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RESEARCH ARTICLE

ICT PATHWAYS AS CATALYSTS TO THE DEVELOPMENT OF SMALL ENTERPRISES IN RWANDA: EMPIRICAL EVIDENCE FROM FOUR DISTRICTS

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Abstract

This study was set out to establish the impact of ICT usage on small businesses development in rural Rwanda; investigate whether there is a need of accessing business information using ICT and find out what kinds of gargets used to access such information. Secondly, find out to what extent ICT is used by small business people in rural areas and find out the Government's efforts in extending ICT infrastructure to rural areas, and whether the effort, resources committed is worthy the ICT uptake by the rural communities. The study also was set out to establish the relationship between the rural business growth and ICT access by rural small business people who use it.

The study was a descriptive survey design that used both qualitative and quantitative approaches. The study population included forty participants who were small business people from four rural districts but excluding district information officers/administrators who were subjected to an interview guide that helped the research to locate and identify 10 rural based business people from each district under study. Ten respondents who were selected from each of four Districts answered questionnaires.

The research questions probed about the need of accessing business information using ICT, what kinds of ICT gargets available to rural small business people to aid them access business information and also research questions probed about the information deficit between the information accessed and information needed.

The research findings indicate that the ICT infrastructure do exists in the districts though not extensive and rural business people are aware of the same but they do not fully utilize it despite advantages associated with it, the reason being the cost of access of using ICT and lack of knowledge to use it. This means that rural small business people are disadvantaged and lack the basic skills required to harness the benefits of ICTs.

However the study showed that those who use ICT to access necessary business information have ripped benefits than those who do not. Those who use ICT in accessing information were found to be between 25~35 years which suggested that only young people have embraced ICT.

It was concluded that; ICT usage is till limited and government should step in to build infrastructure, increase the degree of awareness and offer ICT usage incentives as it does not make economic sense for private investors to go into rural ICT investment.

It was recommended that; there should be training and assessment of usability to promote rural adaptation of ICT. Have in place procedures on how to achieve ICT policies contained in NICI Plans in order to realize vision 2020 targets.

Government should set up vocational training schools that offer trainers courses and introduce adult ICT education training for rural population. Subsidize more ICT access cost to make it affordable for everyone who wishes to utilize ICT services.
Government should make it a priority of having ICT available, accessible and affordable to everybody. Government should use appropriate technology in rural electrification program that is simple to achieve and provide power that is necessary for internet connectivity. There is therefore a need for broad-based and equitable access to ICTs in rural areas consistent with ongoing processes of decentralization, democratization and policy revisions that take into account of good governance considerations.

Introduction

1.1 Background to the study

The worldwide development of information and communication technology (ICT) has accelerated dramatically over the past decade, spurred by an increasingly global economy or globalization. Technological advances have led to falling prices for ICT goods and services and that has provided a strong incentive to replace other forms of capital and labour with information technology equipment (Jorgenson, 2001)
The revolution in the ICT sector coupled with a loosening of trade restrictions has encouraged the growth and expansion of ICT. The global economy is entering a digital age and information has become the primary resource for economic development (Talero and Gaudette, 1996). Countries without access to the latest tools and technologies will find themselves unable to compete in the global market place (De Melo, 2000).
Information is the catalyst, the driving force and the product of evolutionary processes of change. Good information flow is an integral part of development. Information technology and information products and services are concepts and realities that have become unavoidable for anyone involved in the issues of production and development.
(Mulira 1995) states that Information Communication and Technology (ICT) facilitate quick economic, social and political transformation.
That global trade and investment are more becoming dependent on timely flow of data. It can be deduced that communication capabilities in rural areas could bolster faster economic growth. ICT empowers rural people in business to make increased demands to governments and may force officials to adjust and accept the demands of local population. ICT stimulates interaction and enables people or societies to access to knowledge and resources.
The impact of ICT in improving the economy and good management for production cannot be overlooked. Exposure to global economy and financial situations, trade and opportunities makes business more manageable. The timely flow of money and market information is one of the most crucial areas for rural small business people to become competitive in the local market. Competitiveness, information and communication can assist the rural people to fulfill their information needs but also to negotiate on a local forum (Montealegre, 1996).
Information and communication technologies, and particularly the Internet, are transforming all human activities dependent on information, including rural development. ICTs present new opportunities for individuals and communities to be not only consumers but also producers of information that is consumed daily by stakeholders for the purposes of business development.
Information is a crucial tool, without which no sector of life can succeed, because success heavily relies upon an informed workforce. Some kinds of communications and some kinds of issues brought to conditions have some kinds of effects (Avegevou, 1998).
This means that if ICT's and information access isssues are brought to small business people, there will consequently be some kind of effect on business growth. However, rural people have not been able to access information because of socio-economic barriers. These have been characterized by low educational levels and oppressive cultures that target the weaker sex especially in developing countries like Rwanda. The high cost of connectivity to internet is a barrier to majority plus the equipment or communication handsets are still beyond the reach of rural small business people.

Rural business people still face barriers in contributing to and benefiting from development operations because of the gap in the information access and ICT use. This has limited the profitability and awareness of growth of their businesses and also restricted them from institutions that offer financial services leading to high transaction costs.
Information access has been a vital tool in changing the way small business people contribute to the economic development of a country. Rural people have of recent been distinguished from their reproductive role in society to their productive role in business and they need information and communication to achieve that for effective and efficient managing of their businesses. Information contributes greatly to production at work hence the need for it to be properly organized so that it can be retrieved quickly at the point of need when important decisions are to be made, hence the use of information communication technologies is very vital in business growth.

One of the development challenges confronting developing economies (LDCS), Rwanda in particular is to develop the capacities, strategies and mechanisms necessary to take full advantage of the opportunity offered by ICTs for development. Given the potential for the ICTs to induce changes, many development analysts believe that these instruments can play an important role in development process (Thioune, 2003).
The digital divide has the global impact of increasing the gap between the haves and have-nots. To remedy this, it requires reducing the digital divide and greatly improving the access to ICTs to the broad mass of underprivileged in the less developed world.
In this information age, development paradigm has become technology centric, and a success in the global economy will depend on access to ICTs. Unequal access to ICTs as a development resource has exacerbated the marginalized geographical locations and sections of world communities.
One approach to increase exposure of ICT to critical mass is through the establishment of community Tele-centers (Etta and Paryn-Wamahiu, 2003). Tele-centers have become an important component of development programs that seek to narrow the digital and the knowledge divides that exist throughout the world between regions, communities as well as urban and rural.
Tele-centres are believed to play a major role in mobilizing communities to address their development problems. Tele-centres can be used as information hubs that capture, repackage and disseminate information to rural communities (FAO 1998). Tele-center is a widely recognized term that encompasses most variants of shared access facility with an explicit development objective. Most Tele-centers are multipurpose, typesetting, faxing, internet, (although many are beset by connectivity problems, phone and computer training, plus other value added services that vary from site to site. Most Tele-centers in developing countries have been established by external funding agencies in partnership with NGOs and/government structures. They are intended to bridge the digital divide by reaching those who otherwise would be unlikely to access ICT services (Parkinson, 2005).
As early as 1998 the Government of Rwanda initiated its ICT blueprint dubbed -"An Integrated Framework for Socio-Economic and ICT Policy and Plan Development and Implementation for Rwanda". After a series of consultative encounters with stakeholders and the general public this document was fine-tuned and adopted in 2000. ICT was identified as a tool “to transform a subsistence economy into an information-rich, knowledge-based one, and accelerate economic growth.
The government of Rwanda has shown the foresight to include the establishment of multi purpose community Tele-centers (MCT) in the NICI plan 2010. The MCTs would provide a range of services, internet access, a basic library and documentation center, ICT literacy training, e-government services, e-learning, e-commerce linkages, small and micro-enterprises support, as well as market information for farmers and local cottage industries in Rwanda. Rwanda has learned that this information revolution is not simply a technological or economic revolution but an institution as well. Indeed, unless the institutional revolution leads the way, then developing countries cannot achieve the full benefits of the information revolution and risk being left behind (Wilson, 2004).
Rwanda government realizes that, while there are numerous commercial initiatives, there is also a need for institutions in the public and non-profit sectors to seize the new opportunities presented by ICTs.
Rwanda is engaging in this institutional revolution by advocating ICT led socio-economic development. This is championed by RURA, RITA and other government agencies with private sector participation. Linking the development of MCT network to regional centers, district headquarters, agriculture field offices and small village centers and townships provide a concrete way of ICT related community development. This study examines the contribution of ICT access to rural development in Rwanda.

1.1.2 Rwanda’s social-economic indicators 2014

Based on the above figure, especially on poverty level and settlement patterns (83%) rural, shows the gravity of the problem and the need of a comprehensive policy to address the situation. One way would be to make regions,

societies or communities develop economically, socially and politically. This can be achieved through information communication that can reach many people and regions by reducing the digital divide.

1.2 Statement of the problem

The small business efforts need relevant, accurate and up to date information to help them improve production in their businesses, they need to recognize and be exposed to information communication technologies as a potential success tool and the best supplement to traditional communication. It is very clear that information communication and technology play essential role in advancing economic and social welfare and it is important to recognize that the causal relationship is complex and ICTs are certainly no panacea.
The Government of Rwanda has invested a lot in ICT, both in infrastructure, physical and human capital development purposely to enhance ICT penetration throughout the country. The research gap in this study therefore, is to find out how ICT is used as one of the factors that contribute to small business development and why they still depend on traditional methods of communication for some business information in spite of ICT benefits.

1.3 General objective of the study

The general objective of the study is to assess the impact of information communication technology access to small business development in Rwanda.

1.3.1 Specific Objectives of the Study

The study was guided by the following specific objectives

1. To assess the information needs of small business people in Rwanda
2. Identify the different gargets used by small business people in Rwanda to access business information
3. To determine gaps which exist between information accessed and the information needed by small business people to facilitate their businesses
4. To establish ICT usage and accessibility by small business owners

1.4 Research questions

1. What are the information needs of small business people based in Rwanda?
2. What are the types of information communications technologies used by small business people in Rwanda?
3. What are the information gaps which are not currently addressed by use of information communication technologies (ICTs) by small business people?
4. How does ICT usage and accessibility enhance the development of the main business activities of small business owners

1.5 Scope of the Study

The research is about access to information communications technology and how it has facilitated small business development. The research dwelled on the importance of ICT access to the development of small business growth. The study covered both educated and non educated small based business people where views of both respondents were analyzed.
The study assessed the impact of ICTs access on small business growth between 2005 and 2014. This is because the NICI Plan phase 1 (2005) falls in this period. The study covered 2 provinces (North and South) and 4 districts two from each province. The criteria of choosing the area of study is based on highest and lowest populated provinces in Rwanda and same criteria applied to districts within those selected provinces.The investigation focussed mainly on small business people in Rwanda who access information to further develop or expand their businesses.

1.6 Operational Definitions

- **Commercial information needs:**

This is knowledge necessary for producing or likely to produce profit.

- **Information access:**

This is the means or the right of using, reading or obtaining knowledge, in the form of facts, news etc to help satisfy an information need.

- **Information Communication Technologies(ICT'S)**

These are tools, used to process and transmit information between human beings and technologies. Because of ICT we come to talk of the information age/society. It is not always clear what the concept of information and communication technologies or ICTs really refers to. Some theorists appear to equate ICTs with new technologies such as computers and the internet (Langmia, 2005) or deal with computers and internet connectivity alone when discussing ICTs (Polikanov and Abramova, 2003). However, the concept can be wider than this. In a document prepared by Batchelor and Scott (2005) for the Organisation for Economic Co-operation and Development (OECD), this point is elaborated:
"While the common use of ICTs tends to refer to the newer technologies of phone and internet, the term ICT is best used to also include more traditional communication media such as radio and television. Digital convergence is gradually bringing devices to the market that include the traditional media (phones with radio, media centres with computing capability and television), which will increasingly blur the distinction between old and new ICTs. (Batchelor and Scott, 2005)"

Hence, there is a common distinction between old/traditional and new/modern ICTs, although these lines are increasingly blurred. ICTs can also be defined in terms of their qualities or the set of tasks they can perform. The OECD panel of statistical experts have defined ICTs as '… the set of activities that facilitate, by electronic means, the capturing, storage, processing, transmission and display of information' (de Alcántara, 2001: 3). This definition captures the set of attributes associated with ICTs, rather than listing the various devices possessing these attributes, and is as such perhaps a more useful definition. This is even more so due to the digital convergence discussed by Batchelor and Scott (2005), in which phones can also be radios and mini-computers, while computers can be TVs, radios, and phones.

More than two decades ago, Lorentzen (1988) developed a theoretical framework for understanding technological innovation, which still has much to offer when trying to understand the concept of ICT and the role of ICTs in socio-economic development. She defines technology as a process, and not simply a thing that can be bought and used. This is because socio-economic choices, which have a bearing on the final product, are implicitly or explicitly made in the process of technological innovation. This makes technology a social product.

- **Information Technology:**

This is the science or practice of collecting, processing, storing, using and sending out information by means of computer systems and telecommunications.

- **Rural based business people**

In this study, we take rural business people as all those men and women operating or conducting their businesses outside Kigali city with a known physical address.

1.7 Limitations of the Study

The limitations the research met during the study include;

i) The slow retrieval of questionnaires since many of the respondents may not be committed to the study while others may not know how to answer questions. Sweet talking to respondents was done by researcher.
ii) Computer access for data storage of information especially at district and local business centers was lacking which brings the reliability and validity of data into question.
iii) Poor or no records keeping made it hard to gather full information to enable assess, effect and relevance of ICT.
iv) Time was a constraint as the research required a hectic schedule since the research was carried out in the rural communities.
v) The scattered locations of small and medium enterprises (SMEs) around the country made contact with them difficult.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

In this chapter, literature is reviewed according to the study variables. It is obtained from text books, journals, magazines and websites.

2.2 Historical background of ICT

On March 10, 1876, in Boston, Massachusetts, Alexander Graham Bell invented the telephone. A crude thing made of a wooden stand, a funnel, a cup of acid, and some copper wire (http://www.privateline.com/telephonhistory). But these simple parts and the equally simple first telephone call started the process of innovations in the field of ICT.
From then telephone became the medium of communications between people and nations. It was followed by the invention of computers in the mid of 20th century and soon after internet followed. The internet bubble of 1990s signaled the importance of ICT as a development tool and enabler.
Many countries sized the opportunity to embrace ICT in their development policies and programs including Rwanda.

2.3 ICT Policy in Rwanda

The Rwanda Information Communication Technology for development referred to as NICI, begun in 1998 under the auspices of the African Information Society Initiative (AISI) of United Nations Economic Commission for Africa (UNECA). The process is designed to put in place and implement the necessary policies and plans capable of addressing Rwanda's development challenges in this information and technology age. To accelerate the country's socio-economic development process that would transform Rwanda into information-rich and knowledge-based economy and society (NICI plan page 18)
The Government of Rwanda committed itself to the implementation of envisaged four rolling NICI plans over 20 year life span of vision 2020 in order to transform Rwanda into information-rich knowledge –based economy.
NICI plan 1 or NICI 2005 was to support the development of an economic base and environment to accelerate economic growth by transforming Rwanda into a knowledge-based economy.
By transforming the economy from being predominantly agricultural to an information-rich and knowledge-based economy, the Government of Rwanda has envisaged its economy moving to the middle income bracket by the year 2020. The Government of Rwanda has decided to use ICT as one of the tools to reach this developmental goal.
Chapter four, on voice telephony and universal access in Telecom Law No 44/2001 of 30/11/2001, article fifteen, states that; "Notwithstanding the provisions of paragraph (2)-(3) of Articles 15 and 23 of this law, public telecommunications operators shall provide
every natural person and organization with a connection to a public telephone service within that area of the Republic to which their individual license extends".
Public telecommunications operators should promptly respond in not more than 15 days to a request for connection to a public network from any natural person or organization and:
1° give estimated dates when this will be provided and when the public telephone service will commence and;
2° inform the user that the user's name has been placed on any waiting list for the connection and;
3° provide the connection as soon as it is technically feasible and reasonably economic to do so;

If a public telecommunications operator considers it is unreasonable to provide a connection to a public telephone service, or a potential user, he refers the matter to the Regulatory Board for a decision which is binding on both the operator and the potential user.
Public telecommunications operators give a written contract to every natural person and organization which requests a public telephone service. The Regulatory Board specifies the matters which are, as a minimum, requirement contained in each contract. The above highlighted provisions in the Rwanda's Telecommunication Law are to show the importance attached to the development of ICT by the Government of Rwanda. The development of ICT in Rwanda cannot be a task of the state alone, but together with private sector participation through public private partnership.

The Government of Rwanda has experienced major economic reforms including reforms in telecommunications sector, like privatizing Government owned Telecom operators and liberalizing Telecom industry with the aim to increase competitiveness in telecommunications industry and to attract foreign investment.
However, these measures so far have met with modest success in terms of access to telephony and international bandwidth for internet and computer based applications. The challenge of increasing ICT access beyond major urban centres remains a major challenge for the Government of Rwanda due to heavy investment required for infrastructure development, human resource, illiteracy rate and lack of awareness by the rural population among others.

2.4 Some achievement of NICI 2005

The above table shows the growth in ICT usage as indicated by increases in number of subscribers for each of 4 ICT components. There is a tremendous growth in Rural Telephony that would directly benefit rural business people. The growth in Mobile and Internet is a national growth indicator and to portion rural growth in Mobile and Internet is hard to determine although the trend is a good sign of ICT development. It is also assumed that whoever had a subscription of internet had a computer. However, not everyone with a computer had internet.

2.5 Some challenges of NICI 2013

Although efforts of making ICT penetrate into rural areas were made, the growth of ICT in Rwanda faced or is still facing challenges of high cost of basic Internet connection and remains a strong deterrent in many rural areas. In remote areas, both the high cost of Infrastructure and of operating ICTs with generators and satellite backhaul make spreading access a tough business case for telecom operators.
The telecommunication and electricity infrastructure development is still lacking or is poorly developed in rural areas. Satellite and wireless technologies are now in use through a Government Telecommunications Agency (New Artel S.A) in some rural areas, but these are largely developed around urban cities, like Kigali, Butare and others and even here, the infrastructure is often inadequate and costs are high. There are problems of low bandwidth and there is a need for strengthening the Internet backbone, which Rwanda Utility Regulatory Agency (RURA) is trying to implement using Universal Access Fund by subsidizing bandwidth cost from international suppliers.
Rwanda as a developing country is lacking IT expertise to develop local content and there is a marked shortage of relevant material in local languages that responds to rural people's needs. Rwanda has a poor population more than 50% live below the poverty line. Poor people either lack telephony equipments due to high prices, or face high tariffs that limit their use of telephony services.
Training and capacity building must be an integral part of all ICT projects in order to create critical mass of people in participation, but this is hampered by the lack of human resource capacity in Rwanda. Even where services are delivered effectively through ICT, communities remain underserved due to a lack of awareness of the role of ICT and limitations in the knowledge of exploiting the opportunities offered by ICT.

2.6 Impact of ICT on other countries; a case of South Korea

In 1950s South Korea was a developing country as Rwanda was. With much emphasis on industrialization and ICT usage, Korea is now ranked as number one country with a networked community or information society

2.6.1 ICT Policy of Korea

The success of Korean ICT policy was based on three phases; phase 1 (1988~1993), phase 2 (1994~2002) and phase 3 (2003~2007)
Phase 1 was for National basic information system (Dat) abase building). This was first National Computer Project that focused on Government computerization by networking all Databases.
Phase 2 referred to as Information Superhighways. This was Korean Information Infrastructure (KII) initiative. ICT infrastructure was built that included fiber optics, WiMax and WiBro throughout the country. This took a combination of all Databases and computers within the country. This was followed by ignition of mass-use of internet/IT through awareness campaign of incentives and training 10 million people to use internet in 2001.
Phase 3 referred to as Internet Diffusion era. This is system integration (e-Government road map2007) for "seamless" service. This is a combination of infrastructure, contents and applications. This made South Korea to ranked number 1 in the World in terms of Infrastructure, Opportunity and Utilization of ICT.
Source; http:www.itu.int/osg/spu/publications/worldinformationsociety/2007/WISR07_

Opportunity refers to affordability and coverage. Affordability refers to cellular and internet tariff as a % of per capita income. Coverage refers to the % of population covered by cellular telephony and internet.
Utilization refers to usage and quality. Usage refers to internet users per 100 inhabitants and Quality refers to the ratio of Broadband internet subscribers to the total of internet subscribers.
Infrastructure refers to network and device. Network refers to proportion of household with a fixed lines telephone, mobile cellular subscribers per 100 inhabitants, proportion of households with internet at home and mobile internet subscribers per 100 inhabitants.

2.7 Information Communication Technology (ICT) and small business development

ICT is creating a universal technology platform for buying and selling of goods & services and for driving important business processes within the economy. It has inspired new ways of organizing and managing that is transforming businesses and the use of information systems in everyday life. Along with bringing new benefits and opportunities, ICT has created a new set of management challenges. The study will establish the benefits of ICT for information access to small business people.
ICT has brought the rural people of the world so close that the concept of distance has almost been eliminated.
Some of the modern communication channels through which information is passed on are Telephone, Telefax, Television, Radio, Video, audio tapes and computer based systems like email, internet, CD ROMs and other audio visual media. Scanners and plotters have made communication further easy by providing possibilities of transmitting and duplicating all kinds of maps, illustrations and drawings.
It is not a surprise concern to have emerged the effects of new technologies on business people's economic and social roles. Salay and Walshman (1995 noted that with the emergence of the economic forces of globalization, which rely heavily on communication technology, ICT's have become increasingly important tools to accelerate social and economic development.
According to Oshikoya and Naveledein (1998), small business people generally lack basic management skills to start an enterprise as well as necessary lobbying skills. They lack information on many factors of business enterprise. UNESWA (2005) identified barriers faced by small business people in establishing successful businesses and these include; small business people are left out of new technology and therefore, forced to rely on traditional methods. Small business people have been limited to access of information due to low education hence few opportunities of apprenticeship. Also contacts, communication and networking opportunities for small business people are rare because socially small business people are not encouraged to leave their shops and meet a lot of people.
Montealegre (1996) commented that for many small business people networking forms a major part of the present strategy to gain advice and information as well as provide information market research. Some rural people have used information networks as a method of gaining independent and objective assessment of business performance.
Rwanda Government therefore, can make information and communication a key strategy for promoting small business growth and development in general. The role of ICT in transforming the economy is necessary for quick flow of information required by business people on issues like available markets, sources of inputs, prevailing market prices, key business contracts and other relevant information could not be ignored.
The government through Rwanda Information Telecommunication Authority (RITA) has already started the initiative to support the ICT cause by building telecenters in some selected rural areas where many small business people can access internet since most of them cannot afford individual connection. These modern telecenters will facilitate information access to enhance trading activities. It also provides a wide information resource for local and foreign needs.
The Government of Rwanda understands that ICTs can only serve as effective tools of development, especially in poverty reduction and opportunity for all, if people in every corner of country and at all levels of society have reliable and affordable access to them.
However, this requires massive investment in infrastructure and human capital that remains a major challenge for the nation. This has led the Government of Rwanda to adopt a strategy discussed and adopted as a plan of action by leaders of Governments who attended World Summit on Information Society, December 2003 in Geneva, Switzerland which set the target of connecting villages with ICTs and establish community access points by 2015.

2.8 Traditional Communication Channels

Communication is the backbone of socio-economic benefits. Economic success and development is based on right information to the right people at the right time. Abidi (1991), that information access can be achieved only through active and efficient communication systems.

The traditional communication methods like printed work, newspapers, books, newsletters, posters and drama, cinemas, personal and informal verbal messages (word of mouth), debates, lectures, mail, seminars, workshops and panel discussions still enjoy considerable domination in business information and many rural people are exposed to these channels.

2.9 Information needs and access

Information needs are the necessities people need to be aware of through information. According to Abidi (1991), such information includes educational, recreation, employment opportunities and commercial information needs. The commercial information small business people may need to be empowered include loan availability and access, banking facility, goods available at the local market, prices and market trends.

Information access is the ability for one to identify and retrieve relevant, adequate and up-to-date information to be utilized on a particular information need. Information can be accessed through many access points. So, any business information that is not accessed by small business people is useless and not effective.

Many rural people access information from business information sources like the government, private companies, newspapers, professional associations, rural peoples' groups, libraries and resource centers, personal and professional contacts, conferences, workshops, exhibitions, seminars etc.

Of recent, it is common to find small business people associated in groups/cooperatives to enhance their economic empowerment. Small business people's economic activity has been bolstered by a multiplicity of these economic alliances which create access to resources such as capital, training for savings and marketing (Rathgeber and Adera, 2000).

2.10 Identified gaps

Investment in ICT is inevitably results in opportunity costs as they divert investment from other development needs and priorities. Heeks (1999) noted that here are finite amounts of money, time and attention investing in these ICTs means explicitly not investing them in other development areas. Yet the ICT fetishists have so far been unable to demonstrate how ICT based information represents a more important resource than water, food, land, shelter, production, technology, money, skills or power in development.

Nevertheless, the revolution of ICTs has profound implications for economic and social development. The key issue for both governments and donors is to ensure that ICT access reaches even the most marginalized groups, while at the same time ensuring that ICT projects meet the needs and demands of the target population.

The study therefore tries to find the relationship between the Government of Rwanda efforts and the rural population benefits from ICT.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Research design

According to Churchill (1979), a study design is simply the framework or a plan for a study that is used as a guide in collecting and analyzing the data. While Joel and Berman (1982:65) define a study design as "the specified framework for controlling data collection". As for this particular study, the descriptive research design was preferred. This is because the study variables were not to be manipulated since the study only aimed at presenting a general overview of the role of ICT to small business development in Rwanda. According to Gilbert A. Churchill Jr (1979), descriptive research is a research design in which the emphasis is on determining the frequency with which something occurs or the extent to which two variables co vary. The study was intended to show how ICT access and usage affects or influences the small business development. The research employed the above design guidelines for the study that was carried out

3.2 Sample size and Study area

Rwanda has five provinces; Northern, Eastern, Southern and Western Province, Kigali being the capital city is also taken as a province. The sample of respondents was selected from two (2) provinces excluding Kigali due to its location and advantages over other four (4) provinces in Rwanda. The criteria of choosing the area of study was

based on highest and lowest populated provinces in Rwanda and same criteria applied to districts within those selected provinces.

The investigation focussed mainly on rural based small business people in Rwanda who access information to further develop or expand their business.

The sample included forty (40) people who use ICT to facilitate their daily transactions. The respondents were selected using purposive sampling that included from each district the first registered ten (10) tax payers of local to the district. This is because the research interest was to assess how rural based small business people have benefited as a result of using ICT to access business information.

3.3 Data sources

Data sources were both primary and secondary data. This study used both secondary and primary sources of data because none of them was sufficient to stand on its own. The research combined them so that they compliment the shortcomings in each other. The local administrators of the districts and provinces were subjected to interview while the rural business people were subjected to a questionnaire that had close ended questions.

3.3.1 Primary data

The primary data information was provided during the process of interviewing the respondents and from the self - administered questionnaires. Local District administrators provided information concerning local small business traders. This was about local taxes paid, their locations/addresses, size of their business and general characteristics. Joel and Berman (1982) argue that primary data are those collected to solve specific problem under investigation. Primary data are necessary when a thorough analysis of secondary data is unable to solve the research problem.

The primary source data was obtained from rural based small business people using questionnaires observations. Face to face interviews were used to get information from local administrators of districts. The questionnaires acted as a qualitative tool which was used to provide feedback of user perceptions on the quality, adequacy and efficiency of

services provided by Telecom and ISP operators while accessing business information. The information got from interviews was unstructured but nevertheless important for the research.

3.3.2 Secondary data

The secondary data for the research was obtained from minutes of district meetings, district books of accounts, text books, written journals, magazines, newspapers and websites. The researcher carried out a keen examination of ICT development in Africa and the world at large to throw more light on the concepts of ICT being a tool to development.

3.4 Instruments and Data collection Methods

A questionnaire is a set of questions designed to generate the data necessary for accomplishing the objectives of the research study. The questionnaire was the main instrument that gathered data. This questionnaire was simple and straight forward so as to solicit as much information as possible while taking the shortest possible time of the respondents. The questionnaires were self administered since the respondents selected were able to read, understand and write. It elicited information on; personal information, the information needs of rural business people in Rwanda, the different ICT gargets used by rural business people in Rwanda, and find out how useful information communication technology is to their business. The other instrument was an interview guide (face to face) for local district administrators which gathered some information that supplemented information from questionnaires.

3.5 Validity and Reliability

The research pre-tested the instrument using a pilot sample taken from population under study. The experts including research supervisor were requested to judge the instruments with regard to the comprehensiveness of the questionnaire to answer the research questions. The questionnaires were revised to incorporate these comments.

3.6 Data processing and Analysis

The research edited, tabulated and analyzed the collected data so as to discern meaningful and logical patterns from it. The study used statistical instruments like graphs, charts, and tables using Microsoft office excel to describe the data. The study used descriptive statistics of frequencies and percentages to get a meaningful interpretation of answers from research questionnaires. It is defined that data processing refers to the transformation of respondents' views to meaning full text.

3.6.1 Tabulation

Tabulation was carefully done for the purposes of putting data into some kind of statistical tables showing the number occurrence of responses to particular questions. This helped in grouping categories of respondents who share similar views and easy to be in percentage figures for easy interpretation.

CHAPTER FOUR: RESULTS AND DISCUSSION

Table 1: 1.2; Social- Economic indicators

Population	11,200,000
Area, sq. km	26,340
Population density	325
Population growth	2.3%
Rural population	83%
Mortality under 5 years, per 1000	203
Households	1,858,000
HIV prevalence 14-49 years	5%
Scholl enrolment, %gross	120
Primary school completion	69%
Secondary school enrolment	24%
Tertiary education enrolment	6.7%
Adult literacy % ages 15 and over	61%
Computers per 1000 people	15
GNI Atlas method in current $US	3.3 billion
GNI per capita, current $US	650
GDP Atlas method, current $US	3.5 billion
GDP annual growth	5.3
Poverty below $US1 per day	60%
Capital, Kigali	960,000 people & 720 sq. km
Internet price basket per month, $US	45.5
International bandwidth, bits per person	4
Internet Subscribers	43000
Internet Users	500,000
Broadband Subscribers	1,7000

Source: MINECOFIN 2014

Table 2.2 ICT Profile

Service provided	Service provider/operator
Fixed Telephones	Rwandatel is dominant and MTN has license but has not started. Airtel provides satellite based fixed telephony in rural areas.
Mobile Telephones	MTN is dominant and Rwandatel provides CDMA mobile.
Internet services	Rwandatel is dominant (ADSL) and MTN provides WiMax on small scale. Artel Communications provides rural connectivity using satellite. ISPA is a private ISP operates with not more than 50 subscribers but all located in the city.
Cyber cafes $ Telecentres	All together are about 500 points but only 25% are located in rural areas
VSAT	About 20 privately owned VSAT stations are in the country but these are mostly NGO and foreign missions.

Source; RURA Database 2013

Table 3: 2.4; ICT policy development and growth

	2001	20014	Percentage change
Fixed Telephone subscribers	22,000	88,972	4.4%
Mobile subscribers	67,521	289,343	118.2%
Rural Telephone subscribers	128	10098	341%
Internet subscribers	1470	4,875	95.5%

Source; RURA Database 20014

Table 4: 2.6; Korean World ICT ranking

		Overall	Opportunity	Infrastructure	Utilization
1	Korea	0.80	0.99	0.74	0.67
2	Japan	0.77	0.99	0.73	0.58
3	Denmark	0.76	0.99	0.84	0.43
4	Iceland	0.74	0.99	0.73	0.49
5	Singapore	0.72	1.00	0.71	0.45
6	Netherlands	0.71	1.00	0.72	0.41
7	Taiwan	0.71	0.99	0.75	0.38
8	Hong Kong	0.70	1.00	0.71	0.40
9	Sweden	0.70	0.99	0.72	0.38
10	England	0.69	0.99	0.70	0.39

Figure 1: Telecentre Model.

Source: Primary survey.

Table 5: 3. Population of Rwanda per province;

Provinces	**Population**
East	1,700,137
West	2,043,555
North	1,560,862
South	2,058,209
Kigali	765,990

Source: MINALOC 2006

4.1 Introduction

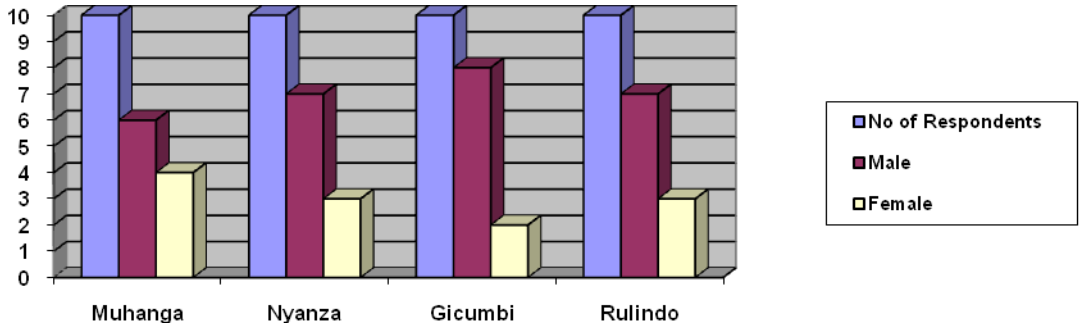
In this chapter, data is analyzed and findings presented in accordance with the set objectives

Table 6: 4.1; Gender of respondents per District

	Muhanga	Nyanza	Gicumbi	Rulindo
No. of Respondents	10	10	10	10
Male	6	7	8	7
Female	4	3	2	3

Source: Field data, November, 2014

Graph 1: 4.1; Gender of respondents



Source: Field data, November, 2014

The number of respondents was ten from each District who answered questionnaires. The respondents were selected from the districts recorded information that identified ten small business people. The respondents indicated their sex. In total males were 28 (70%) and females were 14 (30%).
Results are shown in the graph above; however this imbalance could be attributed to the differences in statistical distribution of research sampling, limited financial independence of women and African culture practices that keep women at home tending to domestic work.

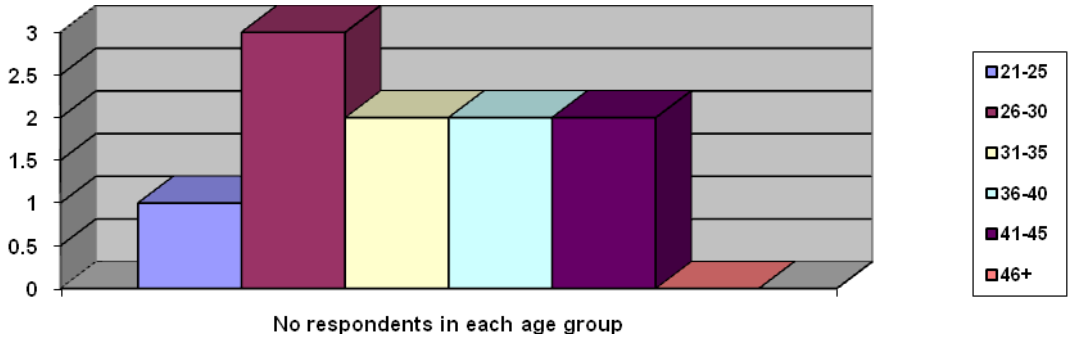
4.2 The age aspect in districts

Table 7: 4.2; Age group of respondents in Muhanga District

Age group	No. of respondents in each age group
21-25	1
26-30	3
31-35	2
36-40	2
41-45	2
46+	0

Source: Field data, November, 2014

Graph 2: 4.2; Age group of respondents in Muhanga District



Source: Field data, November, 2014

The most dominant age in business is 26-30. Overall, 20-35 years group account for 60% of participants. By interpretation, the youth are highly involved in rural business development in Muhanga District.

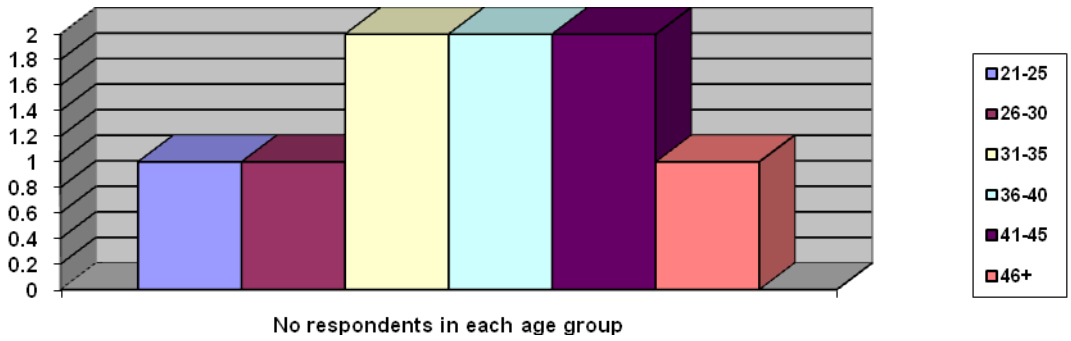
4.2.1 Nyanza, South Province

Table 8: 4.2 Age groups of respondents in Nyanza District

Age group	No. of respondents in each age group
21-25	1
26-30	1
31-35	3
36-40	2
41-45	2
46+	1

Source: Field data, November, 2014

Graph 3: 4.2 Age groups of respondents in Nyanza Districts



Source: Field data, November, 2014

The age group between 20-30 years are not involved in business as shown in the table above. This can be attributed to the fact that Nyanza district has many learning institutions than other district and it could be possible that majority of young people take longer periods of their younger age in schools.

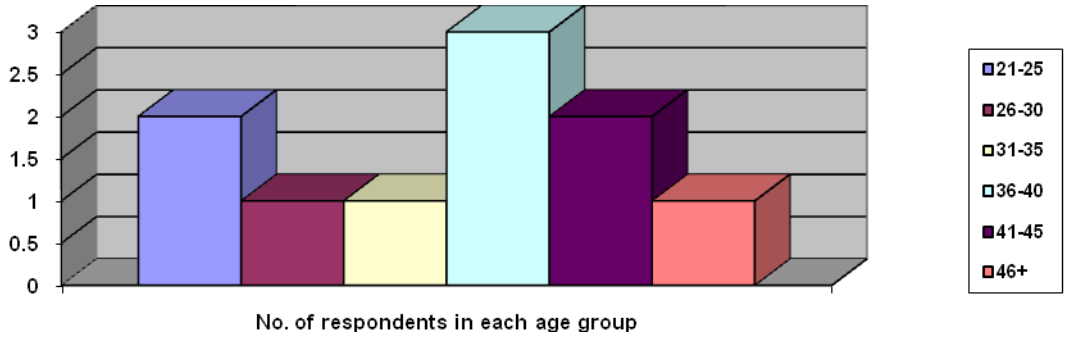
4.2.2 Rulindo, Northern Province

Table 9:4.2 Age groups of respondents in Rulindo District

Age group	No. of respondents in each age group
21-25	2
26-30	1
31-35	1
36-40	3
41-45	2
46+	1

Source: Field data, November 2014

Graph 4: 4.2; Age groups of respondents in Rulindo districts



Source: Field data, November, 2014

The results shows a slightly change age composition of business entrepreneurs in Rulindo but follows a major trend of young people being more involved in business entrepreneurship than their seniors.

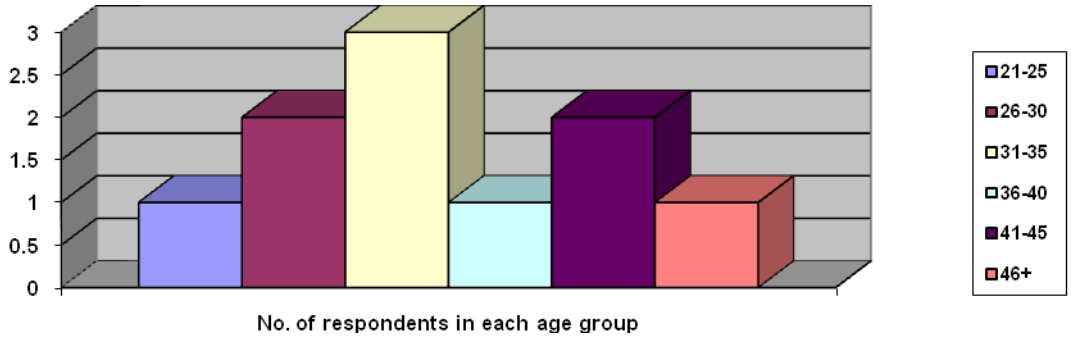
4.2.3 Gicumbi

Table 10: 4.2 Age groups of respondents in Gicumbi District

Age group	No. of respondents in each age group
21-25	1
26-30	2
31-35	3
36-40	1
41-45	2
46+	1

Source: Field data, November, 2014

Graph 5: 4.2 Age of respondents in Gicumbi District



Source: Field data, November 2014

Results above confirms the belief that ICT has been embraced by young generation as old generation seems not to be using ICT in their business affairs. Figures above show that young age group of 20-45 use ICT in their business.

4.3 Education level of respondents

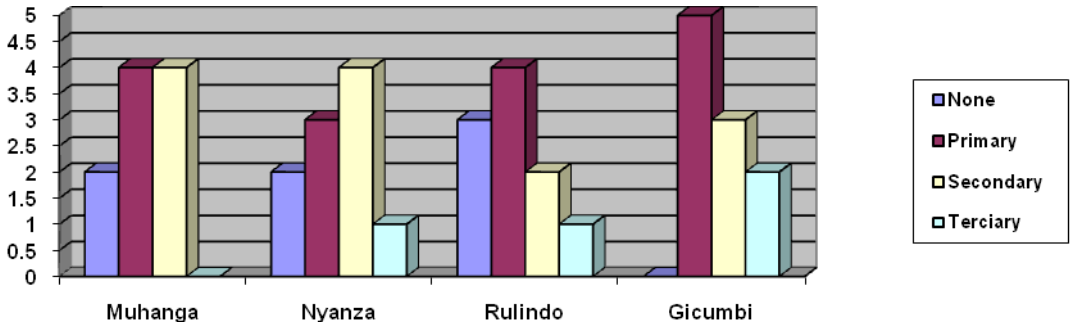
Table 11: 4 Education levels of respondents

Districts	Muhanga	Nyanza	Rulindo	Gicumbi

None	2	2	3	0
Primary	4	3	4	5
Secondary	4	4	2	3
Tertiary	0	1	1	2
Total	10	10	10	10

Source: Primary data

Graph 6:4.3 Education levels of respondents



Source: Field data, November 2014

The majority of small business people are graduates of primary school. In fact, all the respondents said they use Kinyarwanda in all their business activities. However, this assertion deserves cautious treatment because some business people in these districts interact with importers and other foreign customers who might not understand Kinyarwanda very well. There is therefore a likelihood of using the second (foreign) language such as French, English and/or Swahili.

As explained above, majority of small business entrepreneurs are graduates of primary who drop out of school at an early age due to poverty. This may explain why ICT have not taken root in small business areas as it is in urban areas due to little education of rural people.

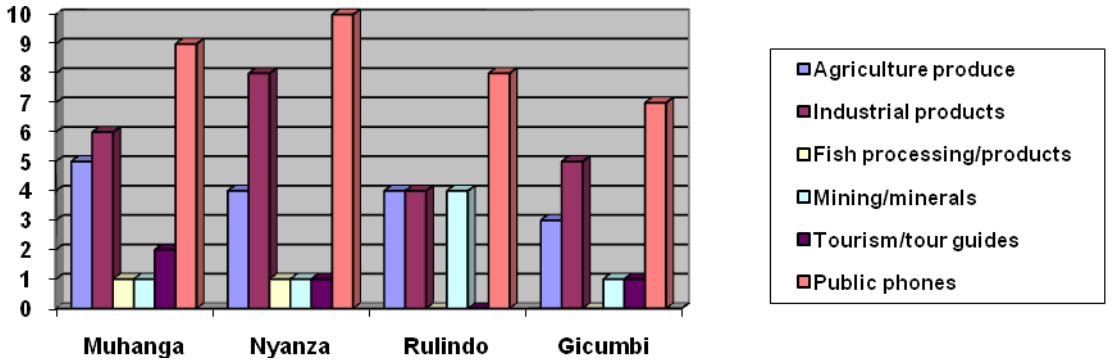
4.4 Small businesses done in the District by respondents

Table 12:4. Small businesses done in the District by respondents

Types of Business	Muhanga	Nyanza	Rulindo	Gicumbi
Agriculture produce	5	4	4	3
Industrial products	6	8	4	5
Fish processing/products	1	1	0	0
Mining/minerals	1	1	4	1
Tourism/tour guides	2	1	0	1
Public phones/cyber cafes	9	10	8	7

Source: Field data, November 2014

Graph 7: 4.4 Small businesses done in the Districts by respondents



Source: Field data, November, 2014

The results above show that industrial products are dominant business in all districts that small Business people are involved in apart from the public/cyber cafes service trade.
Apart from public phones service, industrial business dominates and is followed by agricultural business. Nyanza has more diversified types of business while Rulindo has less diversified business. Public business is dominating because majority of small business people cannot afford personal communications equipment and therefore use shared access points. This is more of digital poverty.

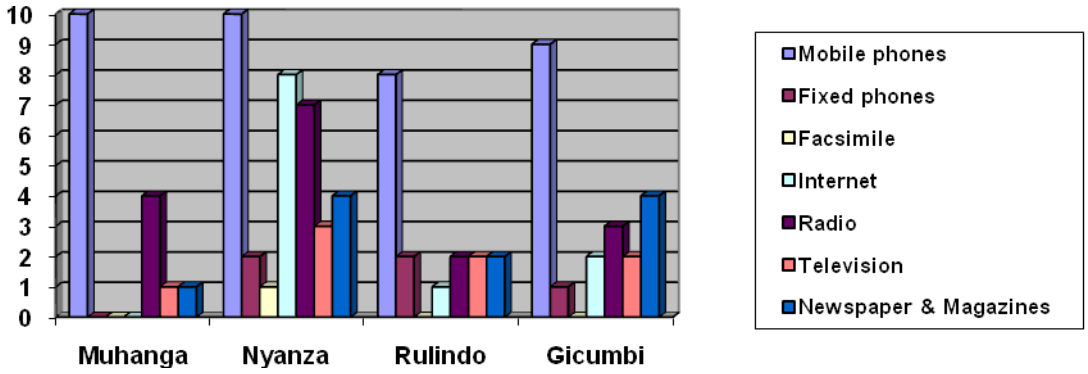
4.5 Gargets used to access business information

Table 13: 4.5; Gargets/Tools used to access information to enhance business growth

Tools	Muhanga	Nyanza	Rulindo	Gicumbi
Mobile phones	10	10	8	9
Fixed phones	0	2	2	1
Facsimile	0	1	0	0
Internet	0	8	1	2
Radio	4	7	2	3
Television	1	3	2	2
Newspaper & Magazines	1	4	2	4

Source: Field data, November, 2014

Graph 8: 4.5; Gargets/Tools used to access information to enhance business growth



Source: Field data, November 2014

Results show that mobile phone is a dominant tool in accessing business information. However, ICT is not only about mobile phones but rather infrastructure, content and applications. Most of these content and applications require the usage of internet resource. Only Nyanza business people have utilized internet resource more than the rest. From discussion with respondents and desk research, Nyanza has more developed ICT infrastructure than other three districts. Apart from the use of mobile phones, there is limited uptake of ICTs by rural entrepreneurs. The internet, which is a modern key tool to access business information, is not used in most areas. This may be due to lack of connectivity in most rural areas and geographical terrain does not facilitate easy network connection of the whole country. The low level of education could be seen as another challenge to the use of internet and newspapers.

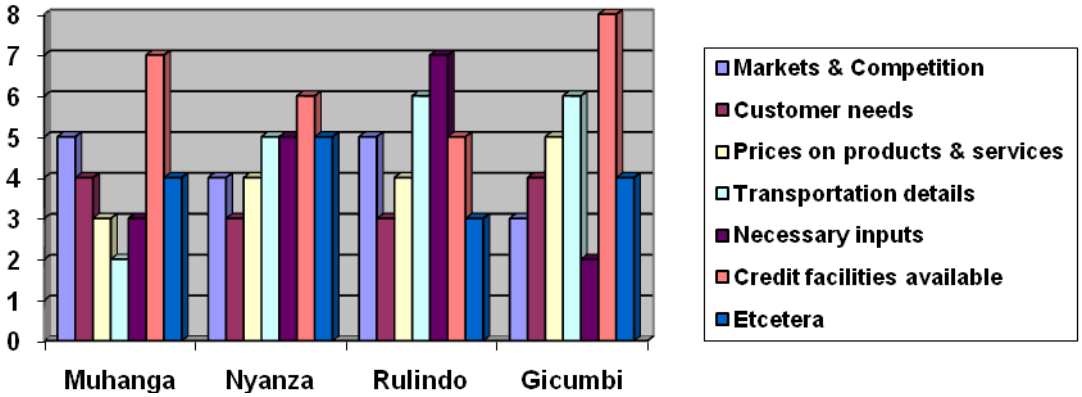
4.6 Information needs of rural Business People

Table 14: 4.6; The most needed information by respondents

Information needs	Muhanga	Nyanza	Rulindo	Gicumbi
Markets & Competition	5	4	5	3
Customer needs	4	3	3	4
Prices on products & services	3	4	4	5
Transportation details	2	5	6	6
Necessary inputs	3	5	7	2
Credit facilities available	7	6	5	8
Others	4	5	3	4

Source: Field data, November, 2014

Graph 9: 4.6; The most needed information by respondents



Source: Field data, November 2014

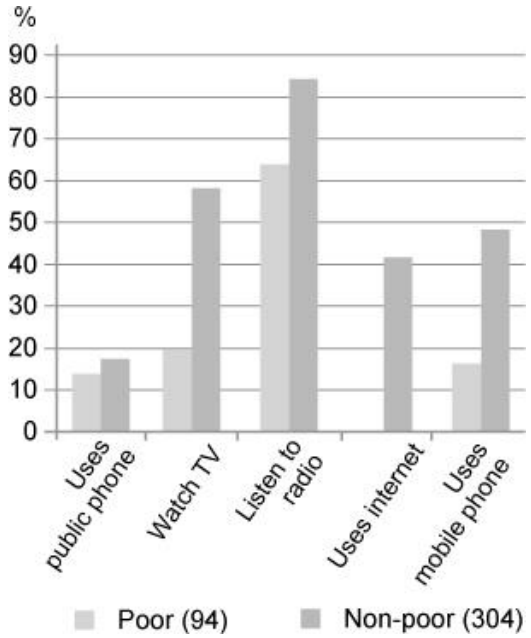
Results show that there is somehow uniformity in business information needs across all districts. The dominant business information need is financial facilities. The most frequently wanted business information and which ICT would help to get is the availability of loan schemes (Credit Facilities).

According to verbal comments from the respondents, rural business people need information to establish sustainable businesses. ICT is seen to be a vital tool in accessing information est-while difficult to get such as markets & competition, customer needs, transportation details, credit facilities, available necessary inputs, product prices, taxes, insurance, as well as business opportunities. It is important to note that the most difficult business information to get (according to respondents) is the innovation (inputs).

ICT access by main activity of Small enterprises

The question of how ICTs contribute to the development of small scale enterprises revolves around issues of access to and use of different ICTs. The survey found that of the different ICTs, radio is the most commonly accessed by households, followed by television. Further, about a quarter of the owners of small enterprises access mobile phone.

Figure 4.0: ICT access by main activity of owners of small scale businesses

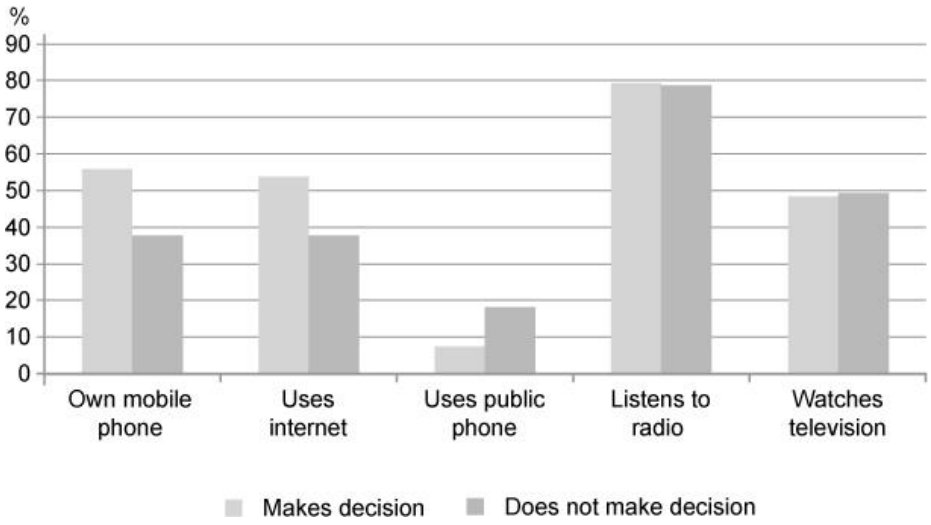


Source: Field data, November, 2014

As seen from the above figure, all the respondents who were asked at random in all the districts agreed that they access information through radios (85%), watching television (58%), then through mobile phones (48%), then through the use of internet (42%) and finally through the use of public phones.

To discuss how ICTs contribute to the development of small enterprises, analysis in this paper draws on arguments that view ICTs as tools that enable people's activities in order to improve their lives. It is not just access to ICTs but what people are able to do with them that is useful in looking at how they contribute to poverty reduction. Using the qualitative data on which this discussion is based, the study found that contribution of ICTs to poverty reduction varied depending on the ICT used and the specific challenges the community faced. The key themes of how ICTs contribute to Small scale businesses are discussed below.

Figure 4.12: Accessing information to help in decision making by business owners



Source: Field data, November, 2014

Use of ICTs enabled small business owners to engage in various economic activities so as to develop their businesses much better.

Findings show that television and radio stimulated and motivated small business owners' interest and increased their awareness of economic activities that they can undertake. Through television and radio, the rural small businesses owners were able to see how businesses are done in some other countries and they them-selves were able to start new businesses like saloons, driving schools, restaurants and car washing bays.

ICTs, particularly mobile phones, ensure that one is able to obtain information about jobs. One of the ways is that with a mobile phone, one may be informed of when and where a job is available.

Travel time and transportation costs had reduced due to use of ICTs. Through ICTs, small scale business owners had saved on the cost of transport and the pain of walking long distances or spending a lot of time in public transport. This was because the business owners could access some services by use of mobile phones or through the internet, which meant that they did not need to travel to seek such services.

Through ICTs, business owners acquired skills and knowledge on improved crop and animal husbandry. Because of radio programs that encourage and teach good agricultural practices, some farmers in the four districts used farmyard manure to improve yields on their farms rather than expensive commercial fertilizers. The farmers also got to know about appropriate agricultural inputs, while others began to experiment with organic growing of vegetables. To underscore this, a respondent in Rulindo stressed, 'Listening to radio has made a difference in farming in terms of the type of seeds to use in this area depending on the season. Otherwise, if you buy seeds from the shop without knowing the type you need, the shopkeeper will sell to you anything. They are after your money'. In the same area, a farmer reported, 'When I need a veterinary to attend to my livestock, I just call him through my mobile phone. This is crucial in enhancing chances of livestock surviving because a veterinary officer is more likely to come in time that when you go to look for him'. Thus, use of ICTs, especially mobile phone, had made it easier for farmers to access veterinary services and several people are now involved in farming as a business and great income generating activity.

Thus through the various ways discussed above, ICTs contributed to various ways in developing the small scale businesses. In terms of human capital, ICTs contributed to acquisition of educational information, agricultural knowledge, and skills that people utilized in activities that improved their lives. From an economic perspective, use of ICTs contributed to initiation of income generation activities and also increased people's income. Further, with regard to empowerment, ICTs enabled people to participate in governance by having their voice heard, which

alleviated helplessness because they knew that they could raise their concern to the rightful authorities and bring about change.

Summary and conclusions

The research findings established a number of revelations in regard to use of ICT by small business people in Rwanda.

- It was established that the most language used in business in Rwanda is Kinyarwanda. However, French language plays a complementary role. English and Swahili languages are also used rarely because of the language being new, but some business people have interest in learning the languages because some of their business partners are from Uganda, the Democratic Republic of Congo and even beyond.
- The leading products small business people in Rwanda are involved in are agricultural and industrial products and public phone as a service. This was experience in the study areas of Muhanga, Nyanza and Rulindo Districts.
- It was established that some of the small business people knew that ICT information was most important to them in the doing the day to day business. ICT is very important in giving them timely information on customer needs, market of products, the current prices of goods and services and the availability of loan/credit facilities.
- It was established that some ICTs like internet, television, news papers and magazines had not been recognized as adequate for commercial information access for some of Rwanda small business people which led them to lag behind their counterparts in information access.

5.3 Conclusions

The following conclusions are drawn from research findings.

1. The research proved that ICT phenomenon was not much a function alone of promoting small business growth in Rwanda. There may be other factors such as the political and economic stability in the country as well as the expansion of trade between Rwanda and neighboring countries of Uganda and the Democratic Republic of Congo and the region as whole. From the discussion with opinion leaders and local district administrators, it was found out that ICT alone did not promote smalll business development but together with other factors like financial incentives, political stability and other infrastructures like power and roads.

2. From the findings, it is concluded that ICT usage is still limited and awareness among the small business is lacking. This is commonly known as digital poverty. The lack of awareness and ICT usage makes little economic sense to private investors in ICT sector to undertake small business investment. To increase the usage of ICT, the Government should step in directly by providing user-incentives to promote usage of ICT by the small population. However, mobile telephones are widely used and fixed telephone land lines are used on small scale. It is suffice to note that ICT is not all about mobile phones
3. The study confirmed that telecommunication technology had a central effect on improving interaction hence information diffusion. For stance, some business people in Rwanda make orders to purchase goods and services using telecommunication means.
4. Finally, it is concluded that having access to ICTs by rural business people did not lead directly to their usage, because most of rural people lacked ICT knowledge

Recommendations

The following recommendations are made.

1. Currently Government has a framework of promoting ICT, contained in NICI plan but this simply gives bench marks on what to be achieved with no explanation on how it is to be achieved. It is recommended that Rwanda Government should put in place procedures and action plans with specific milestones and targets if those policies are to be achieved.
2. There should be a fund in place to train and educate rural business people on how they can accelerate the business growth through adaptation of ICTs in order to encourage community driven networks. This implies that the rural business people should also contribute to content development and management as well as the censorship of the information the technologies carry with them by conducting ICT seminars, conferences and exhibitions.

3. The Government of Rwanda should put in place general principles and priorities for action in harnessing ICTs as tools of development and poverty reduction. Should enforce a shared infrastructure regulatory policy to allow small players in the small business in rural areas to access network backbone at a cost based price.
4. The implementation of the ICT policy should encompass decentralization principals to ensure smooth coordination. Decentralization policy calls for individuals and communities to play key roles in the governance of their administrative areas through participation in the decision making and support social and economic development activities that aim to alleviate poverty in the respective livelihoods. Also a mechanism to evaluate the rural ICT policy performance on business growth, ICT literacy, infrastructure development and other relevant indicators should be developed and put into practice.
5. To reduce the ownership cost and expand access to all, the use of PC based services and applications should be deployed in a shared environment such as in schools, health centres, and public information centres like telecentres around the country.
6. Public Telecenters or media centres with emphasis on small business development should be set up by Rwanda government. Access may be free or a small user fee be paid for maintenance but should be far much cheaper than what is offered by the private sector.
7. Promote small scale ICT Enterprises in remote areas through incentives such as no-fee licensing as well as financial support as start-up investment to encourage ICT uptake among rural population. Loans for ICT equipments should be available at affordable or subsidized interest rates for rural people.

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