TECHNOLOGY CHALLENGES FACED BY RURAL WOMEN IN THE EASTERN CAPE PROVINCE OF SOUTH AFRICA: A CASE STUDY IN THE CHRIS HANI MUNICIPALITY

by

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submitted in accordance with the requirements for the degree of

MASTER OF ARTS

In the subject

COMMUNICATION

at the

UNIVERSITY OF SOUTH AFRICA

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JUNE 2014

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ABBREVIATIONS

AIDS	- Acquired Immune Deficiency Syndrome
ALL	- Animal Improvement Institute
AMREF	- Africa Medical and Research Foundation
CAT	- Computer Application Technology
CHDM	- Chris Hani District Municipality
DHIS	- South Africa District Health Information System
DoC	- Department of Communications
E-TIC	- Environmental Teratology Information Centre
ECA	-Electronic Communications Act
EC	- Eastern Cape
ECT	- Electronic Transactions Act
ECX	- Ethiopia Commodity Exchange
FS	- Free State
GP	- Gauteng Province
GNP	- Gross National Product
HIV	- Human Immunodeficiency Virus
ICASA	- Independent Communications Authority of South Africa
ICT	- Information Communication Technology

IDI - Information Communication Technology Development Index

IFAD - International Fund for Agricultural Development

IPB - Information Communication Technology Price Basket

ILRI - International Livestock Research Institute

I T - Information Technology

ITU - International Telecommunication Union

KACE - Kenya Agriculture Commodity Exchange

KZN - KwaZulu Natal

LP - Limpopo Province

MDGs - Millennium Development Goals

MIS - Market Information System

MP - Mpumalanga Province

MTN - Mobile Telephone Networks

NC - Northern Cape

NDP - National Development Plan

NGOs - Non Governmental Organisations

NW - North West

USAASA - Universal Service and Access Agency of South Africa

UNDP - United Nations Development Program

RESCUER - Rural Extended Services and Care for Ultimate Emergency

RSA - Republic of South Africa

SAFEX - South African Futures Exchanges

SMS - Short Message Service

SSS - Senior Secondary School

VHF - Very High Frequency

VoIP - Voice over Internet Protocol

WAP - Wireless Access Protocol

WC - Western Cape

WHO - World Health Organisation

WSIS - World Summit on Information Society

ABSTRACT

The study sought to explore technology challenges faced by some rural women in Intsika-Yethu and Emalahleni local municipalities, under the Chris Hani District Municipality, in the Eastern Cape Province of South Africa. Available literature reveals that some rural women in South Africa and other developing parts of the world face technology challenges. The study is qualitative and focuses on two municipalities. Thirty-two women participated in the study. Data were collected through in-depth interviews and focus group interviews. Data were presented, analysed and discussed according to the themes derived from the sub-research questions. It emerged from the study that while most women in both municipalities were aware of ICT, they are however facing ICT access challenges in most areas of the municipalities. The findings do not depict the South African government national ICT policy goals which realises the importance of technology in the integration of services for the development of rural areas. Designing intervention programs for secondary school girls and some rural women, as well as monitoring and evaluating ICT programs in rural areas are recommended.

Key terms:

Technology challenges; Accessibility of ICT; Affordability of ICT; Availability of ICT; Rural women; ICT literacy; Universal service; Universal access; Global society; Digital divide; Information society

DECLARATION

Student: 46476253

I declare that **TECHNOLOGY CHALLENGES FACED BY RURAL WOMEN IN THE EASTERN CAPE PROVINCE OF SOUTH AFRICA: A CASE STUDY IN THE CHRIS HANI MUNICIPALITY** is my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references.

..... June 2014
SIGNATURE DATE
MS G CHISANGO

ACKNOWLEDGEMENTS

The researcher feels indebted to many whose support and contribution made the completion of this study possible. The researcher would like to register her gratitude to the following;

- Jehovah God, The Almighty for extending His golden sceptre towards her. “I AM THAT I AM” (Exodus 3:14).
- I am highly indebted to my supervisors Professor NC Lesame, for her untiring guidance of the study; she took me through all the stages of my thesis and Professor BT Mbatha, also for his guidance of the study.
- To the Department of Education, Cofimvaba high school Principal and students for allowing her do conduct research at Cofimvaba high school.
- To the Department of Education, Gcinubuzwe secondary school Principal and students for allowing her to conduct research at Gcinubuzwe secondary school.
- To the Tsomo Women Support Group for allowing the researcher to interview her for the study.
- To the Mayor of Intsika-Yethu local Municipality for allowing the researcher to interview her for the study.
- To the Emalahleni Women Support Group for allowing the researcher to interview her.
- To the Mayor of Emalahleni local Municipality for allowing the researcher to interview her.

DEDICATION

- To my father, Mr SC Chisango and my siblings for their support during my studies.

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CHAPTER 1: INTRODUCTION TO THE STUDY

1.1 THE PURPOSE OF THIS CHAPTER

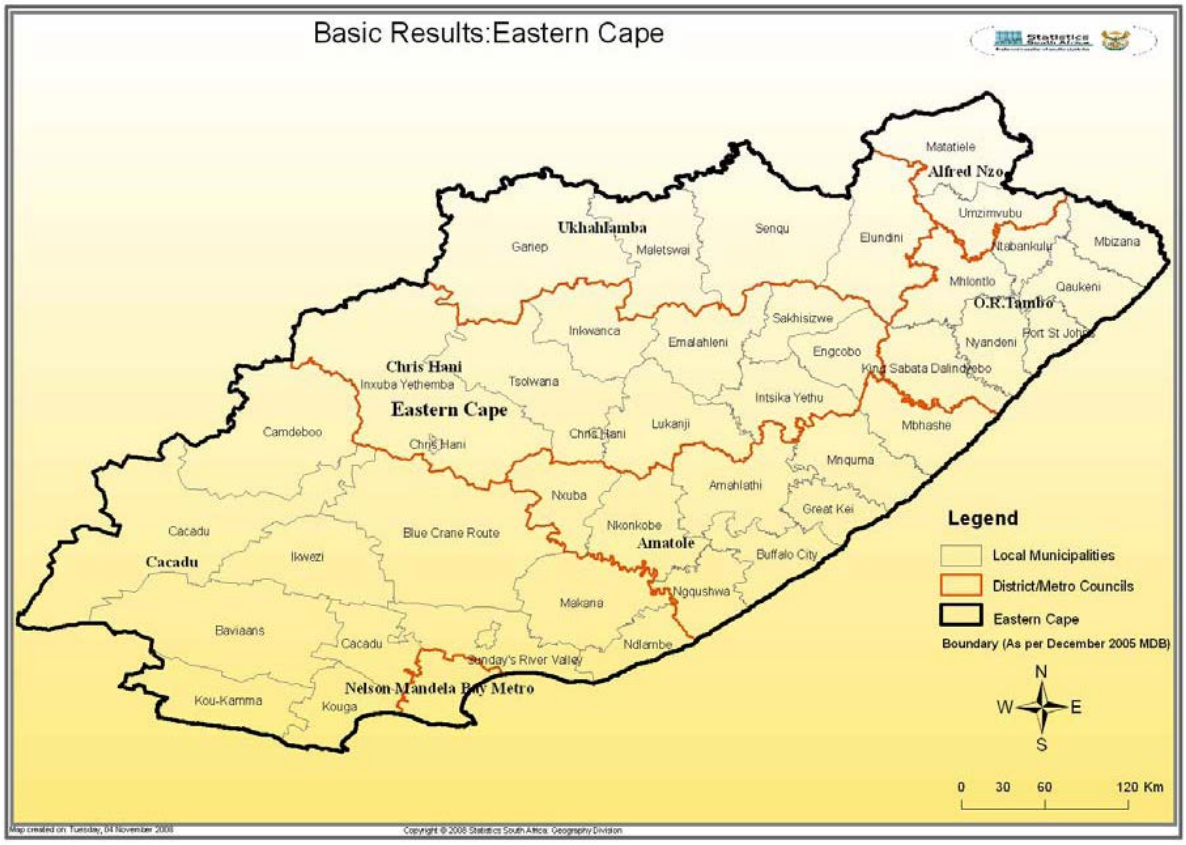
This study sought to investigate and highlight technology challenges faced by rural women in the Chris Hani District Municipality of the Eastern Cape Province in South Africa with the purpose of trying to find solutions to these challenges. This section provides the justification for and also shows the importance of the study. It also describes the conceptual framework of the study and concepts associated with the topic are defined. The background to the study is also described.

Information and communication technology (ICT) includes telecommunication and computer technology to transmit information and cuts across different geographical locations, compressing space and time (Holmes 2004). Rural people primarily depend on agriculture for their livelihood; information and knowledge are paramount for their economic and social development. Information and communication technology use is vital for the development of both rural and urban settings; however there are challenges faced by rural dwellers in their use and uptake of ICTs, such as availability, affordability and accessibility of ICT.

1.2 BACKGROUND TO THE STUDY

Situated at the centre of the Eastern Cape Province in South Africa, the Chris Hani District Municipality (CHDM) is categorised as a C2 Municipality. C2 Municipalities are municipalities "that are water service providers" (The Municipal Infrastructure Investment Framework/MIIF for South Africa 2011:10).

Figure 1: A map of Eastern Cape Province showing district and local municipalities.



Source: Statistics South Africa Community Survey 2007 (Permission obtained from Eastern Cape Development Corporation - East London Strategy Manager)

Municipalities classified as category C2, indicate "a largely rural character and low urbanisation rate as well as limited municipal staff and budget capacity" (McCann 2005:3). In this study the research focused on the following local municipalities, Intsika-Yethu, consisting of Tsomo and Cofimvaba and Emalahleni, made up of Indwe, Lady Frere and Dordrecht (Integrated Development Plan Review: Chris Hani District Municipality 2010/2011). These two local municipalities which are all under the Chris Hani District Municipality, are all classified as B4, meaning that they are all rural areas were subsistence farming is mainly the mainstay of the local economy (McCann 2005).

This study focused on women who live in the selected local municipalities, under the Chris Hani District Municipality, that is, Intsika-Yethu and Emalahleni local Municipalities. Women

in the mentioned municipalities were chosen over women in other municipalities of the same kind because the researcher was residing in CHDM and that made it easier and cheaper for her to conduct the research. The researcher has mainly focused on women support group leaders, Municipal Mayors and high school girls from each municipality. This group of people might be aware of technology challenges faced by women in their particular municipalities.

Furthermore, the dwellers of both Intsika-Yethu and Emalahleni local municipalities are marginalised. Approximately 95 per cent of the total population in Emalahleni stay in the rural areas (Emalahleni Municipality 2010) and also Intsika-Yethu has 95 per cent of its residents staying in the rural areas (Intsika-Yethu Municipality 2007). 55 per cent of the total population in Intsika-Yethu is female and in Emalahleni, 51 per cent is female. There is a high dependency on social grants in both municipalities, unemployment rate in Emalahleni is about 50, 3 per cent and in Intsika-Yethu, it is over 80 per cent, some of the people live on less than a $1 a day, making the municipality one of the poorest in the country and (Chris Hani District Municipality...2012-2017). Some families maybe forced to choose between having food on the table and buying ICTs, thus poverty may hinder the use of ICTs.

The unemployment situation is worsened by the local economies which are unable to absorb job entrant, as well as limited skills base in both municipalities. Low educational levels characterise Intsika-Yethu municipality whose 37 per cent of the total population has no schooling at all (Intsika-Yethu Local Municipality...2007). In Emalahleni, 23 per cent of the total population also has no schooling at all (Emalahleni Local Municipality...2010/11). Lo literacy levels also affect the use and uptake of ICTs.

The use of ICT is rapidly growing in South Africa, but some citizens are not part of the information society. This is not only affecting South Africa, but the continent at large; women constitute the majority of illiterates, for instance in Ghana, women constitute a higher rate of illiteracy, 34, 7 per cent of adult female population are illiterate (The World Fact Book 2013) and in South Africa, 25, 6 per cent of adult female population are illiterate (Hilbert 2011).

Poverty among women also represents a major barrier to ICT adoption, not forgetting cultural factors, such as early marriage, teenage pregnancy, child labour, creating a gender digital divide (Kwapong 2007). It is not only poverty which is a barrier to ICT use among women, but also "illiteracy, lack of training and skills, and irregular or non-existent power supplies act as significant barrier" (Solidarity for African Women's Rights Policy brief for 14th Ordinary African Union Summit 2010:9). Gender digital divide refers "to gender disparities in terms of access, control and content of information and communications technologies (ICT), as well as the necessary capacities to use them" (Mottin-Sylla 2005:15).

It is against this background that an exploratory qualitative study, that is, face-to-face interviews and focus group interviews, is undertaken to provide working knowledge and understanding of the pertinent issues around women and the challenges they face in their usage of ICT in the Chris Hani District Municipality, South Africa. This is done in order to provide input that will inform current and future intervention strategies to improve women's access and use of ICT. The rational informing this study is enshrined in the Millennium Declaration by United Nations in 2000 which states the urgency to ensure that the benefits of new technology, ICT, are made available to all (World Summit on the Information Society 2003).

According to the South African Government Gazette No 26734 (2004), if every South African is to participate effectively in the global economy, no one should be socially excluded and ICT should be made accessible to everyone. It is against this background that this study focused on the challenges faced by rural women in their use of ICT and the possible solution.

1.3 THE NEED FOR THIS STUDY

The aim of the study is to examine the challenges faced by rural women in their use of ICT. Technology is useful to various stakeholders, such as, education authorities, policy makers, policy implementors and women support groups. Policy makers and policy implementors, and women and nongovernmental organisations (NGOs) could come up with ways of assisting rural women. Information and communication technology connects the world, is used to do business, social networking and for economic development of nations. Some

rural areas in South Africa are faced with hardships in accessing ICT. Women in rural areas are the marginalised group in society and it is the duty of researchers to bring to light the plight they experience so that the challenges which they are facing could be addressed.

1.4 MAIN THEORIES THE STUDY IS BASED ON

The study is informed by a theoretical framework, which is the digital divide theory, through Van Dijk's model, Webster's theory of information society and the International Telecommunication Union ICT Development Index. It should be noted that these theories are fully discussed in the subsequent chapters.

1.4.1 The Digital Divide Theory

The digital divide is the gap between the information haves and the information have nots. Urban dwellers have more access to ICT, whereas the poor rural people have limited access to ICT. Individuals in the same society access ICT at different levels due to the differences in socio-economic status and educational levels. This theory is best suited for this study because it aims to look at women from different socio-economic status and how the socio-economic status of a woman affects her uptake and usage of ICT.

Van Dijk (2008:4) argues that having the motivation to use a computer and achieve an Internet connection is the first step to get access to ICT. Motivational access is explained by social and mental factors. Low-income, low levels of education, computer anxiety and technophobia are barriers to ICT use (Van Dijk 2008).

Having an Internet connection and a computer at home or in public place is what Van Dijk (2008) calls physical access. Physical access in developed countries is closing, whereas in developing countries, it is still widening. Some urban dwellers have more physical access to ICT than most rural people. Non-existent and old infrastructure in rural areas perpetuates the digital divide.

Digital skills include operational skills, information skills and strategic skills. Digital skills is the ability to use computer and network sources as the means for goals and for the general goal of improving one's position in society (Van Dijk 2008). There is unequal access as a

result of social stratification that results in classes of winners and losers of the information society (Fuchs & Horak 2008:3).

Van Dijk (2008) states that the usage access is determined by usage time, applications, broadband use and creative use. The highly educated with high levels of income use more applications than the lowly educated people.

1.4.2 Webster's theory of information society

Webster (2005) constructed five definitions of an information society; technological, occupational, spatial, economic and cultural definitions.

Technological innovation has led to the convergence of telecommunications and computing. The increase in mobile telephones and computers as main tools of workplaces and convergence of traditional media of communication indicates the presence of digital technology (Lesame, Mbatha & Sindane 2011:48).

Occupational change is characterised by work requiring an increasing manipulation of text and figures. In South Africa the working population stay in towns and cities where connectivity is high (Oyedemi & Lesame 2005:82). There are, however other labourers, such as farm and mine workers who might not be accessing ICT, though it is used in these sectors.

With the spatial definition of an information society, geographical boundaries are eradicated by technology, distance has been limited and time has been shrunk. Telecommunication technology, such as, Internet and cellphone, allows instant communication on the globe. There is increased use of ICT, especially the mobile phone in both rural and urban South Africa.

Technology plays a paramount role in stimulating economic growth and development. Information industries contribute a certain per cent to the gross domestic product of a country and they have created various jobs for many people.

The cultural definition of an information society focuses "on the impact of ICTs and information on our lifestyle" (Oyedemi & Lesame 2005:85). There is globalisation of culture because people acquire global fashion, music, arts and lifestyle on the Internet. Information

and communication technology is found in both rural and urban South Africa, though their levels of access differ due to different socio-economic factors.

1.4.3 International Telecommunication Union (ITU) ICT Development Index (IDI)

The ITU IDI is best suited for this study because its indicators cover ICT access, use and skills. The researcher used the ITU IDI to track the progress that South Africa is making towards becoming an information society.

Accessibility to ICT services differ in South Africa. Information and communication technology services are easily accessed in the affluent provinces, such as Gauteng and the Western Cape Province, whereas in other provinces, for instance Limpopo and Eastern Cape provinces, ICT are not easily accessed (Oyedemi & Lesame 2005). Information and communication technology are biased towards urban areas which are highly connected, with roads, power and telephones.

Rural areas are discriminated against with regards to ICT access due to weak road networks, non availability of electric power in some areas and a lack of fixed lines (Fourie 2008). Unavailability of telephone lines in rural South Africa can be blamed on Telkom's high prices for installation, rental and calls which resulted in the disconnection of many lines (Horwitz & Currie 2007).It should also be noted that rural areas lag behind in terms of ICT access because of other factors such low levels of ICT skills and low household incomes (Fourie 2008). Some rural dwellers do not afford paying for ICT training skills which are offered at some Thusong centres due low levels of income, hence the majority of them are unable to fully utilise ICT, such as the mobile phone.

The use of the Internet is relatively low in South Africa, with the majority of users found in large cities and areas of high and middle income households (Abrahams & Goldstuck 2010). The majority of the population use ICT for voice communication and text messaging. Limited use of the Internet is blamed on high mobile data prices.

A gradual increase in school and tertiary enrolment is evident in South Africa. 91,7 per cent of persons aged 5-24 years attended school in 2001 and they increased to 93,0 per cent in 2011 and 1,4 per cent of persons aged 5-24 years attended college and they increased to 2,6

per cent in 2011 (Statistics South Africa Census 2011:33). There is extensive use of ICT at tertiary level and some schools. A certain percentage of the South African population is however illiterate, it mainly comprises of the adult population and some school going age children who are out of school (South African Education for all Country Report 2010).

Computer hardware, voice and data are highly priced markets relative to income (Abrahams & Goldstuck 2010). Operators charge high interconnection rates to terminate calls on each other's networks. Mobile Telephone Network (MTN) has had the most expensive prices for the low-user basket, at between ZAR 95, 05 and ZAR 96, 04, while Vodacom has stayed at ZAR 81, 26 and on the other hand, 8ta at an average of ZAR 77, 45 and Cell C at ZAR 72, 15 (Research ICT Africa 2012:4). Though Independent Communications Authority of South Africa (ICASA) regulated the termination price in March 2011 that operators charge each other, this has not created a fair competitive environment and has also not reduced prices for the consumers, resulting in unaffordable communication for the majority of the consumers (Research ICT Africa 2012). The dominant operators, Vodacom and MTN have been able to withstand the pricing pressure from price cuts by 8ta and Cell C.

1.5 THE ROLE OF ICT IN RURAL DEVELOPMENT

Rural development is guided by the eight, United Nations Millennium Development Goals (MDGs). Information and communication technology infrastructure present in rural areas help combat poverty , improve the health of the people and also improve their access to the information that they need, such as, their rights. The presence of ICT infrastructure in a society creates a rich information society which is able to fully participate on the globe.

The presence of ICT in rural areas ensures that farmers are able to access reliable information about agriculture and markets. The use of mobile phones throughout the world created an opportunity to provide financial services over the mobile network (United Nations Development Programme South Africa 2010). Integrating the use of ICT into existing health system helps improve the delivery of health care (Chetley 2006). Information and communication technology therefore plays an important role in the development of rural areas which leads to the eradication of poverty.

1.6 SOUTH AFRICAN POLICY REGARDING THE ROLE OF ICT IN RURAL DEVELOPMENT

The post-apartheid government inherited a telecommunications infrastructure "which was highly skewed in favour of white and urban areas" (van Audenhove 1999:19). South Africa's historical background forced her to restructure ICT policy. It is not only political changes which results in the transformation of South Africa's telecommunications industry, but also as a result of "global economic trends, such as the liberalisation of markets, influenced by the World Trade Organisation's General Agreement on Trade and Tariffs" (GATT) (Lesame 2005:13).

The Telecommunication Policy was enacted in 1996 by the South African government to pursue values which "promoted equal access to telecommunication services or universal service to these services, whether one resides in an urban or rural area" (Lesame, Mbatha & Sindane 2011:206). Universal access and services to ICT are fundamental in the prevention of social exclusion.

The 1996 Telecommunication Act was followed by a number of pieces of legislation, these include, the Independent Communication Authority of South Africa (ICASA) Act of 2000, the Telecommunications Amendment Act of 2001, the Electronic Communications Act (ECA) of 2005 and the Convergence Bill of 2005 (Lesame 2005).

It is the Department of Communications' (DoC) mandate to "create a vibrant ICT Sector that ensures that all South Africans have access to secure, affordable and accessible ICT services in order to advance socio-economic development goals and support of the African Agenda and contribute to building a better world" (Government Communication and Information System: Communications South Africa Year Book 2011/12). Therefore, one of the DoC's main functions is to develop ICT policies and legislation which create a favourable environment for the economic growth of South Africa.

It is South African government policy that ICT should be accessed by all citizens regardless of geographical location and in this study; the researcher seeks to find out the technology challenges faced by rural women in accessing ICT. Information and communication

technology play a crucial role in the economic development of the nation and technology can link the rural areas to urban areas and the world at large.

1.7 THE AIM OF THE STUDY

The aim of this research is to identify technology challenges faced by rural women in their use of ICT and how these challenges can be resolved. This was done through an exploration of the level of ICT access and use by rural women in Chris Hani District Municipality. The level of ICT use can be established by identifying ICT used by the rural women and what they use the technology for. A description of the challenges that rural women face in their use of ICT was done and the study also assessed how the national ICT policy has improved women's access and use of ICT. The study did not only identify technology challenges faced by rural women, but it also established possible measures which can be used to address the problems.

1.8 THE RESEARCH OBJECTIVES

To achieve the above stated aim, the following research objectives were addressed:

- Determine the level of ICT access and use by rural women in the Chris Hani District Municipality.
- Establish the rural women's purpose of using technology.
- Identify challenges that rural women face in their use of ICT.
- Establish possible measures which can be used to address the problems faced by rural women in ICT usage.

1.8.1 Research question

The study answered the following research questions:

1. What is the level of ICT access and use by rural women in the Chris Hani District Municipality?
2. What do rural women use ICT for in Chris Hani District Municipality?
3. What are the challenges faced by rural women in Chris Hani District Municipality in their use of ICT?
4. Which possible measures could be used to address the problems faced by rural women in ICT usage?

1.9 RESEARCH METHODOLOGY

The researcher used a qualitative approach to collect data from the participants. In depth face-to-face interviews and focus group interviews were conducted to solicit for data from the respondents. Research methodology is fully discussed in the subsequent chapters.

1.9.1 The research method

Qualitative research allows the researcher to probe the participants through in-depth face-to-face interviews and get a deeper insight into the phenomenon under study and other hidden issues related to the challenges faced by rural women in their use of ICT.

Qualitative research "creates new concepts and emphasise constructing theoretical interpretations" (Neuman 2006:15), thus the researcher does not only focus on a specific question, but consider the theoretical and philosophical paradigm in an inquisitive open minded settling (Neuman 2006). This is relevant to this study because it allows the researcher to keep on probing the informants through in-depth face-to-face interviews and get a deeper insight into the phenomenon under study and other hidden issues related to the challenges faced by the rural women in their use of ICT.

Qualitative research uses the holistic approach strategy, whereby the researcher aims "to describe and understand events within the concrete, natural context in which they occur" (Babbie & Mouton 2010:272). Human behaviour is affected by the environment in which people live, each context has its own morals and values. Thus, a holistic contextual approach of qualitative research explains in detail how and why events occur in their context.

This design is best suited for this study because it looks at a phenomenon totally, hence giving the researcher the ability to investigate ICT usage by women in the selected rural municipalities under the Chris Hani District Municipality. Leedy and Ormrod (2005) state that the situation is described in rich detail and the readers can draw their conclusions from the data presented.

The research design is the researcher's plan of action that will give guidance throughout the research, indicating who or what is involved, and where and when the study will take place (Du Plooy 2009). This study is qualitative, research participants are two Local Municipal Mayors, two women support group leaders and high school girls. In-depth face-to-face interviews and focus group interviews were conducted.

The two selected municipalities share the same characteristics; they are largely rural and rely on subsistence farming (McCann 2005). Furthermore, the study was conducted in only two municipalities to cut down on costs involved in the study and also the easy management of collection and interpretation of data. A case study method is used in this study because it enables the researcher to select a small geographical area and a limited number of individuals as the subjects of the study (Zainal 2007). The researcher sought to do justice to the study by conducting thorough research in a few municipalities.

1.9.2 Validity and Reliability

According to Nieman, Niemann, Brazelle, Van Staden, Heeyns and De Wet (2002), validity means that findings are based on research evidence that does not fluctuate. In ensuring validity, the researcher with the help of a translator used the participants' home language in interviewing participants who were not comfortable in speaking English Language. A digital

voice recorder was also used. This was done to ensure that the informants' responses are accurately captured.

Reliability on the other hand means the "dependability of consistency" (Neuman 2003:14). Therefore, there is need to ensure that data collection instruments are reliable. The pilot study helps to improve the interview schedules for the participants.

1.9.3 Pilot study

A pilot study was conducted with the aim of ascertaining the validity and reliability of the research instruments before the implementation of the data gathering tools (White 2002). The pilot test is meant to test the interview schedule and the interviewing methods chosen, that is, the focus group interviews and the in-depth interviews. The major reason for conducting a pilot study is to ascertain the overall feasibility of the study, test the data collection instruments before implementation, identify any logistical problems that could negatively affect the main study and also test the data analysis procedures.

The pilot study was done in one local municipality, under CHDM, that is, Engcobo which consists of All Saints and Clarkebury (Integrated Development Plan Review 2010/2011). The municipality selected for the pilot study is not one of the two local municipalities for the main study.

The research participants were made aware of the pilot study in writing. The participating informants, which are, the government official, women support group leader and high school girls, were asked to give their overall evaluation of the research instruments.

1.9.4 Target Population

This study focuses on rural women in the Eastern Cape Province. Population is "a collection of objects, events or individuals having some common characteristics that the researcher is interested in studying" (Mouton 1996:34). In this study, population refers to all rural women under Chris Hani District Municipality, in the Eastern Cape Province of South Africa.

1.9.5 Accessible Population

Accessible population refers to “the units of analysis in the target population to which researchers have access” (Du Plooy 2009:51). This research only focuses on women who are economically active. The research also focuses on women from two local municipalities, Intsika-Yethu and Emalahleni, which are under Chris Hani District Municipality.

1.9.6 Units of Analysis

The researcher identified units of analysis which are included in the study. According to Babbie & Mouton (2010:84), units of analysis refer “to WHAT of your study: what object, phenomenon, entity, process, or event you are interested in investigating”. The units of analysis in this study are the individual women.

1.9.7 Data Analysis Procedures

The researcher used the thematic approach to analyse collected data. Babbie and Mouton (2010:492) state that thematic analysis also called conceptual analysis includes “deciding how many concepts to code for”, and “deciding whether to code for the existence or frequency of a concept”. In this study, data was arranged into themes related to the sub-questions, for analysis. The interviews were recorded on a digital voice recorder and transcribed into writing for the data analysis and presentation.

1.9.8 Research Instruments

1.9.8.1 In-depth Interview

In this study the researcher used in-depth interviews to collect data from the respondents, Babbie and Mouton (2010:289) state that “an instrument acts as a miner who digs deep to get information”. Therefore in-depth interviews allow the researcher to pursue or to probe specific topics raised by the respondents giving deep insight on the topic under study. In this study in-depth interviews were used to collect data from the two Mayors of local municipalities, and two women support group leaders from the two local municipalities.

The in-depth interview allows the researcher to seek clarity on issues misunderstood and might even take the informant back to issues discussed earlier for further elaboration (Babbie & Mouton 2010).

1.9.8.2 Focus group interviews

The researcher also used focused group interviews to collect data. Focus group interviews were conducted at high schools, that is, two different groups, each from one municipality of the two selected municipalities, that is, Intsika-Yethu and Emalahleni.

1.9.9 Ethical considerations

Research ethics are defined as the principles guiding research, from the beginning to the completion of the study (Bryman 2012). In this study, the research ethics were considered; data was collected from human subjects through in-depth interview and focus group interviews. The researcher sought permission from the Department of Education and school principals before collecting data from focus groups at high schools.

The subjects, that is, women and high school girls were told about the nature of the study to be conducted and it was their choice to participate or not to participate. The researcher also sought permission to interview government officials and women support group leaders through written letters.

Each participant signed and dated a letter indicating agreement to participate (Leedy & Ormrod 2005), that is, informed consent. If subjects agree to participate and feel that they want to withdraw, they can do that. Participants will remain anonymous to protect their confidentiality.

1.10 SUMMARY

This chapter has attempted to give a general overview of the study. The background information to the problem under study tried to put the study into proper context. A brief description of the Eastern Cape Province, South Africa, has been made, focusing mainly on Chris Hani District Municipality where the study is centred on. The statement of the problem and the significance of the study have been laid down. Main concepts and theories of the

study have also been explained in relation to South Africa. Research questions outlined serve as a basis to the understanding of the research problem and as a means to find solutions to the problem.

1.10.1 Outline of chapters

In the first chapter, the researcher explains the research problem and its setting, giving an overview of the study. The background of the study is outlined which leads to the statement of the problem, significance of the study as well as the conceptual framework of the study.

In the second chapter, the researcher defines the main concepts and reviews the literature to the study in line with sub-research questions to ensure relevance of the literature review. The main concepts and theories include the digital divide theory, Webster's information society, ITU IDI and Van Dijk's model of types of access to new media.

The third chapter outlines the role of ICT in rural development in South Africa and other parts of the world. Rural development includes moral, political, social and economic potentials of rural societies to facilitate their economic self-reliance.

The fourth chapter reviews the ICT Policy on rural development in South Africa. Information and communication technology policies which were reviewed include the Electronic Communications Act of 2005 and the South African Telecommunication Act of 1996. A brief historical background of South Africa is provided relating it to the need for new ICT policy.

The fifth chapter outlines the research methodology by justifying the research design, instrumentation and data collection procedures in both the pilot and main studies. Data collection methods which were used are in-depth interviews and focus group interviews. Ethical considerations are also discussed.

The sixth chapter presents analyses and discusses the findings of the study. Research findings are critically analysed in relation to the theories in the study. The researcher also thematically presents the discussion.

The last chapter concludes and makes recommendations in line with the findings. Research findings from all participants assisted the researcher to make meaningful recommendations.

CHAPTER 2: MAIN CONCEPTS AND THEORIES THE STUDY IS BASED ON

The study is informed by a sound theoretical framework, indicating and guiding the beliefs and the researcher's worldview, which Denzin and Lincoln (2005) call an action submitting to a view. The digital divide theory, Webster's theory of information society and the International Telecommunication Union's Information and Communication Technology Development Index (IDI) guide the study.

2.1 DEFINITION OF TERMS

2.1.1 Information and communication technology

Information and communication technologies can be defined as "Technologies and tools that people use to share, distribute, gather information, and to communicate with one another, one on one, or in groups, through the use of computers and interconnected computer networks. They are mediums that utilise both telecommunication and computer technologies to transmit information" (Holmes 2004:24). Information and communication technology include the television, radio, Internet, wireless networks and cellular phones. The convergence of ICT has compressed space and time, creating a global village in which people communicate across the globe instantly through technologies, such as voice over Internet protocol (VoIP), video-conferencing and instant messaging.

2.1.2 Information Society

The information society is "a social structure based on the free creation, distribution, access and use of information and knowledge, the globalisation of various field of life" (Karvalics 2007:10). An information society is characterised by the great use of information among the people to take control of their lives, such as, to compare products and to participate on forums. Information is also used as an economic resource by organisations, to ''increase their efficiency, to stimulate innovation and to increase their effectiveness and competitive position'' (Moore Sa). An information society is also characterised by the development of an

information sector which is concerned with satisfying the demand for information facilities, such as computer networks and telecommunication services (Moore Sa).

Other characteristics of a wired society are that the number of those employed in the information and knowledge sector relatively dominates other sectors and the purchase of information goods is also high in the society (Karvalics 2007). Most developed nations are part of the information society, whereas the developing countries are not yet fully information societies. Some parts of the developing nations are information impoverished due to the socio-economic status of the people, ICT services are beyond the reach of many.

2.1.3 Policy

A policy is defined as "public directions set by government as a means of fulfilling its constitutional responsibilities in respect of a particular area of public and private activity" (Lesame, Mbatha & Sindane 2011:207). A policy guides and determines present and future decisions and is often supported by special legislation. Policies have essential parts, that is, objectives and instruments.

Policy objectives are "the ends of a policy and reflect the overall purpose or long-term aims" and policy instruments are "the means of a policy, the actions used to carry it out and the methods by which its objectives are achieved" (Food and Agriculture Organisation on the United Nations...1993). Therefore, policy processes are policy formulation, implementation and analysis. Information and communication technology policies put in place and implemented by the government determine the pace at which a nation becomes an information society.

2.1.4 Information and communication technology policy

Information and communication technology policy sets out the vision for ICT development and its links to national development goals. It covers telecommunication, especially telephone communications, broadcasting, mainly radio and television and the Internet. The policy can be national, regional and international. The ICT policies have common objectives, which include, increasing the benefits from information technology, providing ICT services

at a reduced cost and improving the quality of services and products (United Nations Economic and Social Commission for Asia and the Pacific).

Two critical issues in ICT policy are access and civil liberties (Nicol 2003). Accessibility to ICT is a challenge in some countries, to some it is not only unaffordable to use the technology, but the technology is also not easily available. Civil liberties include human rights, such as, the right to privacy and the right to communicate (Nicol 2003).

Information and communication technology policies and strategies also have to do with activities which impact the quality of life, such as, agriculture, education, health and culture. They can be merged into national policies, for instance, extending Internet access to rural clinics to improve the delivery of health services, thereby bridging the digital divide (Ruxwana, Herselman & Conradie 2010). Legislation establishes how policy is implemented by defining the basic regulatory principles and processes. Good legislation and regulation is necessary to translate policy into reality.

2.1.5 Rural area

In the South African context, rural areas are defined "as the sparsely populated areas in which people farm or depend on natural resources, including the villages and small towns that are dispersed through these areas. In addition, they include the large settlements in the former homelands, created by the apartheid removals, which depend for their survival on migratory labour and remittances" (Rural Development Task Team and The Department of Land Affairs 1997). Some rural areas have limited access to global ICT infrastructure and services. It is the spread of cell phones that has made communication easier for the rural people linking them to the rest of the world. Availability of ICT, such as the radio and Internet access in the rural communities and farms can improve their livelihoods by providing information on health, farming and markets.

2.2 INFORMATION AND COMMUNICATION TECHNOLOGY AND THE SOCIETY

Information and communication technology has made it easy for people to interact swiftly and it has no geographical boundaries, for instance, chat rooms and social networking websites, such as, Skype, have made global and social interaction easy. People speaking

different languages can socialise or trade via the Internet, by using the language translators, which eliminate language barriers (World Youth Report 2003). Technology has therefore removed limitations on people.

Michelson (2013) states that ICT provide the poor, rural communities with computer workstations and laptops, connectivity might solve the problems of poverty, poor health, education and lack of political involvement. Availability, accessibility and affordability of these technologies can provide the much needed information in society.

Information and communication technology is also identified as both a production sector as well as an enabler of development, such as the Grameen Village payphones (Rao 2011). Information and communication technology can therefore be a powerful tool for development because of the global nature of the Internet and the low marginal costs of distribution and communication (Kramer, Jenkins & Katz 2007). Technology substitute for other means of communication, such as physical travel, enabling instant communication and exchange of information.

Kramer et al (2007) also state that ICT increases choice in the marketplace and provide access to unavailable goods and services. For instance, in Chile an Internet network among farmer organisations has increased farmers' incomes by providing information about crop status, weather and global market prices (Rao 2011). Increased ICT use is a critical tool in developing countries in their efforts to eradicate poverty, enhance human development and achieve the United Nations Millennium Development Goals (Ericsson 2012). Information and communication technology is a key source of economic growth and job creation, this result in an increased tax base.

2.3 DIGITAL DIVIDE THEORY

The digital divide theory started with the increase in the use of personal computers in America between 1991 and 1996 (Rapaport 2009). The Clinton administration wondered if access to Information Technology was fairly distributed. A report by the United States of America, National Telecommunications and Information Administration reported on the "have nots" in rural and urban America and inequalities of online access were aspects of

wealthy and poverty (Rapaport 2011). Digital divide is present in both rural and urban settings. The rich easily access ICT whereas it is difficult for the poor to access ICT.

Singh (2010) argues that a policy-deciding element to the definition of digital divide differs between countries. In some countries it revolves around the socio-centricity, whilst in others, it revolves around techno-centricity as the key focus area of policy. Socio-centricity emphasises on the use of technology for the improvement of lives, whereas, techno-centricity stresses the increase in technological possession for reducing comparative statistical imbalances (Singh 2010).

Digital divide is social because of the division between rural and urban people, as well as between high and low-income groups (Beck & Wyzard 2014). In South Africa, there is a gap that exists between the individuals who have opportunities to access technology tools and those who don't have such opportunities (Sikhakhane, Lubbe & Klopper 2005). Some urban dwellers have easier access to computers, libraries and Thusong centres that can be used to access information whereas in rural areas such resources are not easily accessible, hence rural dwellers fall behind in accessing information, creating rural-urban divide. Houses in the rural areas are scattered and the Thusong centre is only found in the small towns and the rural dwellers have to travel long distances to access the Multi Purpose Community Centre. It is further argued that factors contributing towards a lack of facilities in rural areas include high rates of unemployment, low literacy levels and low levels of income (Sikhakhane & Lubbe 2005).

Cognitive resources are also a cause of concern in rural areas. People residing in rural areas also do not have ICT skills and the ICT trainers to assist them in the use of resources. Some do not have digital experience because they lack interest in ICTs, the information want-nots and some are technophobic (Van Dijk 2005). The disconnected class has therefore less chance on the labour market, less educational opportunities and has less chances of participation in politics of society (Van Dijk 2008). Unequal distribution of ICT infrastructure in South Africa and other parts of the world leads to digital divide.

South Africa has liberalised markets which resulted in the higher potential for access, but this does not solve the digital divide problem because the existence of Internet connections

and mobile lines does not mean that the low and medium income classes can afford accessing ICT (Fuchs & Horak 2008). Furthermore, Van Dijk & Hacker (2000) argue that accessing technologies does not close the skills gap. It is only those with digital skills who benefit from advanced digital technology and the more difficult applications and services. Others only use basic technologies for simple applications. Therefore, digital divide refers to both access to and equity in experiences with technology. Access is still an issue in some countries and equity is also a major concern. ICT skills and the capacity to use them are not equitably distributed even when access is available (Beck & Wyzard 2014).

Gender divide also contributes to unequal access to ICT. Some women have few opportunities for personal contact because they are housewives, doing unpaid work and some earning less than their male counterparts (Gillwald, Milek & Stork 2010). These women are disadvantaged by costs of communication. Again, rural women are more likely to be deprived of access to ICTs than rural men due differences in mobility and access to income. Therefore the issues of accessibility, availability and affordability of ICT still need to be addressed in South Africa.

Information and communication technology is accessed at different levels in the same society due to differences in socio-economic status of people. According to Lesame (2005:3), the term “digital divide” refers to “the gap between the access of individuals, households, organisations, countries and regions at different socio-economic levels of ICTs and Internet usage”. It is the gap that exists between the information haves and the information have nots. This is termed as the social structure approach, that is, digital divide is a result of the social structure historical imbalances (Lesame 2014). Urban dwellers have more access to ICT whereas the poor rural dwellers have limited access to ICT.

Furthermore, individuals within the same society access ICT at different levels due to differences in the economic status and educational levels. This results in social divide, which includes, the income gap. People with high income, good education and ICT skills are much more likely to have access to ICTs, to be able to use ICTs and benefit from the usage (Fuchs & Horak 2008). Whereas, the low-income and less educated lack access to information resources, such as, the telephone, Internet and computers (Hindman 2000). Some people have to choose between buying a computer and having food on the table. This theory is

suitable for the study because it aims to solicit information from women of different economic and social status and how the socio-economic status of a woman affects her uptake and usage of ICT.

The then United Nations Secretary General Kofi Annan pointed out that "communication and access to communication technologies are just like social security fundamental human rights and that the digital divide is a pressing humanitarian" (Fuchs & Horak 2008:2). In this study the research sought to find out the technology challenges faced by rural women in their use of ICT and tries to understand the digital divide through the use of Van Dijk's model (2008), Webster's theory of information society and the International Telecommunication Union (ITU) Information and Communication Technology Development (ID) Index.

2.4 VAN DIJK'S ANALYSIS OF THE ACCESS MODEL

There are various factors which affect the uptake and use of ICT by an individual, household, society and a nation. In most developing countries, ICTs are not easily accessed, especially in remote areas. Affordability of ICT and ICT illiteracy are factors among others, which hinder the uptake and use of ICT among the poor and marginalised people. Van Dijk uses a model with four types of access to analyse digital divide. These types of access are motivational access, material access, skills access and usage access (Van Dijk 2008). Unequal access to ICT creates digital divide.

2.4.1 Motivational access

The desire to use ICT drives one to access the technologies. Van Dijk (2008:4) states that "acquiring the motivation to use a computer and to achieve an Internet connection is the first step to get access to these digital technologies". For one to have the need for an Internet connection and computer use, ICT would be of importance to them. It is argued that social and mental factors explain motivational access.

Human Development Index data for Niger seemed to indicate that high poverty and low human development correspond with low Internet access, Fuchs and Horak (2008:7). Low

incomes coupled with low levels of education are barriers to ICT. For one to have the three strategic ICT, the computer, the Internet and the mobile phone, a stable income and ICT literacy are a requirement.

The mental explanation is that some people are computer anxious and technophobic. Computer anxiety and technophobia are "major barriers to computer and Internet access, especially among seniors, people with low educational level and a part of the female population" (Van Dijk 2008:5). A European survey of 2005 cited by Van Dijk (2008) states various reasons for not wanting a home Internet connection, the reasons cited include, expensive equipment, lack of skills, content not useful and high access costs (Van Dijk 2008). Fuchs and Horak (2008:3) state that income gap creates a social divide, that is, those who can afford computer and Internet access and those who cannot. High costs of ICT equipment especially in developing countries hinder the use of ICT among the poor people.

Fuchs and Horak (2008) also state that Internet access cost in Africa is high, for instance, Internet costs in Kenya and Nigeria are extremely high; this is a major barrier to Internet access for the common man. Therefore, in this study the researcher sought to find the technology challenges faced by rural women in Chris Hani District Municipality, Eastern Cape Province.

2.4.2 Physical access

The availability of ICT infrastructure differs in rural and urban areas in most developing countries. Physical access is "having a computer and Internet connection, at home or in a public place" (Van Dijk 2008:8). Physical access divide in Europe is described in terms of the gap between European countries and the gap of demographics, such as age, gender, educational level, type of employment and ethnic minorities (Van Dijk 2008).

Digital divide in terms of physical access is closing in developed countries, whereas, in developing countries it is still growing (Fuchs and Horak 2008). Research conducted in Lucingweni in the Eastern Cape Province stated that the community was promised an ICT centre with computers, but, it never materialised, therefore, "access to the ICT is still a faraway reality for some people" (Busken & Webb 2009:43). Lucingweni is a village made up

of two hundred and twenty two homes and is located about four kilometres from Hluleka nature reserve (Mini-grid for Lucingweni). The digital divide is therefore perpetuated by non-existent and old infrastructure in rural areas. The rural areas are last to be reached by technology, thus inhabitants always lag behind. The following table shows the household ICT goods in Eastern Cape.

Table 1: Household ICT goods in Eastern Cape

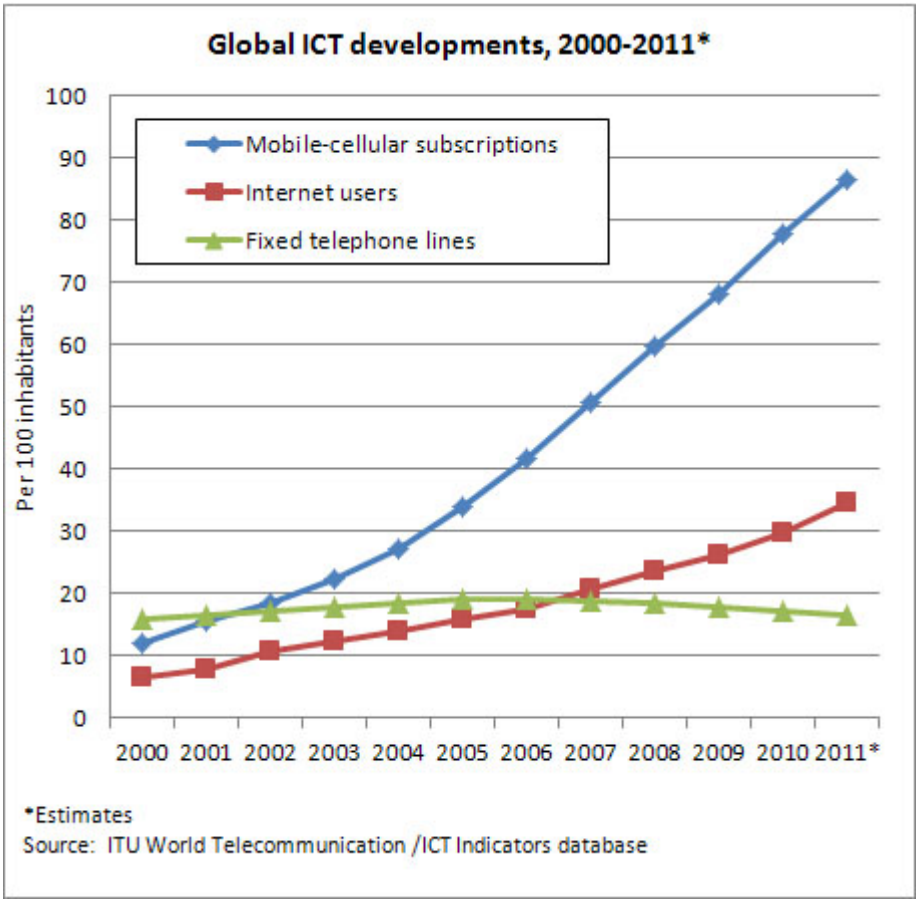
Municipality	No. Of household with a computer	Total No. of household	No. of households with a cellphone	Total No. of households	No. of household with Internet access	Total No. of household	% households with a Computer	% households with a cellphone	% households with Internet access
Buffalo City	25 552	208 389	145 249	208 389	12 155	208 389	12,3	69,7	5,8
Engcobo	166	35 187	17 494	35 187	-	35 187	0,5	49,7	-
Emalahleni	448	31 196	17 952	31 196	290	31 196	1,4	56,4	0,9
Intsika-Yethu	391	43 501	26 183	43 501	51	43 501	0,9	60,2	0,1
Nelson Mandela Bay	56 162	276 881	218 440	2 66 881	21 681	276 881	20,3	78,9	7,8

Source: Statistics South Africa Community Survey 2007, Eastern Cape (03-01-32)

The above information clearly shows that there is a higher penetration rate of the three strategic ICT in people's homes in the urban Buffalo City Municipality and Nelson Mandela Bay than in the rural Intsika-Yethu, Engcobo and Emalahleni municipalities, which are all in the Eastern Cape Province, South Africa. According to the Electronic Communications Act No. 25 of 2005, the digital divide is to some extent a cause as well as a consequence of poverty. A few households have computer and Internet access in their homes in the rural municipalities and the number of people with computers and Internet access is relatively high in the urban municipalities.

Low Internet penetration rate is not only in South Africa, but it is a global issue. This is evidenced by the ICT indicators below.

Table 2: Global ICT developments, 2000-2011



The above ICT indicators show that mobile cellular subscriptions gradually rose from the year 2000, with slightly above 10 people per 100 inhabitants to almost 90 people owning a cell phone per 100 inhabitants in 2011. The use of the fixed telephone line had no significant growth since the year 2000 and the number of people accessing it started decreasing in 2008 to 2011. Internet usage is slowly growing on the globe, with less than 10 people per 100 inhabitants connected to the Internet in 2000 and also only about 35 people per 100 inhabitants used the Internet in 2011.

According to the International Telecommunication Union (2007), less than three per cent of the world's Internet subscribers, or 10, 7 million, were located in Africa in 2006. The reasons behind the low Internet use in Africa include low levels of ICT literacy, lack of fixed line infrastructure and affordability. The cost of ICT price basket in Africa represent 41 per cent

her monthly average income (International Telecommunication Union 2009). Higher prices of ICT reduce access and use of ICT.

Lack of adequate physical access in rural areas socially excludes the rural dwellers from the information society. This is in contrast to the commitment made by world leaders in the 2007 World Summit on the Information Society (WSIS), to "turn the digital divide into a digital opportunity for all" (Solidarity for African Women's Rights Policy brief for 14th Ordinary African Union Summit 2010). However, there is a high penetration rate of the cellphone in all the municipalities regardless of their geographical location. This is due to deregulation and liberalisation of the communications industry. South Africa now has five mobile network operators, which are Vodacom, MTN, Virgin Mobile, 8ita and Cell C.

Global forums, such as the 2003 WSIS and the follow up review in 2000 of the Fourth World Conference on Women in Beijing, 1995, affirm that ICT affect women and men differently. Research conducted in Francophone Africa noted that in places where physical access is guaranteed, women do not use ICT because "of gendered specific constraints; they have more constraints than men in terms of financial availability, mobility and time" (Mottin-Sylla 2005:35). Women also find themselves overburdened by caring for the family, doing household chores and finding little or no time at all to advance their computer skills.

However, ICT challenge is not only in South Africa, but it is affecting all the developing nations, hence a digital divide between the developed and the developing world. Africa is a continent populated by 1,037,524,058 people and there are only 118,609,620 internet users in the continent, which is 11, 4 per cent penetration rate (Internet World Stats, 2011). This can be compared to the United States of America, which is populated by 313,232,044 people and has 245, 000, 00 internet users, which is 78, 2 per cent penetration rate (Internet World Stats 2011).

The statistics clearly show the wide digital divide gap between the two continents. According to the International Telecommunication Union ICT Eye (2009), it is a saddening fact that half of the world has never made a phone call. The majority of such people are in the developing and underdeveloped nations. Therefore, in this study, the researcher sought

to find out the challenges faced by rural women in their physical access to ICT in Chris Hani District Municipality, Eastern Cape Province of South Africa.

2.4.3 Skills access

Digital skills include operational skills, information skills and strategic skills. Operational skills refers to “the capacities to work with hardware and software” and information skills are the skills “to search, select and process information in computer and network sources and strategic skills are defined as “the capacities to use computer and network sources as the means for particular goals and for the general goal of improving one’s position in society” (Van Dijk 2008:10). Information and communication technology literacy skills are a necessity for one to be able to manoeuvre on their own with these technologies.

Information and communication technology skills gap exist in one society due to different levels of education, income and gender, among others. Van Dijk (2006:181) states that information skills and strategic skills are “unevenly divided among populations of both developing and developed societies”. Unequal skills access is a result of social stratification that results in classes of winners and losers of the information society (Fuchs & Horak 2008). Society is stratified into classes according to income levels. Those with high incomes easily access ICTs compared to those with low incomes, hence the skills gap in a society.

However, it should be noted that even at a school setup, the learner is facing challenges in his or her endeavour to use ICT. The teacher though not the fountain of knowledge takes the leading role at a school set up and the learner looks up to him or her. However, according to Hennessy, Harrison and Wamakate (2010), some of the teachers lack expertise and are technophobic in the use of ICT in the classroom. It should be noted again that Hennessey, Harrison and Wamakate (2010) do not solely put the blame on the classroom educator, but also points out that inadequate learning resources that incorporate ICT usage, limited technology infrastructure hinder the effective introduction of technology into schools.

2.4.4 Usage access

Motivation, physical access and skills are not adequate for the actual use of computer hardware and software. Usage access is determined by usage time, applications, broadband use and creative use (Van Dijk 2008). Usage time might be an indicator of digital divide, some people own a computer and are connected to the Internet, but rarely use it, whilst others use the computer and Internet daily. It is further argued that experienced users, highly educated people with high levels of income and young users use more applications than inexperienced users and lowly educated people and senior users who tend to favour simple computer applications (Van Dijk 2008).

A study carried out in umlalazi Municipality in KwaZulu-Natal Province, South Africa indicated that 31 per cent of the women had primary education, 40, 5 per cent had secondary education, 17, 0 per cent had tertiary education and 11, 5 per cent had no schooling at all (Wafula-Kwake and Ocholla 2007). In the municipality under study, CHDM, out of the 114 318 people who never went to school, 30 798 are in Intsika-Yethu, 20 436 are in Emalahleni (Chris Hani District Municipality 2012). Low levels of ICT literacy among some women make it difficult for them to embrace ICT, this further widens the gap between the information haves and the information have nots. People who lack ICT skills are unable to manoeuvre on their own, find information especially on the Internet, process it and disseminate it for their own use.

Studies carried out in Francophone Africa indicated that women's participation in the information society was 0, 65, meaning women have fewer opportunities and benefits than men with regard to ICT (Hafkin & Huyers 2007). This is because the computer is in a language which is foreign to them and some of them have never set foot in a classroom where languages of communication are taught.

The main language on the computer is English; rural women are fluent in their mother tongue. This makes it difficult for the ICT illiterate women to embrace technology. This is echoed by van der Laan (2005:11) who states that "the Web, which for many is a wonderful tool, is not an object of curiosity for most of the poor of the world. It does not contribute to at all to the solution of their daily problems, unless it is localised". Language barrier creates

a digital divide in a society; those who cannot comprehend the language on the Internet cannot make any meaningful use of it. However, women educated to secondary level and beyond do not suffer from a gender gap because they are more likely to work in environments with ICT.

It should however be noted that Microsoft Local Language Program helps local people to access desktop computer software in their own languages, such as IsiZulu, Hausa, Igbo and Kiswahili. In KwaZulu-Natal, such a program at the Kwa Dukuza Resource Centre has helped boost ICT literate among local people in the vernacular; the centre provides digital, technical and academic resources (Microsoft Local Language Program 2009:1). Accessibility, availability, affordability and lack of ICT literacy hinder the use of ICT among the poor people.

2.4.5 Cultural definition

Information and communication technology has made it easy for people of diverse culture to interact, sharing their unique music, food, fashion and arts, this leads to the globalisation of culture. Oyedemi and Lesame (2005:85) state that the cultural approach "focuses on the impact of ICTs and information on our lifestyle". Information and communication technology, such as the television, are found in both rural and urban South Africa, radios "are no longer fixed in the front room, but spread through the home, in the car, the office, and, with the Walkman, everywhere" (Webster 1997:21). Newspapers, computers, web connection, mobile telephony services with the short message service (SMS) are growing (Oyedemi & Lesame 2005:86). An individual can download music, international fashion, socialise with others and learn different cultures on Internet, that is, globalisation of culture.

In South Arica, most urban dwellers acquire global fashion, lifestyle, music and arts through the Internet, whereas, the poor, uneducated rural people are not part of the global culture (Oyedemi & Lesame 2005). It is against this realisation of digital divide reflected in the literature that this study sought to discover the technology challenges faced by rural women in selected local municipalities, under Chris Hani District Municipality, with the view to establish any link between what is in the literature and what was obtained on the ground.

2.5 WEBSTER'S THEORY OF INFORMATION SOCIETY

This study is also informed by Webster's theory of information society. Lesame, Mbatha and Sindane (2011:47) define an information society as a "society which information has become the dominant source of productivity, wealth, employment and power". Webster has five definitions of information society, which are; technological, occupational, spatial, economic and cultural definitions.

The technological definition of an information society pays attention to the convergence of ICT. Convergence of ICT has improved the delivery of communication messages and the quality of service. Previously, communication networks were designed to carry different types of information, for instance, the telephone networks were designed for voice, but with the convergence of ICT, telephones are used to do business transactions. The radio, television, newspaper and books are example of sources of information and "all these can be active at a single moment, through digital television and wireless Internet access", that is, the technological features of life (Holland 2006:3). Communication has improved because of ICT convergence. However, the great question remains, if all rural people are able to easily access, afford and effectively use the converged ICTs.

A society with all these converged technologies in use by people in their daily lives is an information society. Technological advancement is seen with the rapid growth of the Internet, which is capable of economic success and education among others.

Information networks connect locations, resulting in the compression of space and time. Information has become the key resource and the world requires the coordination of global enterprise, that is, "from production, through distribution, to marketing, to marketing-economic affairs are conducted on a world scale" (Webster 2003:7). A wired society provides an "information ring main" to each home, shop, college, office and mobile individuals who have laptops and modems (Webster 2006). Information and communication technology provides the infrastructure that enables information to be processed and distributed instantly regardless of geographical location.

The information society also involves the social aspects of human life. There is an increase in information in social circulation through the expansion of radio and television channels, not forgetting the video technologies, satellite channels and computerised information services (Webster 2003). People are able to access and enjoy the information features, such as, entertainment, social networking and clothing; this might lead to the diffusion of different cultures.

Convergence of ICT and their application creates global networks and new means of economic interaction, (Mansell 2009). An information economy is declared if there is an increase in the proportion of gross national product (GNP) accounted for by the information business, such as the Communication Media and information machines (Webster 2006). An information based economy is dependent on production, distribution and use of knowledge embodied in human beings and in technology.

An information society is also achieved when there is a decline in manufacturing employment and there is a rise in white-collar jobs (Webster 2006). The occupational change also focuses on the transformative power of information and the information is embodied in people through their education and experiences. An increase in information work signals the arrival of an information society.

2.5.1 Technological definition

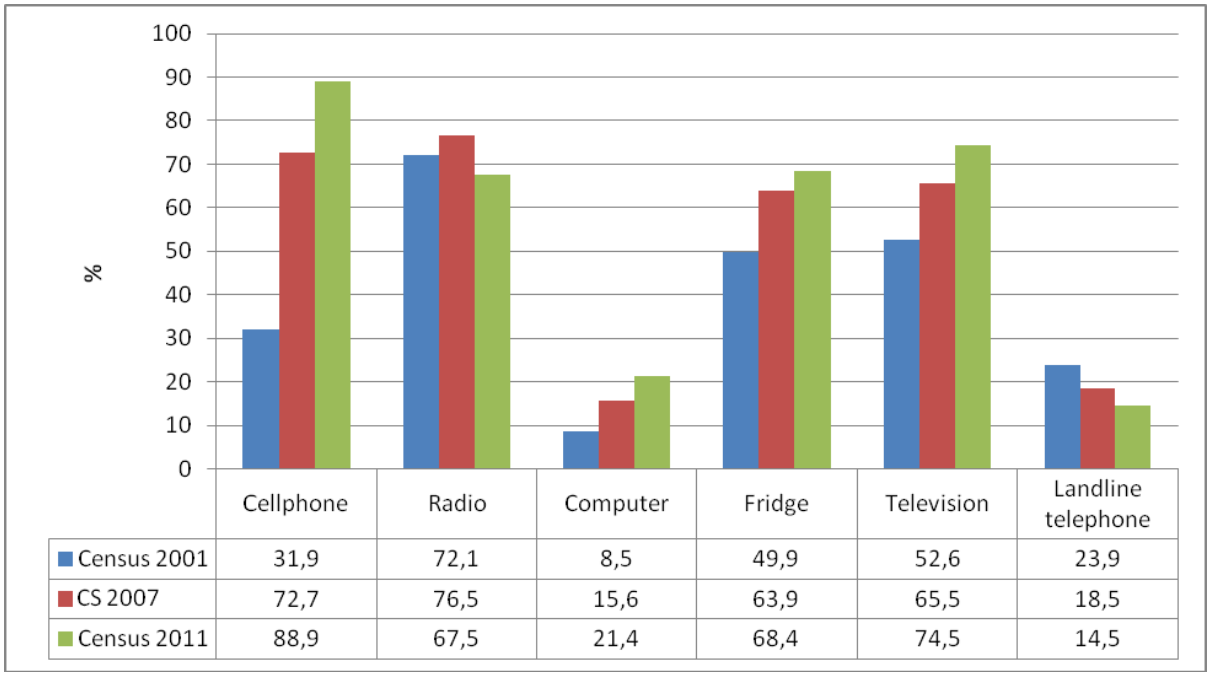
The information society puts emphasis on technological innovation. Webster (1995:3) states that “breakthroughs in information processing, storage and transmission have led to the application of information technologies (IT) in virtually all corners of society”. Technology advancements has led to the convergence of telecommunications and computing. Oyedemi and Lesame (2005 :79) state that the presence of technology “is noted in the computer as the major tool at workplaces, the increasing use of mobile telephone systems all over the world and the convergence of all traditional media of communication (TV, radio, print) into one powerful multimedia platform encapsulated in the online technologies”.

South Africa is part of the global information technology, in most workplaces, workshops, and corporate offices and academic institutions; one can find computers and Internet access

(Oyedemi & Lesame 2005). Communication has been made accessible for people, with Internet cafes found throughout towns, cities and Multi Purpose Community Centres in communities. Lesame, Mbatha and Sindane (2011:54) stated that Statistics South Africa survey "reported a 32, 3 per cent ownership in 2001 which had grown to 79, 9 per cent by 2007". Information and communication technology penetration is increasing in South Africa, the country had about 8,5 million internet users at the end of 2011, an increase from 6,8 million in 2010, which is 17 per cent Internet penetration (Goldstuck 2012). This growth can be attributed to the increase in Smartphone usage in South Africa.

However, high cell phone use has not reduced digital exclusion and it has not also improved the lives of people, but has only improved access to communication technology (Lesame 2013). It should be noted that South Africa lags behind some African countries, such as Nigeria which has an Internet penetration rate of 29 per cent and Egypt's 26 per cent Internet penetration rate (Goldstuck 2012). The main reason for the low Internet penetration rate in South Africa is price. The table below shows other ICT goods owned in South African households.

Table 3: Percentage distribution of households owning various household goods



	Cellphone	Radio	Computer	Fridge	Television	Landline telephone
Census 2001	31,9	72,1	8,5	49,9	52,6	23,9
CS 2007	72,7	76,5	15,6	63,9	65,5	18,5
Census 2011	88,9	67,5	21,4	68,4	74,5	14,5

Source: Statistics South Africa Census 2011

Other ICTs in use include the computers, households with computers increased from 8, 5 per cent in 2001 to 21, 4 per cent in 2011, radio ownership decreased from 72 per cent in 2001 to 67, 5 per cent in 2011 and landline use also decreased from 23 per cent to 14, 4 per cent in 2001 and 2011 respectively (Statistics South Africa Census Statistics Release 2011:65). The ICT data indicates low access and use to some technology. Therefore South Africa "has not yet achieved the status of information society since most citizens do not have access to most ICT necessary to work, earn profits, and improve their lives" (Lesame 2013). The country still has a challenge of narrowing the digital divide.

Some rural parts of South Africa lag behind in these technologies, accessing ICTs in some areas is not as easy as it is in most urban areas, "South Africa must improve public access to computers and the Internet by people living in rural areas" (Lesame, Mbatha & Sindane 2011:54). It should also be noted that it is not a South African issue but it is affecting the continent of Africa as a whole. The International Telecommunications Union (ITU) state that "The price for fixed broadband access remains prohibitively high in developing countries effectively limiting access to the Information Society" (International Telecommunication Union The World in 2009: ICT Facts and Figures 2009:6). Therefore, in this study the researcher seeks to find the technology challenges faced by rural women in their use of ICT, in selected local municipalities, under CHDM.

In the Eastern Cape Province, Statistics South Africa Community Survey (2007) indicates that the proportion of households that had cellular phones were 61, 2 per cent, an increase from 21, 5 percent in 2001. Households which had computers were 7, 5 per cent, which was again an increase from 4, 1 per cent in 2001. Internet access was 3, 2 per cent and landline telephones were 10, 7 per cent, a decrease from 15, 7 per cent in 2001. Eastern Cape was populated by 6 527 747 people in 2007 (Statistics South Africa 2007). The decrease in the use of landlines telephones in homes may be attributed to the spread of the mobile phones which require relatively low ICT infrastructure.

2.5.2 Spatial definition

The use of ICT has led to the compression of space and time. Webster (1995:14) states that spatial conception of the information society emphasises "on the information networks that connect locations and, in consequence, have dramatic effects on the organisation of time and space". Geographical boundaries are eradicated by technology, distance has been limited and time has been shrunk. Telecommunication technology, such as the cellphone and Internet, allow instant communication round the globe. Some interviews are done online and one does not have to travel long distances. Databases can be accessed from Durban to London and Washington. In South Africa, there are telecentres which compress space and time, bridging "the communication gap and digital divide between rural and those who reside in urban areas" (Lesame, Mbatha & Sindane 2011:49). Rural dwellers access technologies such as, the Internet, telephones and facsimile machines at telecentres; these allow them to communicate on the globe. However, in this study the researcher sought to find out if these ICTs are easily accessed at an affordable price by the rural dwellers.

2.5.3 Occupational definition

Information and communication technology is used in most workplaces though not everyone uses them at work. In the CHDM, the majority of the people, 51 per cent are employed in the community services sector, with the trade industry the second biggest employer (Chris Hani District Municipality IDP Review 2011-2012). High levels of employment in agriculture, households and trade is an indication of unskilled labour which constitutes a large part of the district's workforce. Sorghum production programme in Emalahleni and Qamata irrigation scheme in Intsika-Yethu municipalities employ some people in the district. Emalahleni and Intsika-Yethu are subsistence farming areas (Chris Hani District Municipality 2011). The unskilled labour is less likely to be ICT literate and might not be using technology at work.

Lesame, Mbatha and Sindane (2011:48) state that "determining the percent of people involved in information occupation is another popular way of showing that we are now part of an information society". The occupational change is "from work demanding physical

strength to work requiring an increasing manipulation of figures and text, such as in education and the corporate business environment" (Oyedemi & Lesame 2005: 82). Information and communication technology workers include professionals, technicians and managers. Below is a table showing the occupation amongst population employed in South Africa.

Table 4: Occupation amongst population employed in South Africa

	January-March 2012 Thousands
Both sexes	13 422
Manager	1 102
Professional	747
Technician	1 532
Clerk	1 419
Sales and Services	1 969
Skilled agriculture	61
Craft and related trade	1 605
Plant and machinery operator	1 106
Elementary	2 983
Domestic worker	896

Source: Statistics South Africa, Quarterly Labour Force Survey 2012

In South Africa the working population stay in towns and cities where connectivity is high, that is, the use of the computer, Internet and other ICTs. Information and communication technology workers are found among, professionals, technicians, clerks, skilled agriculture workers, workers in mining and technology who use ICTs. There are however others, for instance, farm and mine labourers, who might not be accessing all ICTs, though ICT is used in these sectors.

2.5.4 Economic definition

Information and communication technology plays a paramount role in stimulating economic growth and development. Information industries, such as, Communication Media, information machines and education contribute a certain percent to the gross domestic product (GDP) of a country and they have created various jobs for many people (Lesame, Mbatha & Sindane 2011). Telecommunication companies in South Africa, such as, Vodacom, Mobile Telephone Networks (MTN) and Telkom employ many people in South Africa, for instance, MTN employed 26 716 people in 2012 (Annual Reports-MTN Group 2012) and Telkom had 22 884 permanent employees in the year that ended March 2011 (Annual Reports-Telkom Investors Relations 2011). The mobile operators' revenues in South Africa amount to R98 billion and broadcasting revenues amount to R12 billion (Esselaar, Gillwald & Moyo 2010). The population of South Africa access ICT at different levels due to socio-economic disparities.

Information plays a paramount role in society; (Oyedemi & Lesame 2005: 87) state that information technology has led to a gradual "demise of an industrial economy and an upsurge of information". Computers are compulsory tools in education and they have made global education possible. Colleges are able to recruit students from around the globe due to online education.

The use of computers and Internet is increasing in the education sector in South Africa; for instance, Potchefstroom municipality provides fourteen schools with access to the satellite education channel, Active Mindset (Oyedemi & Lesame 2005:88). Not only in urban areas are students exposed to ICT, but also in rural South Africa, for instance, Kwa Dukuza

Resource Centre in KwaZulu Natal Province. Such programmes enhance computer literacy and prepare the learner for tertiary level and the workplace.

However, the South African economy depends on the mining and manufacturing sectors. A large part of the population resides outside the information economy. In the CHDM, there is a high percentage of employment in the agriculture and trade; this could be due to the fact that these industries are reliant on unskilled labour, of which the large majority of the labour force is unskilled (Chris Hani District Municipality... 2012-2017). Therefore, South Africa cannot be described as an information society (Oyedemi & Lesame 2005).

2.6 ANALYSIS OF SOUTH AFRICA'S INFORMATION SOCIETY STATUS USING ITU IDI INDEX

The International Telecommunication Union (ITU) uses the Information Communication Technology Development Index (IDI) to track the progress countries are making towards becoming information societies and IDI indicators cover ICT access, use and skills (ITU 2011). There is high ICT access and use of ICT in developed nations and these countries have high levels of income, whereas, in most developing countries, access and use of ICT is difficult especially for the ordinary people who has limited ICT skills and is financially handicapped.

In this study, the researcher used the ITU IDI to track the progress South Africa is making towards becoming an information society. Indicators included in the access sub-index are fixed-telephone lines, mobile-cellular penetration and the proportion of households with a computer and with Internet access, use sub-index consists of fixed broadband, that is mobile broadband technologies services and Internet uptake and skills sub-index is composed of school enrolment and literacy indicators (ITU 2011) . Affordability of ICT is also another factor which affects the use and uptake of ICT services. More people access and use ICT in countries where ICT services are affordable.

2.6.1 Access sub-index

The government of South Africa desired solving the problem of unequal access to ICT in the country and it put various ICT policies in place. The 1996 Act granted Telkom a five year

exclusivity and the incumbent managed to build 2,81 million new lines in the underserviced areas, but did not satisfy its “universal service mandate” (Horwitz & Currie 2007:446). Due to its monopolistic power, Telkom charged “high prices for the installation, rental and calls”, resulting in disconnection of the telephone lines (Horwitz & Currie 2007:446). This is evidenced in Emalahleni Local Municipality, were there are a large number of installed facilities which are disconnected due to non-payment of monthly service charges (Emalahleni Local Municipality Integrated Development Plan 2010/11 Review). Unaffordable ICT services also creates digital divide in a society.

The billing mechanisms in the rural areas also contributed to the disconnection of the new lines, most people did not have addresses, so it was different to send bills to them (Horwitz & Currie 2007). The incumbent fixed-line operator failed to provide access to telephone service in South Africa. Only 0, 9 per cent of households in South Africa had landlines (Statistics South Africa General Household Survey 2010). This is echoed by Esselaar, Gilwald & Stork (2006:21) who state that the “the policy intention was to promote affordable access to communications through the privatisation of, and extension of the monopoly of, the fixed-line incumbent Telkom, improved access to voice communication actually came through the introduction of pre-paid mobile services”.

Therefore, here in South Africa, the spread of mobile telecommunication networks, such as Vodacom, Mobile Telephone Network (MTN) and Cell C has led to a high mobile penetration rate across the country with 101,8 per cent of the population owning a cellular phone (ITU 2009). The mobile phone enhances communication, compressing space and time. People regardless of geographical location are able to communicate with others on the globe because of the cellular phone. However, Abrahams and Goldstuck (2010:9) argue that sophisticated “e-development excludes large numbers of the population and large parts of the country; where there is limited or no access to advanced communications at household or firm level”.

Information and communication technology infrastructure is unevenly distributed in South Africa. Abrahams and Goldstuck (2010) further argue that there is unequal access to ICT in South Africa; the majority of the African black population has limited access to global communications infrastructure due to low incomes. 85 per cent of the areas in the

Emalahleni municipality have adequate network signal coverage, meaning that 15 per cent of the areas are disconnected from the global village (Emalahleni Local Municipality Integrated Development Plan Review 2010/2011). In Engcobo, only 16, 65 per cent of the population has direct access to telephones and cellular network, coverage is patchy due to the mountainous terrain; this indicates that these municipalities are not yet fully part of the information society.

E-development is limited to the highly industrialised cities, such as Johannesburg, Durban, Cape Town and Pretoria which have well developed ICT infrastructure services than in small towns and dispersed provinces, for instance, Eastern Cape and KwaZulu Natal provinces, which are disconnected from the highly urbanised hubs. Nationally, 11, 1 per cent of households did not have access to either landlines or cell phones (Statistics South Africa 2010:42) as indicated in the table below.

Table 5: Households with a functional landline and cellular telephone in their dwellings by province, 2010.

	WC	EC	NC	FS	KZN	NW	GP	MP	LP	RSA
None	11,5	19,4	22,8	14,3	10,8	13,5	6,3	7,6	9,6	11,1
Land	3,1	0,8	1,6	0,6	0,8	0,1	1,0	0,1	0,3	0,9
Cell	51,1	69,8	60,3	7,0	72,7	78,0	70,2	85,2	85,8	71,8
Cell & Land	34,3	10,1	15,3	9,1	15,8	8,4	22,6	7,1	4,4	16,2

Source: Statistics South Africa General Household Survey, July 2010.

The use of both cellular phones and landlines in households were prevalent in the affluent provinces, that is ,Western Cape (WC) (34,3 per cent) and Gauteng (GP) with (22,6 per cent) whereas in other provinces, there were households without access to the communication media, Northern Cape (NC) (22,8 per cent), Eastern Cape (EC) (19,4 per cent), Free State (FS) (14,3 per cent) and North West (NW) (13, 5 per cent) (Statistics South Africa 2010:42).

Therefore, some parts of South Africa, that is, cities and some towns are part of the information society, whereas the marginalised areas of the country are partially part of the global village.

2.6.2 Use sub-index

Internet use is limited in South Africa. Abrahams and Goldstuck (2010) state that; the 2010 Internet usage survey indicated a slight Internet usage, with five million users in South Africa. The majority of the Internet users dwell in large cities and are of high and middle income households. Thus, ITU report characterises South Africa as having "relatively low access and usage values" and further asserts that "little progress was made during the past five years, in particular on ICT usage" (ITU 2009: 33).

Most people have a mobile phone for SMS messaging and the phones have "little capacity for enhanced application" (Abrahams & Goldstuck 2010:36). Therefore it can be said that "access to and usage of ICTs are limited to voice communications and text messaging", with only 10 per cent of the households having access to the Internet (Statistics South Africa 2010).

It should be noted that residing in one of the large cities of South Africa does not necessarily mean that one has access to electronic goods and services. There are some people where households situated far from the urban centres may be living without ICT services.

South Africa has however, made progress in becoming an information society. Previously, consumers relied on Telkom for voice, Internet access and International bandwidth, but, now have a wide market for access through mobile service providers, such as MTN and Vodacom. However, "high mobile data prices may limit demand for accessing Internet services from a mobile phone" (Abrahams & Goldstuck 2010:31). Unaffordable mobile data prices hinder the use of Internet among some people.

Internet use is highest in Western Cape (45, 6 per cent) and Gauteng Province (41, 6 per cent) households and it is lowest in Limpopo (9, 9 per cent) and Eastern Cape (14, 6 per cent) (Statistics South Africa 2010:42). Dwellers of these provinces are of different socio-economic status.

Various strategies for digital inclusion were put in place, such as telecentres and public libraries were people can access and use ICT services (Gomez, Pather & Dosono 2012). These ICT services are however accessed for a fee and not everyone can afford using all the technologies. Engcobo dwellers do not even enjoy the benefits of having a Thusong Service Centre because it does not exist and residents rely on public phones and cellular phones for communication (Integrated Development Plan: Engcobo Local Municipality 2006-2011). Therefore, not everyone in South Africa is part of the information society.

2.6.3 Skills sub-index

The skills sub-index is composed of school enrolment and literacy indicators (ITU 2011). Information and communication technology skills are a necessity in everyday life for "growth, survival at home (whether it is urban or rural community), become productive in the workplace to achieve community develop goals" (Abimbola 2012:1). The use of ICT is extensive at tertiary level and at some schools. However, Abrahams and Goldstuck (2010:13) argue that "Internet access is restricted to some fee paying schools and to public schools in a few provinces where programmes are in place". There are some children who are out of school due to various socio-economic reasons, as indicated in the table below.

Table 6: Estimated Number of children not in school.

Age band	Estimated Number of children not in school
7 to 13 years primary school age band	75 528
7 to 15 years basic education age band	121 373
14 to 18 years secondary school age band	363 049
16 to 18 years FET age band	317 204
7 to 18 years	438 577

Source: South Africa Social Surveys, Barriers to Education Study, 2009.

A gradual increase in literacy in South Africa might also mean that the number of people with ICT skills is also increasing because it is at school where computer skills are taught. It

should however be noted that not all children are exposed to ICT skills due to the unavailability of resources, such as computer laboratories and electricity. Children who do not attend school are not exposed to ICTs because it is where ICT skills are taught. Therefore, in this study the researcher intends finding out technology challenges faced by rural women who include high school girls in their use of ICT.

The South African Education for all Country Report (2010:32) states that "in 2009, 7 per cent of the adult population in South Africa were totally illiterate and 12 per cent of the adult population were functionally illiterate". Therefore an estimated 5, 5 million adults in South Africa were illiterate or functionally illiterate (Statistics South Africa Social Survey 2010).

It is difficult for an illiterate person to easily use ICT services. Hence, one of the goals of the Department of Education, South Africa is to a achieve "a 50 per cent improvement in levels of adult literacy by 2015, especially for women and equitable access to basic and continuing education for all adults" (The South African Education for all Country Report 2010:31). There are programmes in place, such as Kha Ri Gude Campaign which is available at no cost to adults who have little or no education and classes are presented in communities (The South African Education for all Country Report 2010).

It should also be noted that South Africa has seen an increase in the number of children at primary school, high school and young adults at tertiary institutions, as indicated in Table 7 below.

Table 7: Educational attainment for persons aged 20 years and older.

Year	2002	2003	2004	2005	2006	2007	2008	2009	2010
Other	0, 2	0,3	0,1	0,1	0,1	0,2	0,2	0,2	0,1
Tertiary	9,2	9,3	9,6	9,7	9,1	9,9	10,9	10,9	11,2
Grade 12	21,5	21,9	23,5	22,8	24,2	23,7	24,4	26,1	26,2

Some Secondary	34,0	35,7	34,4	36,0	36,0	36,6	35,5	37,3	37,5
Completed Primary	7,0	6,5	6,7	6,4	6,4	6,4	6,0	5,7	5,7
Some Primary	17,3	16,1	15,7	15,2	14,6	14,5	14,1	12,4	12,3
None	10,8	10,2	9,9	9,6	9,7	8,7	8,8	7,4	7,0

Source: Statistics South Africa General Household Survey, July 2010.

The number of individuals with a tertiary education increased from 9, 2 per cent in 2002 to 11, 2 per cent in 2010 and those with Grade 12 from 21, 5 per cent to 26, and 2 per cent. The per cent of individuals without schooling decreased from 10, 8 per cent in 2002 to only 7 per cent in 2010 (Statistics South Africa General Household Survey 2010:14). The level of literacy is gradually increasing in South Africa.

Though the levels of literacy are gradually increasing here in South Africa, local municipalities under CHDM are characterised by low educational levels and high levels of functional illiteracy and skewed skills base. Thirty-seven per cent of 196 246 Intsika Yethu Local Municipality residents have no schooling at all and less than 10 per cent of the population have no matric or post matric qualification (Intsika Yethu Local Municipality 2007: 12). This contributes to unemployment and poverty in the municipality, making it difficult to afford and access ICT services.

Emalahleni Local Municipality has a functional literate population of 53, 87 per cent and 20 436 00 residents with no schooling at all, unemployment rate for the area is high, (Emalahleni Local Municipality Integrated Development Plan 2011). Statistics south Africa Community Survey (2007) estimated a population of 115 011, a large number of the population is therefore illiterate, making it difficult to use advanced ICT services.

Therefore, 30 per cent of the total population of 810 300 people in Chris Hani District Municipality do not have any school education, 23 per cent have some primary school education, 7 per cent have completed primary education, 25 per cent have some secondary education, 9 per cent completed Grade 12 and 6 per cent have some form of higher education (Republic of South Africa Provincial and Local Government: Chris Hani Nodal

Economic Development Profile 2007). It is difficult for an individual with low levels of education or no education at all to easily manoeuvre with ICT on their own and this creates digital divide skills.

2.6.4 Affordability of ICT

Affordable ICT services make it easier for the people to use ICTs in their everyday life. Information and communication technology Price Basket (IPB) is a "composite measure based on the price of for fixed-telephone, mobile-cellular telephone and fixed-broadband Internet services, which helps monitor the cost of ICT services and provides a useful indication of how affordable services are" (ITU 2011:6). Countries with high ICT prices have low levels of ICT access and use, whereas countries where ICT services are relatively affordable, more people access and use ICTs.

Using ICT is expensive here in South Africa. Abrahams & Goldstuck (2010) argue that telecommunications markets here in South Africa, are highly-priced markets relative to income, with respect to both voice and data. Cell C charges R15, 00 for 100 megabytes of data bundles, MTN charges R29, 00, Vodacom charges R100, 00 and Telkom Mobile All Networks charges R30, 00 for the same quantity of data bundles. In CHDM, 52, 9 per cent of the dwellers live in poverty and the Human Development Index (HDI) in the district was 0, 46 in 2012, which is below 0,50, an acceptable figure (Chris Hani District 2012), hence some people may not afford using ICTs. Operators charge high interconnection rates to terminate calls on each other's networks, making communication unaffordable for the majority of the consumers.

It is stated that South Africa "ranks poorly for prepaid mobile telephony affordability, she is ranked 30th out of 46 African states" (Research ICT Africa 2012). Compared to her neighbour, Namibia, another developing country, South Africa prepaid mobile prices are three times more expensive than Namibia (Research ICT Africa 2012). Expensive mobile telephony limits some users to voice and text messaging only.

It should also be noted that the Independent Commission Authority of South Africa (ICASA), through its termination rate regulations effective March 2011, introduced a tariff "glide path from the current level of 89 cents for peak time calls to an eventual level of 40 cents in

March 2013" (Theron & van Eeden 2011:1). Again, this rate will be above what is considered to be the cost of an efficient operator (Research ICT Africa 2012).

Computer hardware and bandwidth prices are high relative to the income of the majority of households (Abrahams & Goldstuck 2010). Advanced ICT services, such as, education, entertainment, banking and shopping remain expense for many people.

Some local municipalities under CHDM are characterised by high levels of poverty and unemployment. Ninety-seven per cent of the Engcobo population have either no income or access income of less than R940 social grant per month (Integrated Development Plan 2006-2011). It is not only Engcobo which is characterised by high poverty, but also Intsika Yethu Municipality, 76 per cent of the population is poor with income levels less than R1 500 per annum (Intsika Yethu Local Municipality LED Strategy and Implementation Plan 2007). Advanced ICT services are therefore meant for a few who can afford them.

2.7 SMALL AND MEDIUM ENTERPRISES (SMEs) AND THE USE OF ICT

In the District municipality under study, Small and Medium Enterprise play a significant contribution to the economy of the Eastern Cape Province; they collectively contribute 29 per cent to the provincial economy and also collectively contribute to 37 per cent of employment in the province (Chris Hani District Municipality 2012). The use ICT might enhance productive among SMEs. Small and Medium Enterprises are not only important in developing economies, but are the backbone of all economies. They are "a key source of economic growth, dynamism and flexibility in advanced industrialised countries, as well as in emerging and developing economies (Organisation for Economic Co-operation and Development 2006:1). There is high unemployment rate in South Africa and it is estimated at 25, 6 per cent (Statistics South Africa 2013), unemployment leads to poverty, 57 per cent of South Africans live in poverty (World Bank 2008:21). Small and growing businesses under the right conditions are important for the creation of jobs and employment required to reduce poverty in developing countries. It should be noted that a successful business requires access to market information, finance and tips from others. Information and communication technology are important for the small business to grow into larger firms.

International Finance Corporation (2011:6) stated that small businesses can be key parts of "thriving, globally competitive industries, creating the large numbers of jobs needed to eradicate poverty". Incomes are created for the workers, who are able to improve their standard of living in both rural and urban areas. In CHDM, the SMME and Cooperatives Business Development programmes were created to promote the development of sustainable SMMEs and cooperatives, thus increasing the number of economic enterprises and creating jobs. R 2 425 494 was granted to SMMEs and cooperatives and 120 jobs were created during the period 2008/9 and 2009/10 financial years (CHDM IDP 2011-2012). Financial access and other factors such as market information and ICT enable the growth of SMMES.

In South Africa, SMEs account for about 7, 8 million jobs, that is, about 61 per cent of the country's employment and also contribute between 52 per cent and 57 per cent to gross domestic product (GDP) (Goldstuck 2012). Small and medium enterprises contribute to a country's national product by either manufacturing goods of value, or through the provision of services to both consumers and or other enterprises (Berry, von Blottnitz, Cassim, Kesper, Rajaratnam, van Seventer 2002:10). The micro-enterprise economy also increases the average productivity of labour in the economy as a whole by pulling the unemployed and low-skilled labour, whose skills are not adequate to be employed in larger firms (Berry et al 2002:16). However, the Global Entrepreneurship Monitor report indicates that South Africa's entrepreneurial uptake is only around 7 per cent of the country's adult population, its entrepreneurial uptake should exceed 10 per cent of the adult population (Business environment specialists 2013:3). Therefore, more entrepreneurism is required in South Africa.

2.7.1 Categories of Small Businesses

In the South African context, a small business is defined as "a separate and distinct business entity, including co-operative enterprise and non-governmental organisations, managed by one owner or more which, including its branches or subsidiaries, if any, is predominantly carried on in any sector or sub-sector of the economy" (National Small Business NBS Act 102 of 1996 as amended in 2003). The NBS Act categories small businesses in South Africa into

five groups, namely survivalist, micro, very small, small, small and medium, hence the term SMMEs for Small, Medium and Micro Enterprises.

2.7.1.1 Survivalist Enterprise

The survivalist enterprises are activities by people who are unable to find a job, these include hawkers, vendors and subsistence farmers and there are no skills training in the particular field (White Paper on National Strategy for the Development and Promotion of Small Business in South Africa Notice 213 of 1995). Economic hardships in most developing countries force some people to resort to small-scale businesses for survival. In the Ciskei and Transkei regions of the Eastern Cape Province of South Africa, subsistence farming is one of the main sources of living (Chris Hani District Municipality 1DP Review 2011-2012). The income generated is less than the minimum income standard or the poverty line (Mahembe 2011:26). The survivalists have limited economic resources, inadequate knowledge, and are therefore reluctant to adopt ICT (Celuch, Murphy and Callaway 2007).

2.7.1.2 Micro-enterprise

Micro-enterprises are very small businesses which employ no more than five people (Fink & Disterer 2006) and they include spaza shops, household industries and mini bus taxis. These small businesses usually do not have business licenses and accounting procedures (White Paper on National Strategy for the Development and Promoting of Small Business in South Africa Notice 213 of 1995).

2.7.1.3 Very small enterprise

Very small business enterprises employ less than ten paid employees, with the exception of mining, electricity, manufacturing and construction sections, which employ twenty people (Mahembe 2011). These enterprises operate in the formal market and have access to ICT.

2.7.1.4 Small enterprise

Small enterprise employ a maximum of fifty people are more established than very small enterprises, for instance the Engcobo Charcoal Manufacturing project employs 32 people (CHDM IDP Review 2011-2012). The enterprise is usually directly controlled by the owner-

community and is likely to operate from industrial or business premises and is tax registered (White Paper on National Strategy for the Development and Promoting of Small Business in South Africa Notice 213 of 1995).

2.7.1.5 Medium enterprise

The medium enterprise employs a maximum number of 200 employees, especially for the mining, construction, manufacturing and electricity sectors (Steyn & Leonard 2012). The enterprises are often characterised by the decentralisation of power to an additional management layer (Mahembe 2011). These enterprises also employ in-house Information Technology resources and introduce more advanced operational systems (Steyn & Leonard 2012).

2.7.2 Models of technology diffusion

2.7.2.1 Epidemic model

The level of technology diffusion in the economy as a whole determines a firm's propensity to adapt a technology at a certain point in time. The epidemic model of technology diffusion stress information spillovers from users to non-users of a particular technology (OECD 2012). Users of the new technology pass information onto the non-users who, in turn, adopt the technology and spread information further, hence the higher the number of ICT adopters, the more likely a non-user is to get to know about these technologies and start using them. In South Africa, 63 per cent of SMEs have a website and are more likely to be highly profitable than those without one (Goldstuck 2012). The number of people who search online for service providers is ever increasing, meaning that 37 per cent of South African SMEs who do not have a website are in danger of being irrelevant to their customers (Goldstuck 2012). The Internet is critical to the growth of the economy and is also important to the sustainability of small businesses, which create employment.

2.7.2.2 Rank models

Rank models also known as probit models are based on the idea that the benefits from adopting a new technology depend on the characteristics of the firms and the markets

(OECD 2012). A firm's capability to exploit ICT is largely determined by the skills of its employees. Financial and technical resources determine whether the firm will be able or not to afford the costs arising from the adoption of ICT (Steyn & Leonard 2012).

Information and communication technology diffusion is determined by the firm, sector and the country-levels. The economic theory suggests that there is positive relationship between size and technology adoption, large firms are in a better position to adopt because they have fewer financial constraints (OECD 2012). Information and communication technology plays an important role in the growth of SMEs. However, the use of technology involves costs, computer hardware and software need to be bought and installed (Olawake & Garwe 2012). New SMEs without access to finance may find it difficult to purchase necessary technology.

Here in South Africa, access to finance has been singled out as one of the main challenge impeding the survival and growth of start-up SMEs (Mazanai & Fatoki 2012:1). New firms may find it difficult to access finance due to the fact that they may fail to furnish collateral security (Kauffmann 2005). The International Finance Corporation IFC (2006) stated that race is still a primary driver of financial access in South Africa. Race and gender work to the disadvantage of the black women who have low levels of income and of formal access to economic opportunity and financial services (Mazanai & Fatoki 2012). The inability of some SMEs to access finance hinders the growth of the small firms into larger firms; this might even result in the total failure of the firms.

There is also a relationship between human capital and technology adoption, the adoption of new technology requires a workforce with the appropriate skills to use it. Lack of skills is a major obstacle to the growth of SMEs and "skills acquisition through training can provide a long lasting solution to the survival battle of the SMEs" (Afolabi & Macheke 2012:2). The state of education is blamed for the low entrepreneurship in South Africa; some young people enter the workforce without adequate academic training and are not able to find work that would have skills for a career as value-adding entrepreneurs (Business environment specialist 2013). Management skills are also important to the survival and growth of new SMEs. In South Africa, the lack of education and training reduces

management capacity in new firms resulting in low level of entrepreneurial creation and high failure rate of new ventures (Olawake & Garwe 2012:3).

The characteristics of the sector and the market in which the firm operates, also impacts ICT diffusion. Competition spurs ICT investments because it forces firms to seek ways to strengthen performance relative to competitors. Firms facing stronger competition are more inclined to innovate and adopt new technology, in order to strengthen their performance and chances of survival (OECD 2012:4). Information and communication technology can reinforce a firm's competitive position by improving its ability to rapidly react to market changes and customer needs as well as reducing costs (Steyn & Leonard 2012).

Information and communication technology diffusion is affected by different characteristics of countries in terms of geographical landscape, ICT infrastructure, prices and the regulatory environment (Kauffmann 2005). Cities have shown higher rates of broadband diffusion than rural areas because they have better telecommunications infrastructure and the costs of deployment of new infrastructure are lower (OECD 2012), hence lower rates of broadband diffusion in some rural areas impede the expansion of small businesses.

Most of the businesses have a low technology orientation due to low levels of technological and science skills in the majority of the South African population, as well as the exorbitant costs of new technology which is beyond the reach of most small businesses (The Department of economic development, tourism and environmental affairs Free State Province 2012). Businesses need information about their clients, suppliers, products and services in order to be competitive on the market and make better decisions.

2.8 INFORMATION AND COMMUNICATION TECHNOLOGY LITERATURE REVIEW

Information and communication technologies are a necessary tool for the economic, social and political development of a nation. Space and time are compressed and information is easily disseminated. Over three quarters of the world's poor live in rural areas and they lack economic opportunities and have a limited voice in governance (Barnard & Gale 2011).

Technology has helped in the reduction of poverty, by spreading necessary information, such as health, agriculture and market information, hence improving standards of living.

South Africa has implemented the National Development Plan (NDP) which aims to "to eliminate poverty and reduce inequality through uniting South Africans, unleashing the energies of its citizens, growing an inclusive economy, building capabilities, enhancing the capacity of the state and promoting leaders working together to solve complex problems throughout society" (South African Government Information 2012). Availability of affordable ICT services to all citizens will enable the growth of an inclusive economy. The objectives of the plan include quality education and skills development for all by 2030 (South African Government Information 2013). One of the enabling milestones for the NDP includes making high-speed broadband internet available to all at competitive prices (South African Government Information 2012). It is only ICTs which can connect South African citizens regardless of geographical location. South Africa like other developing countries is faced with ICT challenges.

Some disadvantaged communities face accessibility, affordability and availability of ICT challenges. However, with government support and telephone companies, these challenges can be minimised. This was the case with the Ashaninka Indian village in Central Peru, where a computer, generator, a satellite dish and a big screen monitor were given to the village by the Canadian government, a telephone company and a non-profit organisation (Roman & Colle 2002). Not only ICT services were made available to the village, but, tribal leaders received ICT skills training which led to the development of their web site. Furthermore, a portable generator provided electric power needed at telecentres and this can also be done in other rural areas which do not have electricity.

From the Ashaninka case, it can be learnt that with ICT skills and connectivity, a community can improve their standards of living. Through the Ashaninka web site, villagers sold their oranges to Lima which is a distance away, boosting their tribal revenue (Roman & Colle 2002). The Internet provides market information required by the farmer and telecentres also link communities with ICT.

Some schools in rural South Africa do not have access to computers and the Internet, others lack the required skills to fully utilise the advantages of ICT (ICT access and use in rural schools in South Africa: The Northern Cape Province Sa). In an effort to bridge the digital divide, and with the sponsorship from Vodacom, IT Master and Pinnacle, the deputy Minister of the Department of Communications handed over computer laboratory equipment and connectivity to Jonguhlanga Secondary school in Mthatha and Chief Henry Bokleni High school in Ngqeleni, both under the Eastern Cape Province, South Africa (Tubbs 2013). The strategy focuses on establishing new access centres to the disadvantaged communities by providing broadband connectivity to 1 650 schools. Access to the Internet assists learners in the learning process and prepares them for the world of work. The use of ICT in education does not only enhance teaching, but it also enhances administrative processes.

The Peeble Valley community in the Mpumalanga Province, South Africa, a local clinic is the hub for network users, and links other disconnected clinics, schools, homes and farms in the area free of charge (Ramoroka & Jacobs 2013). Reliable broadband wireless network serves as a catalyst to deliver healthcare services and also other social services. The highly skilled personnel came from outside the Peeble Valley community, yet long term benefits require transferring technological capabilities and building adequate local skills (Ramoroka & Jacobs 2013). This contrast with the Ashaninka Indian village, in Central Peru, where tribal leaders received ICT training skills and have a sense of ownership of the telecentres.

The language on the Internet may be a prohibitive barrier for some communities in their use of information, most of its content is written in an academic or business style (Gigler 2004). It should therefore be noted that there are some middle aged women in Ashaninka village who might not benefit from the availability of ICT because they cannot read or write (Roman & Colle 2002). It is further argued that it is not only some of the Ashaninka women who might be shut out of the information society because of their literacy level, but also some women from other parts of the globe.

This includes some adults from even the developed countries, such as, America. In America, some adults physically access the computer, but they might remain shut out of the information society because they cannot read (Roman & Colle 2002). Hence, in Venezuela,

an ICT project was integrated into the bilingual and intercultural education program of the indigenous people. The Sociedad Civil de Apoyo al Indigena, a nongovernmental organisation trained indigenous teachers in linguistics, production of books in indigenous languages and use of ICT (Gigler 2004). Indigenisation of created a high sense of ownership of the project by the community and it also created a meaningful use of ICT.

In India, workers of a "village knowledge centre" address the issue of ICT literacy by downloading computer network information, such as, weather reports, as audio files, and play them on loudspeakers. That made the telecentres relevant to the community, including the ICT illiterate members of the society.

Unaffordable ICT services and unavailability of infrastructure can hinder some communities from fully benefitting from technology. Hence, the Community Access Program in Canada provided funds to make the Internet affordable in rural and urban communities across the nation (Roman & Colle 2002). Affordable ICT services enhance the use of technology in the society.

A national ICT policy can also play a paramount role in providing favourable regulatory and tariff environment and also human resources required for the success of the telecentres. Policy goals led India to double the number of persons it would graduate from its technology training institutes and Egypt created facilities in her 27 provinces that can train 30 000 people annually in computer use (Roman & Colle 2002). Even here in South Africa, Technology training institution should increase their intake of students so that the nation has adequate human resources and telecentres also train ICT skills to willing people in disadvantaged communities.

Technology is the key to the economic development of a nation. The Kerala state of India's ICT policy strategy led to the creation of the "TechnoPark" at Trivandrum (Arun 2004). Kerala's ICT policies also include IT @School which promotes the use of IT in the school curriculum, training of teacher and supply of IT hardware and it helps in increasing ICT literacy. Kerala state contrasts with the telecentres in rural China, which do not fill the information void, but simply enhances the livelihoods of those who are already educated and relatively wealth (Bailur 2008), hence widening the digital divide.

Information and communication technology skills are vital if meaningful incorporation of technology is to be made in socio-economic development programs. Subjects, such as, Computer Application Technology and Information Technology can be made compulsory at both primary and secondary school levels. Schools should be provided with adequate resources, such as, the computer laboratory, training teachers and electricity. Computer skills should also be taught to community members at telecentres.

Studies in Mexico indicated that those who have the control of the ICT might hinder the society's use of technology because of potential challenge to their authority (Roman & Colle 2002). A school girl at a Mexican school stated that her teacher did not encourage her to use the computer because she might learn something the teacher does not know (Roman & Colle 2002). Therefore, teachers should also be trained in ICT skills which they can incorporate in the teaching and learning activities at a school setup.

Arun, Heeks and Morgan (2004) argue that barriers to effective use of ICT in developing countries are a result of gender relations in societies where women are socialised towards non-technical careers, such as, software development, whereas in developed countries, there is an increasing representation of women in software production. At the IT @School, it was mandatory that all the teachers gain ICT skills and women were given unprecedented entry into ICT by virtue of the fact that women constitute 67 per cent of teachers in Kerala (Gender experiences in IT @School, an ICT enabled education project of Kerala India: Sa). Another possible solution to gender relations problems is also offered by Arun et al (2004); ICT projects which are gender sensitive can play a paramount role in reducing gender inequalities. This might reduce barriers of unequal access to ICT and unequal access to the benefits of technology.

2.9 CONCLUSION

There is skewed access to ICT in South Africa as a result of socio-economic disparities. There are other divides within the digital divide, such as, the rural-urban divide, gender-divide, educational divide and income-divide. Therefore, South Africa as a country has a lot to do for her to close the divides so that everyone becomes part of the information society. This

was acknowledged by the then Minister of Communications Pule (2010:2) who stated that South Africa's greatest challenge is to "narrow the gap between the have and have-nots, the skilled and the unskilled, as well as bridge new gaps, particularly those created by the digital age". The majority of the population is part of the information society, especially those who dwell in large cities and towns, and are of middle to high incomes. Whereas the poor marginalised people, especially rural and other inhabitants of small towns and farms are excluded from the global village.

The ITU IDI was used track the progress South Africa is making towards becoming an information society. The three major cities, Durban, Cape Town and Johannesburg are highly wired, whereas the small towns and rural areas do not have well developed ICT infrastructure, making it difficult for the most people to access ICT. Unequal physical access to ICT in South Africa creates the digital divide within the same society. Other factors which widen the digital divide include prohibitive costs of ICT services and low levels of ICT skills among some people.

CHAPTER 3: THE ROLE OF ICT IN RURAL DEVELOPMENT

3.1 INTRODUCTION

This chapter highlights the role played by ICT in rural development. Most rural areas in Africa and other developing nations are information impoverished and providing information is a key component to development. Rural people primarily depend on agriculture for their livelihood. Rural dwellers face challenges; the ever changing climate, accessing markets, plant and animal diseases, drought, environmental issues, among others and it is only ICT which can link remote areas to the globe.

Rural development is defined as the "development that benefits rural populations; where development is understood as the sustained improvement of the population's standards of living or welfare" (Anriquez & Stamoulis 2007:2). Rural development can thus be viewed as the development of the social, economic and political potentials of rural societies to enhance their self-reliance through the provision of appropriate infrastructure (Benedict 2010). Internationally, the World Summit on Sustainable Development in 2002 and the World Summit on the Information Society in 2003 placed greater focus on the role played by knowledge and innovation in supporting development (James 2010:17). Information and knowledge are required for the development of a society and it is the use of ICT which can easily disseminate the information to the people.

Many people in developing countries are poverty stricken and hungry, in 2005, 25% of the people were living on less than US$1, 25, approximately ZAR11, 33 (United Nations Millennium Development Report 2011). Information and communication technology infrastructure present in rural areas may help combat poverty, improve the health of the people and also improve their access to the information that they need, such as their rights. Information and communication technology creates a rich information society which is able to fully participate on the globe.

Information and communication technology can enhance the power of knowledge for development if they can be easily accessed because "while education develops cognitive

skills, information gives content to knowledge" (Chapman & Slaymaker 2002:12). Most rural areas are information impoverished and providing information is a key component to development. Knowledge, information and communication have been "a strategic focus of development agencies and governments alike for over half a century" (Chapman & Slaymaker 2002:1). The rural people require information to make decisions on their livelihood and it is ICT which disseminate the information. Below is a table with the United Nations Millennium Development Goals.

Table 8: Eight Millennium Development Goals (MDGs)

Goal 1	Eradicate extreme poverty and hunger
Goal 2	Achieve universal primary education
Goal 3	Promote gender equality and empower women
Goal 4	Reduce child mortality
Goal 5	Improve maternal health
Goal 6	Combat HIV/AIDS, malaria and other diseases
Goal 7	Ensure environmental sustainability
Goal 8	Develop a global partnership for development

Source: United Nations Statistics Division. Millennium Indicators Database (2008)

Achieving the United Nations MDGs in Africa and in other developing nations will help save millions of lives, ending the scourge of hunger and malnutrition. Education and good health leads to productive lives. Creating the conditions for achieving the MDGs, especially in the rural areas is one of the pillars of growth, equity and food security. Information and communication technology provide opportunities for rural development as discussed below.

The South African National Development Plan focuses on "putting in place the things that people need to grasp opportunities such as education and transport and to broaden opportunities through economic growth and the availability of jobs" (KPMG: A business response to the National Development Plan 2012:2). The Plan aims at reducing poverty and inequality in the country.

Unemployment and poverty go hand in hand; unemployment rate in South Africa was at 23, 9 per cent in the fourth quarter of 2011 and the youths are the majority of the unemployed, about 71 per cent of the unemployed between the ages of 15-34 in the fourth quarter of 2011. Furthermore, 39 per cent of the population lives under the National Planning Commission's recommended poverty line of R418, in 2009 prices, per person per month (KPMG: A business response to the National Development Plan 2012:15). The National Planning Commission hopes to bring the number of people to zero by 2030; this would be possible if the country creates 11 million additional jobs.

The government has however come up with programs to try and eradicate poverty and unemployment in the country, especially in the rural areas. People in the rural areas have been given the opportunity to overcome extreme poverty and hunger, through the government's Comprehensive Rural Development Program (CRDP) (South African Information National Planning Commission 2012). Two thousand four hundred and forty-seven household food gardens were established at CRDP sites and the Department of Rural Development and Land Reform has injected R15, 7 million into agricultural cooperatives, for instance the Bana Ba Kgwale Agricultural Primary Cooperative, which was formed by 25 youths from Jericho in North West. The cooperative sell produce to the local community and create employment to other youth in the area.

Klynveld Peat Marwick Goerdeler (KPMG) business response to the National Development Plan (2012:15) states that disadvantaged areas in South Africa receive poor quality education and "literacy and numeracy test scores are low by African and global standards". This can be blamed on infrastructure shortages at some public schools, such as unavailability of electricity, desks and chalkboards. A poor education system prevents South Africans from escaping poverty and inequality. It is however, the core vision 2030 of the National

Development Plan of South Africa to “ensure that all children can access and benefit from a high quality education, especially in literacy, mathematics and science”. In order to achieve universal primary education, in 2012, the National Curriculum Framework for children from birth to 4 years of age and Guideline for Developing Learning Programmes was finalised and there are 19 261 registered early childhood development (ECD) centres, with just below 845 000 children receiving ECD and partial care services (South African Government National Planning Commission 2012).

Though the public health system is ailing, South Africa is striving to combat HIV/AIDS, HIV Counselling and Testing campaign started in April 2010 and by March 2012, more than 20, 2 million people had undergone testing (South African Government Information National Planning Commission 2012). In the fight against HIV/AIDS, e-MUM Web application was initiated in 2010 in Gauteng, South Africa, and it was serving 30 000 patients and managing 70 000 different patient cases (Morrison & Morrison 2012).

E-MUM is a medication monitoring technology which has changed how tuberculosis and HIV/AIDS are treated, patients are reminded to take medication and if a patient does not adhere, the device sends a non-compliance message to the server (Morrison & Morrison 2012). The 2030 vision of the National Development Plan of South Africa is to broaden the coverage of antiretroviral treatment to all HIV-positive people and a R1, 6 billion pharmaceutical plant will be built to produce ingredients for antiretroviral medication which will start operation in 2016.

It is not only HIV/AIDS which the country is concerned with, but also the fight against malaria. South Africa has discovered a drug to treat malaria, which may be able to block transmission of the parasite (South African Government Information National Planning Commission 2012). Furthermore, it is the vision of the government that by 2030, healthcare system should provide quality care to all, free at point of service, or paid for by publicly provided or privately funded insurance (A business response to the National Development Plan 2012).

Developing a global partnership for development is one of the MDGs. South Africa has become a member of the BRICS (Brazil, Russia, India, China and South Africa); she is part of

the developing economies of the world, “the ones that are looked at to shape the future of the global economic environment” (A business response to the National Development Plan 2012:11). South African own economy registered a 67 per cent growth between 1994 and 2010.

3.2 ECONOMIC ACTIVITIES AND MARKET ACCESS

Poverty is highest in Sub-Saharan Africa and South Asia. It is agricultural development that can have a great impact on inclusive growth and poverty reduction (Audinet & Haralambous 2005). According to Chapman and Slaymaker (2002:15), “the rural people primarily depend on agriculture for their livelihood; agriculture provides the bulk of their income and is the main source of nutrition”. They are however facing challenges due to the ever changing climate, rainfall patterns are continuously changing because of global warming. There are droughts, floods, and animal and plant diseases.

People need to be aware and alert of all natural disasters which affect them and animals. Kelles-Viitanen (2005a) states that “ICT can play a major role in helping to monitor food security related issues, such as weather, drought, crop failures, pests, and to inform governments on impending food scarcities and famines”. Dissemination of information is easily done through the use of ICT.

It is ICT which can ensure that farmers are able to access reliable information about agriculture technologies and markets at lower transaction costs. Information and communication technology also allows rural poor and small holders “to tap opportunities provided by the global economy” (Kelles-Viitanen 2005b). For instance, in Mali and Senegal, the Environmental Teratology Information Centre (E-TIC), provides training tools and ICT to farmers, herders and fishermen. The farmers do away with the middleman and directly sell their produce at market rates favourable to them. Internet access is available in remote areas and community journalists use the Internet as an important source of information (International Telecommunications Union 2011). The use of the Internet enables people to access information regardless of one’s geographical location.

Studies conducted by Kozma (2005) in Uganda stated that a Ugandan farmer, who previously produced ten 100kg sacks of maize per acre, increased the productivity of his farm to twenty sacks per acre, after he learned how to use manure as fertiliser. Therefore, information is critical to ending poverty and technology can be the key to getting information required by people.

The remote areas are therefore connected to the globe via the Internet and people may participate on issues which affect them through tele-conferencing. They can also communicate with extension officers for information regarding farming. In Kenya, the Kenya Agriculture Commodity Exchange (KACE) provides crop growers with up-to-date commodity information via text message and the farmers' access prices of fruit and vegetable from different markets. Those Kenyan farmers have "quadrupled their earnings because they have access to information about potential buyers and prices before making the often arduous journey into urban centres to sell their produce" (United Nations Millennium Development Goals 2011:98). Therefore the use of ICT in rural areas helps in the reduction of poverty.

The small farmers and breeders in the remote areas of Mali and Senegal obtain information concerning market prices on their mobile phones via mobile Internet, Short Messaging Service (SMS), Wireless Access Protocol (WAP) or MMS. Information and communication technology therefore enables quick "dissemination of information about commodity prices, supply market fluctuations, allowing them to mitigate yield losses" (Rural Realities, real Solutions ICTs for Rural Development 2011). The farmers are able to make informed decision before they sell their produce.

In most developing countries, in rural areas, it is costly to access financial services and the use of the mobile phone throughout the world has created an opportunity to provide financial services over the mobile network. According to Grin Rao and Patinaik (2006:90) technology "provides information about employment and generates opportunities to women and underprivileged people regarding self-employment and income resources". An individual is able to look for employment on Internet and the use of ICT, such as the mobile pay phones has created jobs for some people in rural areas.

A living example is the Grameen project in Bangladesh; women have been given the mobile telephone to service the local village (Chapman & Slaymaker 2002). The women make a living from the mobile phone; they charge an extra fee for making and receiving phone calls. These women are able to provide for their families and sent children to school; therefore ICT eliminates poverty in rural areas (Chapman & Slaymaker 2002). Also, in Tanzania, the community payphones are owned and operated by entrepreneurs, who make a living by buying airtime from the network and sell it to the local people (United Nations MDG Report 2011). Information and communication technology creates employment for the people which improves the living standards of the community.

It is often difficult and costly to bring goods and services effectively to the spatially dispersed rural population (The Integrated Sustainable Rural Development Strategy 2000). Most people residing in remote areas face difficulties in accessing services, such as banks, which are usually found in towns and one has to travel long distance to access the bank and it is also expensive. However, mobile banking diminishes the difficulties faced by people residing in rural areas when accessing traditional banking services.

Banking has been made a lot easier in the rural communities, WIZZIT is a bank which is "bringing secure and efficient mobile banking to hundreds of thousands of people in South Africa", it employs WIZZKids who are fluent in the local languages to help "bank the unbanked" through mobile phones (The World Bank Group 2007). WIZZIT offers "low-cost transactional bank account that uses any cellphone on any network for making and receiving payment, together with a MasterCard branded debit card which can also be used at ATMs and point-of-sale devices" (International Finance Corporation World Bank Group-Stories from the Field-WIZZIT Micro-lending Pilot South Africa 2007). With the use of ICT, both space and time are compressed, making it easy for individuals to communicate and do business.

3.3 ADDRESSING EDUCATIONAL ISSUES

Education plays a paramount role in the development of a society, nation and region. Information and communication technology improves "the management of the education

systems, speeding up development processes, and facilitating teaching and learning" (eLearning 2013). Information and communication technology can be used to improve teaching and learning at a school set up. The President of Uganda Yoweri Museveni said "This technology will enable young people to tap into the mainstream of information and knowledge, where they learn and play, expand their imagination and creativity, and collaborate with their peers across the African continent and the world" (The World Bank Group 2007). Information technology cuts across continents, compressing space and time.

Nyana (2009:3) states that "in today's global information society, non-literate people are at a permanent disadvantage-unsure of their rights, unable to fulfil their potential and unable to play a full part in society. They are disempowered. Literacy is a right and a capability that is fundamental to overcoming poverty". Literacy has also expanded and it now includes ICT literacy.

Therefore, one of the strategic objectives and targets for the Government of South Africa for the period 2009-2014; include improved quality of basic education (United Nations Development Program UNDP 2010). The quality of education can be improved by using ICT at schools and the community. Information and communication technology enhances teaching and learning. The Department of Rural Development and Land Reform donated Mac book and other ICT equipment to Gaopotjake High school in Mokgalwaneng as part of a project to bring the best technology and practical skills to schools (United Nations Development Program 2010).

The project is not only meant for Gaopotjle High School which is situated in Mokgalwaneng, North West Province in South Africa, but other neighbouring schools will benefit (South Africa Government Information Department of Rural and Land Reform 2012). The use of ICT develops the learner's creativity and higher order thinking skills, such as analysis and evaluation skills, essential for effective participation in daily life. Exposure to ICT at school also prepares the learner to tertiary education and the workplace.

Pupils can research on Internet for assignments, type their projects and socialise with other learners across the globe, leading to the diffusion of cultures. Information and communication technology compress space and time, therefore a learner in the rural

Eastern Cape can communicate with another student in Gauteng and even in London via the Internet. Information and communication technology is also for the teacher, who is able to improve the teaching and learning methodology to suit learners' needs.

3.4 ADDRESSING HEALTH ISSUES

Information and communication technology are a vehicle which can be used to bridge the digital divide between healthcare centres in rural and urban areas. The developing world is affected by sickness and diseases, for instance, Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome (HIV/AIDS) is taking a severe toll among subsistence farmers, and this reduces the number of able adult workers, leaving many children as orphans with limited knowledge about how to farm (Hazell 2007). At the United Nations Millennium Summit in 2000, the international community agreed on working to achieve eight critical economic and social development priorities by 2015, such as, reducing child mortality; improving maternal health; combating HIV/AIDS; malaria and other diseases (United Nations Development Program 2010). Some remote areas in developing countries do not easily access a clinic or a hospital and the use of ICT can assist in bringing health care to the people.

World Health Organisation (WHO) (2005) cited in Chetley (2006:10) states that health is at the centre of the Millennium Development Goals, health "is central to the global agenda of reducing poverty as well as an important measure of human development". A large proportion of South Africans live in the rural areas where health care is provided by clinics. Integrating the use of ICT into the existing health system helps improve the delivery of health care and the use of telemedicine improves diagnosis and enhances patient care.

Information and communication technology is bringing health care to the people in a more efficient way, for example, Africa Medical and Research Foundation (AMREF) a telemedicine project in East Africa (Chetley 2006). Here in South Africa, the Medical Research Council partnered with MTN and the Department of Health to deliver Telemedicine to 100 primary healthcare facilities in all the nine provinces, making effective healthcare available to all South African (Morrison & Morrison 2012). The telemedicine project links many patients in

remote areas with services and skills to hospitals. It also connects clinical peers and specialists who are then able to provide advice to Health Care Professional residing in remote areas of the country. Clinical staff from rural hospitals uses the electronic mail to forward patient information, such as the case notes and x-rays. Also, in the Tamil Nadu state of India, the Sustainable Access in Rural India program provides wireless Internet connections to 8 000 people in more than 50 villages (Wireless Internet Institute 2003) cited in (Chetley 2006:37). The kiosk operators take pictures of eyes and e-mail them to hospital doctors, who in turn recommend a remedy or visit the clinics. Telemedicine is therefore an "enabling tool that could bridge the gap between healthcare and specialist facilities" (Republic of South Africa Department of Health 2012/13-2016/17:15). The use of such ICT enables the people to cut transport costs of travelling to referral hospitals.

Here in South Africa, the South Africa District Health Information System (DHIS) was launched in 1998 in all the nine provinces (Chetley 2006). The DHIS is a systematic data-gathering tool that could be used to identify health issues and it enables 4,153 public clinics to collect information on ten national health indicators. Again in South Africa, the "Soul City" is a health communication program that uses the radio, television and other media to raise awareness and understanding of issues, such as, HIV &AIDS.

The use of technology, that is, the mobile walkie-talkie and a Very High Frequency (VHF) radio has had an impact on maternal mortality in Uganda. The Rural Extended Services and Care for Ultimate Emergency (RESCUER) project in Eastern Uganda made use of a VHF radio and mobile walkie-talkies to empower traditional birth attendants, to partner with the public health service centres to deliver health care to pregnant women (Chetley 2006). The project has led to a reduction in maternal mortality from 500 per 100,000 in 1996 to 271 per 100, 000 in 1999 (Chetley 2006:23). Mobile technology has thus provided an opportunity to revolutionise healthcare, in most developing countries, like South Africa, that have challenges of providing care in deep rural areas, but have a thriving telecommunications market (Republic of South Africa Department of Health 2012/13-2016/17). Improved health in rural areas is a result of the presence of ICT which breaks down communication barriers between disadvantaged communities and urban areas.

The use ICT, for example the radio, is cost effective and it covers a wide area offering affordable communication support services to remote and inadequately equipped health facilities and communities (Chetley 2006). Information and communication technology compresses time and distance, dwellers of rural and remote areas benefit from health programmes presented on radio. Thus, ICT solutions, such as e-health, telemedicine and education are vehicles to bridge the digital divide between rural and urban healthcare centres (Ruxwana, Herselman & Conradie 2010). They resolve the problems in the rural health sector.

3.5 ADDRESSING ENVIRONMENTAL ISSUES

Human livelihood depends on the environment and it is human beings who should protect it. The protection of the environmental assets and natural resources is one of the Millennium Development Goals (United Nations Development Program 2010). Soil erosion, siltation and deforestation; among others negatively affect the environment. Lack of adequate knowledge usually results in people not taking care of the environment which they depend on for their survival. Information and communication technology, such as the radio, can be used to teach people on how to protect the environment and to practise farming methods which are not detrimental to the environment and aquatic life.

In Senegal, an information technology training centre as well as an Internet cafe was set up and residents of the Guede-Chantier village are able to share information on the environment and natural habitat (International Telecommunications Union 2011). The inhabitants of the rural areas are able to protect their natural resources.

The radio is an ICT which is used to disseminate information to the rural people. In Ghana, radio stations which broadcast development oriented programmes in the vernacular languages, for the people of Upper East and Upper West regions of Northern Ghana (Chapman, Blench and Kranjac-Berisavljevic & Zakariah 2003). Rural radio was used to raise awareness on nature conservation, such as, dangers of soil erosion and bush-burning.

3.6 CONCLUSION

Information and communication technology plays a paramount role in rural development. Rural people depend on agriculture for their livelihood and the use of ICT to develop agriculture can have a major impact on poverty reduction in Sub-Saharan Africa. It is only ICT which link remote areas to globe and provide necessary information required by the farmers, such as, weather reports and market information. Information and communication technology can be used to improve the quality of education, preparing the learner for tertiary education and the world of work. The health of the people is critical in their economic and social development, hence the UN MGDs, which include combating the spread of HIV/AIDS, malaria and improving maternal health. The health of the people can also be improved by using ICT which can bring health care to some remote areas which do not easily access clinics and hospitals.

The presence of ICT infrastructure in rural areas may assist in combating poverty, improve farming methods and improve the health of the people. Rural development is an essential component of fighting poverty and eradicating dependency on other countries. It creates self-sufficiency for members of a community. Information and communication technology infrastructure also improves their access to the information that they need, such as human rights and environmental issues. Rural development is necessary in order for the marginalised societies to be able to fully and meaningfully participate on global issues. It is ICT which links the rural areas and remote parts of a country with urban centres and also the entire world.

CHAPTER 4: THE SOUTH AFRICAN POLICY REGARDING ICT'S ROLE IN RURAL DEVELOPMENT

4.1 INTRODUCTION

This chapter explains the South African government ICT policy with regards to the role played by ICT in rural development. The South African government realised the importance of ICTs and endorsed various ICT policies which address issues of affordability, accessibility and availability of ICT services in the country. These ICT policies include the Electronic Act of 2005, the Electronic Transaction Act of 2005 and the Broadband policy.

In 1994, the South African government inherited a telecommunications infrastructure "which was highly skewed in favour of the white and urban areas" (van Audenhove 1999:19). The government has made ICT policy in order to address the imbalances left by the legacy of apartheid. The government does not only want to address political imbalances, but also socio-economic inequalities in the country. The nation is faced by developmental challenges which include the eradication of poverty. The South African government realised the paramount role played by ICT in the economic development of the nation. The availability and accessibility of affordable ICT in rural areas can result in the development of the disadvantaged communities. For the entire South Africa to effectively participate on the globe, ICT is paramount because it can link the country and the world at large. The Department of Communications is the policy maker and the Independent Communications Authority of South Africa (ICASA) is the Independent regulator.

4.2 SOUTH AFRICAN ICT POLICY AND RURAL DEVELOPMENT

The government of South Africa acknowledges that ICT play an important role in the integration of services for the development of rural areas. The government promotes the use of ICT in all sectors, such as agriculture and small enterprises (Republic of South Africa: Department of Communication (DoC)... 2011: 6). Hence the DoC's main functions include "developing ICT policies and accompanying legislation which creates the conditions for an

accelerated and shared growth of the South African economy" (Republic of South Africa: Department of Communication No 35255 2011: 6).

The DoC is the custodian to the development and implementation of the National ICT Policy in South Africa. Its mandate is "to create a vibrant ICT sector that ensures that all South Africans have access to secure, affordable and accessible ICT services in order to achieve socio-economic development goals and support the African Agenda and contribute to building a better world" (Republic South Africa: Department of Communication 2012).

Enshrined in the 1996 Constitution, the South African ICT Policy upholds "the idea of universal service or equitable provision of ICT services based on the principle of equality before the law, in terms of provision of telecommunication services in all areas, regardless of whether the area is urban or rural or whether the persons are poor or rich" (Lesame, Mbatha & Sindane 2011:207). The Telecommunications Act of 1996 introduced through the 1996 Constitution, addresses the issues of universal access and service. Availability of ICT enables people to enjoy the benefits of these technologies, such as, e-education, e-health and social networking.

The aim of having a universal service policy is "linking communities and economic interest of reaping the benefits arising from the optimisation of information flows between the productive sector and the markets" (Lesame, Mbatha & Sindane 2011). Information and communication technology facilitate information flow required for the economic development of both rural and urban areas, delivering services, through tele-health, tele-government and tele-education which are not readily available (van Audenhove 1999).

The then Minister of Posts, Telecommunications and Broadcasting, Jay Naidoo stated that "In the Global Information Society, there is a direct positive correlation between access to telecommunications and socio-economic development. We realise that telecommunications is no longer the consequence of development rather it is a necessary precondition" (van Audenhove 1999:18). This realisation made the Parliament of South Africa to pass legislation in 1996 to roll out telephone service to the previously disadvantaged and establish an independent regulator to oversee the reform (Horwitz & Currie 2007:445). Telkom was mandated to extend services to the previously unconnected households and communities,

by rolling out 1, 7 million lines in underserviced areas, connecting 3, 204 villages to the telecommunication network, building 1, 67 million lines and installing 120, 000 payphones (Oyedemi 2009:7). Many households were however disconnected due to high tariffs charged by the incumbent and also poor billing mechanisms which made it difficult for the people to pay their bills.

4.2.1 The Electronic Communications Act of 2005

The Electronic Communications Act (ECA) of 2005 also endorses the principles of universal service and universal access. One of the objectives of the ECA is that the government has to "provide the universal provision of electronic communication networks and electronic communications services, broadcasting services and connectivity for all" (Republic of South Africa: Department of Communication... 2011:7). In this study, the researcher sought to find out if the principles of the Electronic Communications Act were effectively implemented in the rural Intsika-Yethu and Emalahleni local municipalities and if all the dwellers are all connected to the global village. The government through ICASA facilitated the licensing of Under-Serviced Area Licenses (USALs), to address the participation of SMMEs in ICT markets and at the same time addressing the aim of universal access to all.

4.2.2 The Electronic Transaction Act of 2005

The government also realised that by using electronic transactions, rural communities would be using their resources efficiently as money that would have been used for transport purposes would be channelled to other household needs. Hence, the implementation of the Electronic Transactions Act (ECT) No. 25 in 2005, this act promotes the use of electronic transactions by small enterprises and universal access. The use of e-commerce also enables rural enterprises to expand their markets.

Neotel was also licensed to operate and provide high speed Internet connectivity to 5, 000 public schools, rural medical clinics and FET Institutions (Oyedemi 2009).

The government of South Africa made the Universal Service and Access Agency of South Africa (USAASA) responsible for furthering the goal of universal access and universal service (Oyedemi 2009). The USAASA facilitates the installation of telecentres across the nation,

telecentres provide services, such as the Internet, facsimile and photocopying, video facilities and ICT training services to rural and underserviced areas, these are essential in the provision of services, for instance, tele-governance (Universal Service and Access Agency of South Africa 2008). Multi Purpose Community Centres also disseminate information required by communities in their daily lives. Information and communication technology help link the poor communities, radio programmes can inform communities on how to protect the environment, prevent land degradation and promote eco-tourism. It should be noted that for people to enjoy the benefits of ICTs, the services should be affordable as indicated by the General Notice 987 No. 31333 (2008:6) which states that "affordable communications for all, citizens and businesses alike, throughout South Africa, is at the core of its vision and is the goal of its policy".

4.2.3 The Broadband Policy

The United Nations World Summit on Information Society (WSIS) resolved that ICT infrastructure is an essential foundation for the information society (Republic of South Africa: Department of Communication Government Notice No. 33377 2010). The expansion of infrastructure is essential in the provision of content and services. In 2007, the government of South Africa approved the building of an information society.

The National Broadband policy of South Africa was gazetted in July 2010 and the policy focuses "on increasing the accessibility, availability, affordability and usage of Broadband services throughout South Africa" (Republic of South Africa: Department of Communication Government Notice No. 33377 2010:6). It should be noted that the costs of broadband are high in South Africa, with monthly charges ranging from under R100 to over R20 000 per month, making it unaffordable to the majority of the population (Republic of South Africa: Department of Communication Notice No. 36332 2013:7). South Africa is currently characterised by high cost of services, saturation in urban areas and limited access in rural areas, and with such conditions, the Internet's rate of expansion in South Africa will decline from above 15 per cent to 10 per cent per year by 2015 (Republic of South Africa: Government and Information System 2013: 100). Affordability is an issue of concern in the rural areas under study. Intsika-Yethu local municipality is one of the poorest municipality in

the Eastern Cape Province, with 25 043 households experiencing chronic hunger and the CHDM as a whole, has a high malnutrition and hunger index (Chris Hani District Municipality 2012-2017). Poor households are therefore forced to spend the greatest per cent of their income on food rather than on ICTs. Furthermore, there is high dependency on grants and remittance as the main source of household income due to high unemployment, especially in the poor areas of CHDM. According to CHDM (2012-2017), many people in Engcobo and Tsolwana depend on remittances, in Emalahleni, they depend on social grants and almost half the population of Sakhisizwe get their income from wages.

Broadband infrastructure is critical in achieving digital inclusion, enabling universal, sustainable and affordable access to ICTs by all, and providing connectivity and access to remote and marginalised areas (Republic of South Africa: Department of Communication Government Notice No. 333377 2010:4). Here in South Africa the national optic fibre footprint is concentrated in Johannesburg, Cape Town and Durban and the fibre routes do not cover villages, small towns and underserviced areas (Republic of South Africa: Department of Communication Notice No. 36332 2013). Broadband provides access to the Internet, which is a source of local and international electronic content. The South African 2011 Census results indicated that 64, 8 per cent of households in the country had no access to the Internet, of the households that had access, 16, 3 per cent accessed it via cell phones, 8, 6 per cent from home, 4, 7 per cent from work and 5, 6 per cent from elsewhere (Statistics South Africa Census 2011 Statistical Release 2012:66). The lack of appropriate broadband infrastructure in rural areas deprives the majority of Internet connection as indicated by the Census 2011 findings.

It is essential for the government to analyse the impact of ICT programmes across the country. The Department of Communication, South Africa, launched the South Africa e-Barometer in August 2011, to measure the progress of the country's uptake and use of ICT tools (Republic of South Africa: Government and Information System 2013). For South Africa to be an entirely information society, every corner of the nation has to be wired and people are able to connect with the rest of the world, that is, e-readiness (Zuppo 2012).

Broadband services promote economic growth, for instance, reducing the cost of communication. Increased access to information can make it easy for Small Medium and

Micro Enterprises to promote and sell their products and services on the globe. Broadband services also promote social benefits, such as improved quality of education and improved quality and access of health services. With the low Internet penetration rate stated above, the majority of South Africans are deprived of the benefits of broadband.

Below is a comparison of the use of ICT in agriculture in South Africa and selected African countries. Effective use of technology in agriculture is a result of the government ICT policy formulated, implemented, monitored and evaluated in a country. Hence the researcher compares the use of ICTs in agriculture.

4.3 ICT USE IN AGRICULTURE: A COMPARISON OF SOUTH AFRICA AND SELECTED AFRICAN COUNTRIES

The use of ICT in agriculture is a necessity. Many people on the continent of Africa rely on farming for their survival, with smallholder farmers forming the bulk of agriculture produce and at the same time remaining the majority of the food and income poor (Muriithi, Bett & Ogaleh 2009). The need for improved agriculture has also been exacerbated by "rising food prices that have pushed over 40 million people into poverty since 2010 and the growing global population has also increased the demand for food with an expected 9 billion people by 2050" (The World Bank 2011:3). Therefore improved farming productivity can be enhanced by connecting rural farmers to knowledge; farmers feed the growing population and create employment for the people thereby reducing poverty.

The realisation that many people rely on agriculture for survival and that some farmers were disadvantaged by the apartheid regime made the South African Agriculture Extension to undergo change from a dualistic service (separate for commercial and small scale farmers) to a single amalgamated service focusing on the needs of both the previously disadvantaged small scale farmers and large-scale commercial farmers (South African Directorate Scientific Research and Development 2005:8).

The 2005 National Food Consumption Survey found that "52 per cent of households in South Africa experienced hunger and that at least a third households were at risk" (General Household Survey Series Volume IV Food Security and Agriculture 2002-2011:11). The majority of the poor households are found in the predominantly rural provinces of Eastern Cape, Limpopo and Mpumalanga. Below is a table which shows the provincial food adequacy status in South Africa.

Table 9: Food adequacy status by province in South Africa, 2011

	GP	MP	NW	FS	WC	EC	LIMP	KZN	NC	S A
Food access severely inadequate	5,9	8,9	9,3	8,9	6,8	7,7	5,4	4,1	10,4	6,5
Food access inadequate	12,6	17,2	23,6	14,7	16,6	17,3	7,8	13,1	19,3	14,6
Food access adequate	81,5	73,9	67,1	77,4	76,6	75,0	86,8	82,9	70,3	78,8

General Household Survey Series Volume IV Food Security and Agriculture-Food adequacy status of households by province, 2011.

Inadequate food supplies in most rural areas can be blamed on lack of agricultural information and the smallholder farmers are unable to transition from subsistence to commercial agriculture. Hence, 25, 5 per cent of the rural dwellers in South Africa does not have access to food (General Household Survey Series Volume IV Food Security and Agriculture 2002-2011:26).

Many African countries rolled out ICT infrastructure in rural areas in a bid to socially include the entire nations on the globe. Information and communication technology use in agriculture can eradicate poverty which is "the lack of what is considered as a minimum requirement to sustain a livelihood in a given society by a household or an individual" (Obayelu & Ogunlade 2006:46). With improved agriculture, farmers may be able to feed the growing population. Below is a table showing the farmers' information needs in relation to the crop cycle and market.

Table 10: Farmers' Information needs in Relation to the Crop Cycle and Market

Before Planting	Before Harvest	After Harvest	Market Information
Information on agricultural inputs, Such as seed, fertiliser and pesticide	Good agricultural practices	Postharvest management	Alternative market channels
Credit	Pest management	Storage	Commodity prices
Weather	Harvest time techniques	Grading and standardisation	Wholesale market price information
Soil testing	Packing	Logistics	Consumer behaviour
		Market information	

Source: Narula and Sharma 2008

4.3.1 Market Information

Market information is a necessity to the farmer; it helps the farmer make informed decisions before selling farm produce. Lack of market information creates the problem of poverty trap that locks smallholder farmers into subsistence production and imperfect markets where they typically trade in low volumes (Okello, Al-Hassan & Okello 2010). The use of ICT in agriculture has helped in linking farmers to markets. The approximate per search costs of making personal visits are $USD 0, 8, approximately ZAR 7, 18 and the cost of using mobile phones is $USD 0, 2, approximately, ZAR1, 77 (Goyal & Gonzallez-Velasa 2012:11). In Niger, mobile phones have not only increased farmers' access to markets, but have reduced the cost of acquiring market information in rural areas.

With the expansion of mobile networks in Niger, farmers learn where they can sell for a better price, this has led to the unification of prices, for instance, grain price differences have decreased by 20 per cent and traders' search costs have decreased by 50 per cent (Mobile Devices and Services...).

This can be compared to the South African Futures Exchange (SAFEX) which is used for hedging maize, wheat and sunflower, this is a Market Information System (MIS) established to modernise the country's agricultural marketing services (Tollens 2006 cited in Maumbe 2010). However, it is argued that weak ICT infrastructure in rural areas of South Africa has made e-government services ineffective and the South Africa's e-government program remains fragmented across provinces (ITU 2009). Access to market information plays a paramount role in rural development, as farmers need to have access to markets nationally and globally if trade is to be facilitated.

Information and communication technology enables the novel Ethiopia Commodity Exchange (EXC) in Addis Ababa to transmit commodity price information to farmers. Electronic display boards were installed in 31 centres across Ethiopia and market data reaches the farmers through the display boards, as well as on the exchange website (Asenso-Okyere & Mekonnen 2012). Market information is also provided through text messaging in four local languages, making it easier for the local people to understand the messages. In Kenya, the Kenya Agricultural Commodity Exchange (KACE) provides market information on crops and livestock to smallholder farmers and small-scale agribusinesses. Information kiosks, located in rural Kenya provide KACE market information to farmers and also SMS are used to send information on daily agriculture commodity prices and opportunities to sell or bid through text messages (Asenso-Okyere & Mekonnen 2012).

Farmers in Kenya call The Kenya Farmers Helpline ("Huduma Kwa Wakulima") and speak to agriculture experts in English or Swahili (The World Bank 2011). This assists farmers in making informed farming decisions. M-Farm which is aimed at improving Kenya's agriculture sector also connects farmers with one another, NGOs and the government (Donovan Sa). Peer-to-peer collaboration can improve market information and enhance learning opportunities.

4.3.2 Livestock farming

Information and communication technology has enabled International Livestock Research Institute (ILRI) to overcome data limitations and prohibitive administrative costs to create an index-based livestock insurance product (The World Bank 2011). The program provides

Northern Kenya farmers with livestock insurance for 6-8 animals per year for a premium of US$ 50- 100. The index based livestock insurance seeks to curb the effects of drought and poverty in Northern Kenya. If a drought occurs, the livestock insurance policy indemnifies the pastoralists' loss.

A similar program in South Africa, is the Animal Improvement Institute (ALL) which uses a wide range of ICT in its scheme to help farmers in improving their livestock (Engelhard 2004:8). Most livestock data is fed into the centralised integrated registration and genetic information system, keeping South Africa's livestock producers competitive on the globe (Engelhard 2004).

Information and communication technology is also used in mango and tomato farming. In Blydepoort, Mpumalanga Province, South Africa, a computerised system of irrigation is being used in the mango and tomato farming (Information for Development 2005). The farmers installed a computerised irrigation network that uses short message system to notify operators of water pressures that are either too high or too low.

4.3.3 Health of farmers

Africa is haunted by the HIV/AIDS pandemic, which has played a significant part in hampering growth and development in afflicted countries , as the potential working force is rapidly being depleted (Pade, Mallison & Lannon 2005). Hence, in South Africa and Kenya, mobile phones are being used to send reminders to HIV positive patients about their anti-retroviral therapy schedule (Asenso-Okyere & Mekonnen 2012:15). The health of the farmer is important, healthy farmers can give their best and increase their labour productivity.

4.3.4 Mobile banking

Mobile banking has cut down travelling expensive for the rural farmers. In South Africa, WIZZIT, a mobile bank is targeting the country's estimated "unbanked" 16 million including farm workers and rural entrepreneurs (ICT Update 2007). Also, in Kenya, M-PESA allows farmers to send and receive money using the mobile phones (Asenso-Okyere & Mekonnen 2012). Phone calls substitute travel, saving time which is important for farmers because crops are time-sensitive.

4.4 CONCLUSION

The majority of rural dwellers in Africa rely on agriculture for their livelihood. The use of ICT in Africa and other developing nations arrives at a crucial time, improving the agriculture sector can reverse the trends of food insecurity, poverty and environment degradation. Information and communication technology can increase agriculture production by facilitating access to services, to market information and lower transaction costs of farmers and traders.

It is only ICT which link remote rural areas to the globe and provide necessary information required by farmers, such as weather forecast and market information. Information and communication technology can also be used to improve the quality of education at schools and the community. The rural learner is connected to the other child globally through ICT, share information, experiences and does independent research. This also prepares the pupil for tertiary education and the world of work. The health of the people is critical in their economic and social development, hence the UN MDGs, include combating HIV/AIDS, malaria and improving maternal health. Some remote areas do not easily access clinics and it is only ICT which can be used to provide information on health issue.

CHAPTER 5: RESEARCH METHODOLOGY

5.1 INTRODUCTION

The purpose of this section is to give an overview of the research design and methods used in carrying out this research. Methodology solicits to show how knowledge is obtained and it directs the research design (Denzin & Lincoln 2005). The study made use of a qualitative research methodology because the researcher intended to explore and find out information from the participants, using in-depth interviews and focus group interviews, in selected municipalities under Chris Hani District Municipality, South Africa and how these challenges can be resolved.

5.2 THE RESEARCH METHOD

5.2.1 QUALITATIVE

Qualitative research is defined as “a form of systematic empirical inquiry into meaning” (Shank 2002:5). It is planned, ordered and this type of inquiry is grounded in the world of experience. Qualitative research “creates new concepts and emphasise constructing theoretical interpretations” (Neuman 2006:15), thus the researcher does not only focus on a specific question, but considers the theoretical and philosophical paradigm in an inquisitive open-minded settling, (Neuman 2006). This is relevant to the study because it allows the researcher to keep on probing the informants through in depth face-to-face interviews, focus group interviews and get a deeper insight into the phenomenon under study and other hidden issues related to the challenges faced by rural women in their use of ICT.

Qualitative research uses the holistic strategy, whereby the researcher aims “to describe and understand events within the concrete, natural context in which they occur” (Babbie & Mouton 2010:272). Human behaviour is affected by the environment, in which people live; each context has its own morals and values. Thus, a holistic contextual approach of qualitative research explains in detail how and why events occur in their context. This design is best suited for this study because it looks at a phenomenon in totality, hence giving the

researcher the ability to look at ICT usage by women in the selected rural municipalities under Chris Hani District Municipality.

The situation is described in rich detail and readers can draw their own conclusions from the data presented (Leedy & Ormrod 2005). The researcher also seeks the opinion of colleagues in the field in order to determine if the researcher has appropriately interpreted and drawn valid conclusions from the data, which gives thick descriptions of the data collected, this makes it easy for other readers to draw their own conclusions.

5.3 THE RESEARCH DESIGN

The research design is a researcher's plan of action that will give guidance throughout the research, indicating who or what is involved, and where and when the study will take place (Du Plooy 2009). The study is qualitative, research participants were women support group leaders, Municipality Mayors and high school girls. Face-to-face interviews were conducted with the two Mayors from the selected local Municipalities as well as two selected women support group leaders, each from one municipality.

Focus group interviews were used to collect data from selected two high schools, each from one municipality. The researcher selected high school girls because they reduce variation and facilitate group interviewing. Informants from different municipalities might be facing different challenges in their use of ICT and interviews are particularly useful for getting the story behind the participant's experiences (McNamara 1999). The researcher only selected two out of the eight local municipalities in the district to cut down on costs involved in the study and also the easy management of collection and interpretation of data.

The researcher sought to do justice to the study by conducting thorough research in a few municipalities, thus a case study method is used. A case study is a detailed investigation of an individual or group aiming at capturing all the details of a particular individual or group within its real life context (National Centre for Technology 2007). The case study was also chosen because it enables the researcher to describe the context of the study in detail. A description of Intsika-Yethu and Emalahleni local Municipalities under Chris Hani District

Municipality is done to give a clear picture of the context where the unit of analysis is embedded (Babbie and Mouton 2010).

Furthermore, a case study allows multiple sources of data, in this study; a few interviews are conducted with a variety of informants from the Eastern Cape Municipalities under study, providing much more detailed information than what is available through other methods (Neale, Thapa & Boyce 2006). The detailed qualitative information produced in case studies "not only help to explore the data in real-life environment, but also help to explain the complexities of real-life situations" (Zainal 2007:4). A qualitative approach permits the researcher to gain insight into the perceptions, feelings, concerns and aspirations of the rural women.

5.4 AREA OF STUDY

5.4.1 TARGET POPULATION

Population is "a collection of objects, events or individuals having some common characteristics that the researcher is interested in studying" (Mouton 1996:34). In this study, population refers to two government officials, two women support group leaders and 28 high school girls from two local Municipalities under CHDM, in the Eastern Cape Province of South Africa.

5.4.2 Accessible population

Accessible population refers to "the units of analysis in the target population to which researchers have access" (Du Plooy 2009:51). This research only focuses on women between the ages of 15-50 years, these women are economically active. The research also focuses on women from two local municipalities, Intsika-Yethu and Emalahleni, which are all under the Chris Hani District Municipality.

Informants for this study are two government officials, that is, two mayors from the selected local municipalities. Each Mayor might be aware of the challenges faced by women in their particular municipalities. Municipality government representatives and women

support group leaders might be aware of the challenges faced by women in their use of ICT in the municipalities.

The two women support group leaders from municipality are the ones who work with women and are or be might be aware of the challenges faced by women in their use of ICT in their respective municipalities. High school girls from each Municipality facilitate group interviewing and they might be facing ICT access and use challenges at school and in their communities.

5.4.3 Sampling

In this study, the researcher used purposive sampling, which refers to "the deliberate choice of an informant due to the qualities the informant possesses" (Tongco 2007:147). Municipal Mayors from two local municipalities, Intsika-Yethu and Emalahleni, two women support group leaders, one from each municipality, and fourteen high school girls also from each of the two mentioned municipalities were selected for this study. The researcher used class registers to select girls who participated in the study. Mature learners were mostly selected, therefore, age groups of the girls were considered. The respondents were purposively sampled to address specific questions related to research questions. Koerber and McMichael (2008: 11) state that the researcher should seek to include people who represent the widest variety of perspectives possible within the range specified by their purpose. The chosen informants might be aware of technology challenges faced by rural women.

5.4.4 Units of analysis

Units of analysis refer "to WHAT of your study: what object, phenomenon, entity, process, or event you are interested in investigating" (Babbie & Mouton 2010:84). The units of analysis in this study are the individual women in the study.

5.5 DATA COLLECTION INSTRUMENTS

5.5.1 In-depth Interview

A qualitative interview is “an interaction between an interviewer and a respondent in which the interviewer has a general plan of inquiry but not a specific set of questions that must be asked in particular words and in a particular order” (Babbie & Mouton 2010:289). In this study the researcher used in-depth interviews to collect data from the respondents. The researcher interviewed two local municipality Mayors, from Intsika-Yethu and Emalahleni. Also, two women support group leaders were interviewed, each from the municipalities under study. The interviews were approximately forty-five minutes long and were tape recorded. Local municipality Mayors and women support group leaders were interviewed because they work with women and might be aware of the technology challenges faced by the women and the municipalities at large. A research assistant was also present to help translate the interviewer’s questions into the local language and also translate responses to the researcher were necessary. Interviews may be useful as follow-up to certain responses to questions, that is, responses can be further investigated (McNamara 1999) and bring to light other issues which the research might have omitted.

Babbie and Mouton (2010:289) state that an instrument acts as “a miner who digs dip to get information”. Therefore in-depth interviews allow the researcher to pursue or to probe specific topics raised by the respondent giving dip insight on the topic under study. The respondent does most of the talking revealing or disclosing more information while the researcher is transcribing the conversation.

The in-depth interview allows the researcher to seek clarity on issues misunderstood and might even take the informant back to issues discussed earlier for further elaboration (Babbie & mouton 2010). Therefore this data collection method is suitable to find out the challenges faced by rural women in their ICT usage.

5.5.2 Focus Group Interview

The researcher also collected data using focus group interviews. A focus group is a method whereby the researcher collects data from a group of people at the same time “get-ten-for-

the-price-of-one" (Babbie & Mouton 2010:292). In this study, focus group interviews were conducted at two high schools, each from one municipality of the two selected municipalities, that is, Intsika-Yethu and Emalahleni. The researcher interviewed fourteen high school girls from each municipality. The focus group interviews were approximately forty-five minutes long and were all tape recorded. A research assistant was also present to help translate the interviewer's questions into the local language and also translate responses to the researcher were necessary. Research was conducted at only two high schools in selected municipalities, under Chris Hani District Municipality to cut down on costs.

This method is suitable for this study because "it provides data that are rich in ideas and provides opinions and attitudes from the subjects' point of view" (Du Plooy 2001:199). The researcher is able to collect data from a group of people at the same time, this saves time and money. In this study two focus groups were used to collect data and the researcher explored the themes under study from the groups.

A focus group allows a group of people to gather together and make meaningful discussions as a group and not individually (Babbie & Mouton 2010). This method is useful in the study because a group of participants might come up with common issues which they feel affect their use and uptake of ICT.

5.6 PILOT STUDY

A pilot study was conducted with the aim of ascertaining the validity and reliability of the research instruments before implementation of the data gathering tools (White 2002). The pilot test is meant to test the interview schedule and the interviewing methods chosen, that is, the focus group interviews and the in-depth interviews. The pilot study was conducted in Engcobo local municipality which is also under Chris Hani District Municipality and has the same characteristics with Intsika-Yethu and Emalahleni local municipalities. The researcher with the research assistant, conducted in-depth interviews with the local municipal mayor and the women support group leader. Also, focus group interviews were conducted with fourteen high school girls from one school in Engcobo. The researcher used class registers to purposively select the girls who participated in the study. Mature learners were mostly

selected, therefore the age groups of the girls were considered. The researcher asked the participants if all the questions were clear and made improvements to her questioning techniques where it was necessary. She also asked the participants if there were other issues related to the study that she did not include in her interview guide and made the additions to her questions, hence improving the interview guide for the actual field research. The major reason for conducting a pilot study is to ascertain the overall feasibility of the study, test the data collection instruments before implementation, identify any logistical problems that could negatively affect the main study and also test the data analysis procedures.

5.7 DATA COLLECTION PROCEDURES

The researcher collected data from the local municipality Mayors, women support group leaders and high school girls, all from Intsika-Yethu and Emalahleni municipalities, under Chris Hani District Municipality. Data is collected through in-depth and focus group interviews. The researcher is assisted to collect the data by an interpreter who speaks the local home language in CHDM. The interviews are recorded on a recording device to ensure that the participants' responses are correctly captured.

5.8 DATA ANALYSIS PROCEDURES

The researcher used the thematic approach to analyse collected data. Babbie and Mouton (2010:492) states that thematic analysis, also called conceptual analysis includes "deciding how many concepts to code for," and "deciding whether to code for the existence or frequency of a concept". In this study, data is arranged into themes related to the sub problems, for analysis. The interviews were recorded on a digital voice recorder and transcribed into writing for the data analysis and presentation.

5.9 VALIDITY AND RELIABILITY

According to Niemann, Niemann, Brazelle, van Staden, Heyns & De Wet (2002), validity means that findings are based on research evidence that does not fluctuate. In ensuring validity, the researcher with the help of a translator used the participants' home language in interviewing participants who were not comfortable in speaking English Language. A digital voice recorder was also used. This was done to ensure that the informants' responses are accurately captured.

Reliability on the other hand implies "the extent to which results are consistent over time" (Golafshani 2003:2). Therefore, there is need to ensure that data collection instruments are reliable and can be used several times the same results are obtained. The pilot study helps to improve the interview schedules for the participants. The researcher was able to rephrase some interview questions which were not clear to the respondents during the pilot study.

Research experts, that is, the supervisors of this study were engaged to look at research instruments to ensure construct and face validity of the instruments.

5.10 ETHICAL CONSIDERATIONS

Research ethics deal with matters such as privacy, confidentiality and professional control (Du Plooy 2009). In this study, the research ethics were considered, data was collected from human subjects through in-depth interviews and focus group interviews. The researcher sought permission from the Department of Education and school principals before collecting data from focus groups at high schools.

Everyone who participates in the study would have freely consented to participation without being coerced or unfairly pressurised (Quinn & Cochran 2002). The subjects, that is, the women, government representatives, women support group leaders and the high school girls were told the nature of the study to be conducted and it was their choice to participate or not to participate. The researcher also sought permission to interview government officials through written letters.

A brief discussion of the study was done including the duration of the focus group interview. Each participant signed and dated a letter indicating agreement to participate (Leedy &

Ormrod 2005), that is, informed consent. If subjects agree to participate and feel that they want to withdraw, they can do that. Also, the participants used pseudo names instead of their real names to protect their confidentiality. Data was also collected from in-depth interviews and the interviewees were debriefed of the interview and the purpose of the study.

The researcher guaranteed the interviewees that their responses will remain confidential and anonymous (Leedy & Ormrod 2005). And will be used only for study purposes. The researcher also made known her name and contact numbers and will provide a complete research project to the government representatives and women support group leaders.

The pilot study was conducted in Engcobo local Municipality, under Chris Hani District Municipality. The municipality selected for the pilot study is not one of the two local municipalities for the main study.

The research participants were made aware of the pilot study in writing. The participating informants, which are, the government official, women support group leader and high school girls, were asked of their overall evaluation of the research instruments.

5.11 BIOGRAPHICAL VARIABLES

The below biographical variables for secondary school girls show that the participants for the focus group interviews were drawn from all grades and are of different ages, and their experiences with ICT at both school and society are varied.

Figure 2: Respondents' age group- Cofimvaba SSS

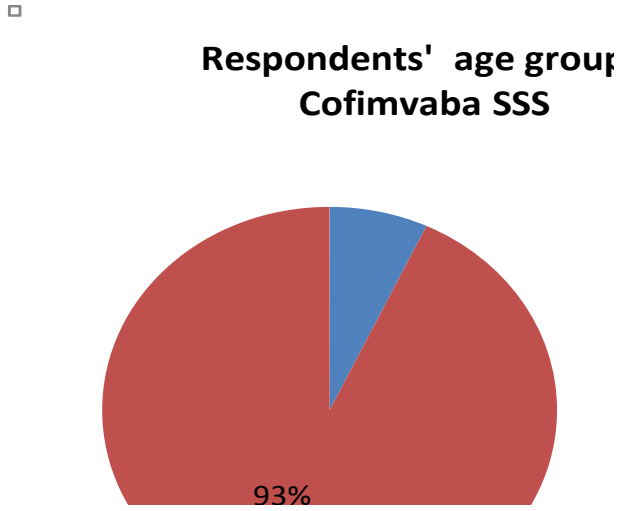


Figure 3: Respondents' current grade- Cofimvaba SSS

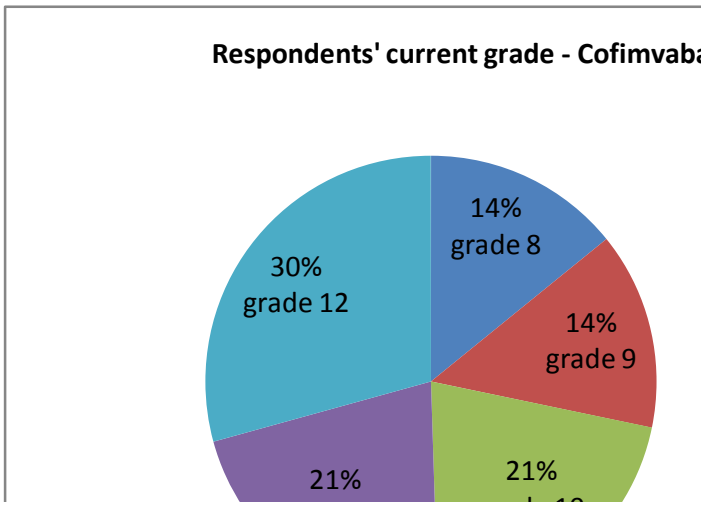


Table 11: Biographical variables for Cofimvaba Senior Secondary School (n=14 girls)

Biographical Variables	Variable Description	Frequency	Percentage
Gender	Female	14	100
Race	Black	14	100

Age (years)	12-14 15-20	1 13	7 93
Current Grade Registered for	8 9 10 11 12	2 2 3 3 4	14 14 21 21 29

At Cofimvaba Senior Secondary School an equal number of grades 8 and 9 were drawn, that is 2 learners per grade (14 per cent). Also an equal number of grades 10 and 11 were drawn, that is, 21 per cent (n=3) per grade. Four grade 12 learners participated, that is, 29 per cent. The majority of the participants were between 15-20 years, that is 93 per cent and only one learner was between the ages of 10-14 years, that is, 7 per cent of the participants. Mature responses were obtained from both Cofimvaba and Gcinibuzwe secondary schools.

Figure 4: The respondents' age group- Gcinubuzwe SSS

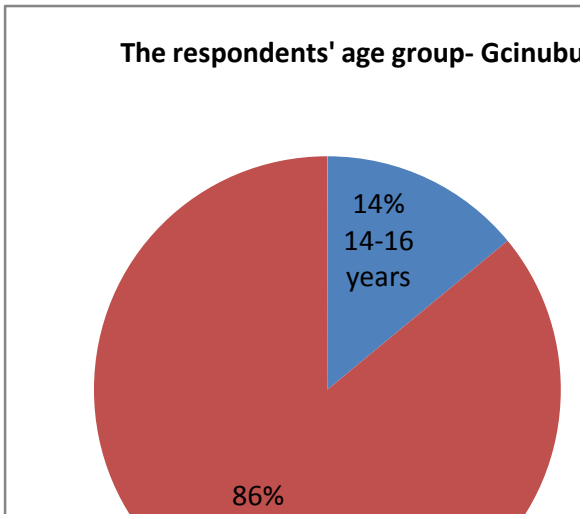


Figure 5: Respondents' current grade- Gcinubuzwe SSS

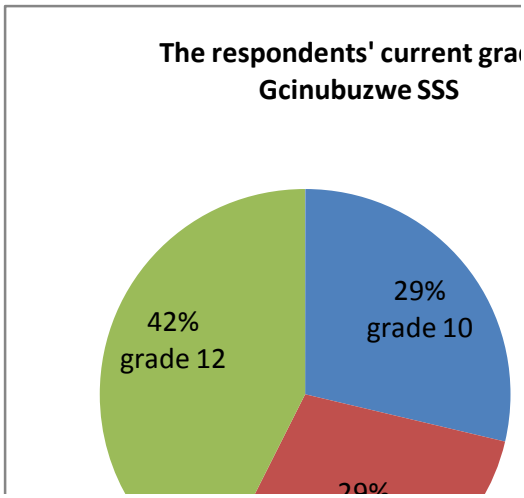


Table 12: Biographical Variables for Gcinubuzwe Senior Secondary School (n=14 girls)

Biographical Variables	Variable Description	Frequency	Percentage
Gender	Female	14	100
Race	Black	14	100
Age (years)	14-16 16-20	2 12	14 86
Current grade registered for	10 11 12	4 4 6	29 29 43

At Gcinubuzwe secondary school, an equal number of grades 10 and 11 was drawn, that is, 29 per cent from each grade (n=4) and 6 grade 12 learners, that is, 43 per cent. The participants at Gcinubuzwe are of mature age, most of them were between the ages of 16-20 years, that is, 86 per cent (n=12) and only 2 pupils were between 14-16 years.

5.12 CONCLUSION

In this chapter, the researcher provided a description of the research design and methodological procedures which were followed in collecting data for this study. The study involved human subjects. Two instruments were used for the purpose of data gathering, aimed at finding answers to the main research questions and these are in-depth face-to-face interviews and focus group interviews. The instruments allow the researcher to probe for more information and it also allows the respondents to express their views and might even bring to light other issues related to the study. Ethical considerations were also discussed in this chapter. Research moral guidelines and principles are followed to protect the participants during and after data collection. In the next chapter, the researcher presents, analyses and discusses data collected.

CHAPTER 6: DATA PRESENTATION AND ANALYSIS

6.1 INTRODUCTION

This study sought to explore technological challenges faced by rural women in the Eastern Cape Province of South Africa: A Chris Hani District Municipality Case Study and how these challenges can be resolved. In the previous chapter, the researcher provided a description of the research design and methodological procedures followed in gathering data using in-depth interviews and focus group interviews. Focus group interviews were conducted at Gcinubuzwe secondary school on the 4th of February 2013 and at Cofimvaba secondary school on the 7th of February 2013. In-depth interviews were conducted with the Intsika-Yethu municipality Mayor on the 6th of February 2013 and with the Emalahleni local municipality Mayor on the 5th of February 2013. Tsomo women support group leader was interviewed on the 6th of February 2013 and the Emalahleni women group leader was interviewed on the 4th of February 2013. Data takes mainly a verbal form and is also presented in tables and pie charts. In this presentation, numbers are used instead of research participants' real names. Finally, conclusions are drawn from the findings.

6.2: DISCUSSION OF FINDINGS THEMATICALLY

The study aimed at finding out the technology challenges faced by rural women in Eastern Cape Province: A Chris Hani District Municipality Case Study and how these challenges can be resolved. This study focused on Emalahleni and Intsika-Yethu Local Municipalities. In this section the research findings are discussed in light of themes drawn from the research sub-questions that guided the study. The discussion focuses on findings generated from qualitative data collected through focus group interviews and in-depth interviews.

6.2.1 Theme 1: Knowledge of Information and communication technology

This theme sought to bring to light the level of ICT knowledge among Emalahleni and Intsika-Yethu women. Awareness of ICT and or lack of it affect the uptake and usage of ICT in the society.

From the in-depth interviews conducted, it emerged that most women in Emalahleni and Intsika-Yethu Municipalities are aware of various ICT, but the knowledge of using them is limited in both municipalities. Respondent 3, a women support group leader, from Emalahleni said that Women in Agriculture and Development Projects, such as poultry, catering and piggery mainly use the cell phone which allows instant communication. However, not everyone owns a cellphone in the municipalities. Communication is usually about the women's projects, such as, catering. They however, cannot access the Internet, which is required to access market information for their produce. Some of the women from both municipalities lack ICT skills to search, select and process information. According to the research findings, some women lack basic literacy skills and the municipalities do not have training programs for them. They also lack strategic skills, that is, the ability to use the computer and network sources to improve one's position in society.

Respondent 1, a government leader from Intsika-Yethu Municipality said that:

> *"Those who have access to these resources they do not know how to fully utilise these resources, they have a challenge of the background knowledge on how the ICT infrastructure can assist them".*

This was echoed by Respondent 4, a government leader from Emalahleni Municipality who said that:

> *"Most women afford the cellphone for making calls and SMS, very few people are able to use the Internet".*

It emerged from the interview that the Thusong centre situated in Cofimvaba only offers other ICT services, but does not offer ICT skills training to the people. In Emalahleni Municipality, the ICT container had just been installed by the time the interviews were

conducted and was not yet in operation, thus, there were no ICT skills training offered in the municipality.

According to a government leader, Respondent 1, Intsika-Yethu Municipality tried to find 6 people who could train ICT skills to others in the municipality, but only 3 pitched up and they had to be sent to Queenstown, the biggest town in CHDM, where there were functional co operations.

Respondent 1 from Intsika-Yethu Municipality said:

> *"The concept of ICT is fairly new and is not moving as fast as one would wish, there is not much that is being done by those with access to promote the use of ICT to other women who are not well versed on the use of ICT, so it is moving very slowly to transfer the usage of ICT skill".*

There are no programs in the Municipality which assist women in obtaining ICT skills. Those with high income easily access ICTs compared to those with little income, hence the skills gap in one society. That is, some women lack what van Dijk (2008) calls access skills, to search, select and process information in computer and network sources. Furthermore, some are incapable of working with software and hardware. Digital divide is therefore not closing in South Africa, due to differences in ICT skills, it is actually deepening.

6.2.2 Theme 2: Accessibility of Information and communication technology

Accessibility of ICTs is a challenge to some women in rural areas and this study sought to find out the degree of ICT access in Emalahleni and Intsika-Yethu Municipalities.

The South African government adopted the Telecommunications Policy in 1996 to pursue values which "promoted equal access to telecommunication services or universal service to these services, whether one resides in an urban or rural area" (Lesame, Mbatha & Sindane 2011:206). The responses obtained from the research participants do not depict the goal of Telecommunications Policy.

Respondent 4, a government leader said that Emalahleni is a "deep rural area, so computers, laptops and cell phones are easily available at government offices", therefore

"women who are not working in any government setup are only limited to the cell phone, some do not even have the cell phone, remember one has to buy the cell phone".

The researcher also found out that in Intsika-Yethu Municipality, women are facing similar challenges as those faced by Emalahleni women. Respondent 1, a government leader from Intsika-Yethu Municipality said that:

"Usage of ICT is quite a big challenge because the Municipality is rural, very few women have access to ICT" and also "only women working in government institutions are privileged to have access to ICT".

The above responses show that ICT physical access gap exist in both Emalahleni and Intsika-Yethu due to different levels of education and income, some women solely rely on government social grants and a few are employed at government institutions. Those who work at government institutions easily access ICT compared to other women in the community, hence the physical access gap in the same society. These findings supports the digital divide theory as argued by Fuchs and Horak (2008) who state that the income gap also creates a social divide, that is, the working class who can afford computer and Internet access and those who cannot.

Physical access to ICT infrastructure in both Emalahleni and Intsika-Yethu Municipalities is limited. Respondent 1 from Intsika-Yethu stated that there is only one Thusong centre in the Municipality, it is situated at Cofimvaba town and has ten computers. The Thusong centre offers ICT services to 21 wards, that is, about 200 villages. Though, according to respondent 2, a women support group leader, there is an ICT centre in Tsomo town, the centre is not a Multi Purpose Community Centre.

By the time the interviews were conducted three ICT containers had just been recently delivered, one in Indwe, one in Lady Frere and the other one, in Dordretcht, these small towns make up Emalahleni Municipality. According to Respondent 3, a government leader, the ICT centres were not yet functional. Previously, there were no ICT centres in Emalahleni Municipality, making it difficult for the dwellers to access ICT services, hence travelling to Queenstown, the biggest town in CHDM.

According to Respondent 4, a government leader, Emalahleni Municipality comprises of 17 wards, which is more than 200 villages, excluding farms. The Thusong centres are too few to cater for the entire Municipality.

Though the world leaders made a commitment at the 2007 WSIS, to "turn the digital divide into a digital opportunity for all" (Bridging the Digital Divide in Africa 2010), inadequate physical access in Emalahleni and Intsika-Yethu Municipalities socially excludes the rural dwellers from the information society. Most people in these Municipalities rely on government social grants; therefore they cannot afford having a computer and Internet connection at home. Therefore, large numbers of people in the community are excluded from sophisticated e-development, due to limited or no access to advanced communications at household level, (Abrahams & Goldstuck 2010).

Accessibility to ICT is also a major concern at secondary schools were the study was conducted. Literacy is changing with the changing world of technology, it has expanded to "include literacy in information and communication technologies" (Cunningham 2000; Harste 1994; Leu 2002; Moll 1994; Paris, Lipson & Wixson 1994; Yopp & Singer 1994). Therefore it is not only the ability to read, write and count figures, but it also entails computer skills. Furthermore, computers are compulsory tools in education and they have made global education possible.

The use of the computer and Internet is increasing in the education sector in South Africa, for instance, Kwa Dukuza Resource Centre in Kwa Zulu Natal Province, where the rural learner is exposed to ICT, enhancing computer literacy. It is not the case with some learners in Intsika-Yethu and Emalahleni Municipalities who are not part of the information society.

From the focus group interviews conducted at Cofimvaba SSS and Gcinubuzwe SSS, it was found out that the schools are producing some pupils who lack computer skills and that makes it difficult for them to easily adapt in this world of ever changing technology. Therefore, the South African government has failed to deliver ICT services to all the people.

Pupils at both Cofimvaba and Gcinubuzwe secondary schools said that there are computer laboratories at their schools. However, not all of them access the computers. At Cofimvaba Secondary School, not all learners are taught Computer Application Technology (CAT), only

three classes out of twenty-one are CAT learners. The pupils are also not allowed to use cell phones in the school premises and the cyber laboratory is only meant for CAT learners.

At Gcinubuzwe SSS, the computers are available but, no learner uses them and they are also not used during the teaching-learning process. Furthermore the computers are not connected to the Internet. A learner said that:

> *"I was at a school where I was learning computers, but now I am here, I am no longer doing them".*

The pupils at Gcinubuzwe SSS are highly disadvantaged and this widens the digital divide in the society. The learners are even aware that some students are using ICT at their schools and they themselves will be at a disadvantage at tertiary level. Therefore, according to the ITU IDI sub-indices, South Africa is not an information society; some learners do not access ICTs in the classroom.

The scenario at both secondary schools were research was conducted thwarts the government's e-education policy which states that, "Every South African manager, teacher and learner in the general and further education and training bands will be ICT capable (that is, use ICT confidently and creatively to help develop the skills and knowledge they need as lifelong learners to achieve personal goals and to be full participants in the global community) by 2013. Instead of closing the digital divide, the school institution is actually widening the gap between the information haves and the information have-nots. It is at school where a learner regardless of social background is supposed to be exposed and taught computer, Internet and other ICT skills.

The challenges that pupils at Cofimvaba and Gcinubuzwe SSS are facing could be a result of inadequate learning resources that incorporate ICT usage, limited technology infrastructure and these hinder the effective introduction of technology into schools (Harrison & Wamakate 2010).

Though the Government Gazette No 26734 (2004) states that if every South African is to participate effectively in the global economy, no one should be socially excluded and ICT should be made available to all. Research participants from Gcinubuzwe SSS stated that

there are no computer laboratories in the surrounding communities. The pupils are thus not able “to tap into the mainstream of information and knowledge, where they learn and play, expand their imagination and creativity, and collaborate with their peers across the African continent and the world” (The World Bank Group 2007). Libraries are also not found at school and the community, therefore the Department of Education failed to provide libraries for the schools and the community. Unavailability of libraries makes it tough for pupils to research for their studies and they only rely on the teacher who is not the fountain of all knowledge. This indicates the failure of the government to provide ICT services to all people as stated in their Acts. Therefore, the students and other people in their community are socially excluded from the information ring.

Furthermore, at Gcinubuzwe SSS, a research participant said that they travel to Lady Frere for ICT services, such as faxing and the Internet, and they are sometimes forced to travel as far as Queenstown, which costs R60 return fare, if there is no network in Lady Frere. It is expensive travelling long distances for ICT services, a respondent said that they pay R20 to travel to and from Lady Frere and others pay R14 return fare to Lady Frere. Though according to Webster’s spatial definition, ICTs compress space and time, the rural folk are forced to travel seeking connecting to others, due to unavailability of ICT services in the area under study.

The researcher also found out from the participants at Cofimvaba secondary school that some villages under Intsika-Yethu Municipality do not have electricity, for instance, Gqogqorha, Ntsume and Tsakane. Dwellers of those villages cannot charge their cell phones, watch television and do other things which require electricity. School learners suffer because they cannot study at night. Therefore, “irregular or non-existent power supplies act as significant barriers to access and use of ICTs, particularly in rural areas” (SOAWR Policy Brief for 14th Ordinary African Union Summit 2010:9). This indicates government failure to provide universal services and universal access to ICT infrastructure and services.

It also emerged from Respondent 2, a women support group leader in Intsika-Yethu Municipality, that teenage pregnancy is an issue affecting the girl child, and this creates the gender digital divide. “There is also drug and alcohol abuse in the Municipality”, this is mainly due to poverty and peer pressure amongst the youth. Pupils drop out of school

where ICT skills are taught and they become part of the information have nots in society. Information and communication technology physical access gap creates a society whereby some citizens cannot fully participate in social, economic and political issues which affect them.

6.2.3 Theme 3: ICT literacy level among rural women

The first sub research sought to ascertain the level of ICT literacy among rural women in the Eastern Cape Province of South Africa.

From the study, it emerged that the majority of women in both Intsika-Yethu and Emalahleni Local Municipalities have low levels of ICT literacy. Respondent 1, a government leader from Intsika-Yethu Municipality said that:

> *"The municipality is very rural and there is a challenge of literacy in the area, so it hinders the curiosity of people, they do not want to be associated with ICT".*

This was echoed by Respondent 3, a women support group leader, who said that most women in Emalahleni are lowly educated; some never went to school and it is therefore difficult to use technology.

From the two respondents, it can be safely said that some women are not motivated to use ICT because of low levels of education and Van Dijk (2008) calls it motivational access. For one to have the three strategic ICT, the mobile phone, Internet and computer, ICT literacy is a requirement. Therefore, a low level of education among some women in both Intsika-Yethu and Emalahleni Municipalities is a challenge to the uptake and use of ICT.

Respondent 4, a government leader, also from Emalahleni said that:

> *"With the ICT, the main language, that is, English, on the computer is not our language, remember our home language is Xhosa and a few Afrikaans and English, and so it does affect them".*

Rural women are fluent in their mother tongue and the language on the computer is foreign to them and this makes it even more difficult for the ICT illiterate women to embrace technology. Language barrier creates a digital divide in society; those who cannot comprehend the language on the Internet cannot make any meaningful use of it. Low literacy levels in a community might mean low chances of getting employment, as well as low entrepreneurship skills and this also results in poverty in that society.

6.2.4 Theme 4: Affordability of ICT to rural women

Information and communication technology services are not for free, therefore data was solicited from the women who participated in the study to find out the affordability of ICT to the ordinary rural women. Low incomes coupled with low levels of education are barriers to ICT. For one to have the three strategic ICT, the computer, the Internet and the mobile phone, ICT literacy and a stable income are a requirement.

Most women in the Intsika-Yethu and Emalahleni Municipalities are finding it difficult to use ICTs because they are expensive. Respondent 3, a women support group leader from Emalahleni said that:

> *"Most women are so poor; they do not have their own Internet".*

All the research participants in the study said that most people in both municipalities under study are poor and they rely on government social grants as a source of income, such as child grant and old age pension. The majority of the women do not work and the money that they obtain from social grants is inadequate to buy food and clothes. They are therefore unable to buy ICTs, such as laptops, modems and printers.

Some girls at Gcinubuzwe SSS said that they work in town during the school holidays so that they get money to buy cell phones. Respondent 4, a government leader also shared the same view that not all women have the mobile phone, "*remember one has to buy the cell phone*". Furthermore, the girls at Gcinubuzwe said that most parents buy the cheap cell phones and "*we cannot access all the information*". Such cell phones do not have all the enhanced applications that are required by school pupils, such as Internet connection.

This makes it impossible for the school child to research and even socialise with others through social networks, hence they are cut off from the global culture. Furthermore, the price for fixed broadband is high in developing countries, limiting access to the information society (ITU World Telecommunication / ICT Indicators database 2009). Most people are limited to voice and text messaging only due to expensive mobile telephony.

6.2.5 Theme 5: Possible approaches to overcome technology challenges in rural areas

The theme on possible approaches was derived in an attempt to overcome the challenges that are faced by some rural women in the uptake and usage of ICT. The possible solutions were sought from the research participants.

Respondents 1, a government leader and 2, a women support group leader both from Intsika-Yethu Municipality said that the community should be trained basic ICT skills at Thusong centres by the municipality, so that they are able to help themselves and their families. The respondents said that some have cell phones connected to the Internet, but they cannot assist their children with homework.

Advocacy by schools, the municipalities and the government, is another possible solution that was suggested by Respondent 4, a government leader from Emalahleni Municipality. She said that some women have smart phones but are unaware of the programs on their phones, so advocacy is a necessity. Information such as health issues, emailing and weather forecast reports can be obtained from the mobile phone.

Respondent 3, a women support group leader from Emalahleni Municipality said that the municipality's women who lack ICT skills should seek help from those who have the knowledge. She also said that, Women's Forum Groups should make the Special Programs Manager of the Municipality aware of their problems regarding ICT use in the community. A project could be started by the municipalities to teach these women about ICT issues.

Learners at both Gcinubuzwe and Cofimvaba secondary schools suggested that the Department of Education should make sure that all learners are taught CAT. At Gcinubuzwe, the research participants felt that an Internet connection will be of great help to the school.

It would make their studies a lot easier and at the same time preparing them for the world of work.

At Cofimvaba secondary school, the girls who participated in the study said that libraries should be made available by the government in villages because pupils who attend school there do not have access to libraries. Furthermore, the girls stated that the libraries should also have computers connected to the Internet.

Research participants at Cofimvaba SSS stated that some villages Intsika-Yethu Municipality do not have electricity; again the government has failed to provide services in the municipality. Darkwa (2011) argues that a solution to the power problems in developing countries is to develop an Off-Grid Digital Electronic Network as an initial communication and computing network for off-grid users in rural Africa. That could be based on solar energy solutions to the power problems.

6.3 A CRITIQUE OF THE UNIVERSAL SERVICE AND AGENCY ACCESS OF SOUTH AFRICA

The Universal Service and Access Agency of South Africa (USAASA) was established through the Electronic Communications Act, No 36 of 2005, to ensure that “every man, woman and child whether living in the remote areas of the Kalahari or in urban areas of Gauteng can be able to connect, speak, explore and study using ICT” (Universal Service and Access Agency of South Africa 2013). The above research findings indicate that the USAASA has failed to fulfil its mandate of “promoting universal access and universal services” (van audenhove 1999) in both Emalahleni and Cofimvaba local municipalities. Not every learner is able to study using ICT because of access challenges, that is, unavailability of the Internet at some schools and inadequate computers to cater for all learners, this perpetuates education marginalisation.

Failure by the USAASA to provide adequate ICT in the two municipalities under study also prevents some of the locals from fully exercising their fundamental human right enshrined in the 1996 South African Constitution, that is, the right to communicate (Statutes of the Republic of South Africa- Constitutional Law Act No. 108 of 1996). The right to communicate includes the right to access the means to speak and to be heard. The government, with the

help of the private sector, roll out ICT in some provinces, such as Gauteng, but has failed to do so in the rural Eastern Cape. Furthermore, training is offered by universities in the affluent cities and the same could be done in the rural areas.

Research findings indicate that some community members of Cofimvaba local municipality cannot easily access the only multipurpose community centre situated in Cofimvaba, due to cost, low levels of ICT and distance. The scenario is even worse in Emalahleni local municipality which did not have a functional Thusong centre by the time research was conducted, yet it is also the USAASA's duty to install telecentres around the country (van audenhove 1999). The USAASA is rather slow in its provision of services to disadvantaged communities. Telecentres extend services to underserviced areas and provide various ICT services, such as, internet, fax and photocopy. It is therefore difficult for some of the Cofimvaba and Emalahleni dwellers to participate on online forums which affect them as citizens of the country. There are no ICT skills training programmes in both Intsika-Yethu and Emalahleni local municipalities. The USAASA has therefore failed to fulfil its mandate of universal access and universal service in the two municipalities under study. The low-income, isolated and disadvantaged residents remain shut out of the information society.

Being disconnected from an information society also means failure to acquire necessary information on farming, markets, health and other social and political issues. The economy of the municipalities under study remains relatively underdeveloped due to unskilled labour force, unaffordable ICTs and low ICT skills. South Africa remains two worlds in one, with some effectively enjoying the benefits of connectivity, whilst others remain disconnected.

6.4 CONCLUSION

From the above data analysis, it can be said that some rural women in Emalahleni and Intsika-Yethu Local Municipalities under CHDM of the Eastern Cape Province, South Africa, are facing a lot of challenges in their uptake and use of ICT. Issues of affordability, accessibility, availability and low ICT literacy are negatively affecting the women in their desire to use ICTs.

Furthermore, the researcher found out that not all women have mobile phones, this contradicts with the often stated data that South Africa has a mobile penetration rate which is 100 per cent or above. These challenges perpetuate the digital divide in the South African community. Information and communication technology government policies are on paper, but they have not yet been fully implemented in some parts of the communities where this study was conducted. The researcher agrees with Singh (2010) who argues that in the area of ICT, the South African government's trends ally it to an agenda which conflict with the hopes and rights of the majority of South Africans.

The researcher therefore proposes that CHDM involves universities which might offer ICT training skills to the rural dwellers at the MPCCs. The number of MPCCs rolled out in the local municipalities should be increased and evenly distributed so that they are easily accessed by all the people.

Therefore in this chapter, the researcher presented, analysed and discussed the data collected mainly from in-depth interviews from government representatives and women support groups from Intsika-Yethu and Emalahleni Municipalities, and also from focus group interviews conducted at two secondary schools in the mentioned municipalities. Data presentation, analysis and discussion were done in line with the sub research questions that guided the study.

CHAPTER 7: CONCLUSION AND RECOMMENDATIONS

7.1 INTRODUCTION

This study sought to explore the technology challenges faced by rural women in Emalahleni and Intsika-Yethu Local Municipalities, under CHDM, in the Eastern Cape Province of South Africa and how these challenges can be resolved. The study employed qualitative research methodologies that are focus group interviews and in-depth interviews. Research participants were government representatives, women support group leaders and secondary school girls. Data were analysed presented, analysed and discussed according to the themes derived from the research questions. The researcher also proposes recommendations to improve the ICT use in rural areas.

7.2 Review of the Research Problem

The study was undertaken to investigate and highlight technology access and use challenges faced by rural women in CHDM of the Eastern Cape Province of South Africa, with the purpose of trying to find solutions to the challenges. This was done by involving the women who dwell in the municipalities under study. In dealing with the digital divide, the South African government has implemented ICT policy which enhances issues of accessibility, affordability and availability of ICT to all citizens. The researcher analysed the data collected in Emalahleni and Intsika-Yethu Municipalities in relation to the ICT policy.

7.3 Summary of findings

7.3.1 Knowledge of Information Communication Technology

Most women in both Municipalities are aware of various ICTs, but they lack ICT skills. This is because of low levels of education among some women, poverty and inaccessibility of some of the ICT infrastructure in the communities. Secondary school pupils are aware of ICTs around them, but the school set up does not offer ICT skills to all the learners, hence creating a digital divide at school.

The Eastern Cape Provincial government could collaborate with other stakeholders, such as, universities, civil society, Communications, business, and global development parts (Lesame 2013). Rhodes and Fort Hare universities are working with the Dwesa community of Amathole district in the Eastern Cape Province through their Telkom Centre of Excellence, providing locals with ICT training, e-commerce and innovative ways of making information available to the locals (Eliasz & von Staden 2008). A similar project could setup in the Chris Hani District Municipality where ICT skills' training is needed by schools and the community at large.

Both Emalahleni and Intsika-Yethu local municipalities could involve the telecentres organisation, an institution representing the e-skills training needs of communities and telecentres located in such communities (Lesame 2013). The institution could support the Thusong centres with skilled people who in turn train the communities ICT skills.

7.3.2 Accessibility of Information and communication technology

It emerged from the study that accessing ICTs in both Emalahleni and Intsika-Yethu Municipalities is a major concern. Most women do not easily access all ICTs; it is only women working in government institutions who have easy access to ICTs. Therefore, there is digital divide in one society, the information haves and the information have nots. The USAASA is responsible for providing access throughout South Africa and the findings indicate that it has failed to fulfil its mandate in the Chris Hani District Municipality. The municipalities could seek funding from non-profit organisation and set up accessible ICT centres throughout the communities. Global System for Mobile Communications operators, such as, Mobile Telephone Network and Vodacom can also be approached so that the community connection is analysed and expanded to reach the disconnected parts of district.

7.3.3 Information and communication technology literacy level of rural women

The researcher found that some women in the municipalities where research was conducted have never been to school and are ICT illiterate. The Eastern Cape Department of Education could expand adult literacy programs to all rural areas where there is need and provide resources, such as books and computers. There are however some who are formally

educated and have ICT skills. Differences in educational levels create digital divide in one society, the information haves and the information have nots. The information haves are the educated women who can afford to buy and use ICT at home and workplaces. The information have nots are those who cannot afford owning ICT at home and lack ICT skills.

7.3.4 Affordability of Information and communication technology

From the study, the researcher found out that ICTs are beyond the reach of many women in the two municipalities studied. Most women rely on government social grants as a source of income and cannot afford buying all ICTs. This is a hindrance to ICT use and some women are left out of the information society. The women could pay a monthly subscription of R20 to access the Internet and other ICT services.

The local municipalities could also involve business partners engaged in ICT projects, such as Telkom, the South African telecommunications incumbent and private telecommunications, Cisco. Telkom and Cisco "add both financial and human resources as well as advanced ICT expertise" (Lesame 2013:85). Financial assistance is required when telecentres are setup in communities and also the expertise to train people who lack ICT skills.

7.4 Limitations to the study

The study was only conducted in Intsika-Yethu and Emalahleni local municipalities, under the CHDM, in the Eastern Cape Province of South Africa. The research findings cannot be generalised to other municipalities in Eastern Cape and the rest of South Africa. The researcher only used two qualitative data collection methods, yet other methods could have been used.

7.5 Recommendations

Against the research findings and the findings from the literature review, the following recommendations are made. These recommendations are made in line with the research questions, all with the view to enhance approaches that overcome challenges faced by rural women in their ICT use.

The researcher makes the following recommendations:

7.5.1 Designing intervention programmes for school learners

The Eastern Cape Provincial Government should design ICT strategy for the province and local municipalities implement the strategies in the communities. The National Department of Education should make it policy that all learners from primary to senior secondary school are taught and examined ICT skills. Computer Application Technology and Information Technology should be made compulsory subjects in schools. Access for all should be ensured at schools, access to computers should be increased at schools so that all learners are able to use ICTs for educational programmes.

A computer literacy program for educators in South Africa, together with the provision of programs required in the teaching learning process and measures to protect the infrastructure is recommended. The Department of Education at provincial and district levels may conduct the ICT literacy program for teachers at school.

7.5.2 Designing intervention programmes for rural women

Again, it is the Eastern Cape Provincial Government which should design ICT strategy for its municipalities. Thusong centres should be easily accessed in rural areas; they should be installed in wards by the USAASA and other stakeholders, such as, non-profit organisations, which fund ICT projects. Information and communication technology skills should be taught to all disadvantaged people. Local municipalities could work with science and technology institutions, such as the Meraka Institute which provides among other things, training, technical implementation and monitoring of the projects (Eliasz & von Staden 2008). The government could subsidise ICT services and tools so that even the poor members of the society are able to use ICT services. It should be ensured that e-government services are in the local language where necessary.

Furthermore, the telecentres should be made relevant to the community, that is, electronic networks should meet the needs of the communities, such as, information on agriculture, markets and health. The women could design their own website and sell their produce to

other communities. Also, the community should be familiar with the language on the computer.

The local community should also take part in the design, implementation and management of the Thusong centres; this enables them to influence decisions which will affect them. The involvement of the locals might yield better results from the Thusong centres. Community participation builds a sense of ownership.

7.5.3 Monitoring and evaluation of ICT programmes in rural areas

The government may evaluate the effectiveness of ICT policies already in place. Measures should be put in place to monitor and support ICT projects in rural areas. The provincial government could also involve academic institutions in monitoring and evaluation of ICT projects. Universities, such as Rhodes and Fort Hare have students doing research on Village Connectivity, which will provide insight into the effectiveness of ICT programmes in the communities (Eliasz & von Staden 2008). The community should also take a great part in the evaluation of ICT projects.

Women could thus be resourced by their provincial governments, non-governmental organisations involved in rural development, Global System for Mobile networks and academic institutions, with ICT services, infrastructure and skills. Technology is a catalyst for the social and economic development of rural areas. Information and communication technology could be used to improve the lives of women, by providing market information for their agricultural produce, weather reports and cellphone banking.

7.6 Implications for further research

This study was confined to Emalahleni and Intsika-Yethu Local municipalities in the Eastern Cape Province of South Africa. Future researchers may study the same issue on a large scale and may also take a comparative dimension in which ICT issues in rural South Africa are compared to other rural areas in developing countries.

7.7 Importance of the study

This study attempted, with a degree of success, to uncover the challenges faced by rural Emalahleni and Intsika-Yethu municipalities and how these challenges can be resolved. The challenges include accessibility, affordability and availability of ICTs. The study also gathered solutions to the challenges faced by the rural women. Recommendations were given and they are centred on the need to improve ICT access and equip all citizens with ICT skills.

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APPENDIX A

INTERVIEW SCHEDULE FOR HIGH SCHOOL GIRLS

Introduction

Moderator introduces self, the clients and the project.

Focus Group Objectives

Objectives are briefly discussed.

Participants Consent

The views expressed in the discussion will be treated with privacy and strict confidently and will be used solely for the purposes of the study. There shall be no right or wrong answer and everyone is free to express their views without fear or favour. A recording device will be used during the discussion and will be used in transcribing the discussion to write the report.

Participants introduce themselves and their background. Participants remain anonymous.

Knowledge

A) What do you know about Information Communication Technology (ICT)?

Usage

A) Which types of ICT are used at your school and community?

B) Which is the most commonly used among the mentioned ICT?

C) How do you use ICT in the learning process?

Accessibility

A) Which ICT infrastructure is easily accessible at your school and community?

B) Which ICT services do you think will benefit you but are unavailable at school and in your community?

Literacy

A) In your opinion how is the level of education of women in your communities affecting the usage and uptake of ICT?

B) What are your experiences in the use of ICT with other high school girls and women in this municipality?

Finance

A) How do you think the income in your households has affected the use and uptake of ICT?

Challenges

A) What could be the possible challenges faced by girls of your age and other women in the use of ICT in this municipality?

B) What could be done to address the challenges that you face in ICT usage?

Participants fill in the demographics questionnaire.

Thank you.

APPENDIX B

INTERVIEW SCHEDULE FOR THE GOVERNMENT REPRESENTATIVES

Introduction

Moderator introduces self, the client and the project.

Brief explanation of objectives

Participant introduces self

The views expressed in the discussion will be treated with privacy and strict confidently and will be used solely for the purposes of the study. There shall be no right or wrong answer and everyone is free to express their views without fear or favour. A recording device will be used during the discussion and will be used in transcribing the discussion to write the report.

Usage

A) Which type of ICT is commonly used by women in this municipality?

B) Are there programs in place which promote ICT use among women?

Literacy

A) In your opinion, how is the level of education of women in this municipality affecting their usage and uptake of ICT?

Finance

A) How do you think the level of disposable income in the households has affected the use of ICT?

Government Policy

A) What does the policy regulations regarding ICT and women entail?

B) How far have the ICT Policy Regulations been implemented in the Municipality?

Challenges

A) What could be the possible challenges faced by women in their use of ICTs?

B) How can the challenges faced be addressed?

Strategies for the Municipality

A) What plans/strategies do you have as a mayor to improve ICT usage by women in the Municipality?

B) Are the plans already implemented/are yet to be implemented?

C) Are there any obstacles faced when implementing ICT policy, if so, what are they and how do you intend solving them?

APPENDIX C

INTERVIEW SCHEDULE FOR WOMEN SUPPORT GROUP LEADERS

Introduction

Moderator introduces self, the client and the project.

Brief explanation of objectives

Participant introduces self

The views expressed in the discussion will be treated with privacy and strict confidently and will be used solely for the purposes of the study. There shall be no right or wrong answer and everyone is free to express their views without fear or favour. A recording device will be used during the discussion and will be used in transcribing the discussion to write the report.

Usage

A) Which ICT are commonly used by the women in your community?

B) How do women use ICT to develop themselves and the society at large?

C) Are there specific programs which promote the use of ICT in the community?

Accessibility

A) Which ICT infrastructure is easily accessible in the community?

B) Which ICT services do you think will benefit women but are unavailable?

Literacy

A) In your opinion how is the level of education of women in your community affecting the usage and uptake of ICT?

Finance

A) How do you think the level of disposable incomes in households has affected the use and uptake of ICT?

Challenges

A) What challenges are faced by women in this Municipality in their use of ICT?

B) How can the challenges be addressed?

C) What is your word of encouragement to women regarding ICT?

APPENDIX D

INFORMED CONSENT FORM-LEARNERS

University of South Africa

Department of Communication Science

Title of Study
Technology Challenges faced by Rural Women in the Eastern Cape Province of South Africa: A Chris Hani Municipality Case Study

Conducted by: Chisango Grasia

Purpose of the study

I am a Master of Arts in Communication student. I am conducting research as part of my Master's thesis and my supervisors are Dr NC Lesame and Dr BT Mbatha. I would like to know if you would allow your child to take part in the research study on technology challenges faced by rural women in the Eastern Cape Province of South Africa: A Chris Hani Municipality case study.

Procedures

The researcher will conduct a focus group interview in relation to the topic stated above and a voice recorder will be used to capture the interview. Your child, with fellow schoolmates will be asked the questions in a group of fourteen.

Confidentiality

All the information obtained from the interview will be strictly confidential. Your name will not be used; instead numbers will be assigned to the informants.

Your participation is voluntary; you may withdraw at any time from participating in the study.

Participant's agreement statement

I am the father/mother/ legal guardian of _____.
The purpose of the study and the extent to which my child will be involved was explained to me. I have understood the purpose of the study and the extent to which my child will be involved in the study. I, unreservedly, agree for him/her to take part in it voluntarily.
I understand that I or my child am (is) free to withdraw from the study at any time at our own will. I have explained to the minor under my care that I have no objection in him/ her taking part in this study and he/she too has agreed to it.

Signed at (Place) _____ on date _____

By (Full Name) _____

Address _____

Witness: Name _____ Signature: _____ Date: _____

APPENDIX E

INFORMED CONSENT FORM-WOMEN SUPPORT GROUP LEADERS

University of South Africa

Department of Communication Science

Title of Study
Technology Challenges faced by Rural Women in the Eastern Cape Province of South Africa: A Chris Hani Municipality Case Study

Conducted by: Chisango Grasia

Purpose of the study

I am a Master of Arts in Communication student. I am conducting research as part of my Master's thesis and my supervisors are Dr NC Lesame and Dr BT Mbatha. I would like to know if you would be willing to take part in the research study on technology challenges faced by rural women in the Eastern Cape Province of South Africa: A Chris Hani Municipality case study.

Procedures

The researcher will conduct an in-depth face to face interview in relation to the topic stated above and a voice recorder will be used to capture the interview.

Confidentiality

All the information obtained from the interview will be strictly confidential. Your name will not be used; instead numbers will be assigned to all the informants.

Your participation is voluntary; you may withdraw at any time from participating in the study.

Participant's agreement statement

Please Tick (√) Box

1. I confirm that I have read and understand the information sheet for the above study and have had the opportunity to ask questions. ☐

2. I understand that my participation is voluntary and that I can withdraw when I feel like. ☐

3. I agree to take part in the above study. ☐

4. I agree to the interview / focus group / consultation being audio recorded ☐

5. I agree to the use of anonymised quotes in publications ☐

Name of Participant	Date	Signature
Name of researcher	Date	Signature

APPENDIX F

INFORMED CONSENT FORM-GOVERNMENT REPRESENTATIVES

University of South Africa

Department of Communication Science

Title of Study
Technology Challenges faced by Rural Women in the Eastern Cape Province of South Africa: A Chris Hani Municipality Case Study

Conducted by: Chisango Grasia

Purpose of the study

I am a Master of Arts in Communication student. I am conducting research as part of my Master's thesis and my supervisors are Dr NC Lesame and Dr BT Mbatha. I would like to know if you would be willing to take part in the research study on technology challenges faced by rural women in the Eastern Cape Province of South Africa: A Chris Hani Municipality case study.

Procedures

The researcher will conduct an in-depth face to face interview in relation to the topic stated above and a voice recorder will be used to capture the interview.

Confidentiality

All the information obtained from the interview will be strictly confidential. Your name will not be used; instead numbers will be assigned to all the informants.

Your participation is voluntary; you may withdraw at any time from participating in the study.

Participant's agreement statement

Please Tick (√) Box

1. I confirm that I have read and understand the information sheet for the above study and have had the opportunity to ask questions. ☐

2. understand that my participation is voluntary and that I can withdraw when I feel like. ☐

3. I agree to take part in the above study. ☐

4. I agree to the interview / focus group / consultation being audio recorded ☐

5. I agree to the use of anonymised quotes in publications ☐

Name of Participant	Date	Signature
Name of researcher	Date	Signature

APPENDIX G

Request letter to Cofimvaba Department of Education

8106 Beverly Hills

Evaton West

1984

Johannesburg

23 January 2012

The District Director

Cofimvaba Department of Education

Private Bag X214

Cofimvaba

5050

Sir/Madam

RE: Request for permission to conduct research at Cofimvaba High School

I am a Master of Arts student at the University of South Africa. I kindly request for permission to carry out research at Cofimvaba High School as part of my studies.

Topic: Technology Challenges faced by Rural Women in the Eastern Cape Province of South Africa: A Chris Hani Municipality Case Study.

Target group: Female learners.

Mode of data collection: Focus group interview.

Expected starting date: As soon as possible.

Delivery to your office: Copy of completed Research Report.

I hope that my request will be granted.

Yours faithfully

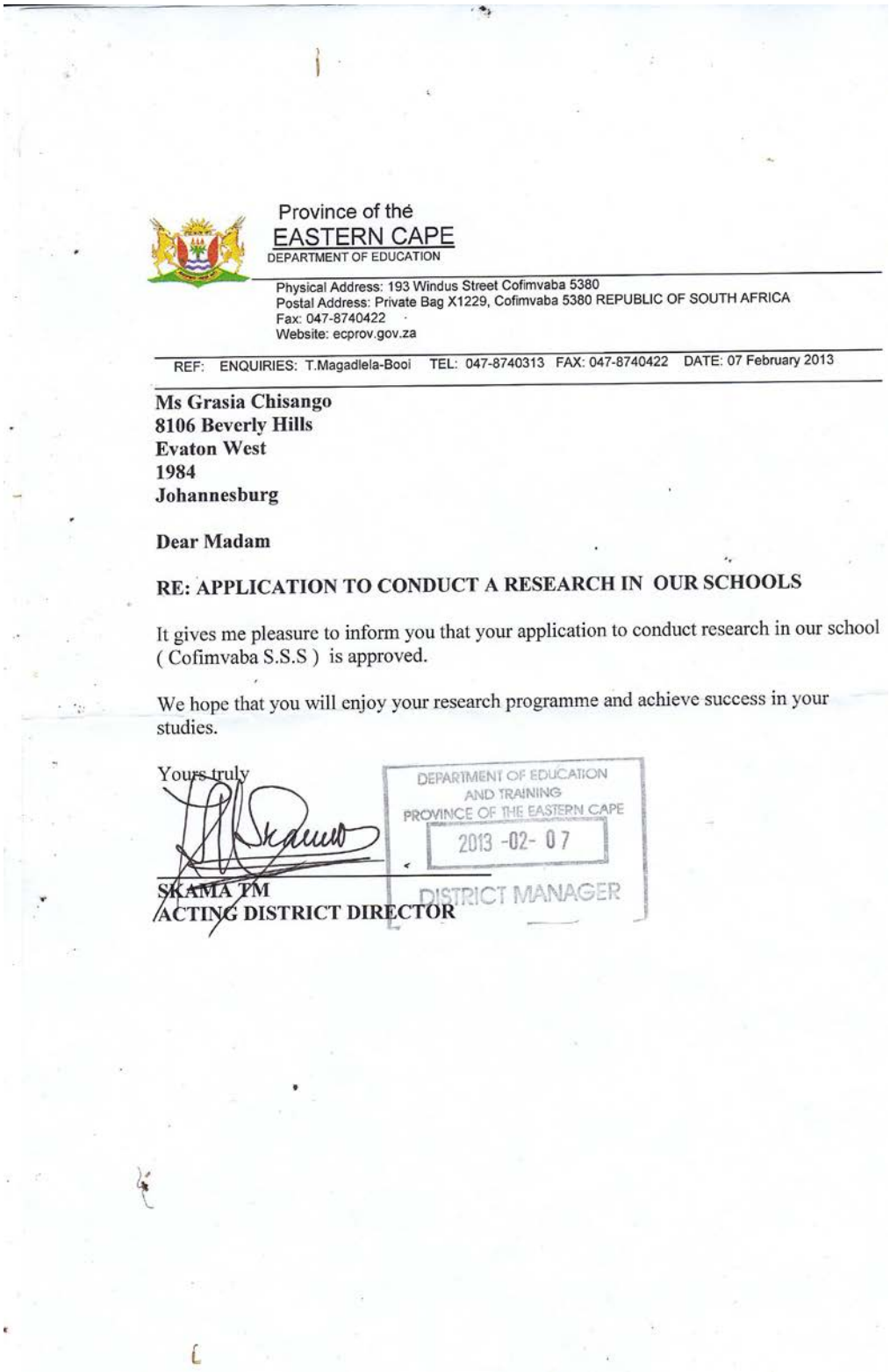
Grasia Chisango

Student Number 46476253

Contact 078 352 9063/ 074 838 4744

APPENDIX H

Permission letter from Department of Education



Province of the
EASTERN CAPE
DEPARTMENT OF EDUCATION

Physical Address: 193 Windus Street Cofimvaba 5380
Postal Address: Private Bag X1229, Cofimvaba 5380 REPUBLIC OF SOUTH AFRICA
Fax: 047-8740422
Website: ecprov.gov.za

REF: ENQUIRIES: T.Magadlela-Booi TEL: 047-8740313 FAX: 047-8740422 DATE: 07 February 2013

Ms Grasia Chisango
8106 Beverly Hills
Evaton West
1984
Johannesburg

Dear Madam

RE: APPLICATION TO CONDUCT A RESEARCH IN OUR SCHOOLS

It gives me pleasure to inform you that your application to conduct research in our school (Cofimvaba S.S.S) is approved.

We hope that you will enjoy your research programme and achieve success in your studies.

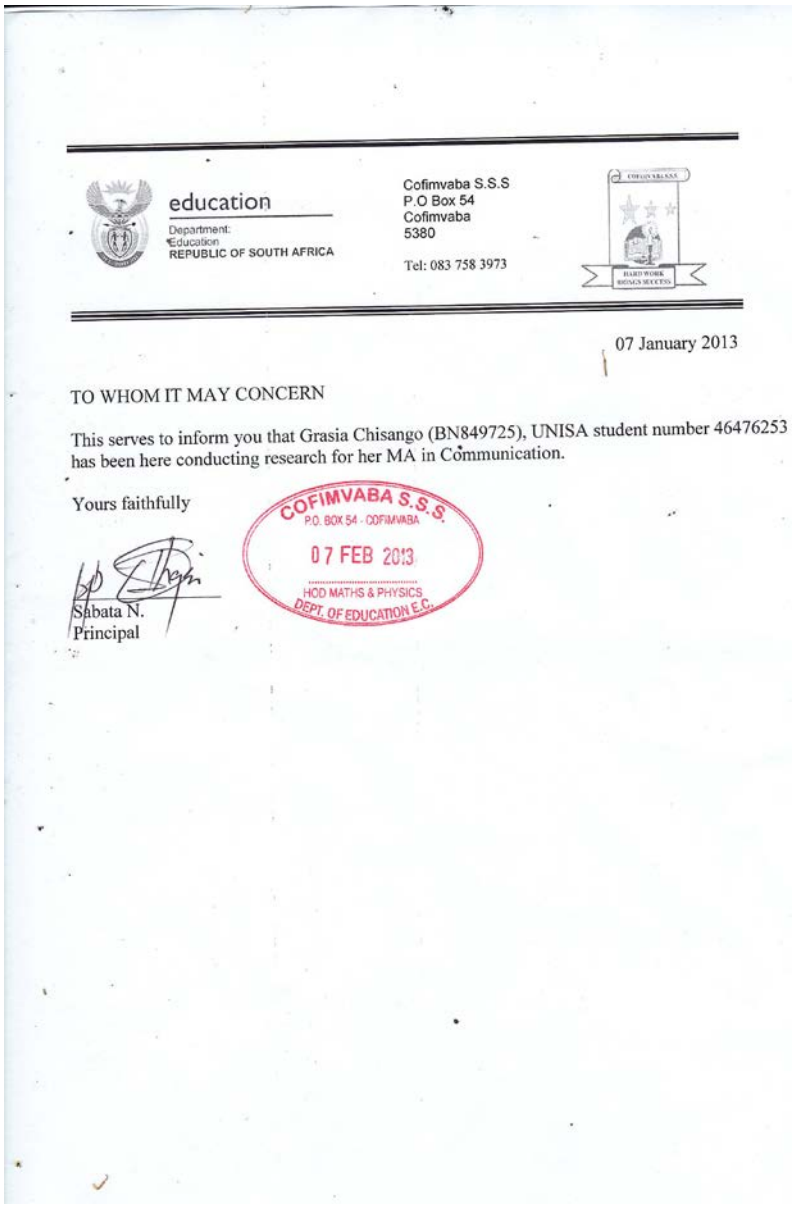
Yours truly

DEPARTMENT OF EDUCATION
AND TRAINING
PROVINCE OF THE EASTERN CAPE
2013 -02- 07
DISTRICT MANAGER

SKAMA TM
ACTING DISTRICT DIRECTOR

APPENDIX I

Letter from Cofimvaba Secondary School



education
Department:
Education
REPUBLIC OF SOUTH AFRICA

Cofimvaba S.S.S
P.O Box 54
Cofimvaba
5380

Tel: 083 758 3973

07 January 2013

TO WHOM IT MAY CONCERN

This serves to inform you that Grasia Chisango (BN849725), UNISA student number 46476253 has been here conducting research for her MA in Communication.

Yours faithfully

COFIMVABA S.S.S.
P.O. BOX 54 - COFIMVABA
07 FEB 2013
HOD MATHS & PHYSICS
DEPT. OF EDUCATION E.C.

Sabata N.
Principal

APPENDIX J

Request letter to Emalahleni Department of Education

8106 Beverly Hills

Evaton West

1984

Johannesburg

23 January 2012

The District Director

Emalahleni Department of Education

Private Bag X214

Emalahleni

5050

Sir/Madam

RE: Request for permission to conduct research at Gcinubuzwe Senior Secondary

I am a Master of Arts student at the University of South Africa. I kindly request for permission to carry out research at Gcinibuzwe Senior Secondary as part of my studies.

Topic: Technology Challenges faced by Rural Women in the Eastern Cape Province of South Africa: A Chris Hani Municipality Case Study.

Target group: Female learners.

Mode of data collection: Focus group interview.

Expected starting date: As soon as possible.

Delivery to your office: Copy of completed Research Report.

I hope that my request will be granted.

Yours faithfully

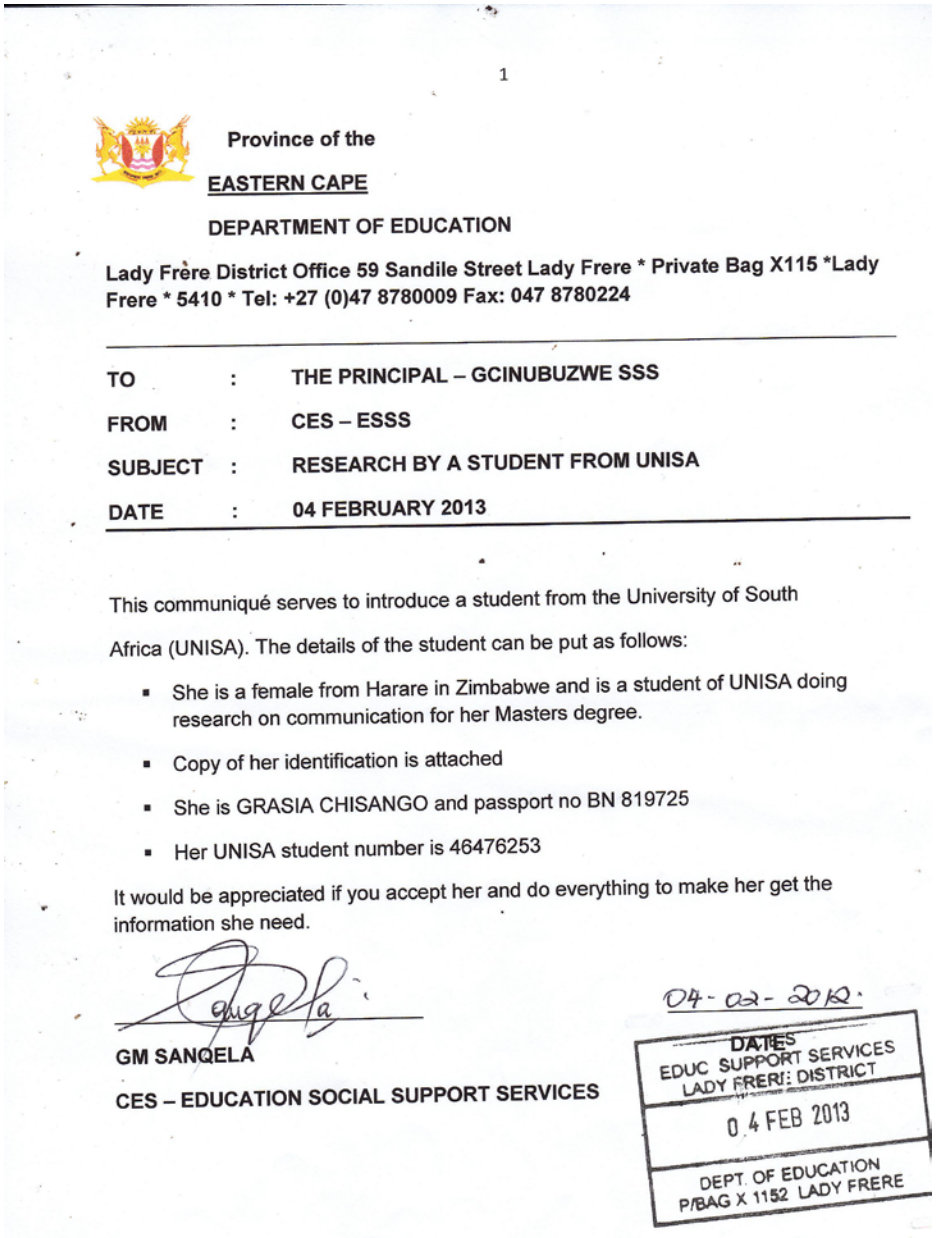
Grasia Chisango

Student Number 46476253

Contact 078 352 9063/ 074 838 4744

APPENDIX K

Permission letter from Department of Education



1

Province of the

EASTERN CAPE

DEPARTMENT OF EDUCATION

Lady Frere District Office 59 Sandile Street Lady Frere * Private Bag X115 *Lady Frere * 5410 * Tel: +27 (0)47 8780009 Fax: 047 8780224

TO	:	THE PRINCIPAL – GCINUBUZWE SSS
FROM	:	CES – ESSS
SUBJECT	:	RESEARCH BY A STUDENT FROM UNISA
DATE	:	04 FEBRUARY 2013

This communiqué serves to introduce a student from the University of South Africa (UNISA). The details of the student can be put as follows:

- She is a female from Harare in Zimbabwe and is a student of UNISA doing research on communication for her Masters degree.
- Copy of her identification is attached
- She is GRASIA CHISANGO and passport no BN 819725
- Her UNISA student number is 46476253

It would be appreciated if you accept her and do everything to make her get the information she need.

GM SANQELA

CES – EDUCATION SOCIAL SUPPORT SERVICES

04-02-2013

DATE

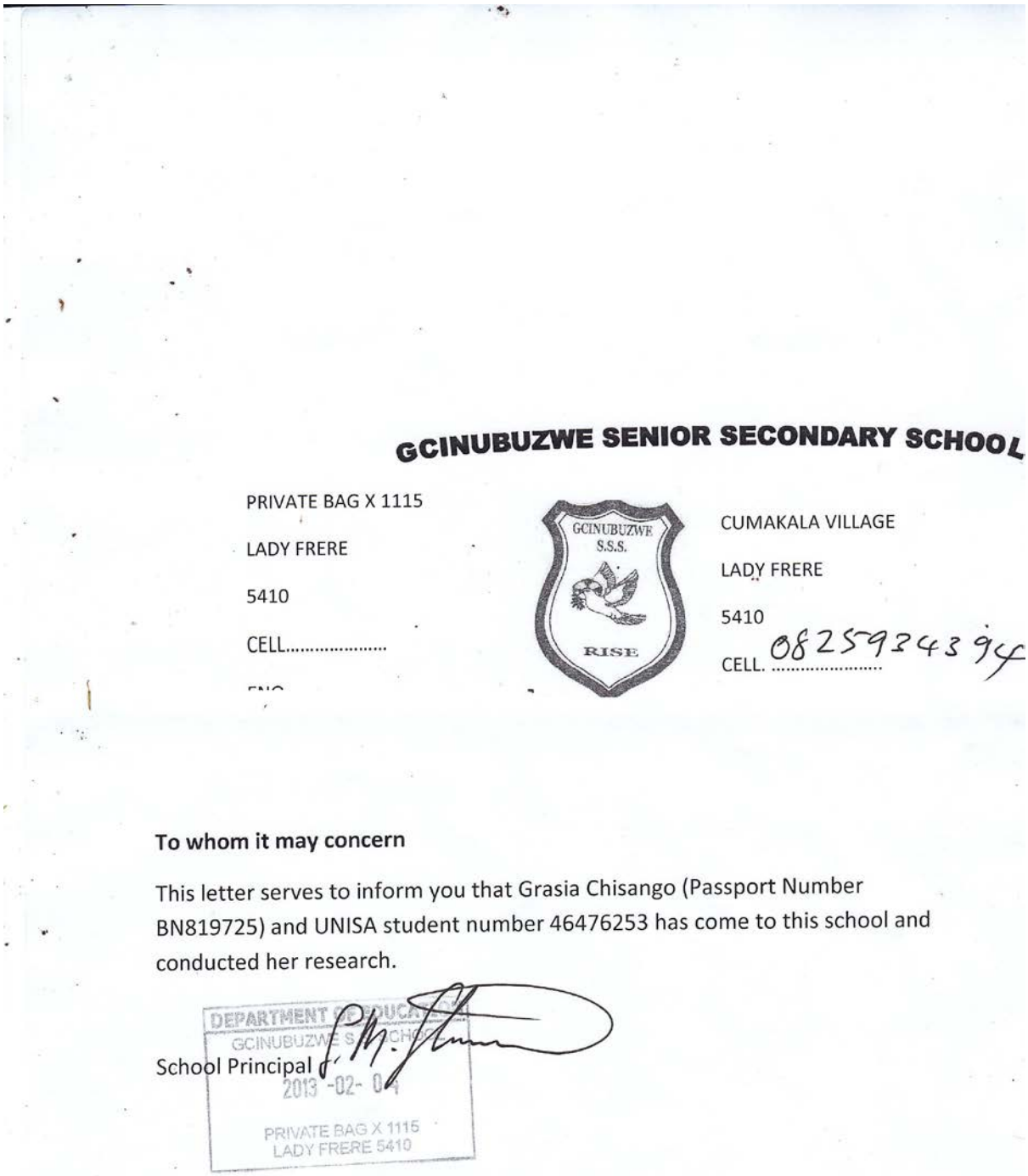
EDUC SUPPORT SERVICES
LADY FRERE DISTRICT

04 FEB 2013

DEPT. OF EDUCATION
P/BAG X 1152 LADY FRERE

APPENDIX L

Permission letter from Gcinubuzwe Secondary School



GCINUBUZWE SENIOR SECONDARY SCHOOL

PRIVATE BAG X 1115
LADY FRERE
5410
CELL.....

GCINUBUZWE S.S.S. RISE

CUMAKALA VILLAGE
LADY FRERE
5410
CELL. 0825923439

To whom it may concern

This letter serves to inform you that Grasia Chisango (Passport Number BN819725) and UNISA student number 46476253 has come to this school and conducted her research.

School Principal

DEPARTMENT OF EDUCATION
GCINUBUZWE S.S.S.
2013 -02- 04
PRIVATE BAG X 1115
LADY FRERE 5410

APPENDIX M

Request letter to Intsika-Yethu Municipality

8106 Beverly Hills

Evaton West

1984

Johannesburg

23 January 2012

The Mayor

Intsika-Yethu Municipality

P O Box 433

Cofimvaba

5380

Sir/Madam

RE: Request for permission to conduct research study with the Mayor.

I kindly request for permission to conduct research with the Mayor.

I am a Master of Arts student at the University of South Africa who wishes to conduct research with the Mayor as part of my studies.

My study is on, Technology Challenges faced by Rural Women in the Eastern Cape Province of South Africa: A Chris Hani Municipality Case Study.

I intend to collect data through an in-depth interview with the Mayor.

I hope that my request will be granted.

Yours faithfully

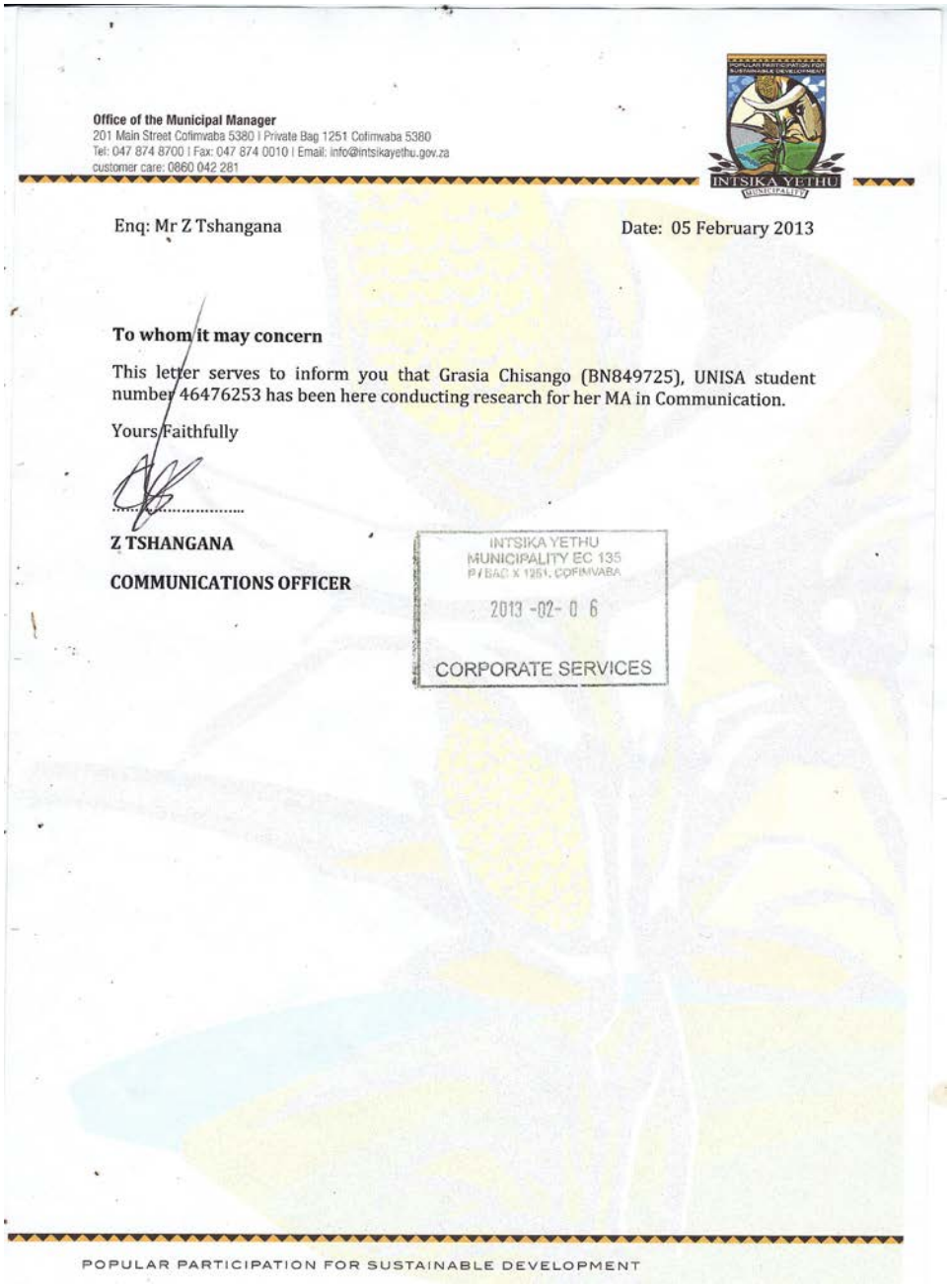
Grasia Chisango

Student Number 46476253

Contact 078 352 9063/ 074 838 4744

APPENDIX N

Permission letter from Intsika-Yethu Municipality



Office of the Municipal Manager
201 Main Street Cofimvaba 5380 | Private Bag 1251 Cofimvaba 5380
Tel: 047 874 8700 | Fax: 047 874 0010 | Email: info@intsikayethu.gov.za
customer care: 0860 042 281

INTSIKA YETHU MUNICIPALITY

Enq: Mr Z Tshangana

Date: 05 February 2013

To whom it may concern

This letter serves to inform you that Grasia Chisango (BN849725), UNISA student number 46476253 has been here conducting research for her MA in Communication.

Yours Faithfully

.....

Z TSHANGANA

COMMUNICATIONS OFFICER

INTSIKA YETHU MUNICIPALITY EC 135
P/BAG X 1251, COFIMVABA
2013 -02- 0 6
CORPORATE SERVICES

POPULAR PARTICIPATION FOR SUSTAINABLE DEVELOPMENT

APPENDIX O

Request letter to Tsomo Women Group

8106 Beverly Hills

Evaton West

1984

Johannesburg

23 January 2012

The Women Support Group Leader

Tsomo

5400

Sir/Madam

RE: Request for permission to conduct research study with the Women Support Group Leader.

I kindly request for permission to conduct research with the Women Support Group Leader.

I am a Master of Arts student at the University of South Africa who wishes to conduct research with the Mayor as part of my studies.

My study is on, Technology Challenges faced by Rural Women in the Eastern Cape Province of South Africa: A Chris Hani Municipality Case Study.

I intend to collect data through an in-depth interview with the Women Support Group Leader.

I hope that my request will be granted.

Yours faithfully

Grasia Chisango

Student Number 46476253

Contact 078 352 9063/ 074 838 4744

APPENDIX P

Permission letter from Tsomo Women Group

TSOMO WOMEN'S SUPPORT CENTRE

TSOMO MUNICIPALITY
72 Main Street
TSQMO
5400

ENQUIRIES: Mrs. P.T.Manyase
Tel. number: 0474880059/0835079217
Fax number: 0474880196/0474880319

06 FEBRUARY 2013

TO WHOM IT MAY CONERN

This letter serves to confirm that Grasia Chisango (BN819 725), UNISA Student Number 46476253 has been here conducting research for MA in Communication.

Yours faithfuly

.....

P.T. Manyase Manager

APPENDIX Q

Request letter to Emalahleni Municipality

8106 Beverly Hills

Evaton West

1984

Johannesburg

23 January 2012

The Mayor

Emalahleni Municipality

Private Bag X1161

Lady Frere

5410

Sir/Madam

RE: Request for permission to conduct research study with the Mayor.

I kindly request for permission to conduct research with the Mayor.

I am a Master of Arts student at the University of South Africa who wishes to conduct research with the Mayor as part of my studies.

My study is on, Technology Challenges faced by Rural Women in the Eastern Cape Province of South Africa: A Chris Hani Municipality Case Study.

I intend to collect data through an in-depth interview with the Mayor.

I hope that my request will be granted.

Yours faithfully

Grasia Chisango

Student Number 46476253

Contact 078 352 9063/ 074 838 4744

APPENDIX R

Request letter to Emalahleni Women Group

8106 Beverly Hills

Evaton West

1984

Johannesburg

23 January 2012

The Women Support Group Leader

Private Bag X1161

Lady Frere

5410

Sir/Madam

RE: Request for permission to conduct research study with the Women Support Group Leader.

I kindly request for permission to conduct research with the Women Support Group Leader.

I am a Master of Arts student at the University of South Africa who wishes to conduct research with the Mayor as part of my studies.

My study is on, Technology Challenges faced by Rural Women in the Eastern Cape Province of South Africa: A Chris Hani Municipality Case Study.

I intend to collect data through an in-depth interview with the Women Support Group Leader.

I hope that my request will be granted.

Yours faithfully

Grasia Chisango

Student Number 46476253

Contact 078 352 9063/ 074 838 4744

APPENDIX S

Request letter to use Chris Hani District Municipality Map

From: grasia chisango [mailto:grasiac@yahoo.co.uk]
Sent: 10 September 2012 08:29 PM
To: Lesley Govender: ECDC - East London
Subject: Re: Map of Eastern Cape

Dear Lesley

I would like to copy an Eastern Cape map and paste it on my thesis to explain the location of Chris Hani District Municipality where my research is centred on.

Thank you.

Regards

grasia

APPENDIX T

Permission letter to use Chris Hani District Municipality Map

RE: Map of Eastern Cape

Tuesday, 11 September, 2012 8:05

From:

"Lesley Govender: ECDC - East London" <lgovender@ecdc.co.za>

To:

"grasia chisango" <grasiac@yahoo.co.uk>

Dear madam

Can you not go to google maps and get this off the internet.

Kind regards,

Lesley Govender: ECDC - East London

Strategy Manager
Unit: Office of the CEO
Tel:043 7045616
Cell:083 451 2195
Fax:0866701916
Eastern Cape
South Africa
email: lgovender@ecdc.co.za
www.ecdc.co.za