must be at least one telecentre at each sector. The district is made up of 12 sectors" (UTD2).

4.5.2 Opportunities and benefits of telecentre to users

Respondent (MTD) explained that telecentre have created opportunities and benefits to the community through various services offered by telecentres earlier mentioned. He provides an example saying that:

> "…Students are using telecentre facilities such as internet for research purpose on various subjects such as mathematics, physics, and computer science etc, before they

used to rely on library at school with few text books where one book is shared to15 students, but now they come here and use internet to do their research" (MTD).

He further said that telecentre offer different services such computer training and other related information technology services such as internet that create opportunities and benefits at the end for example whether information for farmers, low cost and easy access to government information, and skills etc.

"… I'm a business woman resident of Kayonza town, since I started coming to this telecentre I was provided with free trainings on how to start and grow a businesses. They teach you and keep on advising you in running of your business. I got an opportunity of securing loan from the bank with the help of telecentre and I'm using it perfect and I'm able to repay back in installment of monthly. My capital has increased and business is advancing at high rate making abnormal profits" (UTD 1).

"I am a teacher by profession. I teach mathematics and physics at different secondary schools in Kayonza district I started teaching long time ago before the coming of technology and used to teach through traditional method of teaching (blackboard and chalk). But things have changed due to technology and we teachers had to change as well...I go an opportunity to go for training on how to use ICT in teaching and learning...It was government sponsorship of six months to be trained on use of ICT in teaching and learning...when i came back to my teaching schools it was difficult because i could not get a place to do practice...The establishment of telecentre was an opportunity not only to me but to all my fellow teachers and students. He said that they use telecentre facilities such as internet to do research on use of ICT in teaching practical subjects like physics biology, and chemistry. For example in physics they use You Tube and type in '*Newton's' first law experiment'* and then listen and watch demonstration. Google is another internet explorer to be used and then following links and learn more about it rather than using content of one author in the text book at school. He further said that teachers have benefited from telecentre facilities such as internet to upgrade their knowledge as well as making practicing on various aspect of ICT in teaching and learning" (UTD 2).

4.5.3 Challenges in use of telecentres

Respondent MTD said that there no challenges so far. Asked if there are any challenges that telecentre users encounter in the use of telecentres, MTD responded in this way:

> "yeah, definitely challenges are there, especially old people find it difficult in use of telecentre facilities such as computers in learning programs such as word processing, spreadsheet, and PowerPoint as well as internet …some of the communities say that telecentre is far from their homes and they find it difficult to come to telecentre they to catch public bus and pay some fee …other communities (known as non-users) still thinking that telecentre is for luxury and wastage of time and money".

Asked other respondents what challenges they encounter in the use of telecentre and ICTs in general. The respondent (UTD1) said that:

> "I did not encounter any problem in learning how to start and manage a business as it was my main focus at telecentre. However, in business also one has to know computer basics and internet to do business well, so I had to learn computer programs such as word processing, spreadsheet, and database as well as internet. My challenge was using keyboard for typing and use of spreadsheet for calculation and database for keeping records. I used to make mistakes in using excel formulas and at time make losses due to poor use of excel calculation".

> "To me I did not face any challenge in use of telecentre facilities. My comment is to thank the government of Rwanda for providing telecentres as a tool for promoting rural communities" (UTD2).

4.6 **Huye community telecentre**

Huye community telecentre is located in Huye district in the Southern Province of Rwanda. Telecentre serves a population from 14 sectors made up of 509 villages (known locally as *imidugudu*). That population is estimated at 290,677 on area of 581.5 km^2 with inhabitant of an average of 500 km^2. The district is well known for the home of old University in Rwanda known as National University of Rwanda (NUR) and the

National Museum. Huye community telecentre and the district in which it is situated are shown below (Figure 4.5) as follows:

Figure4.5: Huye Community Telecentre



Telecentre is the only public facility that offers a range of communications services, including internet access, e-mail, and fax etc as well as administrative services such as photocopying, printing, scanning, typing service, word processing, spreadsheet, and database service etc . But there also private internet cafés that offer same services to those of public facility, the only difference is in cost of change in use of facilities, the costs for private services tend to be higher than those at public facility and people tend to go public service. Telecentre is most occupied by university students and this limits local communities from the use of telecentre.

The respondents from Huye telecentre were identified below (Table4.7) as fol

Table4.7: Codes given to participants in place of their real names from Huye Telecentre

Telecentre / Respondents	Code
Huye community telecentre	TE
Manager Huye community telecentre	MTE
Huye community telecentre User 1	UTE1
Huye community telecentre User 2	UTE 2

4.6.1 Telecentre contributions to community development

The respondent (MTE) explained that Huye community telecentre was the only place in the Huye district that provided public services such as computer program training, internet, photocopy, scanning and printing. Telecentre have introduced an additional services these include offering free training to the entrepreneurs to start and grow businesses; to advertise/promote the coaching program to the local business community in various areas. These areas include entrepreneurial development services, business registration, and business advice and counseling, IT services, business information services, export development services, tourism information, tax advisory services, environment compliance and cleaner production services.

The respondent highlighted that communities are unaware about telecentres role to their development. Currently most people who use telecentre are those that already have knowledge on ICT, most of them being university students, NGOs employees, district employees, and hospital employees. Telecentre is working closely with the district authority and secretary executives of sectors in creating awareness about telecentre and how it can assist in promoting their well-being socially and economically. He further mentioned that five students from Huye district have secured their degrees in distance learning program study through use of telecentre facilities such as computer

and internet and currently ten more students are using the facilities for the same study and this contributes to their development of knowledge skills.

Respondent (UTE1) expressed her opinion on telecentre's contribution to community development by saying that has the ability to contribute to community development through of use of ICTs such as internet and computer trainings in areas of software programs, creating knowledge skills that will lead to job creation. She further made comment on TE' contribution to her well-being:

> "… before coming of this telecentre I had no knowledge about computer and internet, so when the telecentre came here, I registered for computer training course for beginners and internet. To a sure you I'm now a computer literacy. I have gained skills ready to upper grade to computer diploma course, as well as degree and even further to higher level so as to compete for the job worldwide".
>
> "… I support the idea of rolling out telecentres to rural areas because through their facilities such as internet and other services such as trainings can create information society, a society that is based on knowledge… But it does not make sense to roll out one telecentre within entire district to have information society… If the government is to make the country a knowledge based economy and telecentres can play important role especially in rural areas, then more telecentres has to be rolled out at least each telecentre in a sector" (UTE2).

4.6.2 Opportunities and benefits of telecentre to users

Respondent (MTE) explained that telecentre have created opportunities and benefits to the community of Huye district through providing IT services such as computer trainings, in introduction to computers, word processing, excel, PowerPoint, database and internet. He further pointed out that:

"…telecentre have created opportunities through use of its facilities such as internet, where residents have been using internet to apply for admissions at university, jobs, checking whether information, and market prices etc".

The two respondents felt that the community telecentre offered them access to computer and other related service as both of them narrates opportunities and benefits:

"I benefited from telecentre services such as computer trainings and internet…I had an opportunity to acquired knowledge and skills from computer training this will assist me in getting job in future…in Rwanda to attain any job in the government or private sector it is compulsory that one must write theory paper exam and computer exam in order to qualify for the post…the computer skills acquired from telecentre will assist in completing at job market within the country and outside" (UTE 1).

"… Telecentre is the best channel to overcome poverty through the use of its facilities such as internet and computer training etc. Telecentres facility (internet) has helped me to secure admission and scholarship at University, I applied via online and my application was successful delivered. After some time I received an e-mail which says that I'm among those who have been selected for the scholarship I should come for an interview at University campus. I attended the interview and passed it and awarded year renewable scholarship depending on academic performance. Assume telecentre was not in place, I wouldn't have got an opportunity to study at university. I thank the government of Rwanda for this initiative of deploying telecentres to rural areas" (UTE 2).

4.6.3 Challenges in use of telecentres

Respondent MTE explained that the most challenge in use of telecentre is that rural communities do not turn up to use telecentre accept those that are resident in Huye town mostly being university students. Asked why they are not coming to use telecentre, the manager responded that most of the rural communities are not educated, language issue, and some even think that telecentre is government business to consume their money through government so called (amajyambere) meaning ICT.

Asked other respondents what challenges they encounter in the use of telecentre and ICTs in general. The respondent (UTE1) pointed out that the challenges she met when she started her training at TE, the first one was using keyboard in typing and the second was excel because of those mathematical formulas and yet I'm not good in mathematics and last but list was Microsoft access in creating query tables and records.

"… the challenges met were technical for example machine hanging up when you are on web browser and stops you from working until it has to be fixed …But my concern

challenge in general as earlier mentioned TE is not capable of making a tangible contribution to the community development of the whole district. The district is too big to be served by one telecentre" (UTE 2).

4.7 Nyanza community telecentre

Nyanza community telecentre is located in Nyanza district in the Southern Province of Rwanda, Its capital city is Nyanza. Telecentre serves a population from 10 sectors made up of 420 villages (known locally as *imidugudu*). That population is estimated at 282,445 on area of 671.2 km^2 with inhabitant of an average of 335, 5 km^2.

Telecentre is the only public facility that offers a range of communications services, including internet access, e-mail, and fax etc as well as administrative services such as photocopying, printing, scanning, typing service, word processing, spreadsheet, and database service etc . Historically, there were no post offices, banks or other facilities for these administrative and communications services.

The respondents from Nyanza telecentre were identified below (Table 4.8) as follows:

Table4.8: Codes given to participants in place of their real names from Nyanza Telecentre

Telecentre / Respondents	**Code**
Nyanza community telecentre	TF
Manager Nyanza community telecentre	MTF
Nyanza community telecentre User 1	UTF1
Nyanza community telecentre User 2	UTF 2

4.7.1 Telecentre contributions to community development

Respondent MTF explained that telecentre offers variety of services to the rural community such as computer training, internet service, photocopying, scanning, and

printing etc. Telecentre has also introduced an additional services these include offering free training to the entrepreneurs to start and grow businesses. Telecentre also advertise/promote the coaching program to the local business community in various areas. These areas include entrepreneurial development services, business registration, and business advice and counseling, IT services, business information services, export development services, tourism information, tax advisory services, environment compliance and cleaner production services. All these services are provided in away to promote development to rural communities. He further highlighted that:

> "In rural areas of Nyanza, telecentre have become information facilitator to the community through internet, computer trainings and other service such training on how to start and manage a business among other, and such facilitation provides availability, accessibility, and affordability of information leading to community development" (MTF).

Telecentre user (UTF1) described the opportunities and benefits acquired from the telecentre:

> "... in terms of opportunities, I managed to learn computer and internet and now I can type my tender bid document on computer. I also use internet to communicate to other business men aboard via e-mail regarding prices on commodities before making quotations for tender. This helps me to make calculate profits in advance and I use spreadsheet software that I learnt from telecentre to do calculation. … Before I used to write on papers and take the hand written papers to Kigali to be typed on computer and I could also use calculator for calculations and sometimes I make mistakes. …With the use of ICTs such as spreadsheet software I'm no longer occurring errors in my calculation like before spreadsheet does not permit errors once there is an error it will not work out. I have benefited from the use of telecentre facilities such as internet and computers to improve my quality of work, making it faster and easier".

> "… I can say that I have gained many things after the establishment of telecentre, most important is the certificate obtained in Cisco system networking as an additional to my degree in engineering. It will help me to get better job and earn good salary hence increase in my well-being socially and economically. Secondly I use internet to research

for the job advertisement worldwide as I read articles on networking to develop more skills in computer" (UTF 2).

4.7.2 Opportunities and benefits of telecentre to users

The respondent (MTF) explained that telecentre have created opportunities and benefits to the people of Nyaza district through various telecentre services as earlier mentioned. Most of community members who have benefited through government telecentre initiative were students, farmers, business people, and civil servants etc. The manager highlighted some of the benefits to each of the above mentioned community members.

The respondent indicated that students use internet to do their research on various subjects such as history, geography, social science, and economics etc, they (students) access to information about education opportunities for further studies, easy access to exam results, computer trainings, and even those students who do their studies via distance learning use telecentre. In case of farmers, he indicated that farmers use internet to access market price information of their agricultural products, weather information for crop planting, and also they participate in computer trainings so as to manage their database record etc.

Business people use internet to access government and private tendering information, computer training courses to make their business more efficient and also to enable them to keep their business records easily and neat. For civil servants, they use internet to communicate to their friends in other districts through e-mails, job advertisements, do research in relation to their job work, and also sending weekly reports to the mayor of the district. He made his remark by saying that:

> "…before the establishment of telecentre, some of these services above mentioned could not be done. …those that could be done were through hardworking, time consuming, and very costly. But now the services are being offered at telecentre easily, less time and at low cost".

The respondent (UTF1) in his response acknowledged the beneficial impact that telecentre has made to him. He is a business man before he used to spend too much

money traveling from Nyanza to Kigali the capital city to get his work done such as typing tender bid document on computer and printing hard copies to submit for tender evaluation etc. plus the money he spends of transport and sometimes accommodation if the work is not done in one day. He further said that the establishment of telecentre is an opportunity to him because the same type of work is being done at telecentre and even at low cost. He has benefited through saving that money he used to spend and now he can use to care for his family through buying food etc. hence leading ton an increase in his income. He provided simple example to which telecentre have benefited to community.

> "…before when someone need to make a photocopy of an identity card you had to go around looking for some who will go to Kigali the capital city to help you to get a copy. It could take you three days or more to get the person but now it takes you a second to get that copy of identity card. … surely it is an opportunity to have a telecentre in our community as well as benefiting through its services such as photocopying, printing, scanning, word processing, and internet. To me this is one way of promoting rural community" (UTF1).

The respondent (UTF2) expressed her view on opportunities and benefits that telecentre have provided to the communities by pointing out couple of examples, she pointed out that telecentre have provided opportunities through use of ICT services such as internet to get informed on different aspects of life like health and medical information on HIV/AIDS and malaria; education information such as knowledge skills, vacancies in different schools, Universities; socio-economic such as job advertisement, tendering information; good governance information such as corruption, elections, gender; agriculture information such as weather information, market price information etc. She pointed out that such information could be delivered through radio as announcement and could be announced once or twice if you do not get it, that would the end and miss an opportunity of getting HIV/AIDS drugs as an example. But through use internet at telecentre information can be retrieved any time. She added that telecentre does not stop from providing internet it also helps the communities in getting other

services which was not in place before such as photocopying, printing, and sending fax etc.

4.7.3 Challenges in use of telecentres

Despite the fact that telecentres manage to provide services earlier mentioned there are some challenges, majority of the people of Nyanza district are un educated, they do not know how to read and write and this hinders most of the communities in use of telecentre, despite government effort in making all people at least know how to read and write still remains a challenge (MTF). He further said that some communities live far away from telecentre and they (local resident) have to catch public bus that takes two hours to reach at telecentre and on additional to that, they have to pay some transport fee. Therefore they find challenge in travelling to come for telecentre services earlier mentioned.

Asked other respondents what challenges they encounter in the use of telecentre and ICTs in general. The respondent (UTF1) said that:

> "… I do not encounter any challenge in the use of telecentres and ICTs in particular, but I will explain some of the challenges that Nyanza communities face in regard to use of the telecentre. First and fore most, telecentre is allocated on the main road in Nyanza town and most of people live far way from here no way they can have access to the telecentre, secondly lack of awareness about the telecentre. It is only those communities who live in Nyanza town that can use telecentre".

Another respondent (UTF2) expressed her view in this way: To her, she did not get any challenge in use of telecentre facilities. But she made a comment that most of the communities are not getting opportunities and benefits due to challenges such as lack of awareness. She mentioned that some even do not know what a telecentre is all about and some those that know what is it about they argue that telecentre is as far from their location areas the distance is more less equal to travel to Kigali the capital city.

4.8 Summary of rural telecentres e-access case studies

Some of the major findings of the rural telecentres e-access case studies are given below. They are grouped according to the objectives of the study

4.8.1 Socio-economic development

In all districts, telecentres were only public facilities that offer coaching program to the local business community in various areas. These areas include entrepreneurial development services, business registration, and business advice and counselling, IT services, business information services, export development services, tourism information, tax advisory services, environment compliance and cleaner production services. This has created skills and jobs to rural communities. In all districts, telecentres were the only place that provides public access to the internet. In all districts, telecentres were the only place that provides public facilities at low cost. In all districts, telecentres were only public facility that offers free training to the entrepreneurs on how to start and manage businesses.

The respondents said they have used knowledge acquired from telecentre training on how to start and grow business and managed to secure loans from bank and now their business are operating perfect and they have improved socially and economically.

Respondent in Rulindo community telecentre revealed that telecentre provides training to employees districts and community local leaders starting from level of village (known as *Imidugudu*), cell (known *as Akagari*), and sector (known *as Umurenge)* in various ICT courses such as introduction to computers, word processing, spreadsheet, database, publisher and internet. This has improved their efficiency at their workplace. All telecentres visited use electricity for supply of power to telecentre facilities.

4.8.2 User opportunities and benefits

The respondents said they use internet to access information about education such as learning materials like school curriculum, teacher's guide, and text books; easily access to their national examination results reducing the cost of travelling to RNEC Kigali as

well as time consuming; and opportunities for further studies. The respondents indicated they use telecentre facilities such as internet to access information on job advertisements, government and private tender information. The respondents said that through telecentre facilities such as internet and computer trainings they have acquired computer knowledge skills, secure jobs, tenders, and study scholarships

The majority of respondents said that free training to the entrepreneurs on how to start and grow businesses and IT services such as internet and computer trainings are the most common beneficial services among others gained from the use of telecentre. The respondents indicated that they got an opportunity to study Cisco system networking program at telecentre and they awarded certificates.

4.8.3 **Challenges**

The respondents indicated that lack of education and language barriers are the most challenging in use of telecentre facilities such as internet and computer programs. The respondents said that using keyboard for typing and handling mouse, as well as learning spreadsheet and database was a challenge to them. The respondents indicated that old people find it difficult in use of telecentre facilities such as computers in learning programs such as word processing, spreadsheet, and PowerPoint as well as internet.

Historically, there were no post offices, banks or other facilities for these administrative and communications services. The respondents said that the majority of the people are not aware of the telecentre and its services. The respondents said that telecentre is far from some of the community homes and they find it difficult to come to telecentre they to catch public bus and pay some fee. Other communities (known as non-users) still thinking that telecentre is for luxury and wastage of time and money.

The respondents said that one telecentre is not capable of making a tangible contribution to the community development of the whole district. The district is too big to be served by one telecentre. Three out six managers revealed that at present the most

challenge they face is the size of the building, that telecentre is operating in, it is small compared to the number of people that is intended to provide service.

4.9 Conclusion

The findings presented in this chapter were organised and discussed according to the interview questions and were presented under the following themes: telecentre contributions to community development, opportunities and benefits of telecentre to users, and challenges in the use of telecentres. Each of these themes ware discussed according to each telecentre. Based on the data presented from research findings in this chapter, formed the basis for the data interpretation presented in chapter five.

The key themes that emerged from the finding presented indicate that, although there are developments such as knowledge skills, job creation, easier and faster means of communication, increased access to information related to opportunities for further studies, agricultural market prices, soil fertilization, and weather information through use of telecentre facilities in rural areas of Rwanda, significant challenges for effective use of public facilities for development of rural communities still exist. Some of these include, uneducated, lack of skills, language barrier, lack of awareness, and telecentre is too small to serve the entire district. As a result, telecentre mainly benefits small group of user communities.

CHAPTER FIVE: INTERPRETATION OF RURAL TELECENTRES E-ACCESS CASE STUDY

5 Introduction

This chapter provides an interpretation of research findings reported in chapter four of the study which indicated the full appropriation of new technology in use of e-access for socio-economic development. The research findings were derived from qualitative study on the role of telecentres in promoting socio-economic development. The chapter also provides a review of literature that supports the interpretation of research findings of the study.

The purpose of this research is to explore the strengths and weaknesses of NICI Plan II policy formulation on the role of telecentres in socio-economic development. This was done by reviewing the actions of six out of thirty government telecentres in promoting socio-economic objectives set in NICI II plan. The study examined the following aspects on the role of telecentres: telecentre contributions to community development; opportunities and benefits of telecentre to the users; and challenges in the use of telecentres. Analysis of the results of the study was used to analyse the strengths and weaknesses with respect to policy objectives and policy statements set out in the NICI II Plan and thus to inform policy implementation for establishment of other telecentres. These objectives include: promoting community access to information, contribution towards socio-economic development, improving the delivery of public and private sector services, and ensuring effective e-government and e-governance.

The central question of the study:

How do the lessons from telecentres provide guidance for strengthening future policy on telecentre activities for socio-economic development?

In order to explore the main research question, the following are the guiding questions that will frame the research:

1 To what extent are telecentres effective in promoting socio-economic development in rural communities?
2 What are the trends in the use of telecentres in improving delivery of services to local communities?
3 What challenges affect access and use of telecentres for access to information and e-governance?
4 To what extent does the Rwandan government telecentres implementation programme support the socio-economic development objectives specified in policy?

In this chapter data are organised and presented according to the themes reported in chapter four of study four and other empirical data provided in the chapter. The themes include: telecentre contributions to community development; opportunities and benefits of telecentre to users; and challenges in the use of telecentres. The discussion addresses the guiding sub-questions of the study mentioned above.

5.1 Telecentre contributions to community and socio-economic development

In this section the theme addresses the sub-research question: To what extent are telecentres effective in promoting socio-economic development to the communities. The findings of the study revealed that the most effective benefits of e-access to rural communities through telecentres to be skills development, job creation, increased income within the community, and low cost in telecentre services. The findings of the study clearly indicated that telecentre facilities have been effective in contributing to community development through a range of communication services such as internet access, e-mail, and fax etc and administrative services such as photocopying, printing, scanning, typing service, word processing, spreadsheet, and database service etc. The findings also revealed that telecentres provide free training to the entrepreneurs to start and grow businesses; advertise/promote the coaching program to the local business community in various areas. These areas include entrepreneurial development services, business registration, business advice and counseling, and business information services. These study findings are in line with Mulozi (2008:24) argument which states

that “through skills training services, telecentres help to build a skill base for local business”.

Fontaine (2002) also indicated that the effective usage of telecentres facilities play a major role in promoting community access to information for social activities, commercial/business growth, and research purposes. Access can mean internet, computing, and telecommunications tools provided to the communities. Besides, Madden, Savage & Simpson (1997) pointed out that telecentres performs an important role in community development through generation of business enterprise and employment; empowering people through access to knowledge and information; and facilitation of technology and diffusion.

Other scholars from the review of literature that supported the study findings include Bailey & Ngwenyama (2009:1) who pointed out that “telecentres have been established in many countries as a means of providing access to Information and Communication Technologies (ICTs) in order to enhance community development”. Sey & Fellows (2009:01) also described that telecentres impact to the communities is high in a variety of areas such as development of e-access skills, job creation, and civic engagement Jacobs & Herselman (2005:74) as well indicated some of the developmental areas to which telecentre felicities have contributed to the community, these include: improving computer literacy and knowledge in the community, creates employment opportunities, provides e-access in the community, services not too expensive, and friendliness towards the consumers. Similar sentiments were found in the findings of this study most of the respondents said that through the use of e-access, telecentres have contributed to the community development in various areas such as skills development, job creation, increased income within the community, and low cost in telecentre services as earlier mentioned. Each of these developmental areas is discussed in turn below:

5.1.1 **Skills development**

The findings from the study revealed that telecentres promote community development through e-access, a result of user’s access to ICTs such as internet services, computer

trainings, and other IT services. In this study most of the respondents revealed that through telecentre facilities such as internet and computer trainings have helped them to acquire computer knowledge skills, secure jobs, tenders, and study scholarships. The sentiments justified by most of the respondents in respect to skills development was that they have gained many things after the establishment telecentre, most important is the knowledge obtained in computer training courses such as introduction to computers, word processing, spreadsheet, database, publisher and internet. They mentioned that such programs have contributed to their academic development through acquisition of computer skills and exploitation of new ideas that will support them in future. This was supported by Kaiser, 2005; Parkinson & Ramírez, 2006; Parkinson & Lauzon, 2008 cited by Sey & Fellows (2009:8) argument which states that "there are signs that the use of public access venues for computer skills development is linked to users' perception that exposure to computers and the internet will enhance their current and/or future employability". Ariyanandu (2009:15) added that "one of the greatest impacts of telecentre network has been the opportunity given to poor people to improve their knowledge on computer education. In many telecentres, computer literacy is one of the most popular activities".

The findings also revealed that some of the communities have managed to upgrade in computer knowledge with the course of Cisco system networking which will help them to secure better jobs. This aligns with the study conducted by Hunt (2001) in various countries across Latin America and the Caribbean; the study revealed that telecentre ICTs brings about significant positive change in communities such as skills development, employment opportunities, increase access, and outreach. The current study findings indicated that telecentres have provided free computer trainings in various ICT courses such as introduction to computers, word processing, spreadsheet, database, publisher and internet to local administration of the district and it has improved their efficiency at their workplace. The study findings revealed that the next phase will be training all district community local leaders starting from the bottom level of village (known as *Imidugudu*), cell (known *as Akagari*), and sector (known *as*

Umurenge). This will help the local leaders to develop computer skills as well as improving in service delivery and manage to communicate easier and faster especially in sending day-to-day report to the district mayor via internet (e-mail) instead of travelling to the district headquarters to submit the report. The study finding were supported by Mukerji (2008:2) statement, which states that "telecentres as delivery point for e-government services can lead to better local administration and improved government citizen/business/government interface leading towards increased reach, transparency, responsiveness, accountability, efficiency, effectiveness, citizen's empowerment and participation".

5.1.2 **Job creation**

In this study the respondents acknowledged the socio-economic upliftment through the use of telecentre facilities such as internet, computer trainings, and other services such as free coaching program to the local business community in various areas like entrepreneurial development services, business registration, and business advice and counselling, IT services, business information services, export development services, tourism information, tax advisory services, environment compliance and cleaner production services. For example, many claimed that telecentre facilities have led to job creation and study opportunities including securing study scholarships via internet.

Particular example was narrated by a respondent in Kayonza community telecentre as she expressed her change of life since she started using telecentre. she stated that she had initially capital of 100,000Rwf(USA170$) in opening a boutique shop after her failure to go get marks or points to take her to university. But after the establishment of telecentre she registered on free training course on how to start and manage business at telecentre, after her completion, she managed to secure loan from banque populaire du Rwanda (BPR) (known as people's bank of Rwanda) of 1,000,000Rwf and now her business has increased making more profits and able to re-pay back in monthly installment to the bank and she started that she is planning to resume her studies on self sponsorship on a part-time study at university.

The findings revealed that telecentres have been effective in promoting communities especially community co-operatives in securing tenders from government, NGOs, and private institutions. Particular example was narrated from a respondent who revealed that a community co-operative organisation dealing with supply of agriculture food crops such as rice, beans, and maize have used telecentre facility such as internet and managed to secure eight tenders in two years. These findings align with the study conducted on rural business process outsourcing through telecentres in India which indicated that "ICT applications have played an important role and have been instrumental in providing jobs and income opportunities, education and training, access to markets, information related to economic activities, and a range of citizen services" (Datta, 2009:9).

5.1.3 **Increased income within the community**

In the this study, the findings were in accordance with two scholars views on telecentres effectiveness in increasing income to the community Mukerji (2008:2) pointed out that the effective usage of telecentre facilities "can lead to an increase in income and hence improvements in the livelihoods of the people by providing increased access to information related to the market, better farming practices, available job opportunities etc". Oestmann & Dymond (2001:4) also pointed out that one of the effective and positive usage of telecentres among others in promoting socio-economic development was through giving local producers access to market information, thus reducing the need for middlemen and increasing rural incomes. Example is web-based retailers of crafts and artwork known as world2market (*www.elsouk.com)* there is evidence that activities carried out have increased income of local craft persons and artists.

Both arguments support the findings of study where respondents acknowledged the beneficial impact that telecentre have made to them especially the local business people. The findings revealed that local business people used to spend too much money traveling from their location place to Kigali the capital city for typing tender bid documents on computer and printing hard copies to submit for tender evaluation, plus the expenses spend on accommodation if the work is not done in one day so that they

can return to their place. With the effective establishment of telecentres the same type of work is being done at telecentres and even at low cost of charge. The study findings also revealed that local community use e-soko database www.e-soko.gov.rw to access information on market prices on agricultural products such as Irish potatoes, and rice etc within the country. They also browse internet for information via search engines like Google and yahoo and at the same time use it to reach out to other farmers in the region and beyond in regard to new methods of farming and this has led to their increase in productivity.

5.1.4 **Low cost in telecentre services**

Majority of the respondents in this study revealed that telecentres were the only place that provides public services at lower cost, easier, and faster to communicate. The findings from this study have shown that they (respondents) prefer pay to use internet to get information and computer training to get skills because it is at low cost and information can be retrieved anytime anywhere the user can be located. However, one respondent revealed that the charge for telecentre service (i.e. internet) is still high especially for people in rural community compared to their earnings which are still at low-level and it is difficult to afford to pay for internet.

The finding also indicated that before the establishment of telecentre, people used to get communications services such as internet access, e-mail, and fax etc and administrative services such as photocopying, printing, scanning, typing service, word processing, spreadsheet, and database service etc at high cost plus cost of travelling to Kigali because it was the only place to offer such services. But now the services are being offered at telecentre easier and faster at low cost.

These findings of study are in line with the literature which indicated that the costs of using telecentres facilities are held at low cost (Jacobs & Herselman, 2005). As their research conducted on ICT-Hub model for rural communities indicated that the customers could afford to pay for the e-access usage and with the majority of the respondents indicated that the prices were very reasonable. Mulozi (2008:23) also

supported the current study findings adding that “most of rural African communities fall within low-income levels and generally lack access to ICTs, telecentres enables local people to access ICTs at a low cost with shared services”.

5.2 Opportunities and benefits of telecentre to users

The second theme of the study sought to identify and analysis the trends in use of telecentres in improving delivery of services to local communities by exploring the opportunities and benefits of telecentres to the users, in this section the theme addresses the second sub- research question: What are the trends in the use of telecentres in improving delivery of services to local communities. The findings revealed the most common opportunities and benefits of telecentre to the users to be training services (such as computer training, business training), business service support, and access to information (such as education, health, agricultural, and business). The findings are supported by Clark (2001:2) argument that telecentre users are driven to telecentre “for a quality, competitively priced and timely products, accessibility, customer service, new learning opportunities, social and work opportunities, less travelling, new and maintained services, and services to make them more efficient and competitive”. Colle (2001) also added that telecentre facilities offer significant opportunities to communities like information sharing and benefits through access to education, health, marketing advantages, and better connection between government and individuals.

5.2.1 Training services

The findings revealed that the establishment of telecentres have provided opportunities to the rural community in various areas of training such as computer training and business training with most of respondents revealed that it was through training services that they could be able to get familiar with information technology and develop basic IT skills, technical knowledge and communication skills that they now apply to their workplace. Other studies which reported similar findings include the study of Murray *et al*. (2001:198), the A CTCNet (1998) survey revealed that “…most respondents reported that telecentre had helped them overcome their fears of computer and increased their

self-confidence and skills in using them. The training programs range from the most basic to the more advanced to computer skills".

5.2.1.1 **Computer training**

The findings revealed that telecentre facilities have provided an opportunity to rural communities to study computer training programs such as introduction to computers, word processing, spreadsheet, database, publisher and internet hence benefited through gaining computer knowledge skills, improving work skills, information sharing, upgrading in advanced computer courses like Cisco networking program, improving social network, employment opportunities, and access to information such as learning materials, market price information, and study opportunities etc. These findings align with Karara (2010:1) argument which states that "telecentres enhance efficiency and effectiveness of local government processes using ICT and improve the delivery of government services to the rural population, empowering people in rural areas in ICT, computer training, and create services based on ICT and facilitating access and connectivity". Norton *et al*. (2000:103) as well indicated that in their study, they found that "Hungary's telecentres offer services such as computer training, acting as centers for information gathering and social projects, sponsoring cultural events, and assisting residents with finding jobs". The findings were also supported by Ojo (2005) who emphasized that telecentres play an important role in use of ICTs for community development through providing training in use of computers, communication services, and administration services.

5.2.1.2 **Business training**

The findings indicated that telecentres have played important role in promoting local business communities through business training program. The findings from the study revealed that telecentres were only public facility that offers free training to the entrepreneurs on how to start and manage a business. The respondents mentioned that they got an opportunity to be trained in various areas such as business planning, entrepreneurial development services, business registration, and business advice and counselling and this has created skills and job opportunities to them. Particular example

was narrated by one of telecentre managers who revealed that they work closely with local business community cooperatives and so far four co-operatives have came with their draft business plan proposal and were trained on entrepreneur development service such as how to start and manage a business, and six more are currently on training. This has helped the local business community cooperatives to secure loans from banks and manage their businesses. The findings of this study were a bit contrary with the results obtained by Norton *et al.* (2000) revealed that telecentres in middle-income countries offer basic services and advanced services such as business training, support distance learning, and telemedicine while telecentres in lower income countries offer basic services such as telephone services and word processing. This argument does not align with the findings of the current study because the study findings indicated that Rwandan telecentres offer business training and yet Rwanda is considered to be among lower income countries.

5.2.2 **Business support services**

In this study, the findings revealed that telecentres were only public facility that advertise/promote the coaching program to the local business community in areas of entrepreneurial development services; business registration; business advice and counseling; IT services; business information services; export development services; tourism information; tax advisory services; environment compliance and cleaner production services. The findings of this study indicated that telecentres does not stop from business training, it also continue to make follow up on their business progress, giving them business advices and providing professional business support guide on securing loans from bank and provide other necessary support that would make their business success. This was reinforced by telecentre local user who narrated that she had capital of 100,000Rwf and after her acquired skills from telecentre business training and business advice and counseling she managed to secure 1,000,000Rwf from the bank and now her business is progressing well making reasonable profits.

In business support services, the findings are emphasized by Norton *et al.* (2000:45) arguments that telecentres in early stages focuses on providing basic services such as

photocopying and computer use and training, and after certain period it starts “focusing on developing more advanced services and training programs for core users and developing value-added activities such as small business support to enlarge its reach in the community”. This is in line with the Rwandan telecentres as it has been revealed by the respondents that telecentres initially used to provides services like, photocopying, scanning, binding, CD-writer, printing, public internet access, and word processing and after a certain period other services like business training and business support services were introduced at free of cost in order to promote rural communities.

5.2.3 **Access to information**

Telecentres were the only public access points located in rural areas that provide public with e-access this has been revealed by all the respondents from study. They indicated that e-access have created more opportunities and benefits to the public much more from computer basics to advanced in various areas of education, health, agriculture, and business. The study findings were supported by Gómez & Ospina (2001:1) statement that:

> The emphasis on access to the technology, though important, has shifted to the far more important issues of its meaningful use and social appropriation. Much of the effort to date has been dedicated to providing public and community access to the Internet through telecentres and related activities.

The findings on each of the above mentioned areas were reinforced by particular examples from respondents of the study and supported by the review of literature as shown below:

5.2.3.1 **Education**

The findings revealed that telecentre facilities have provided opportunities to rural communities to have access to information via internet on learning and teaching materials like school curriculum, teacher’s guide, and text books; easily access to national examination results reducing the cost of travelling to RNEC Kigali and time consuming, securing university admissions and scholarships via online, language knowledge skills, assignments and research via Google research engine, internet

libraries, and students who do their studies via distance learning used telecentre facility. The benefits includes knowledge skills development, low cost, less time consuming, easier and faster means of communications, and further studies etc. The findings align with Gómez & Ospina (2001:6) statement that:

> Telecentres offer students and the public new sources of information, and constitute important tools for doing research and to facilitate the learning process with the help of trainers. …students become telecentre users to do school assignments and research, and, in their wake, other users may end up doing likewise.

5.2.3.2 **Health**

The findings revealed that telecentre facilities have provided opportunities to rural communities to have access to information via internet on human diseases information on HIV/AIDS, malaria, diarrhoea etc, and findings revealed that getting such information helps the local communities to know better on how prevent such diseases before being attacked by the diseases. To reinforce the argument, they mentioned that although such information could be delivered through radio and television it comes as announcement and could be announced it once or twice and if you do not get it, that would the end and miss an opportunity of getting HIV/AIDS drugs for example. The benefit is that with the use of internet at telecentre information can be retrieved any time and anywhere in the country where access is available. The findings of this study were supported by a study report of UN ICT Task Force Report (2004:24) "... the use of telecentre ICTs have provided an effective and cost-effective channel for the distribution of healthcare and disease prevention information to the general public". Telecentres have become more effective channel to access a variety of information and communication covering a variety of social aspect of health. Colle & Roman (2001:30) added that:

> Telecentres can provide communities with knowledge and information from outside sources, which can then be integrated with local knowledge. For example, a telecentre can be used by a local health organization to collect information and develop material for public awareness programs on issues such as reproductive health, HIV/AIDS or female genital mutilation

5.2.3.3 **Agriculture**

Farmers got an opportunity to use internet to get information on various methods of farming through information gathered from internet on (government, NGOs etc) websites, effective fertilization, up to date weather information, and market price information (e-soko database system enables local farmer to access local market price information via mobile SMS) hence giving local farmers an opportunity to negotiate in selling their products. The findings revealed that farmers have benefited from such information through knowledge skills on how to increase their production that will generate more income to them. The findings align with the scholars arguments Duncombe & Heeks (2002) argued that ICT is regarded as a means for communicating market/demand information.

According to Kanyesigye (2011) Rwanda in particular, through the use of telecentre ICTs has far reaching positive impact on famers' livelihoods. Example, the e-soko project has played a significant role in improving socio- economic development to communities in Rwanda and for this it has won the 2011a ward recognised as a model innovative project in Africa that facilitates Rwandan farmers to access market prices the award was awarded by Technology in Government in African (TIGA).

The findings are also reinforced by the argument from by Mulozi (2008:24) who revealed that internet have provided an opportunity to local farmers to access information that enable them to improve farm practices, market price information, linking agricultural products to market, and increase in income levels. Particular example was narrated to Zambia, local farmers use www.iconnect.zm and enables local farmers to access local price information via mobile SMS. This aligns with the findings of the current study which revealed that for case of Rwanda local farmers use www.esoko.gov.rw for local market price information.

5.2.3.4 **Business**

The findings revealed that local business communities got an opportunity to use internet to access information on government and private services such as job advertisements, tender information, commodity price information, and with one respondent mentioned that she use internet to read information on how to avoid corruption. They also use internet to communicate to other business parterres within the country and abroad through e-mail, chat, facebook, and twitter. These services have made their business more efficient and effective, easier and faster means of communication, and services at low cost. The findings were supported by Mulozi (2008:24) argument that:

> A telecentre supports rural businesses through a variety of services. Local business uses shared ICT infrastructure to access and link with urban markets. Rural entrepreneurs utilise the services to communicate and access business information resources to expand their businesses. They use a local centre as a communication platform for products and services.

5.3 **Challenges in the use of telecentres**

In this section the theme addresses sub- research question: What challenges affect access and use of telecentres. The findings from the study reveals a number of challenges but the most critical which influence the use of telecentres which a line with those that are highlighted in the literature review in chapter two include literacy and level of education within the community, language barriers, lack of awareness and skills, and size of telecentre. These challenges align with Foley *et al*. (2002) who categorised such challenges into socio-economic challenges and socio-personal challenges. The socio-economic challenges include low- income, low level of education and lack of technology skills, and socio-personal challenges as attitudinal and behavioural issues such as low level of awareness, interest and acceptance of ICTs usage, and language barrier. The literature indicated that such challenges affect the use of telecentres in more particular the developing countries. Besides, the challenge of size of telecentres revealed in the study findings was not supported by the literature due to the fact that in other studies conducted did not indicate such challenge.

5.3.1 **Literacy and levels of education within the community**

The literacy and levels of education is the most concern within the rural communities as revealed in the findings of the study to be the most challenge to the use of telecentres. This is due to the fact that majority of the people in rural areas do not know how to read and write especially adult people and this affect the use of telecentre facilities. The findings of the study are supported by the statistics from other studies which revealed that over 90% of the population in Rwanda lives in rural areas depending on subsistence farming with close to 60% of the population living below the poverty line and almost 40% extremely poor (Siegel *et al*., 2011) the illiteracy rate estimated to be 50% among adults living in rural areas (Nsengiyumva & Baingana, 2007) and about 70-90 % speak only Kinyarwanda (Samuelson & Freedman, 2010). The findings also align with literature review which indicated that Low level of education and lack of technology skills are the key challenges affecting the use of telecentres in developing countries and as a barrier to achieve socio-economic development within the rural communities (Foley *et al*., 2002; Conradie *et al*., 2003; Akisnola *et al*., 2005; and Etta & Parvyn-Wamaliu, 2003). Kayabwe & Kibombo (1999:192) added that "…Illiteracy and low levels of educational attainment can hinder many rural people from using, or even visiting the telecentre, unless measures are put in place to take care of both literate and illiterates".

5.3.2 **Language challenge**

Although English and French are the official languages for business and commerce in Rwanda and English being compulsory language used in the schooling system, language still remains a challenge especially in rural areas where majority of the community speak local language known as Kinyarwanda. Kinyarwanda is the only local language used in Rwanda a part from foreign languages. The study findings revealed that some of the communities are limited from the use of telecentre facilities because of language barrier. The findings indicated that the most beneficial services offered at telecentre are computer training programs and internet and are offered in English and yet it is not understand by many of the communities. This affects most of rural communities especially adult people who have never got chance to study English even though they know how to read and write in their national language.

In this study, the findings align with Huerta & Sandoval-Almazan (2007) study conducted on telecentres in developing countries and indicated that lack of knowledge on English language, which is the predominant language in the internet is found to be a substantial barrier to the effective use of telecentres in rural areas. This is due to the fact that the application of ICTs are programmed in foreign languages such as English and hence most people in rural areas of developing countries are un-educated hence becoming a major challenge in adaptation and use of telecentre facilities.

5.3.3 **Lack of awareness and skills**

The awareness and technology skills from telecentre services are important to rural communities when used effectively can make change in people's livelihood. Nevertheless, the study findings identified awareness and skills as another challenge that influences the use of telecentres in Rwanda. The findings of the study revealed that majority of the rural communities are not aware of telecentres and its offered services hence led to lack of telecentre offered activity skills. Such challenges have made it difficult for communities to associate in the use of telecentres activities. The findings align with literature review which indicated that lack of awareness and skills limits rural communities from the use of telecentre facilities in developing countries (Foley *et al*., 2002 and Akisnola *et al.,* 2005). The findings also align with the results obtained by Madden *et al*. (1997:284) as they revealed that "telecentre users suggest that there is a lack of awareness about telecentre services offering and their benefits". The findings from telecentre users suggested that telecentre managers should establish appropriate public awareness for telecentres opportunities and benefits to the communities through various communications such as radio, meetings with community local leaders (*known as abayozi b'imidugudu*), word of mouth, and leaflets etc.

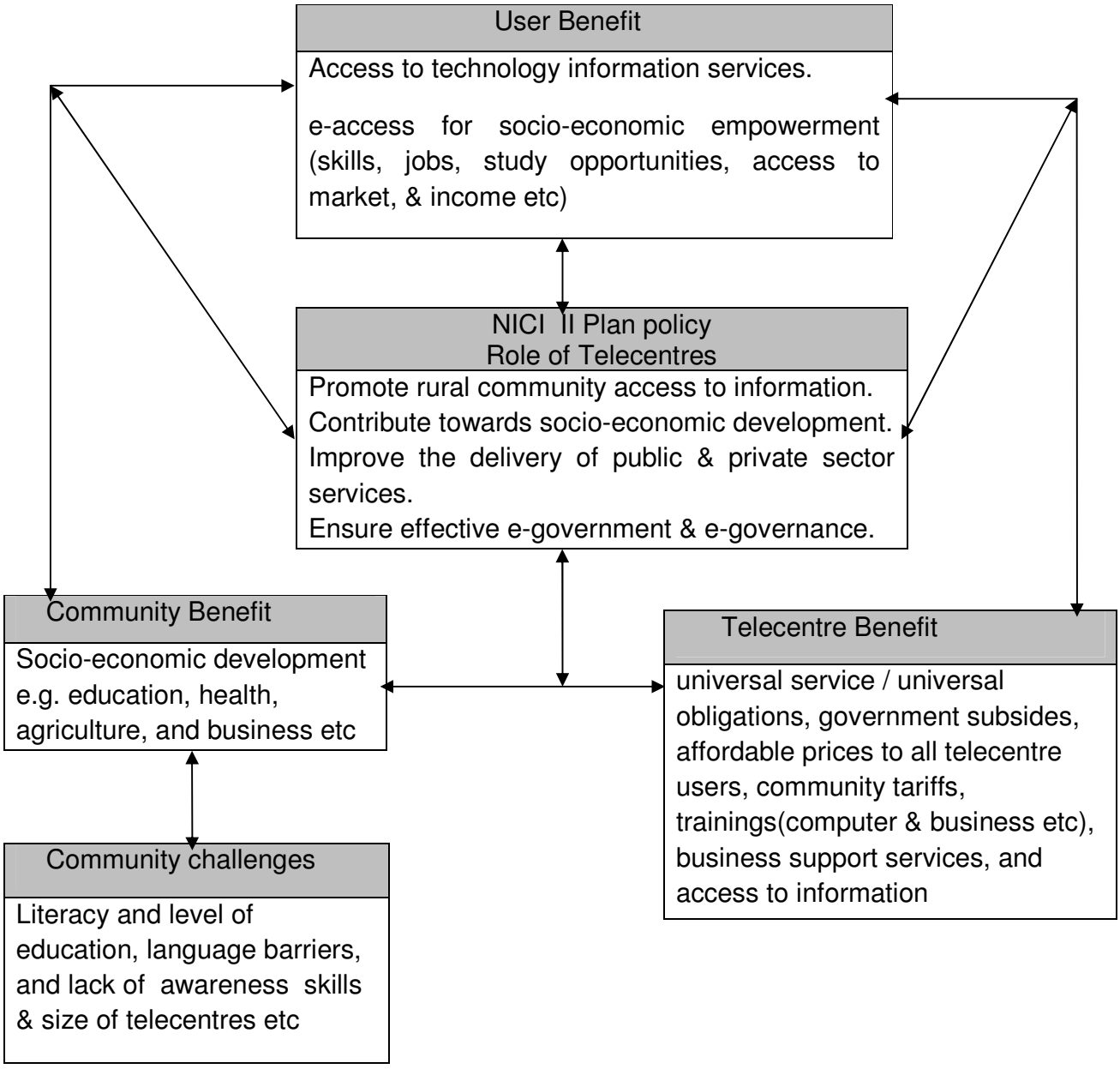
5.3.4 **Size of telecentre (physical form)**

The findings of the study indicated that the size of telecentres was a challenge, this was revealed by telecentre managers indicating that size of the building that telecentre is currently operating in is small compared to the number of people that is intended to provide services. Many people come and fail to get access due to shortage of space

and equipments. On other hand, telecentre users also revealed that one telecentre is not capable of making a tangible contribution to the community development of the whole district. The district is too big it can not be served by one telecentre.

Based on the findings of the study, analytical framework for rural telecentres e-access case studies were developed as shown below (Figure 5.1) which composes of elements of benefits and challenges for the use of telecentre facilities as earlier mentioned in chapter four of the study.

Figure5.1: Analytical framework for role of telecentres policy and practice based on study findings.



The framework conceptualised the elements that constitutes of the role of telecentres, user opportunities and benefits, community benefits, and telecentre benefits as well as community challenges. The NICI II plan from the inception has clear objectives of

integrating e-access to rural communities through various ways, and telecentres have been chosen as best channel to deliver access to information in rural areas of Rwanda. The resultant policy effect will be promoting socio-economic development, in this way rural communities will be empowered with the opportunities and benefits when integrate themselves with telecentre activities such as computer trainings, internet, business trainings and business advice and counseling etc. Besides, the findings of the study as previously discussed indicated that opportunities and benefits are the most demonstrated by telecentre users, however, there are challenges that hinder non-users from the use of telecentre facilities were indicated in the analytical framework elements (see Figure 5.1). The discussion on each of the elements was described in the above chapter while the NICI II plan policy for the role of telecentres was described in chapter one of study.

The discussion of the study findings helped the researcher draws out similarities and differences in the precipitation of telecentre opportunities, benefits and challenges viewed through the lens of case studies of six telecentres. The discussion on the study findings comes out with lessons for future NICI plan policy.

5.4 **Similarities**

All six cases indicated that telecentres were only public facilities that offer coaching program to the local business community in various areas. These areas include entrepreneurial development services, business registration, and business advice and counselling, IT services, business information services, export development services, tourism information, tax advisory services, environment compliance and cleaner production services. These have created skills and jobs to rural communities.

All six cases indicated that telecentres were the only place that provides public access to the internet. All six cases indicated historically, there were no post offices, banks or other facilities for communications services and administrative services. All six cases indicated that telecentres were the only place that provides public facilities at low cost. All six cases indicated that telecentres were only public facility that offers free training to the entrepreneurs on how to start and manage businesses.

All six cases indicated that telecentres have equal number of equipments. The reason is that all telecentres belongs to the government, and the government supplies the same quantity of equipments. All six telecentre managers revealed that Illiteracy and level of education, and language barriers are the most challenges to the rural community for the use of telecentre facilities. All case studies indicated that telecentres use electricity meaning that all telecentres are allocated in rural area towns where there is electricity.

5.5 **Differences**

Three telecentres (Gicumbi, Rulindo, and Nyabihu) offers Cisco system networking program at telecentre and awards certificates to the graduates. Four telecentres (Gicumbi, Rulindo, Nyabihu and Kayonza) appear to place a greater importance on trainings such as computer training and business training that provide more opportunities and benefits such as knowledge skills and job creation.

Two telecentres (Huye and Nyanza) appear to place a greater importance on providing services like photocopying, printing, scanning, typing service, internet access, e-mail that provides opportunities and benefits like access to information (sending and receiving e-mails, job advertisement, tender information, market price information, and student examination results information).

The study findings revealed that three out six telecentre managers Gicumbi, Rulindo, and Nyabihu) at present the most challenge they face is the size of the building, that telecentre is operating in, it is small compared to the number of people that is intended to provide service.

The findings of the study indicated that each telecentre serves an estimated population on an area km^2 that is different from one another for example :Gicumbi community telecentre serves an estimated a population of *364,000* on area of *829* km^2; Rulindo community telecentre serves an estimated a population of *264,854* on area *of 567* km^2; Nyabihu community telecentre serves an estimated a population of *298, 386* on area of *567* km^2; Kayonza community telecentre serves an estimated a population of *234,106 on area of 1,954* km^2; Huye community telecentre serves an estimated a population of

290,677 on area of *581.5 km*^{2}; and Nyanza community telecentre serves an estimated a population of *282,445* on area of *671.2* km^2

5.6 **Policy analysis of NICI Plan II**

The Rwandan ICT for Development (ICT4D) or NICI plan singled out e-access as a key enabler for socio-economic development in Rwanda towards its vision 2020 (RITA, 2006). The NICI II plan policy covers a wider context of socio-economic development objectives including telecentres objectives: promote rural community access to information; contribute towards socio-economic development; improve the delivery of public and private sector services; and ensure effective e-government and e-governance. Such objectives offer opportunities to bridge developmental divide and digital divide in rural, remote and urban areas. e-Access is necessary to facilitates socio-economic development process, because it can enable access to government services, communication services, community development services, education and training services, computer services and applications, resource services, social development services etc under conditions where such access has not been possible without ICT, such as in rural Rwanda.

The availability and use of ICT through e-access have provided opportunity to communities for accessing and using appropriate technologies to solve problems through engaging with developmental activities in areas of health, educational, agriculture, and e-commerce. The NICI II plan has greatly emphasised on establishment of telecentres to the community among other ICT projects in respect to the bridge digital divide (RITA, 2006). There have been significant progresses in NICI II plan for socio-economic development. This has been highlighted in the report of ECA (2011:2) which indicated that:

> The review of the achievement showed that NICI II implementation has enabled Rwanda to strengthen the foundation laid by the implementation of NICI I Plan to enable Rwanda make progress towards *sustaining* and *consolidating* her economic development and growth towards improving national prosperity and global competitiveness and eventually

achieving the status of a middle income status and an information-rich and knowledge-based economy in 2020.

5.7 Strengths and weaknesses of NICI II plan with respect to policy on telecentres

The government of Rwanda through NICI II policy plan has made the commitment to deploy thirty telecentres in the rural areas of Rwanda in support and facilitating the successful of its policy objectives. Nevertheless still shortages of access points to rural areas exist. The study findings indicated that telecentre deployed in each rural district is not enough to provide access to the whole district communities, indicating that telecentres are benefiting small group of communities that resident near telecentre. Another weakness drawn from the study findings is that all telecentres were deployed in the district main towns (known as district capital city) and most of the population resident far way from district capital, and this becomes a barrier to those communities in getting access to information and demand for more establishments of other telecentres. The alternative to the success of the policy in this effort a complement of two ICT buses known as mobile telecentres have been introduced to rural areas of Rwanda with more to be made available in future as it is mentioned in the policy statement of NICI III plan with respect to policy on telecentres.

5.8 Summary

This chapter presented an interpretation of rural telecentres e-access case studies in the light of the role of telecentres in promoting socio-economic development on major findings of important themes presented in chapter four and five of the study. The themes include: telecentre contributions to community development; opportunities and benefits of telecentre to users; and challenges in the use of telecentres. The study findings were discussed in line with the policy objectives and policy statement of NICI plan. The chapter also presented analytical framework drawn from the study findings on major themes analysed in the chapter. It also provides lessons for the future NICI plan policy. The next chapter provides conclusion and recommendations drawn from the study findings and objectives of the study.

CHAPTER SIX: CONCLUSION AND RECOMMENDATIONS

6 Introduction

This chapter provides the conclusion and recommendations which are based on findings from six cases in line with research objectives. The conclusion provides a summary of most significant issues covered in the study such as methodology used in the study; the state of telecentres in Rwanda; the role of telecentres in socio-economic development; and strengths and weaknesses of NICI II plan with respect to policy on telecentres. The study identified a number of key areas for recommendation in respect to improvement, strategies and approaches, and NICI III plan future ICT policy. These key areas include: Literacy and level of education; language issue; awareness and skills development; and telecentre's capacity. The emphasis on recommended areas for policy can result to meaningful use and social appropriation of e-access for socio-economic development to rural communities.

This study set out to investigate the question: How do the lessons from telecentres provide guidance for strengthening future policy on telecentre activity for socio-economic development? The response is set out in the discussion that follows.

6.1 Conclusion

The discussed literature review in chapter two and the study findings reveals that telecentres hold potential role in promoting social and economic development through use of e-access to rural areas. Besides, rural community development requires comprehensive and consolidated e-access policy and regulation strategies developed to create opportunities for development. Many developing countries have taken different approaches for rural community development, Rwanda in particular adopted National Information Communication Infrastructure (NICI) policy plan to prospect on ICT vision 2020 and policy on telecentres is a part of the plan. The government of Rwanda has "recognised the role that information and communication technologies can play in accelerating socio-economic development towards information and knowledge based economy" (RITA, 2006:17). Where by telecentres becoming important access points for

rural communities in adopting information and communication technologies for social appropriation. The purpose of the research is to explore the strengths and weaknesses of government telecentres in promoting socio-economic objectives set for telecentres in NICI II plan in order to inform policy implementation for more establishments of other telecentres. The research used a qualitative study to explore the role of telecentres in promoting socio-economic development in Rwanda viewed through the lens of case studies of six telecentres. The conclusive section looks at the state of telecentres in Rwanda, the role of telecentres in socio-economic development, and strengths and weaknesses of NICI II plan with respect to policy on telecentres.

6.1.1 **The state of telecentres in Rwanda**

Rwanda's program to establish telecentres was launched in the year 2005 as a way to promote socio-economic development to the community. In support, the government of Rwanda has earmarked a total amount of one billion U.S. dollars to be invested in establishing and promoting telecentres in the country" (Ochuodho, 2006:1) and currently there thirty multi-purpose community telecentres (MCTs) throughout the country. The study findings indicated that these telecentres have offered varieties of services to rural communities which have created opportunities and benefits such as computer knowledge skills, job creation, increased income, study opportunities, and access to information in areas of education (such as learning and teaching materials like school curriculum, teacher's guide, and text books; easily access to national examination results, securing university admissions and scholarships via online, language knowledge skills, assignments and research via Google research engine, and internet libraries), health (such as human diseases information on HIV/AIDS, malaria, and diarrhea), agriculture (such as market prices and wealth information), and Business (job advertisements, tender information, and commodity price information). Telecentres provide free training to the entrepreneurs to start and grow businesses; advertise/promote the coaching program to the local business community in various areas such as entrepreneurial development services, business registration, business advice and counseling, and business information services. However, there are also some challenges such as literacy and low level of education, language barriers, and

lack of awareness and skills. For the sustainability of telecentres, all telecentres are supported by the government of Rwanda and with the study observation perspective these telecentres have potential to promote socio-economic development to rural communities in Rwanda.

6.1.2 **The role of telecentres in socio-economic development**

Insofar as the study findings indicated telecentres play an important role in support to community development providing opportunities and benefits to areas of education, health, agriculture, and business etc. This has helped the community to foster their well-being through skills development, job creation, and increased income. These study findings align with the summary provided by Colle & Roman (2001:18) which describes the potential of telecentres in promoting socio-economic development to rural communities:

> Telecentres can be instrumental in the development and well-being of a community. Not only can they provide people with access to information related to health, nutrition, education and other social basic necessities, they can support local entrepreneurs with various business services, market information, and e-commerce opportunities; they can help people connect with distant family, friends, and government officials; and they can provide a setting for entertainment and social affairs.

6.2 **Lessons for future NICI Plan policy**

This section addresses the fourth sub- research question: To what extent does the Rwandan government telecentres implementation programme support the socio-economic development objectives specified in policy? This was addressed through the review of the policy objectives for the implementation program during the period of year 2006-2010 of NICI II plan for deployment of telecentres in rural areas of Rwanda with the aim of promoting socio-economic development. The research found out that this model has created opportunities and benefits, accessible and interactive among the communities. But the policy need further consultation and engagement with community development creating more effort in raising public awareness on the importance of use of e-access to facilitate the nation development process. The lessons for NICI plan on

telecentres for socio-economic development in rural areas of Rwanda include: The community involvement is essential for applicability of e-access within the community; awareness and skills development within the community can enhance the value of e-access to the community; rich in local content which will enable more effective use of e-access within the community; and the private sector role is required for future sustainability of telecentres.

6.3 Recommendations for ICT policy on telecentre's socio-economic development

Based on the findings and discussion presented in the study, several recommendations were made as a result of study undertaken on the role of telecentres in promoting socio-economic development in Rwanda. The study identified a number of key areas for recommendation in respect to improvement, strategies and approaches, and NICI III plan future ICT policy. These key areas include: Literacy and level of education; language issue; awareness and skills development; and telecentre's capacity.

6.3.1 Literacy and level of education

One of this study's recommendations is to improvement the level of education within the communities. The study recommends that Ministry of education should play an important role in educating rural communities so as to reduce illiteracy. This will allow National Information Communication Infrastructure (NICI) future policy plan objectives on telecentres to be achieved. The study agree with the strategies and approaches undertaken by the Ministry of education policy of deploying one laptop child (OLPC) in primary schools and using senior six students on vacation for teaching illiterate residents in their respective communities (MINEDUC, 2011). This will help to minimize the number of illiteracy in the country. Therefore, NICI policy on telecentres should work closely with such initiatives so as to uplift literacy rate in rural areas hence assisting the government meet the millennium development goal of cutting the illiteracy rate by half by 2015 set in the NICI plan future ICT policy. As earlier mentioned the illiteracy rate is estimated to be 50% among adults living in rural areas and about 70-90 % of the population speak local language.

6.3.2 **Language and local content issues**

Language is another critical issue from the study findings. It is the common challenge to most of rural communities in the use of telecentre facilities. It was revealed that majority of rural communities use local language Kinyarwanda and yet computer programs are programmed in foreign languages such as English. Although efforts from the government are under way to make English compulsory language used in the schooling system rural community adults still find difficult to over come the challenge. The study recommends that localised software in Kinyarwanda should be developed or outsourced and installed in telecentre computers and this should align with community trainings. The establishment of such programs can help local communities use computers effectively. These approaches have been effective in other countries like India, China, Singapore, and Malaysia as revealed in the literature of the study and it is quite working well to this developing countries. The NICI III plan future policy should draw lessons from these countries and provide necessary interface for ICT equipments and software in Rwandan local language. This will allow the majority of the rural community who have language barrier to get encouraged in the use of e-access. The in-house development of local content will enhance long-time sustainability of socio-economic development. Local content is necessary because it targets large group of community especially those in rural areas providing opportunities to obtain access to information that will led to socio-economic development.

6.3.3 **Awareness and skills for socio-economic development**

In order for telecentres to reach out to more rural areas, the study recommends that telecentres should create mechanism to raise awareness about telecentres and its services and how it can benefit the community. To improve on the level of awareness telecentres can reach out the community through the approach of radio announcements; “Umuganda” (known as community service or pillar meaning reference to future development of Rwanda). Umuganda occurs every Saturday of the last month where by all Rwandan in the country has to participate in Umuganda with in their respective areas or location and after Umuganda people re-group meet and discuss for their future socio-economic development; local leaders meetings; word of mouth; and

leaflets. Awareness is also a fundamental in policy making processes for future use of e-access and utilisation of e-access. Therefore, NICI III plan policy should be in more consultation and engagement with community development creating more effort in raising public awareness on the importance of use of ICTs to facilitate the nation development process drawing examples from countries like Singapore and Malaysia.

6.3.4 **Telecentre's capacity**

Although the government of Rwanda has deployed thirty telecentres in rural areas, the study findings revealed that these telecentres are small in size and are located in rural district capital cities. As there are many areas in the district which are marginalised and are information deserted. It is therefore, recommended that unified way of building telecentres should be considered before establishment of other telecentres. Telecentres should be big enough to accommodate many users and should be located in appropriate areas most preferred at the cell level. The NICI III plan should introduce new strategy which will expand telecentre infrastructure further into rural areas beyond the district main towns and this will empower and transform the majority of the communities through ICT usage. This will help to attract many users and provide opportunities and benefits that lead to income generation in the communities.

6.4 **Areas of further study**

This research is an exploratory case study which provides a basis on which further research needs to be done on the role of telecentres in promoting socio-economic development. The research covers small size of the sample of six telecentres and with small sample of eighteen participants and this does not warrant the generalisation of findings, there is a need to conduct more in-depth and large scale research to conclusively establish the perspective role of telecentres in promoting socio-economic development in more particular rural areas.

6.5 **Overall conclusion**

The overall conclusion of the study is that telecentres are an important tool for promoting socio-economic development in areas with very low levels of e-Access. Evidence from the literature and from the data collected for this study, shows that telecentres has the potential to offer benefits to rural communities in areas of education, health, agriculture and business. Despite the note progress, the study also revealed that there are some challenges that hinder rural communities from advanced e-Access and the challenges were found to be literacy and level of education, language barriers, and lack of skills and awareness.

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APPENDICES

Appendix 1: Interview Questions

A. Interview Questions for Telecentre Managers

Biographical details of respondent

Name of the Telecentre: .....

Location: .....

Name of the operator (Optional): .....

Date of the interview: .....

1. What services are currently offered in the telecentre?
2. What types of technologies are available in telecentre?
3. How easy did the users find it to familiarise oneself with new technology?
4. How has telecentre been useful to the community?
5. Describe the social and economic role your telecentre plays in support to civil society?
6. How successful has your telecentre been in reaching out to communities?
7. What ideas do you have for making telecentres more sustainable so that it continues to be relevant and used by the community?
8. What are the greatest challenges that telecentre faces?
9. How does your telecentre work towards solution for these problems?
10. Can telecentre contribute to socio-economic development of the people in this community?
11. What are your comments on the implementation of telecentres in the Rwandan context, do you think it has been/ will be successful in achieving what it was meant to achieve?
12. Does the government have a clear vision on telecentres?

Thank you very much for you cooperation

B. Interview Questions for Telecentre Users

Biographical details of respondent

Name of Telecentre: .....

Location: .....

Name of the User (Optional): .....

Date of the interview: .....

1. When did you first come to telecentre?
2. How often do you use telecentre?
3. What type of activities do you do at telecentre?
4. What did you learn from using the facilities at telecentre?
5. Does telecentre help you to do a good job at school or at work, if yes, in which way?
6. In which ways has your life changed since you started using telecentre?
7. How important are technologies used in telecentre to social well- being?
8. How important are technologies used in telecentre to promoting economic benefits
9. How has telecentre programme helped you?
10. What achievements are you most proud of after the establishment of telecentre?
11. How much do you feel your ability to use computer and internet has improved as a result of using telecentre?
12. What challenges do you face in the use of telecentre?
13. Which type of content such as educational, health, technical information, job markets, artistic, recreational, and tourism information do you go for at telecentre and what degree of interest do you have in specific content?
14. What do you think about the cost charge of using telecentre?
15. What is your perception of the quality of the Rwandan telecentres?

Thank you very much for you cooperation

Appendix 2: Timeframe of the study

Timeframe of the study

No	Activity	Months												Years	
														2010	2011
		J	F	M	A	M	J	J	A	S	O	N	D		
1	Registration														
2	Research methods course														
3	Proposal panel														
4	Proposal submission														
5	Writing chapter1,2,3														
6	Data collection														
7	Chapter4: Report data from interviews and findings from document analysis														
8	Chapter5:Analytical overview of the findings reported in chapter4														
9	Chapter6: Conclusion and Recommendations														
10	Draft of research report submission														

11	Revisions & corrections research report														
12	Submission of Revised research report														
13	Review of examiner's comments														
15	Correction and submission of final copy														
16	Graduation														

Appendix 3: Consent letter for telecentre managers

Consent form for collecting data from telecentre Managers

I am a student doing Masters of Management (ICT Policy and Regulation), a degree offered by the Graduate School of Public and Development Management (P&DM), University of the Witwatersrand, Johannesburg, South Africa. I am seeking your assistance with my study. You are being requested to participate in this study to explore the role of telecentres in achieving socio-economic development in Rwanda. The purpose of this research is to explore the strengths and weakness of telecentres in achieving socio-economic objectives set for telecentres in National Information Communication Infrastructure (NICI) II plan, in order to inform policy implementation for the remaining telecentres. The results of this study will be of significance to the domain of ICT policy plan in Rwanda to extend knowledge sharing to communities to achieve socio-economic development on better ways of telecentres implementation in the future and better ways of increasing community accessibility and use.

If you agree to participate in this study, you will be asked to take part in recorded interview which will last for an hour, the participation is voluntarily and you may withdraw your consent and participation during the time of this study at any time without prejudice. If you have any questions/explanations in participation during the study, please do not hesitate to contact the researcher.

I declare that I have read and understood the information provided by the researcher regarding his research and I am aware that all the information I give will be treated confidentially and processed anonymously in this research. I have received from the researcher the information regarding the advantages of the audio-tape recording interviews over the taking notes during the interview.

Name of Telecentre: .....

…… …… …….....

Participant's signature Date Place

Appendix 4: Consent letter for telecentre users

Consent form for collecting data from telecentre users

I am a student doing Masters of Management (ICT Policy and Regulation), a degree offered by the Graduate School of Public and Development Management (P&DM), University of the Witwatersrand, Johannesburg, South Africa. I am seeking your assistance with my study. You are being requested to participate in this study to explore the role of telecentres in achieving socio-economic development in Rwanda. The purpose of this research is to explore the strengths and weakness of telecentres in achieving socio-economic objectives set for telecentres in National Information Communication Infrastructure (NICI) II plan, in order to inform policy implementation for the remaining telecentres. The results of this study will be of significance to the domain of ICT policy plan in Rwanda to extend knowledge sharing to communities to achieve socio-economic development on better ways of telecentres implementation in the future and better ways of increasing community accessibility and use.

If you agree to participate in this study, you will be asked to take part in recorded interview which will last for half an hour, the participation is voluntarily and you may withdraw your consent and participation during the time of this study at any time without prejudice. If you have any questions/explanations in participation during the study, please do not hesitate to contact the researcher.

I declare that I have read and understood the information provided by the researcher regarding his research and I'm aware that all the information I give will be treated confidentially and processed anonymously in this research. I have received from the researcher the information regarding the advantages of the audio-tape recording interviews over the taking notes during the interview.

Name of Telecentre: .....

…… …… …….....

Participant's signature Date Place

Appendix 5: Letter of request for permission

BUHIGIRO Seth,
University of Witwatersrand,
Faculty of Management,
Private Bag 3, wits 2050, South Africa.
E-mail: buhigiros@yahoo.com
24.02. 2011

CEO- Rwanda Development Board (RDB)
P.o.Box 6239 Kigali- Rwanda

RE: INFORMATION LETTER

Dear Sir/Madam,

I am **BUHIGIRO Seth** a Rwandan student doing Masters of Management in the field of ICT Policy and Regulation, a degree offered by the Graduate School of Public and Development Management (P&DM), University of the Witwatersrand, South Africa**.** I am preparing a Master thesis entitled the role of telecentres in achieving socio-economic development in Rwanda. The purpose of this research is to explore the strengths and weakness of telecentres in achieving socio-economic development. I am kindly requesting permission to conduct this research project in "*telecentres implemented in 2nd phase NICI II Plan"* where I will conduct semi-structured interviews with telecentre operators, telecentre users.

This exercise is intended to take place during the month of February- March 2011. Any information collected will be kept private and confidential and no mention of names of the two key informant groups i.e. telecentres operators and telecentres users interviewed will be revealed in the research report. The data are not meant for public consumption and will be analyzed by the researcher, only to be destroyed upon completion of the research.

Thank you for your cooperation.

Yours Faithfully,

BUHIGIRO Seth

Appendix 6: Letter of approval



RDB RWANDA DEVELOPMENT BOARD

Kigali 10th/03/2011

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Dear Buhigiro,

Subject: Approval for Research in telecenters

Referring to your letter requesting the authorization to conduct a research on telecentres in achieving socio-economic development in Rwanda as case study of six telecentres that are in 2nd phase NICI II plan, the six telecentres are: Gicumbi, Rulindo, Nyabihu, Kayonza, Huye, and Nyanza telecentres.

RDB takes this opportunity to inform you that it has no objection to conduct this kind of research in the telecentres mentioned above. In this regard, telecentre managers and telecentre users will facilitate you in providing information where necessary.

Yours sincerely

John Gara
Chief Executive Officer
Rwanda Development Board (RDB)

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