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Topic:

Information Communication Technology (ICT) Community Centres and Agricultural  
Development in the Eastern Cape Province of South Africa: A Case of Dwesa  
Community.

By

Name: Tafadzwa Jaquiline Mukasi  
(200509007)

Thesis submitted to the University of Fort Hare in fulfilment of the requirement of the  
Master of Social Science in Development Studies.

Department of Development Studies  
Faculty of Management and Commerce  
University of Fort Hare

Republic of South Africa

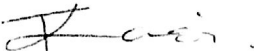
Supervisor: Dr. S. Mago

Co-Supervisor: Dr. P. Monyai

## Declaration

I, Tafadzwa J. Mukasi, hereby declare that this thesis is my own work and that it has not been submitted for any qualification to any university. I further declare that all the work which was written by other authors and used in this thesis has been fully acknowledged.

This thesis is submitted to the University of Fort Hare in fulfilment of the requirement of Master of Social Science in Development Studies in the Faculty of Management and Commerce.

Signed: T.J. Mukasi  


Date: March 2015

## **Dedication**

This thesis is dedicated to my parents, Mr. and Mrs. Mukasi, who have given me support and the opportunity for education throughout my life. Thank you, Mom and Dad, for always having faith in me. I would also like to dedicate this work to my brothers, sisters, nephews and to my niece. Thank you for your prayers and support and here is a challenge to you, my nephews and my niece. The glory for this achievement belongs to God.

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## **Abstract**

The development of Information Communication Technology (ICT) in rural areas has brought about rural agricultural development around the globe. ICTs are reducing segregation and poverty and enhancing rural development. It is changing people's lives by making more efficient all activities involving information and communication. In South Africa the introduction of ICT community centres in rural areas has become an effective tool for boosting efficiency and productivity in rural agricultural development, for example through accessing information on agriculture, quality educational trainings and various skills for rural agricultural development.

This study has attempted to identify the way in which ICT community centres are improving rural agricultural development and livelihoods, and contributing towards growth among the rural poor. It also outlines the manner in which the inhabitants of rural areas are generating information to increase their agricultural production. The study aims to provide an understanding of how ICTs may best be integrated into rural areas, in order to bridge the digital divide. It is emphasised that a precise analysis of the link between ICT community centres and rural agricultural development should be useful for sustained rural agricultural development, development strategies and programs. Data was collected from 55 community members in an effort to assess the impact of ICT community centres on agricultural development. The participants were selected using snowball sampling. To capture data, a survey questionnaire was administered and in-depth interviews were conducted. SPSS was used to analyse data collected from the survey questionnaire.

The results indicate that the majority of the community members are using ICT community centres, and that the gender distribution in the use of ICTs is equal. Most of the community members are assessing the usefulness of the ICT community centre for strengthening communication and for the empowerment which knowledge and information bring. Nevertheless, community members are not yet receiving

training on using ICTs for rural agricultural development. In view of the study results, some recommendations are made, including encouraging communities to react positively to technological changes, ensuring the availability of training in using ICTs to improve agricultural productivity, raising the standards of ICT skills of those people offering ICT training.

**Key words:** Information Communication Technology, rural agricultural development, ICT community centre, Dwesa rural community, rural areas

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## **List of Acronyms**

APPEAL	Asia-Pacific Programme of Education for All
CARE	Cooperative for Assistance and Relief Everywhere
DFID	Department for International Development
EC	Eastern Cape
Edx	Electronic Data Exchange
FAO	Food and Agriculture Organisation
ICT	Information Communication Technology
ICT4D	Information Communication Technology for Development
ILO	International Labour Organisation
ISRDS	Integrated Sustainable Rural Development Strategy
Km <sup>2</sup>	Square kilometres
MMS	Multimedia Messaging Service
NCCR	National Climate Change Response
NFE	Non-Formal Education
NGOs	Non-Governmental Organisations
RDF	Rural Development Framework
RHS	Reed House Systems
SA	South Africa
SLA	Sustainable Livelihoods Approach
SLL	Siyakhula Living Lab
SMS	Short Message (or Messaging) Service
SPSS	Statistical Package for Social Sciences
Stats	Statistics
UN	United Nations
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organisation
WSIS	World Summit on information Society

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# **Chapter 1**

## **Overview and Background of the Study**

### **1.1 Introduction and Background**

Information and Communication Technologies (ICTs) is an umbrella term which refers to “technologies which can be used to interlink information technology devices, such as personal computers, with communication technologies such as telephones and their telecommunication networks” (Chapman and Slaymaker, 2002:1). Pigato (2001) believes that ICT is likely to lessen isolation and poverty, improve service delivery and release new markets in the course of rural development. ICT has brought about growth in rural livelihoods through the development of ICT community centres. ICTs improves access to markets, improves and enhances agricultural development and productivity by providing information concerning risks which often accompany farming, such as drought, poor soil and pests. ICT community centres have been developed as a vital part of the present information revolution, which is contributing to both livelihoods and agricultural development, but access to its use is not distributed evenly, particularly in the rural areas, which has resulted in the existence of the ‘digital divide. The digital divide refers to the gap between rural and urban areas, in terms of how they use and access ICTs. Having access to and making use of information are extremely important to rural development, which gives rise to the great need to make information readily available to all in order to promote rural development and to empower rural communities. If ICT community centres are

used effectively, they should enable communities to speed up sustained growth in rural development, and, as a result, efficiency and productivity should be increased (Tlabela and Roodt, 2007) and access to new markets and other new developments opened up.

Rural communities are benefiting from the Information Communication and Technologies (ICTs) by finding useful information which is aimed at helping them, which improves information concerning markets such as stock prices and agriculture products on demand and which is of relevance to rural agricultural development. Rural areas are associated with low population densities; tend to lag behind in terms of education and in various other respects, resulting in them having little power to control their own destinies. In addition, they lag behind the adoption of new technologies such as computers and telephone and so on, (Fortunato, et al. 2013:158). They are characterised by isolated and sparsely populated areas where the majority of the people depend on natural resources and livelihoods are, to a large extent, connected to small-scale farming, (Fourie, 2008). They are also characterised by higher unemployment rates and populations having more elderly people and children than in urban areas. Rural areas tend to have poor access to information and the knowledge needed to promote rural development, in terms of activities and initiatives by rural people, aimed at improving the quality of life and the well-being of rural communities, (Fortunato, et al. 2013).

Rural development as understood by the Integrated Sustainable Rural Development Strategy (ISRDS, 2000:19), refers to:

a multi-dimensional initiative, encompassing improved provision of services, enhanced opportunities for income generation and local economic development, improved physical infrastructure, social cohesion and physical security within rural communities, active representation in local political processes, and effective provision for the vulnerable.

According to the World Bank, in Southern Africa 70% of the people live in rural areas and are believed to be marginalised and to suffer severe poverty. In particular, rural areas in South Africa, for the past years, have remained impoverished owing to weak access to capital and ICT information, which are central to both agricultural production and rural development World Bank (2013). Such deficiencies have been attributed to the legacy of the apartheid regime and the implementation of ICT community centres in rural areas is one of the strategies which has been adopted to redress this state of affairs and to improve rural livelihoods, World Bank (2013). Most rural economies have failed to gain entry to the mainstream economy, and accordingly they have remained at its periphery. James (2001:3) strongly maintains that “if South Africa does not become a major player in ICTs, the country will struggle to compete”. It is therefore necessary to shape the South African information society by harnessing ICT community centres and the available knowledge to assist rural communities to recognise opportunities to improve their livelihoods and to adopt development goals, such as increasing agricultural productivity. Furthermore, ICT use increases agricultural productivity by accessing information on the stability of

agriculture market prices, the effectiveness of existing agriculture markets and different kinds of products being sold on markets and how there are sold.

Technology is growing at an exponential pace, and most of its devices such as digital video cameras and players, projectors and mobile phones are now compatible with traditional media such as radio via digital satellite and television via cable and digital satellite. Some of these technologies are acknowledged throughout the world as tools for training, strengthening of human intellectual capacity, promoting social changes and shaping modern standards of living. ICT tools are helping people to expand both their awareness and their capacity for empowering themselves by initiating developmental activities and programs in their communities. In the Asian and Pacific regions, ICTs are used to promote non-formal education. According to UNESCO (2005), in 2002 ICT Non-Formal Education (NFE) project was launched by UNESCO's Asia-Pacific Program of Education for All (APPEAL), with the aim of expediting the efficient delivery of education and skills training for the enhancement of living standards, poverty alleviation and community development through community learning centres and other ICT community centres. In Sri Lanka there are ICT community centres which are accessed to enable entrepreneurs in rural areas to use ICTs to market and sell their products. These ICT community centres have helped communities in that they can obtain agriculture information concerning their agricultural productions and information that can improve their marketing and production skills. They are also helping to create an efficient network for sharing information associated with buying raw materials and selling products. Since the 1990s ICTs has boomed in India, in its bid to improve businesses and the livelihoods



of the rural communities (Bollier, 2006). ICT initiatives in India, aimed at bridging the gap between rural and urban areas in India, in order to enable rural communities to have access to urban products and also to enable their products to reach urban communities (Gollakota, 2008). Indian ICT initiatives also aimed to provide communities with information concerning health and agriculture and education services.

In South African rural areas, ICT community centres are empowering most of the disadvantaged communities to obtain services and information from both government and non-government sources, to facilitate training and to facilitate their own development. In this way, isolated rural communities are being brought together via the information web and provided with information and being offered a wide choice of ICT services, which can only enhance their development. ICT community centres are in a position to boost rural agricultural development, especially through the internet, by making available information concerning agriculture and markets and through the use of mobile phone technology such as M-Pesa. M-Pesa is a system of transferring money which allows the transfer of funds by sending a text message without using a bank, which facilitates transfers of money in this way in Kenya and South Africa.

ICTs are transforming communities and people's lives by making information easily available, through dramatically improved communication technologies, which is vital for both agricultural development and the development of sustainable livelihoods.

The use of ICTs are growing swiftly in South Africa, which is why this study focuses on how ICT has become an effective instrument for rural development, and how it is enhancing opportunities for development, such as being able to access government programs in order to submit tender applications, and improving service delivery. The research investigates ICT as an important tool upon which various aspects of socio-economic development may be based. The United Nations advised nations to make available the benefits of new technologies, especially information and communications technologies, in co-operation with the private sector (UNDP, 2003:3).

It is against this background that the study focuses on ICT community centres and agricultural development in terms of the information revolution which is taking place in Dwesa rural community. This research seeks to examine and understand the relationship between ICT community centres and agricultural development. The literature concerning ICTs is quite substantial, both globally and in relation to Africa. In the case of South Africa, there are numerous rural ICTs studies focusing on the education and health sectors. This study evaluates the impact of ICT community centres on the development of rural agriculture and how they are of significance to agricultural development in the Eastern Cape (EC) Province in South Africa. In the next section the problem which motivates this study will be discussed.

## **1.2 The Statement of the Problem**

The problem which this study has identified is whether ICT Community centres make a positive contribution towards agricultural development in the Eastern Cape Province. The assertion that ICTs promote the development of rural agriculture still needs to be confirmed. There is still lack of information on rural agricultural development by rural inhabitants. The failure to make proper use of ICT community centres is affecting the livelihoods and the development of the rural population adversely, particularly in the case of small-scale farmers. This lack of access to information is a barrier which is preventing the adoption and the use of ICTs. Among the factors responsible for this is the uneven distribution of ICT community centres, which contributes to the underdevelopment of the rural areas. The Eastern Cape province, where Dwesa rural area the case study and the focus of this research, is situated, is categorised as “one of South Africa’s poorest provinces, where poverty is ‘deepest’, the poverty gap is widest and the poverty rate, particularly in the predominantly rural areas, is over 70%” (Bank et al. 2010:5). Information gaps threaten agricultural growth in rural areas and highlight the communities’ need for ICT community centres, which will increase their access to markets.

Moreover, the lack of information and communication opportunities available to rural areas in the Eastern Cape Province and low participation in the use of ICT community centres slows the rate of rural development and has adverse consequences for the growth potential of agricultural productivity, resulting in rural communities remaining marginalized and lacking opportunities to adopt innovative technology.

### **1.3 Research Questions**

- Can ICT community centres improve rural agricultural development and enrich the livelihoods of rural areas in the Eastern Cape Province?
- Can the use of ICT community centres make a positive contribution towards promoting goals for increasing efficiency in rural agricultural development?

In accordance with the detailed statement of the problem provided earlier, the objectives of the study are outlined in the following section.

### **1.4 Objectives of the Study**

The objectives of the study are to:

- Assess the impact of ICT community centres on rural agricultural development.
- Identify the challenges involved in adopting and expanding ICT use for rural agricultural development.

### **1.5 Significance of the Study**

Although many researchers have indicated that ICTs are essential in supporting rural development, less attention has been given to agricultural development in Dwesa rural area, in the Eastern Cape Province. In the contemporary world ICTs have a huge influence on the development of both rural areas. ICTs have brought changes in the way in which rural areas access information and communicate. This study sought to assess how ICT community centres improve rural agricultural development and livelihoods, and to understand how communities are obtaining and using

information to sustain and increase agricultural production. Accordingly, this study will contribute to the available knowledge of this subject, particularly concerning the benefits and usefulness of ICT community centres in the development of rural agriculture and livelihoods in the Eastern Cape Province. In addition, it should assist to generate useful suggestions and guidelines for rural communities in the ways to increase the effectiveness of ICT community centres in agricultural development to meet the needs of the community.

In general terms, this study seeks to contribute to the debate on ICTs contribute to rural agricultural development. ICTs give a basis for understanding how best ICTs may be integrated into rural areas to bridge the gap in terms of accessibility to information between the core urban areas and the peripheral rural areas. The following section outlines the justification of the study.

## **1.6 Justification of the Study**

This study seeks to provide a basis for understanding how best the ICT may be integrated into rural areas to bridge the gap, in terms of accessibility of information, between the core urban areas and the peripheral rural areas. It identifies the challenges involved in adopting and expanding ICT use for rural development and, at the same time, it assesses the contribution made by ICT community centres to rural agricultural development in the Dwesa rural area

Understanding the nature in which developing countries are employing ICTs in order to alleviate poverty in rural areas is fundamental to improving agricultural

development and to promoting sustainable development and the livelihoods of rural people. It can contribute to the growth of livelihoods in the following ways: “connectivity, division of labour, scale, replication, accountability, matching, building communities of interest, and education” (Consalvo and Ess, 2011:199). The study was carried out in Dwesa rural area in the Eastern Cape Province, owing to the fact that the area has an ICT community centre which offers technology and ICT skills to the rural population for rural development.

The Eastern Cape Province of South Africa recognises ICTs as an instrument which has potential for rural development, but nonetheless its impact on rural development has yet to be measured and recognised. For example, Dwesa’s Siyakhula Living Lab project aims to offer new technology and skills (SLL and RHS, 2012) to Dwesa community residents. ICTs have become important for the development of livelihoods worldwide and its use is a fundamental element for rural development activities (Chapman and Slaymaker, 2002).

The findings of the study can help to reduce the digital divide between rural and urban areas by addressing the challenges involved in ICTs use and move towards ways of increasing agricultural development, simultaneously advancing the development of both agriculture and livelihoods. Moreover, the study will provide an understanding of developing livelihoods among the rural population in the Dwesa rural area and to help to analyse how the rural inhabitants are lagging behind in their use of information technologies.

## **1.7 Organisation of the Study**

The study is presented in five chapters. The first chapter already presented an introduction and background to the study and explains its objectives, provides a detailed research problem statement and discusses the significance of the study. The second chapter outlines the theoretical foundation underpinning this study in terms of the Sustainable Livelihoods Approach and the Industrialisation of Agriculture Theory, and reviews the existing literature on ICTs and rural development in the Eastern Cape Province. In the third chapter the methodology of the study is presented, including sampling procedures, the collection of data, variables and the analysis of the data. The fourth chapter present the empirical research findings of this study, while the fifth summarises the thesis and links together the empirically-based chapters and the theoretical framework shaping the study. The final chapter presents a summary of the research and the recommendations which are made on the basis of the study.

The following chapter documents the literature informing the study and presents its theoretical basis, which is informed by the Sustainable Livelihoods Approach and the Industrialisation of Agriculture Theory.

# Chapter 2

## Information Communication Technology: Conceptual Overview

### 2.1 Introduction

The chapter will analyse how effective ICT community centres are in improving the livelihoods and agricultural productivity of rural communities in the Eastern Cape Province in South Africa. In general, ICTs have been found to be an effective instrument for expanding knowledge among rural inhabitants, thereby improving their participation in agricultural development and the development of their livelihoods (Balakrishna, 2002).

### 2.2 Information Communication Technology (ICT) and Rural Agricultural Development

It is important to understand the meaning of *Information Communication Technology (ICT)*. Blurton (1991:1) defines *ICTs* as “a diverse set of technological tools and resources used to communicate, to create, disseminate, store, and manage information”. The particular emphasis given to specific aspects of ICT varies from researcher to researcher, but the generally shared broad view of ICTs is:

An integrated system which incorporates the technology and infrastructure required to store, manipulate, deliver and transmit information, the legal and economic



institutions required to regulate ICT access and usage, and the social and inter-personal structures which allow information to be shared and facilitate access to the ICT infrastructure, and through which innovation takes place (Wangwe, 2007:1).

ICT is an umbrella term which includes any electronic product which stores, retrieves, manipulates, transmits and receives information in a digital form, for example, computers, cell phones, the internet and e-mail. Riley (2012) maintains that ICT is categorised into traditional computer-based technology (the use of computers, televisions, satellites) and digital communication technology (sharing information digitally). ICTs are often studied in differing contexts according to how it affects society, such as ICTs in health care, education, agriculture, marketing, manufacturing or rural development. This study looks at the role of ICT in rural agricultural development. ICT for development (ICT4D), as defined by Rouse (2011), is an initiative with the aim of bridging the digital divide or the gap between those who do and those who do not have access to ICTs, and aiding rural development by equalising access to technology and information among communities. ICTs are helping people to communicate and share information with others across the world.

Rural describes the areas which are outside of towns, and which include farmland and areas of wilderness where there are very few inhabitants. The Rural Development Framework (RDF) (1997), has defined a rural area as a sparsely populated area where people depend on farming or on natural resources. According to the National Climate Change Response (NCCR) (2011), in South Africa over 19 million people live in rural areas. Most of the South African rural communities are

impoverished and they still lack access to employment, education, health services, information services and other important resources. In South Africa, small-scale and homestead food production is practised in rural areas on both high potential and marginal agricultural land, with an estimated 1.3 million small-scale farm units (NCCR, 2011). Many of the rural communities depend upon subsistence farming and government grants and services for their livelihoods and agricultural development. In rural communities access to ICT is still limited when compared with urban areas. ICTs are crucial to agricultural development in rural areas, and consequently ICT community centres, as a means of sharing information, provide a vital link in the chain of the development process (International Labour Organisation, 2001). ICT community centres, in particular, improve access to information for the whole community. They are characterised as physical spaces which provide public community-based access to ICT for rural development (Harris, 2001). According to Harris et al. (2001), ICT community centres are designed to provide a combination of ICT services such as internet and e-mail, indicating that in the rural communities ICT is geared, through the creation of community centres, to act as a source by means of which access to ICT services for community members is made possible.

Although ICT community centres can help to overcome the problems which hinder the development of sustainable livelihoods and agricultural development in rural areas in the past, for community members to have physical access to ICT services is, in itself, meaningless if they cannot make use of and exploit the technology and information services to which they have access at the community centres. It is therefore important to consider the type of information to which the community

members can have access to and the ICT skills which they can have, in order to evaluate whether the ICT community centres are can have an impact on the development of both rural agriculture and livelihoods.

In Africa, agriculture is an important source of livelihood for both rural and urban communities, and it helps to reduce poverty by maintaining food security. Accordingly, increased agricultural productivity will bring increased opportunities for the improvement of livelihoods in rural communities. Jones (1997) maintains that, for effective agricultural development to take place there is a need to have access to information concerning all forms of agricultural production, processing and marketing. Accordingly, if information services are affordable, accessible and widely available, ICTs will be able to provide information concerning markets, regulations, opportunities and constraints on agricultural development. Consequently, ICTs can help agricultural development by cutting costs of production and by providing access to market prices for small producers, thereby improving the ability of small producers to deal and negotiate with marketers. According to May et al. (2007), the improvement in production and market information helps communities by providing research on pest and weed control, care of livestock and crops, mechanisation, processing and the adoption of crop diversities. May et al. (2007) gave site-specific management in precision agriculture as an example of how the use of ICTs can enhance the development of agriculture, as it is a knowledge-concentrated management approach which involves ICT applications such as the applications of pesticides and fertilisers to crop production.

ICT plays an important role in rural development and it is now accessible in rural areas, through ICT community centres. These ICT community centres are aimed at offering access to various types of technology and information services to community members, and ICTs can help to disseminate information concerning agriculture among community members. It can bring together people from different backgrounds through information sharing and it helps to avail them to information concerning the rapid changes imposed on their different social structures and agricultural development. ICTs can promote agricultural development by providing new information concerning markets, products and skills which are needed for agricultural development. Kenny (2002) maintains that ICTs can improve livelihoods by empowering community members with knowledge and skills, thereby increasing productivity. Various ICT instruments are enabling reduction of transaction and information costs, for example in Ghana, internet and mobile cellular phones can be used by cocoa farmers to access information on production and markets related to cocoa farming (Asenso-Okyere et al. 2012). According to Martiz (2011), Cocolink, a pilot program was launched by the Ghana Cocoa Board so as to provide cocoa farmers with useful information about improving farming practices, farm safety, crop disease prevention, post-harvest production, and crop marketing. In this program farmers receive information and specific answers to questions at no charge through voice and SMS messages in their local language or English.

Despite the fact that ICT plays a vital role in improving rural agricultural development and the livelihoods of community members, the viability of ICT community centres in rural areas will not be established if the inhabitants of the community are not aware

of the goals of development, which makes it essential for the communities, first, to know and understand their goals and then how these goals may be achieved. Once the development goals are known to the communities they will be able to make use of the ICT community centres and achieve these goals, thereby expanding the use of ICTs and being able to appreciate the potential value of ICTs for rural agricultural development. For example, a study by Fengying et al. (2011), on the impact of this rural information project on rural livelihoods based on the livelihoods framework indicates that the main impact of ICTs on agricultural productivity is capability building and the promotion of information awareness among farmers. Fengying et al (2011), established that farmers are enthusiastic to gain access to technology and knowledge which improves their livelihoods.

### **2.3 Bridging the Digital Divide with ICT Community Centres**

In Africa ICT infrastructures and services develop slowly in rural areas when compared with urban areas. There is an uneven distribution in the access to ICTs via the use of instruments such as the internet and computers, cellular phones, telephones, newspapers, which has highlighted the digital divide which divides those individuals who have access to ICTs from those who do not. According to Harris (2001), this digital divide threatens to deny millions of people the benefits which they stand to gain by having access to ICTs. There is a concern that poor communities are being deprived of the opportunities for livelihood growth generally enjoyed by advanced economies, owing to the scarcity of ICTs, particularly limited internet connectivity (Aygerou, 2003).

To gauge the digital divide which exists between the various communities, ICT penetration needs to be examined and assessed (Corrocher and Ordanini, 2002). ICT penetration refers to the number of active ICT tools within a specific population; it varies among communities, thereby creating a digital divide between those with high levels of access and those with low levels. In South Africa, in an effort to bridge digital divide which exists between rural and urban communities, ICT community centres have been adopted as a means of ensuring that there will be access to ICT services in all areas. Gaven and Anderson (2006) maintain that, if the ICT community centres are used by the inhabitants of the rural communities, they will help to overcome the digital divide which exists between rural and urban communities. The effective deployment of ICT community centres can help to bridge the digital divide by providing access to information and ICT facilities to community members, and these ICT community centres can enable the inhabitants of rural communities to improve their livelihoods and agricultural development. Tlabela and Roodt (2007) maintain that ICTs can increase efficiency and productivity and open up access to new markets. For ICT community centres to be effective in bridging the digital divide, Arellano et al. (2006) maintain that the inhabitants of rural communities must be willing to accept and make use of the amenities. ICT community centres are providing basic ICT infrastructure to rural communities with the aim of promoting rural development. According to Harindranath and Sein (2004), the role of ICTs in rural development has been controversial, but nevertheless it has been conceptualised as a monolithic and homogeneous entity. Harindranath and Sein (2004) maintain that ICT needs to be conceptualised in its many facets, perceptions and its manifold impact upon societies. In order to conceptualise ICTs and the role which it plays, two schools of thoughts were identified by Harindranath and Sein

(2004), the positive school, which advocates ICTs as a means of directing development, and the sceptics who argue that ICT will not determine development on its own, unless it is accompanied by social changes.

Apart from overcoming the digital divide with the aim of improving the growth of livelihoods, this study seeks to identify the challenges involved in adopting ICT and approaches to expand the use of ICT community centres to improve rural agricultural development.

## **2.4 Internet Penetration**

Since the year 2000, internet connectivity around the world has grown exponentially by over 480 percent, (Internet World Statistics, 2011). In Africa affordability and access to the internet are improving significantly, even though these improvements are reaching some rural areas at a slow pace. Although the prices of internet have been dropping continuously, internet penetration is still greater in urban areas than it is in rural areas, which means that there is more access to information in urban communities than in rural communities, mainly owing to a lack of infrastructure in rural areas. In urban areas there are more schools and workplaces with ICT facilities than there are in rural areas.

E-mail constitutes the most common use of the internet in both rural and urban areas. It is a means of communication which enables people all over the world to

have instant written communication. E-mail saves community members the expense of long distance telephone calls and faxes, and it helps people to send messages, both inside of South Africa and abroad, at very cheap rates. With the e-mail, distances and time differences are of no concern, although before the advent of e-mail they hindered communication greatly, particularly for rural inhabitants. Farmers and community members are able to publicize their services and promote their businesses on the internet and to send information to potential funders via e-mail. The internet, and particularly the use of e-mail, helps community members and small-scale farmers to reach an unlimited number of people and potential funders from all of the corners of the world, at very low costs. ICT community centres are helping community members to have access to these services, free of charge.

There is a range of tools available on the internet to assist rural communities in doing research to find information concerning the improvement of their livelihoods and agricultural development. The search engines on the internet were created to facilitate looking for specific types of information automatically from an immense number of websites. Typing certain phrases such as, how to control pests, treatment of red soils, types of crops to plant on Eastern Cape Province soils, on search engines, such as Google and Yahoo, will yield a lot of information linked to the topics on agricultural related issues. Some Non-Governmental Organizations and institutions are offering training and both informal and formal courses online in using the internet to expand the on rural agricultural development and agricultural productivity. For example, EdX organization ([www.edx.org](http://www.edx.org)), which offers free online course materials and which presents formal academic credits after completion of



courses, offers interactive, online classes from the world's best universities, such as Harvard, Berkeley, the Massachusetts Institute of Technology and many other universities. EdX is a non-profit initiative which was devised by Harvard University and the Massachusetts Institute of Technology. It offers subjects such as, rural development, agricultural productivity and many more. There are also other NGOs offering a variety of courses and training through the internet, such as training in agricultural extension for farmers.

To a large extent, ICT community centres are making ICT services easily accessible and inexpensive for community members. In Dwesa, the local wireless connectivity and connection to the Internet aims potentially to support e-health, e-government and e-learning in the future development of the Living Lab (Pade-Khene et al, 2012:266). The internet is enabling the rural poor to have access to knowledge and information, very quickly and cheaply. Today, a great many tasks may be performed via the internet, and the SLL in Dwesa is offering these ICT services, for free, to community members. Rural inhabitants are able to use the internet in agriculture, for example, to make communications concerning natural disasters and in the health community, members are able warn against diseases which will be affecting people at certain times. The internet is an invaluable help in the passing of necessary information to rural inhabitants and farmers to enable them to deal with circumstances of this sort. Khalil (2004) maintains that the emergence of the wireless internet as an inexpensive technology is helping to bridge the connectivity gap which is at the root of the digital divide. Rural communities are now able to communicate by

connecting to the internet, using e-mail and communicating with people all over the world via video call and voice call.

Some stakeholders are helping farmers and communities by making relevant agricultural information easily generated and accessible via the internet. The TeleSupport project in India is a good example of an initiative of this sort, as it gathers questions from farmers and answers them. The local research institutes and universities gather these answers and repackage them on video, in local languages, and store them online on ([www.telesupport.org](http://www.telesupport.org)) to enable the local communities to have access to the information, (Stienen et al. 2007). In this way, TeleSupport allows the farmers to share the skills, experiences and information which they acquire from their agricultural activities, and the communities have clear access to information which is presented in various forms, such as images and videos, and they are also able to store information and the results of their own projects. The project promotes practices which help to make the livelihoods of the farmers and the communities sustainable.

In West Bengal, India, there is an online TeleSupport project for agricultural information management, which aims to network and aid a two-way interaction between the experts and community members. The project provides community members with information and knowledge which is linked to markets and crop and livestock management. Rupak (2010:2) maintains that “the web resources created for sustaining the project hosted a large number of good agricultural practices,

inspired numerous interactions among the stakeholders and facilitated the diffusion of several agro-technologies”.

The following chapter outlines the industrialisation of agriculture and the Sustainable Livelihoods Approach (SLA) as theoretical framework supporting the study. It also highlights the development of SLA and the five types of assets.

# **Chapter 3**

## **Information Communication Technology: Theoretical Overview**

### **3.1 Introduction**

This chapter seeks to review the available literature which is related to ICTs and rural agricultural development. A critical review of the literature is made by identifying the gaps in rural development and knowledge of ICTs and will assess the impact of making use of the ICT community centre on rural agricultural development. The chapter outlines ICT in relation to rural development and discusses the importance of ICTs. It also discusses the Sustainable Livelihoods Approach (SLA) as a theoretical framework and the industrialisation of agriculture theory supporting this study. The SLA will be used to assess the influences which existing ICT community centres in rural areas have had on sustaining livelihoods and the development of agriculture.

### **3.2 Industrialisation of Agriculture**

The vast amount of information which is available on the internet is believed to allow communities to obtain and acquire knowledge to promote the development of their livelihoods and to provide information concerning markets (Norris, 2001). ICT permits market information to be shared more efficiently and enables agricultural

production to meet its targets more accurately and consistently. The industrialisation of Agriculture is a vital factor for rural development, which functions to support and enrich the productivity of farmers in rural areas, thereby facilitating opportunities for rural development. It enhances the competitiveness of agriculture among the members of rural communities as an effective means of achieving a sustainable livelihood in rural agriculture, and it is believed to give a greater opportunity for participation in decision-making in farming.

The Industrialisation of Agriculture Theory maintains that ICT enables farmers to access global market information and to open up new local and international markets which draw better prices and increase earnings for farmers. ICTs can improve agricultural production by providing information for farming such as climate conditions, markets, prices, water-saving measures and methods, fertilisers, irrigation and hybrid seeds. It also provides information and knowledge concerning effective harvesting and processing technologies, crop varieties, pests and approaches to increase productivity. It is only the rich farmers in the rural areas who have access to the farming information which is available on the internet and mobile phones, while the poor majority lacks this easy access to information, resulting in rural inhabitants being marginalised from the benefits that ICTs use can bring to rural development.

According to Fourie (2008), ICTs, if properly applied, helps to improve the livelihoods of the poor populations in the rural areas and to increase their opportunities for

earning a sustainable income. In addition, Fourie (2008), maintains that it is crucial to train the rural poor of South Africa in ICT skills, in order to advance their livelihoods. The use of ICT needs to be promoted in order to reduce the digital divide between the rural and urban communities. This research seeks to assess the impact of ICTs on the rural communities of the Eastern Cape Province in South Africa, Given the understanding of the use of ICTs in rural areas which have been acquired from the literature.

Tlabela et al. (2007) view ICTs as an important instrument which promotes development and economic growth, enabling the government stakeholders use it with the aim of increasing job creation and promoting the values of democracy and human rights, through improved access to information. In agricultural development, ICTs helps people to examine, analyse, find, exchange and present information easily. It helps community members to have access to the ideas and experiences of a far larger number of people from various backgrounds and communities concerning agricultural development. Molo (2003) emphasised how the use of ICTs impact on African communities, believing that it transforms communities and that it has contributed significantly to the developmental process in Africa. ICTs are vitally important for enhancing agricultural development, improving agricultural markets and also for building the capacity of the rural population. They promote agricultural development by increasing efficiency and productivity, making it sustainable. ICTs make it easier to intervene in agricultural development by providing information concerning the controlling of pests and diseases, new ways to optimise productivity and so on. In rural agricultural development, ICTs keep communities updated with

information on markets, such as commodity prices and consumer trends. Rural populations can also find information to improve markets and make informed decisions concerning commodities, crops and when and where to sell and buy goods. ICT are also strengthening the capacity of communities and, by so doing, they are helping them to open up various business opportunities and promoting agricultural development in rural areas.

### **3.3 Sustainable Livelihoods Approach (SLA)**

The study of rural livelihoods has evolved over the last century. While rural livelihood and rural development studies have become crucial within the discourse of developmental studies, there have been questions raised concerning the usefulness of the Sustainable Livelihoods Approach (SLA) in relation to ICTs for rural agricultural development. However, its usefulness to ICTs for rural agricultural development cannot, and should not be underestimated. The term 'sustainable livelihoods' was first used by the World Commission on Environment and Development in 1987, and later employed by Chambers and Conway in 1991. The SLA has become internationally influential in agricultural improvement and in the alleviation of poverty, particularly in rural areas, although recently, it has been applied in urban areas. SLA can be used to assess and evaluate the contributions of existing activities such as agricultural productivities, to the sustaining of people's livelihoods as a means of improving the understanding of the livelihoods of poor people. A livelihood is defined as follows:

“A livelihood comprises the capabilities, assets (stores, resources, claims and access) and activities required for a means of living: a livelihood is sustainable which can cope with and recover from stress and shocks, maintain or enhance its capabilities and assets, and provide sustainable livelihood opportunities for the next generation, and which contributes net benefits to other livelihoods at the local and global levels and in the short and long term.” Chambers and Conway (1992:7).

According to Chambers and Conway (1992), SLA refers to the activities undertaken by rural poor people in order to make a living. In its simplest sense, a livelihood refers to ways of doing things to earn a living for example ways of engaging in agricultural productivity, but the concept has broadened with the recognition of the full range of diverse activities and resources which comprise a farmer's ability to survive over time in a certain manner, by encouraging flexibility and learning while doing so. The SLA is a useful tool in the assessment of using ICT services for rural agricultural development. It is an instrument that can be used in agricultural productivity for planning and assessing agricultural development interventions in rural area. This approach focuses on how small-scale farmers can purposefully use the available resources in rural agricultural development. The assessments allow community members in finding early feedbacks and future impacts for their activities so that assumptions can be examined and adjusted on time.

SLA has two components of SLA: a framework, which helps to understand the complexities of poverty, and a set of principles, which guides action to address and overcome poverty. The approach gives tentative guidelines which can be followed in order to benefit poor communities in agricultural production. SLA comprises six



principles which are described by Ashley and Carney (1999). First, there is the people-centred principle, which focuses on the strengths and priorities of the rural poor. SLA starts by examining the livelihoods of people and how they ultimately change and actively participate throughout the development of their livelihoods and of the rural development. For example in rural agricultural development, small-scale farmers as actors can seek to make their livelihood and to preserve, increase or reduce loss to their agricultural activities can likely use ICTs in a way that will be beneficiary to their agricultural productivity. Secondly, the holistic principle recognises factors and processes influencing livelihood opportunities. SLA recognises that people adopt various approaches to securing their livelihoods. Thirdly, the dynamic principle recognises that poor communities' livelihood strategies can change rapidly, and tries to gain an understanding of the dynamic nature of livelihoods and of the factors which influence them. Fourthly, build on strengths principle analyses the communities' strengths, rather than their needs. Rather than focusing on communities' problems and needs, SLA supports existing strategies of livelihood, and builds on people's recognised strong points and opportunities. The fifth principle, the sustainability principle analyses the institutional, social and environmental sustainability: it aims for sustainability. The last principle is the macro-micro linkages principle, which considers the linkages between two levels to form more supportive policies and institutions. The approach examines the need for policies and the influence of policies and institutions on livelihood opportunities.

In this study, SLA was applied to assess the possible impact of ICT services such as the internet that are accessed through the ICT community centres. In rural

agricultural development ICT community centres can improve its productivity by providing community members access to internet and other modern communication and technology instruments.

The concept of 'sustainable rural livelihoods' has become increasingly central to the discourse on rural development, poverty reduction and environmental management. Such an analysis is important to the understanding of the impact of ICTs on rural development and livelihood transformation. SLA indicates how communities aim to enrich their livelihoods using the resources which they have, and also indicates how livelihoods can be made sustainable by referring to the following essential types of capital or assets which are seen as being vital to sustainable livelihoods. The SLA posits that households make a living by using five types of assets or capital: natural, physical, human, social, and financial, in an environment influenced by institutional and structural factors (Chimhowu and Hulme, 2006:729). Figure 3.1 shows the SLA framework showing the main components of SLA and how the components are linked. This helps to identify effective methods of supporting livelihoods and reducing poverty. Livelihood assets are the basic building blocks upon which households are able to undertake production, engage in labour markets and participate in reciprocal exchanges with other households (Ellis, 2000:31). These assets are connected to one another and they lie at the heart of the livelihoods analysis. Of great importance to the framework is the role of a range of formal and informal organisational institutional factors which influence, enhance and limit sustainable livelihood outcomes (DFID, 1999:40).

Of particular significance to ICTs, the Sustainable Livelihood Approach holds various elements that are interconnected in dynamic manner. In this logic, the SLA is a systemic illustration and one that appears most promising in the context of impact assessment of ICT community centres. Using the SLA is helpful in identifying unanticipated impacts when finding impact assessments of ICT community centre, (DFID, 2001). This approach permits small-scale farmers to consider positive or negative ways in which ICT use for rural agricultural development is likely to interrelate with different agricultural strategies.

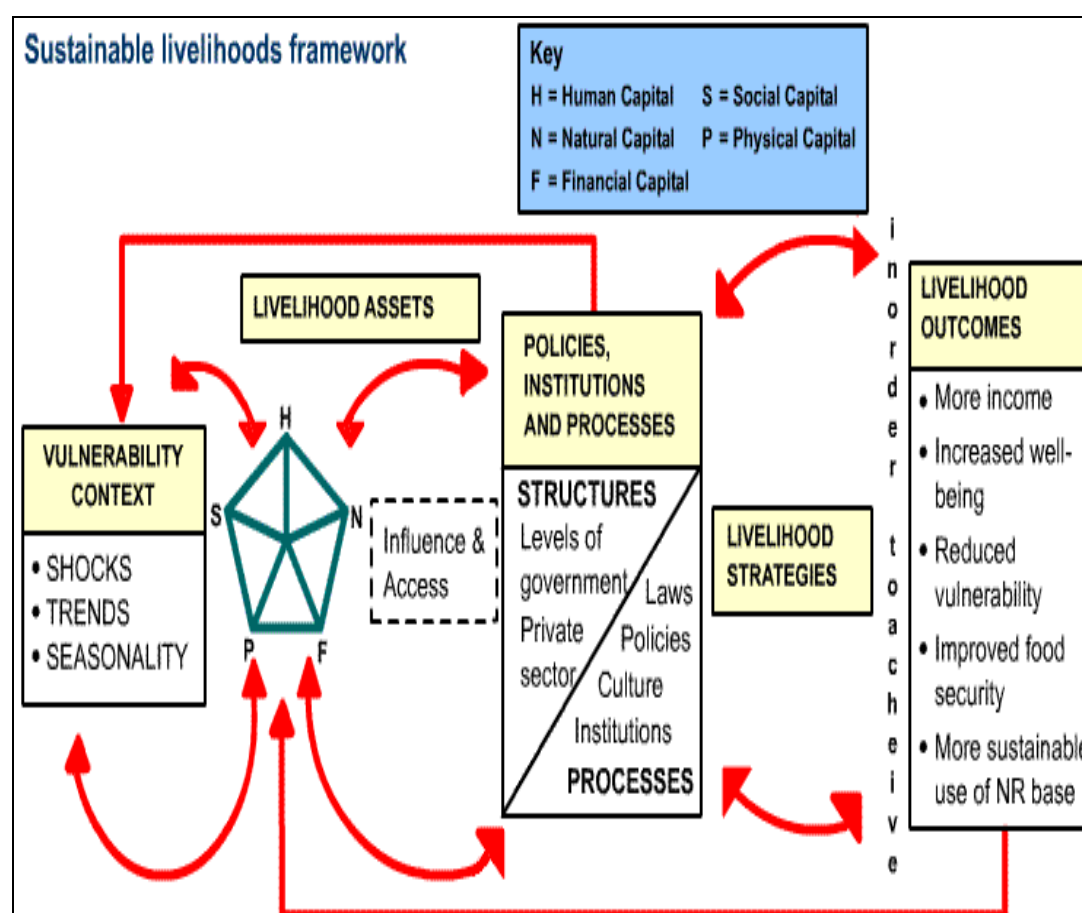


Figure 3.1: Sustainable Livelihood Approach

Source: Adapted by FAO from the original flow diagram prepared by DFID in (1999:11).

The Sustainable Livelihoods Approach (SLA) dates back from Robert Chambers' work from the late 1980s through to the 1990s. The idea of the sustainable livelihoods concept was first brought forward with the aim of eradicating poverty (Krantz, 2001). NGOs such as UNDP, CARE and the World Bank adopted SLA to enact their development programs and as a means of improving the way in which the livelihoods of poor people are understood. The Sustainable Livelihoods Approach succeeded in turning the attention of key policy-makers in donor institutions in the early 1990s, the DFID in 1997 and the Natural Resources Department, away from the competing knowledge and theories to which key individuals had been exposed during the course of their careers (Solesburg, 2003).

### **3.3.1 Human Capital**

Human Capital refers to the knowledge, skills, ability, labour, good health and all the human factors which enable people to pursue various strategies in order to achieve a sustainable livelihood (Department For International Development, 1999). Human Capital is particularly important in that it is needed in order to make use of the four other types of capital. According to the DFID (1999), human assets can achieve their objectives only if the people are willing and able to invest in their own human capital, through attending training and gaining access to services, such as medical services and community centres. Accordingly, the existence and development of ICT community centres can improve access to human assets such as education, and they promote improved agricultural production and marketing strategies, thereby

increasing the surplus and generating income for the livelihoods of rural people. As a result, ICT community centres can have an impact on human assets through the improved access which they offer to educational programs, skills, knowledge and ability to work, which will sustain rural development (Chapman and Slaymaker, 2002).

### **3.3.2 Social Capital**

According to Krantz (2001:9), social capital “refers to the social resources (networks, social claims, social relations, affiliations, associations) upon which people draw when pursuing different livelihood strategies requiring co-ordinated actions.” Social assets are important for the sharing and developing of knowledge, which confirms that social capital and human capital are closely related. Through social networks, social capital can help to mitigate the effects of shocks, and even disasters, in agricultural development. Social capital also helps to increase people’s trust and their ability to cooperate in order to achieve their livelihood objectives. Social networks can improve the competence of communities by learning of the existence of new agricultural developments by forming closer associations with one another, and this can include appreciating the value of ICTs together. Social capital improves the ability of members of rural communities and small-scale farmers to mobilise resources through local formal and informal social network institutions, such as agriculture groups or non-governmental organisations, thereby strengthening their capacities to facilitate the growth of their livelihoods and agricultural development. These social networks help to advance the support systems of rural communities by

gaining access to knowledge and training in certain areas of common interest, such as soil conservation and activities related to crops.

### **3.3.3 Natural Capital**

Natural assets are natural resources such as soil, water and air, which are vital for particular types of livelihoods. Natural assets play an important role in rural areas where people derive their livelihoods mainly from nature-based activities, such as farming and fishing. ICTs impact on natural assets by improving access to information concerning agricultural development, such as information pertaining to appropriate drainage channels, drought relief, steps to be taken to control erosion and so on. However, ICTs can improve the prospects for livelihoods by providing improved access to information concerning natural capital and strategies to deal with problems encountered in agricultural development. By having access to ICT community members can learn to recognise the importance of natural assets and the need to deal with risks which threaten them in order to minimise them. ICTs also improves access to institutions which deal with various aspects of the management of natural resources and strategies dealing with the assessment of risk. Community members can also learn to recognise the quality of land and, in so doing, help to specialise in particular types of agricultural production which reduce and minimise damage to the environment. In addition, communities will also have the opportunity to share their experiences and to compare strategies in order to develop local solutions to problem and conflict situations (Chapman et al. 2003).

### **3.3.4 Financial Capital**

Financial capital denotes the financial resources which people use to achieve their livelihood objectives (DIFD, 1999). Financial assets refer to cash, debt and savings. According to the DIFD (1999), financial assets can be converted into other types of assets and can also be used for the direct achievement of livelihood objectives. ICTs are advancing the effectiveness of agricultural production by reducing the costs of transport, which would otherwise have been necessary to gain access to the information needed to improve agricultural development. Providing access to a wide range of financial aid and financial services, such as credits, savings schemes and loans for agricultural expenditures, such as the building of housing for animals and seed purchases, can also improve the effectiveness of agricultural development in rural areas.

### **3.3.5 Physical Capital**

Physical assets take the form of basic infrastructure and equipment for production required to support livelihoods. This basic infrastructure is essential for sustainable livelihoods and the development of rural agriculture, and includes secure buildings, energy, adequate supplies of water, transport and access to ICT community centres. Physical capital is very important for agricultural development because lack of infrastructure, such as transport, information and communication would prevent the effective distribution of information to improve farming productivity, thereby affecting agricultural yields adversely and in turn, the financial gains contributing to livelihoods to be made from the marketing of the produce. ICT community centres can have an

impact on physical assets in that it supplies invaluable information concerning the access to markets and identifies new markets, processes and techniques for production which help to improve choices where selling goods on local markets is concerned, improving the prospects for rural livelihoods in so doing. In this sense, physical capital can refer to both information handling technology and to the technology which is needed for the purposes of production.

### **3.4 Weaknesses of the Sustainable Livelihoods Approach (SLA)**

Although the SLA draws attention to the important assets which people use to generate their livelihoods and outlines the causes of poverty and assesses the levels of productivity which generate people's livelihoods, it also has some weaknesses. The SLA does not account for the role which ICTs are playing to make rural development truly democratic. It outlines the main components of and the influences on livelihoods but it does not present a comprehensive record of the issues to be considered. It needs to be adapted to include the needs of any given situation. It does not highlight the effectiveness of ICTs as a means of supporting marginalised people to improve the development of their livelihoods and to improve social equality in communities. The approach does not connect the income-generating activities of the rural poor to the way in which ICT tools have been adapted to improve agricultural development. Granting the fact that the SLA's uses are both diverse and flexibly adaptable to a lot of settings, Kollmair and Juli (2002:10) maintain that the SLA does not provide a magic tool which enables people to eliminate the problems of poverty at a single stroke, and that it is not a completely new idea that will be revolutionary for development research and cooperation. Good social capital for one



person might be negative capital for another, and one person might be able to satisfy his own needs with minimum financial assets while another, having more financial capital, might not be able to do so. Although the SLA seems to have no implications for assessing the usefulness of ICTs to sustainable livelihoods, owing to its robust analytical ability, I have drawn on the framework for making sense of agricultural development, in particular, in the contemporary rural areas of South Africa.

The following chapter gives an overview of ICTs for rural agricultural development.

# **Chapter 4**

## **Impact of Information Communication Technology on Rural Agricultural Development**

### **4.1 Introduction**

The impact that the usage of ICTs have on rural agricultural development, their contribution to the growth of rural livelihoods and the benefits and challenges associated with doing so is discussed in this chapter. The benefits and challenges associated with using ICTs differ according to the communities and users concerned and also with respect to the way in which the ICTs are used in each case.

### **4.2 Benefits of Using ICTs**

The use of ICT has great potential to reduce the persistence of poverty in rural areas, and it is helping to improve the lives of the rural poor and to enhance the opportunities for generating sustainable incomes which are emerging as a result. The introduction of ICTs has had a remarkable impact on the manner in which people perform the daily activities and tasks in their lives. There is great potential for the impact of using ICT to yield positive results and benefits for both rural and urban

areas, as it offers a wide range of powerful instruments to improve communication and knowledge. ICT instruments has almost limitless potential to reduce poverty by contributing to the active participation of community members to their community needs; offer an immense range of new opportunities, empower members of communities and to develop their assets. It eliminates social barriers, helps in the management of risks and empowers governmental and non-governmental stakeholders to offer better services to the rural poor.

Modern and traditional ICT tools, such as the internet, television and radio, all serve to enable the delivery of education to disadvantaged and secluded rural areas. ICT training and access to ICTs, especially to ICT community centres, are acting as a medium for introducing a variety of services to empower deprived communities, owing to the fact that access to ICT infrastructure allows networking and sharing of knowledge and information.

ICT access has benefits for community members in terms of creating awareness of new opportunities and developing community and social skills. Through the use of ICTs, communities will have improved transparency and access to information concerning their livelihoods. Moreover, enhancing the livelihoods of low-income earners by improving the implementation of rural development services, giving rural inhabitants opportunities to boost their incomes and empower themselves by participating in processes of decision-making to influence the courses of their own lives. ICT access is benefiting communities by improving the potential for

communication at a greatly reduced cost, and at a faster rate. ICT community centres are very important for the development of agriculture and livelihoods in rural areas, and its availability is benefiting the members of rural communities in many ways.

### **4.3 Contributions Made by ICTs to Rural Livelihoods**

This section discusses how ICTs enable members of communities in rural areas to improve and enhance agricultural productivity and the development of their livelihoods in creative ways. If ICTs are used correctly in rural areas, they advance the livelihoods of poor communities, families and individuals by boosting the accessibility to information in digital form, which encourages the development of rural livelihoods. ICTs serve to expand the mechanisms and processes for communication in rural areas and for the exchange of information. A number of ICT services actively promote rural livelihoods by strengthening the ability of communities to empower themselves. ICT services are also useful for mitigating disasters and risks to life, such as food shortages and illness. For rural livelihoods ICT

“facilitates the acquisition and exchange of information by the poor, necessary to develop relevant livelihoods and strategies, improves communication within and between the institutions responsible for making decisions that affect livelihood options and empowers poor communities to participate in decision making processes” (Batchelor et al. 2003:30).

ICTs have powerful learning tools which can help to make accessible information and knowledge which can assist with both the empowerment of communities and

individuals and socioeconomic development. ICTs such as the internet, from computers and cellular phones, are enhancing the development of livelihoods by offering a less expensive and a more direct means of communication to the rural poor, which enables the inhabitants of rural communities to share knowledge and information easily and quickly.

The literature illustrates that ICTs have a positive impact on the livelihoods of community members in Dwesa. ICT services such as internet browsing on computers in the ICT community centre has an impact on the livelihoods of community members in terms of the five types of livelihood capitals or assets shown in the asset pentagon diagram in Figure 4.1.

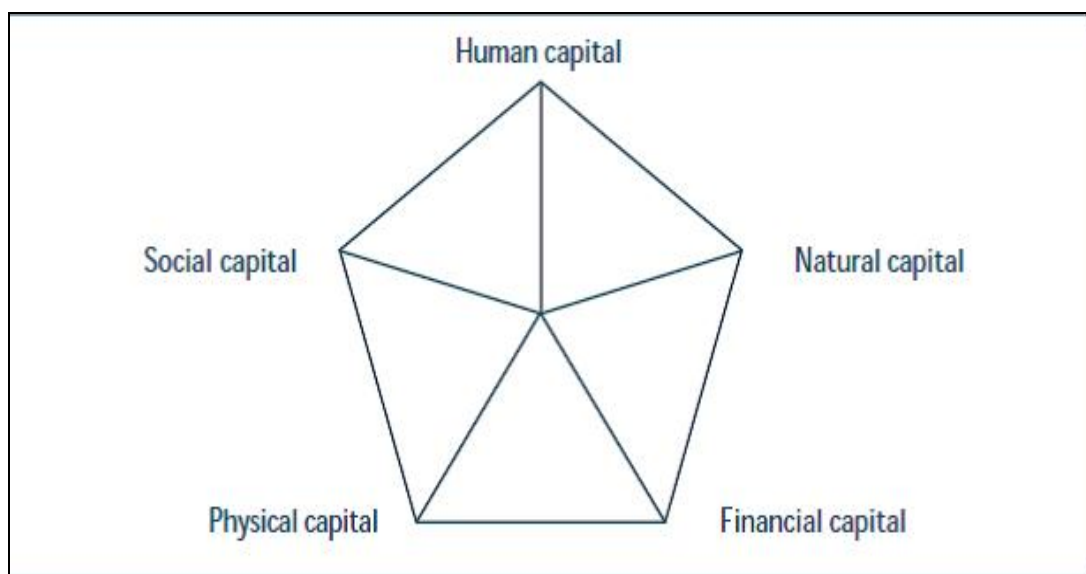


Figure 4.1: The Asset Pentagon

Source: DFID (1999:15).

The use of ICTs assists individuals and communities to conceptualise their assets shown in Figure 4.1, and to respond to threats and opportunities. As a result, individuals and communities have the opportunity to adopt certain strategies concerning their livelihoods which can reduce vulnerability and, in so doing, preserve and advance their well-being. The empowerment of both individuals and communities is very important for achieving sustainable livelihoods, as it facilitates the changing of their means of generating a livelihood, by members of the community, as their capabilities are developed. The breakdown of the asset pentagon into five assets or types of capital may be connected to objectives for the development of rural livelihoods and various strategies for the achievement of each goal. This study shows that ICT has implications for the use of natural capital such as soils, land and water, physical capital such as farming equipment, houses and farms, financial capital such as loans, social capital such as groups, networks, community services and human capital such as health, knowledge, skills, education and capabilities which are needed for the development of the other types of capital. The various types of capital are essential to one another, and, if there is an achievement involving a particular asset, it can have an impact on any one or more of the others. These types of capital need to be expanded for them to contribute to the attainment of a sustainable livelihood. Developing the assets helps to eliminate poverty and to create and maintain the types of capital which sustain independence and promote significant opportunities for communities.

ICT services, such as the internet and phones, are vital and of high value in terms of social networking with friends and family. ICTs are proving to be important in rural

areas, especially in cases where family members have migrated to urban areas to look for work. The ICT community centre in Dwesa has achieved a very significant degree of ICT usage for this rural area. ICT community centres in rural areas are helping to save money for the low income class community members by cutting down the costs of transport and postal services. Lower education and lower income groups are also benefiting and improving their livelihoods through the use of ICTs, which is also benefiting people of all age groups in the community through its ability to assist with the gathering of information and knowledge, (Pade-Khene et al. 2010).

ICTs are making a considerable contribution to the development of livelihoods in rural areas, and are resulting in an escalation of sustainability, productivity and competence for rural farmers. ICTs are enhancing agricultural productivity in that farmers are being made aware of risks, uncertainties and threats for farming, such as poor soils and pests. Small-scale farmers have access to information and knowledge to improve their access to markets and up-to-date information on market and commodity prices. The usage of ICTs offer expanded horizons for the development of livelihoods to communities, allows them to realise new business and agricultural opportunities and prevents social isolation.

ICT tools are playing a significant role to make certain processes better organised and visible. According to Stienen et al. (2007), ICT assists in making laws and land titles more accessible to farmers in rural areas for example through accessing the internet and emails. ICT tools, such as the internet and digital cameras, are assisting

community members in rural areas to file or document and communicate their circumstances. Information can be made available in suitable formats, audio, video or documented data in order for it to be efficiently used and accessed by the community members and small-scale farmers in rural areas. Some of the information can be made available in video or audio formats in the local languages of the community members. Textual information in English can be translated into local languages using websites which are able to translate information. This helps the rural poor to be able to understand information which is useful to them. Most of the information which is stored online may be accessed at any time, and over and over again. ICT tools which are used for accessing and storing information are becoming affordable and more flexible to use. Tools, such as cellular phones and laptops, offer universal access with many functions for communication, transactions and transferring of data. ICT community centres offer a learning atmosphere to small-scale farmers and their groups in the course of encouraging them to find solutions to problems affecting their livelihoods.

Cellular phones, which are replacing the use of landlines to a great extent in many nations, are helping rural communities to advance their agricultural activities. Cellular phones allow rural inhabitants when seeking for assistance and advice when they are faced with problems concerning their agricultural activities. They also allow easy access to information, via the internet, and the facilitation of payments and transactions. Sending and receiving text messages via the short message service (SMS) and the multimedia messaging service (MMS) is equally quick, easy and cost-effective. ICT devices such as cellular phones are making agricultural marketing



more efficient, raising farmers' incomes and providing a platform to deliver services and innovate (Donovan, 2011).

Cellular phones also influence the farmers' participation in activities such as marketing their farm products, which helps to improve their access to the market, which will, in turn, contribute to the alleviation of poverty. Mobile phones are acting as a catalyst to diminish agricultural hazards and in the process; they are also contributing to increase agricultural incomes. In India, farmers are using a BabaJob group on cellular phones to advertise for labour: for example, when they need more workers to help with their harvests, they simply advertise via SMS. According to Donovan (2011), this Indian BabaJob group offers services in which recruiters and workers submit listings via SMS.

The use of ICTs is helping to notify farmers and their potential customers, in various areas of the market, prices for their agricultural products. It also supplies farmers with information concerning where they may buy or sell products at better prices. In agricultural development, the use of ICT is lowering the costs involved in having access to information to improve agricultural practices, thereby raising the standards of agriculture among farmers who had been previously marginalised. Using ICT tools, such as cellular phones and the internet, is helping to remove the need for high transport costs, particularly in rural areas such as the Dwesa rural community, where the roads are poor or, in some areas, there are no roads at all. Farmers can now save transport costs by rather seeking information pertaining to matters such as decision making, selling, buying, harvesting, planting, land preparation, growing,

packing and storing agricultural products by using ICTs. As a result, for farmers, both time and travelling costs are saved and innovative interventions are facilitated.

On some cellular phones, such as Nokia, Apple iPhone and Blackberry, there are mobile application technologies which can be used to deliver information concerning agriculture. For example, on Blackberry mobile phones there are applications such as agricultural news videos which are used to provide information concerning agriculture. Image 4.1 of the study shows examples of applications which can be downloaded on Blackberry Application World and Image 4.2 shows The Western Producer application which can be downloaded on Apple iPhone's iTunes application.



Image 4.1: Agriculture News Videos in Blackberry Application World.

Source: Blackberry (2013)

With the Agriculture News Videos application farmers are able to read news about agriculture and also watch videos which provide agricultural information. The Blackberry mobile phone also has the Agriculture Products (v1) Blackberry application, which provides agricultural news and information, research reports and transaction information. It also provides information concerning the stock market, the products market and the prices of shares.

Image 4.2 of the study shows The Western Producer application form Apple cellular phones, which is a leading agricultural publication which targets farmers in Western Canada. The application was created to enable it to cover modern improvements in agricultural news, production, markets, finances, livestock, technology and rural lifestyles.



Image 4.2: The Western Producer on iPhone Application from Apple iTunes

Source: Apple iTunes (2013)

Mobile phone applications have an advantage in that they identify the diversity of human interests by offering agricultural information and knowledge in conjunction with leisure topics, to encourage people to make use of their services.

#### 4.4 Adopting ICTs for Land Management

This section discusses how the use of ICTs is efficient and effective in the sustaining of land management activities. It identifies how the role of ICTs is fundamental in supporting land markets and land reform activities. According to McLaren and Stanley (2011), when land management is good it creates accurate, accessible, interoperable, timely, secure, and complete information concerning land and

property, in a way which is affordable and efficient and which promotes confidence between the public, its commercial enterprises, and the government.

ICT services provide information which can assist consumers and farmers in decision making. In addition, ICTs enables policy makers to check and follow market trends and encourages transparency in policy making and decision making, which should help to gain the trust of the communities. ICTs provide important documentation concerning issues pertaining to land, which can help users to obtain access to government services through the government electronic resources. In addition, when the quality of land management is good, community members and small-scale farmers are assured of improved agricultural productivity, ownership and security of tenure as a result of development of the infrastructure. A lack of good land management can affect rural agricultural production negatively and weaken food security for the rural areas, as a result. Innovative strategies can be made available to underprivileged communities through the use of ICTs, ensuring that land management targets their individual and community needs. Planning and developing controls in land management help to promote the use of information which is documented in land administration systems. ICTs help in the sharing and analysing of information concerning land with communities, and also help to communicate with stakeholders and farmers concerning the various changes taking place in agriculture.

Access to information concerning land management and markets aids the appropriate use of land, which will stimulate rural agricultural development for small-

scale farmers and community members, and also support changes in land exercises and motivate progress towards the optimal utilisation of resources. It also promotes the development of livelihoods in rural areas by monitoring the demographic and gender distribution of those involved in land activities, thereby discouraging discrimination against minority groups.

Figure 4.2 of the study illustrates the evolution of ICTs as a provider of land information services to support land management. According to McLaren and Stanley (2011), in the early stages of the evolution, large-scale programs for capturing data were used by scanning records in order to computerise land administration processes. Later stages provided online services such as internet services, with the aim of improving the availability of information to internet users. As the internet services were growing, they helped to support a great many services providing information and electronic transactions. As a result, fundamental changes and increased effectiveness concerning service delivery will be attained in land management. ICTs, such as database managing systems, provide strong and secure repositories to administer large amounts of information pertaining to land issues, which helps to sustain the efficient searching and acquiring of vital land-related information.

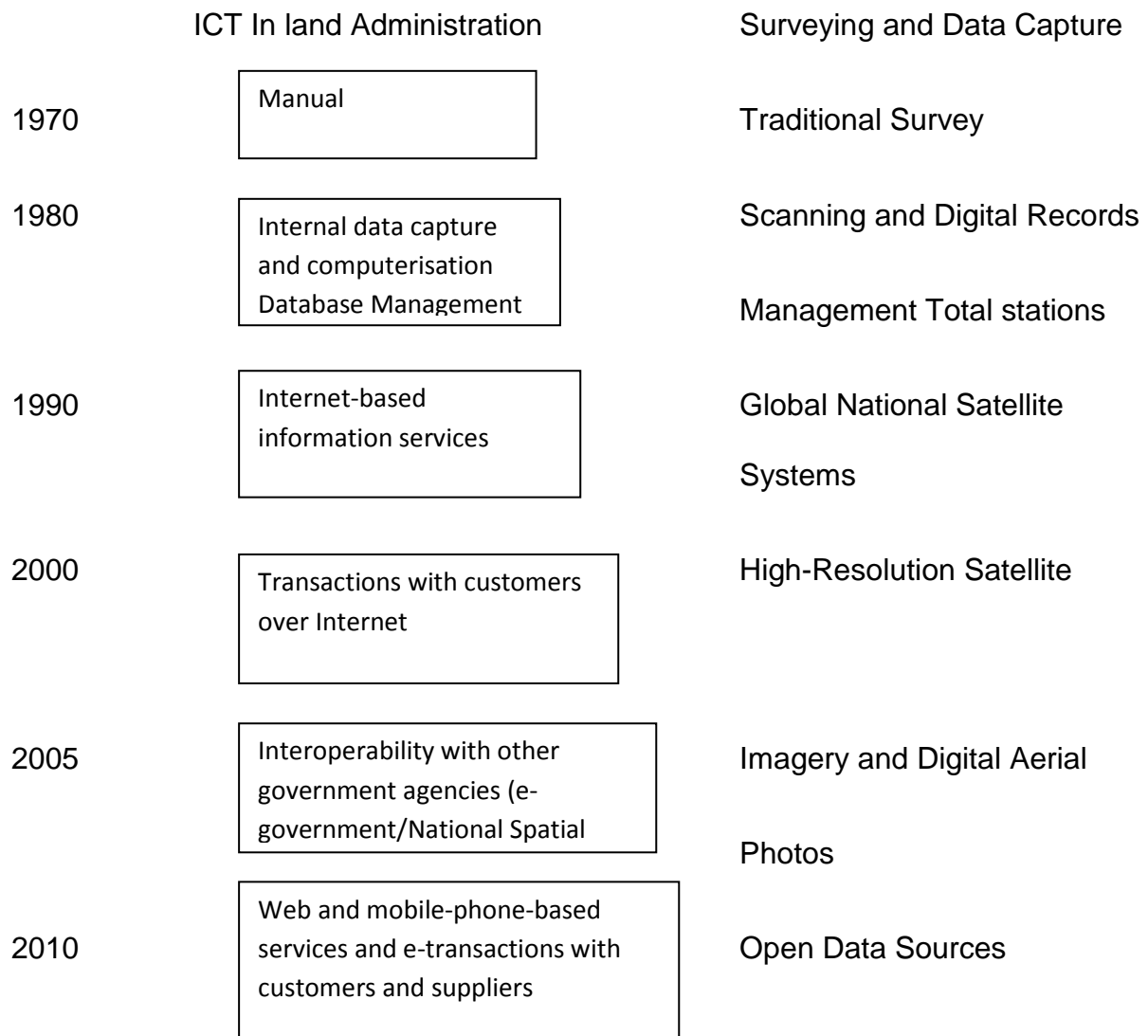


Figure 4.2: Evolution of ICT in Land Administration

Source: McLaren and Stanley (2011:348)

#### **4.5 Challenges Presented by Adopting the Use of ICTs**

Although the use of ICTs is improving and enhancing the development of both livelihoods and rural agricultural productivity, there are also challenges to be encountered by using and having access to ICTs. Making the use of ICTs sustainable can present problems owing to the fact that there are costs which are involved in buying and upgrading ICT tools, maintenance costs and training costs. In order to appreciate the role of ICTs, it needs to be understood that ICTs should not simply be dropped into the communities, in the hope that by doing so a positive impact upon the livelihoods of rural communities might be guaranteed. Communities need to have educational and financial services which would in turn enable them to make use of ICTs, and the devices need to be inexpensive and capable of providing users with valuable content.

In most rural areas, infrastructure is poor and there are high rates of illiteracy and poverty, which can prevent rural inhabitants from having access to ICT services. Low incomes in rural areas can also affect the prevalence of the use of ICTs, as some of the ICT tools are expensive to obtain. Ensuring affordability is vital for providing access to ICT infrastructure and services in rural communities, but it is very important for the development of both rural agriculture and livelihoods to do so. ICT community centres, such as the SLL in Dwesa, which offer free ICT devices and services, are helping to improving the access to and the affordability of using ICT in rural areas. Rural inhabitants who do not have free access to ICT community centres are more likely to decide to use their small incomes to make vital expenditures for food and clothing rather than spending their meagre resources on



ICT equipment. Some people tend only to use ICTs in times of emergency when they need to communicate with families in other locations. Poor access to education in rural areas can prevent members of communities from using ICT tools such as computers and cellular phones, whose use depends on being able to read. Although a few rural areas are using solar energy, there is no electricity in some of the rural areas, which makes it difficult, if not impossible, to operate ICT tools. Hence they will not be able to access up to date information concerning weather patterns and unpredictable market forces from ICT tools.

Poor network coverage for cellular phones and poor transmission frequencies for radios and televisions are also affecting the ability of the rural poor to have access to ICTs. When the network coverage and connection quality are poor, the development of rural livelihoods will also be affected adversely and there will be difficulties in obtaining access to and using ICTs. Network coverage is needed for connectivity for both wired and wireless networks, ICT tools and applications which allow those using ICTs to send and receive information from one area to another. Some community members are unable to have access to ICTs owing to their time-consuming commitments, which is particularly the case for women whose time is taken by household chores and who, consequently, do not have the time to learn to use ICTs. Rural people are often not keen to visit ICT community centres, to use ICTs or to attend ICT training due to lack of person interests.

ICTs use does not guarantee that community members and farmers will make use of the information and knowledge which they obtain, or that they will adopt the programs which are offered to users of ICT. Some of the information which is made available might not target their community or their specific needs, and some information can be inaccurate and difficult to understand. The availability of training affects the adoption of the use of ICTs, particularly in rural areas, where there is a limited number of trainers. If there are not sufficient trainers who are sufficiently competent to facilitate the use of ICTs, community members will not realise the benefits which it offers. The trainers need to have had a great deal of exposure to training materials and formal training to become trainers. They must also have skills and knowledge which are relevant to specific ICT applications such as the internet, e-mail, presentation of data, spreadsheet and data and word processing and in ICT services which are useful and linked to the needs of the rural poor.

Computer literacy is also a challenge affecting the promotion of the use of ICTs in poor communities, which makes it necessary to provide training and education in the first stages of introducing ICT development in rural areas. Without training, first time ICT users will find it difficult to adapt to ICT services such as live internet and e-mail. If education and training are offered, they will help to instil confidence and trust in rural people who might otherwise be suspicious of ICTs and afraid to make use of it. Language is a great problem to be encountered while trying to encourage rural people to adapt to using ICTs. Information is usually provided in one language only, particularly information which is obtained on the internet. Information concerning government services is also provided in English, which most of the literate people in

rural areas cannot read or write. As a result, rural people will not have access to information of this sort.

Communities sometimes fail to adopt ICTs because, in some cases, they do not provide immediate results or solutions to the problems of their communities. Initiating the implementation of ICTs can be difficult owing to strained resources. Belden and Birner (2011) maintain that unstable states or emerging democracies can also make the effective use of ICTs difficult to achieve. Using ICTs in communities with thin models of community participation may produce minimal change (Dahlberg, 2011).

Gender inequalities present another challenge for the adoption of ICTs in rural development. Most rural women are less likely to have access to ICT devices such as cellular phones and computers when compared with men in rural areas. This is mainly because in rural areas women do not have the income to buy devices of this sort, and they do not have the education or the training needed to operate these devices effectively. Social norms and standards in these communities also constitute a contributing factor to the challenges mitigating against the use of ICTs. Belden and Birner (2011:321) maintain that “women’s incomplete understating of how phones and even radio broadcasts could be used for agricultural and innovative purposes is a chief barrier to integrating women as users of ICTs”. In order to reduce the gender inequality in the adoption of ICTs, both women and men need to have comparable income and educational levels. ICT community centres need to focus more on

increasing awareness of ICT education and training services for women in order to enhance the effective use of ICTs by women.

This chapter outlined the benefits and challenges involved in using ICTs for agricultural development in rural areas. ICT has the potential to help to reduce poverty, improve livelihoods and enhance emerging opportunities in rural areas among other contributions which it could possibly make. ICT's contribution to improving rural livelihoods has also been discussed in detail, including how it is increasing the opportunities for communication and for the exchange of information in rural areas.

Discussions regarding how the use of ICT is efficient and effective in the sustaining of land management activities are also highlighted in this chapter. Land management is seen as helping to create access to land, to secure land and to make available accurate information pertaining to land. Challenges which are faced by communities attempting to adopt the use of ICT have also been discussed. These challenges include the affordability of ICT tools, maintenance costs of ICT infrastructures, illiteracy, poor network connections and gender inequality.

In chapter four the research methods in which the researcher used to gather and analyse data will be discussed.

# **Chapter 5**

## **Research Methodology**

### **5.1 Introduction**

This chapter outlines the research methodology which the study adopts in order to achieve the objectives of the research. This section highlights the research methods used to collect and analyse data from members of the Dwesa rural community and the research tools used to conduct the study. The chapter begins by detailing the sampling techniques used and the size of the sample from which data was collected. The study takes an exploratory approach, using both secondary and primary data, as it investigates the impact which ICT has on agricultural development in rural areas. It makes use of a qualitative method in order to seek to validate the accuracy of the results of the research, and it also focuses on a single concept or phenomenon (Creswell, 2003). The research also describes how the data was collected and it examines relationships and individual experiences.

### **5.2 Research Methodology and Research Design**

Qualitative research methodology was employed in order to obtain data which accurately reflected the experiences of the respondents. A research design is a plan and a set of procedures for a research project which involves procedures concerning a broad topic being expressed as detailed methods for the collection and analysis of

data (Creswel, 2003). The study made use of in-depth interviews to obtain data because they are an effective means of investigating and in an in-depth manner concerning a particular topic, in this case, on the effectiveness of ICTs as a means of enhancing agricultural development. Members of the Dwesa community, who have direct knowledge of ICT use and access to the ICT projects, were used as participants to obtain relevant information for the study, and to establish how ICT is improving agricultural development in the Dwesa rural area. Qualitative research methods were employed in the study in order to examine and understand the experiences of the participants. The Dwesa rural community was used to obtain the data for this study.

### **5.2.1 Population and Sampling**

The study was carried out in the Dwesa rural community. The population of the study included those who benefited from using the ICT community centre and those who did not use the ICT community centre, but who had access to and who were using ICT services to support their own work. The research focused on the ICT community centre in the Dwesa rural community. Snowball sampling, a non-probability sampling technique, was applied to choose the sample, owing to the fact that in the Dwesa rural inhabitants were not identified beforehand and were difficult to contact and locate. Employing snowball sampling is more directed and purposeful as compared to other non-random sampling techniques. Twenty participants including those who made use of the ICT community centre and those who did not make use of it were selected for the in-depth interviews, while thirty-five questionnaires were administered to thirty-five people of Dwesa rural area. Bless and Smith (2000)

maintains that a sample should comprise at least thirty participants in order to obtain reliable results. The researcher approached a few respondents who then referred the researcher to the rest of the respondents. Respondents were selected according to their willingness to participate and on the basis of informed consent, among other criteria.

### **5.2.2 Instruments Used to Collect Data**

Qualitative in-depth interviews were used in this study to collect data which is relevant to ICT and agricultural development in rural areas. The researcher used in-depth interviews to obtain in-depth information and comprehensively investigate the points of view of the interviewees. In-depth interviews obtained information on the ICT services that are available at the ICT centre and the manner in which the ICT services are being used. The researcher used in-depth interview in obtaining the benefits and the challenges from using the ICT community centre in Dwesa rural area. These benefits include accessing cheaper means of sending information resulting in the reduction of transport costs in accessing information related to agricultural activities. The interviews in this research documented the responses of the participants from the interview guide (appendix 2). According to Babbie and Mouton (2001:289), in-depth interviews are conducted with one subject or with pairs of subjects at a time, in order to provide an intimate setting for eliciting subjective responses. In assessing the impact of ICT community centre on rural agricultural development, the in-depth interviews were useful because they are open-ended, which allowed the interviewees to share their opinions openly and freely at the pace which was comfortable to them. According to Giddens (2006), in-depth interviews

allow greater flexibility when questioning a respondent and, as a result, the researcher is able to examine issues in greater detail during the interview. Accordingly, the research examined detailed issues on the uses and the importance of ICT use and the way in which ICTs are bridging the gap in rural agricultural development. For this reason, it was important to use in-depth interviews to assess the impact of ICT on rural agricultural development and to achieve other subsidiary goals. This method made use of subtle cues from the participants concerning how the use of ICT was affecting their livelihoods, whether the objectives of the ICT community centre were being met and also the challenges encountered while adopting and expanding the use of ICT for rural development. In-depth interviews were carried out with community members and ICT users who are using ICT to empower themselves and to improve their livelihoods and rural development in Dwesa.

The researcher used an interview schedule which guided the interview process to investigate the impact of ICT on agricultural development in rural areas. Twenty community members who have access to and those who do not have access to the ICT community centre were asked open-ended questions on ICT for agricultural development such as “Among the ICT services you use, which one is important and why?”. The data was collected from each individual and recorded on paper. The research technique gave an understanding of the interviewees' point of view on how ICT services can be used to benefit Dwesa.



A survey questionnaire (appendix 1) was also used as a research technique. A chain of closed-ended questions and open-ended questions were used to collect information on ICT for rural agricultural improvements from individual interviewees. The participants were given a list of predetermined responses from which to choose their answers as well as question that needed their own answers. The central purpose of the survey questionnaire was to provide a broad, extensive profile of the ICT users in the Dwesa community. The survey focused, on biographical information, socio-economic status, income generation, rural agriculture, ICT services and benefits and so on. All of this information was felt to be crucial for establishing a background of fundamental information pertaining to ICT and rural agricultural development in the Dwesa community.

Secondary data sources were used to augment the data collected in the field, using in-depth interviews and survey questionnaires. The secondary data consisted of academic literature and online media reports.

### **5.2.3 Analysis of Data**

The data was analysed after it had been collected, using the instruments described in section 5.2.1. The researcher analysed the qualitative data through thematic content analysis, which is a coding strategy. This approach was developed to assess and evaluate the contributions made by existing activities to sustain the livelihoods of community members. The data was analysed in terms of the community members' strengths or assets, livelihood strategies and how they are used to obtain

sustainable livelihoods. Transcriptions of the interviews were made and these were dismantled and reassembled into the categories which emerged in terms of themes, sub-themes and patterns, and analysed against the literature reviewed in Chapter 3. The data collected by using the survey questionnaire was analysed using the Statistical Package for Social Sciences (SPSS), which is computer software which is used for statistical analysis. By making use of the SPSS, the data could be penetrated to enable parameters, such as frequencies, percentages and ranges, to be detected. In this study, the SPSS analysed the demographic characteristic of the participant such as the age of the participants, gender, employment status, income levels and educational levels of the participants. SPSS also gave a descriptive statistics in percentage of the age distribution and gender distribution of the respondents.

### **5.3 Background to Dwesa: The Study Area**

The Dwesa rural area is located in the Eastern Cape Province of South Africa, within the Wild Coast in the former Transkei. It is situated between the Nqabara and Ntlonyana Rivers, and is roughly 235km<sup>2</sup> in size, consisting of communal and state land (Timmermans, 2004). It falls under the Mbashe Municipality and is close to the towns of Dutywa and Willowvale.

Dwesa is an undeveloped rural area which is accessible only by means of a dilapidated gravel road, which makes it difficult to get to the area, as there is no public transport operating to and from it. Lack of transport and poor roads in the area

make it difficult for the community members to obtain basic needs from nearby towns. As a result of the difficulties concerning transport, links and interaction between the rural area and the nearby towns are far fewer than they might be if better transport and infrastructure were available. The levels of education in Dwesa are still very low, but there are primary and secondary schools in the area. Employment levels are low and there is a high level of dependence upon state pension grants, upon which most of the inhabitants depend for survival. Some of them rely on small-scale farming for their livelihoods. Figure 5.1 is a map of the Dwesa rural area.

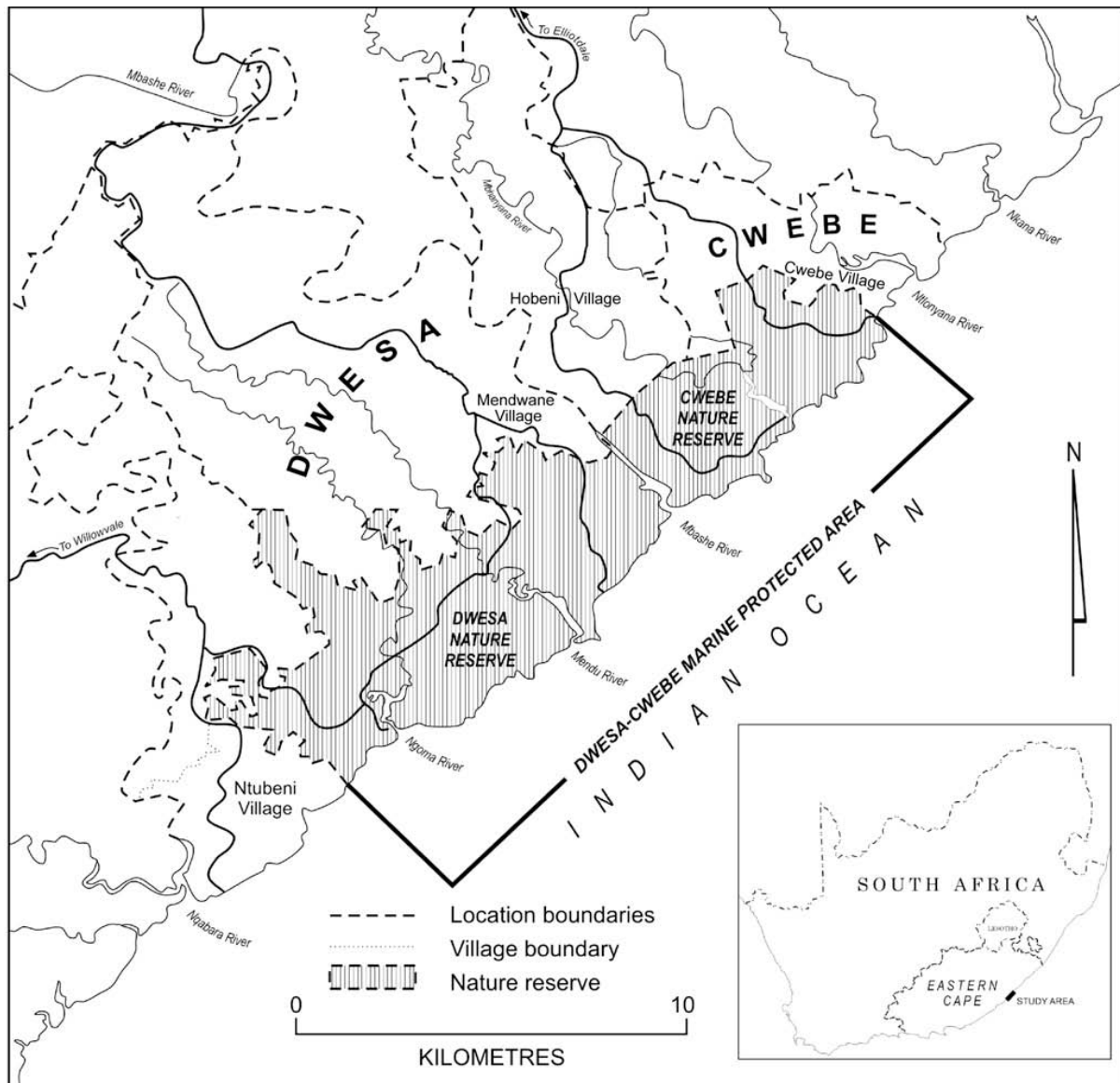


Figure 5.1: Map of the case study area from Timmermans (2004).

In terms of Information Communication Technology in the Dwesa rural community, there is an ICT community centre called the Siyakhula Living Lab (SLL). The SLL was previously known as the Siyakhula ICT Project. The SLL was initiated in 2006 by the Computer Science Departments of Rhodes and Fort Hare Universities, as an initiative for ICT development. A Living Lab is made possible by, “collaborations of

public-private-civic partnerships in which stakeholders co-create new products, services, businesses and technologies in real life environments and virtual networks in multi-contextual spheres” (Schumacher and Niitamo, 2008:2). This ICT project was formed to provide skills and new technology to the rural community of Dwesa and surrounding areas. The SLL aims to develop a multi-functional community communication platform, to be deployed in marginalised and semi-marginalised communities in South Africa, (Pade-Khene et al. 2010). The SLL provides the community members with technical skills for cost-effective e-commerce activities and rural development programs in Dwesa and the surrounding areas. The activities of the SLL include the assessment of barriers to the adoption of ICT and also the providing of techniques for project management for sustainable rural ICT. The project provides computers and telephone land lines.

Households in Dwesa also use older ICT such as television and radios for general information such as weather information and news. Ownership of cellular phones is growing rapidly in Dwesa, where it is associated with social status. Cellular phones are improving communication among the community members and are a symbol of the use of new ICTs in rural areas. In the next section the delimitations of the study will be analysed.

#### **5.4 Delimitation of the Study**

An in-depth interview has the disadvantage of being time-consuming, as it requires a great deal of time to collect and analyse data gathered in this way. Some of the

respondents were not willing to answer some of the questions. Nevertheless, everything possible was done in order to make sure that these problems would not undermine the integrity and quality of the research. Some of the community members were not interested in taking part in the research, but community members were not forced to take part in the study. In order to overcome any misgivings which the participants might have had, the researcher clearly explained the process of collecting data to the community members.

## **5.5 Ethical Considerations**

An ethical clearance certificate was granted by the university's research ethics committee and the consent of the participants was obtained before the data was collected (Appendixes 4 and 3 respectively). The researcher had an obligation to respect the rights, needs, values and desires of the informants. Before the interviews with the respondents started, the researcher explained the ethical standard of confidentiality to the interviewees, who were also assured that the findings of the study would be used for academic purposes only. Before conducting the interviews, the researcher clearly explained their purpose to the participants. Consent forms (Appendix 3) were given to the participants in the study, who had voluntarily given their consent to participate. The participants were treated with respect and dignity and not used as a means to accomplish the objectives of the research.

In conclusion, data was collected from 55 community members in the Dwesa rural community. The research focused mainly on community members who have access

to and who are using the ICT community centre in the Dwesa rural community. Snowball sampling was applied in order to select a sample from the community members using ICT. A survey questionnaire (Appendix 1) was used and an interview schedule (Appendix 2) was also used, to collect data through in-depth interviews. The SPSS was used to analyse the data which had been collected through the use of the survey questionnaire.

The chapter also gave an overview of the background of the case study area, the Dwesa rural area, which is located in the Eastern Cape Province of South Africa. In Dwesa there is lack of transport owing to poor roads, which limits contact between this rural area and the urban areas. The educational levels are still very low in the Dwesa community area, but the area does have an ICT community centre called the Siyakhula Living Lab, which aims to provide communities with ICT skills and knowledge.

The following chapter presents the findings of the research.

# **Chapter 6**

## **Analysis and Interpretation of Data**

### **6.1 Introduction**

According to Levine (1996:1), “data analysis is a body of methods that help to describe facts, detect patterns, develop explanations and test hypotheses”. This chapter presents and analyses the findings, from research which was carried out in the Dwesa rural community in the Eastern Cape Province, South Africa, concerning the role played by ICT community centres in the development of rural agriculture. The data analysed was collected from fifty-five community members who have access to the ICT community centre in the Dwesa community. This chapter will analyse the findings which are related to the impact and uses of ICT community centres for agricultural development in rural areas.

### **6.2 Demographic Characteristics of Respondents**

#### **6.2.1 Age Distribution**

The community members who participated in the study were requested to indicate their ages for the purposes of the research. The findings concerning the age composition of the sample are presented in Figure 6.1. The ages of the sampled community members were put into different groups where each participant belonged



to a single group. Figure 6.1 indicates that most of the community members who have access to the ICT community centre fall under the age group of between less than 18 and up to 24 years age range. The results show that the ICT community centre is used mainly by younger members of the community who are learners at the local schools and those who have finished high school. 57.1% of the respondents who took part in the survey questionnaires were in the age range of <18 and 24. The study found that there were 20% of the respondents in the age range of between 25 and 34. At least 14.3% of these respondents were formally employed and 28.6% were informally employed, and the rest were unemployed. In the age range of between 35 and 44, there were 8.6% of the 35 participants, one of whom is a teacher at a local school in Dwesa. Two of the respondents, who constituted 5.7% of the total sample, fell under the age range of between 55 and 64. This indicates that at least some of the senior citizens in the community are also making use of ICT for their livelihoods, showing that ICT is not only for young people. These respondents were retired members of the community. The results detail the ICT services which are used by the various age ranges. It shows that internet browsing is done by all of the age groups.

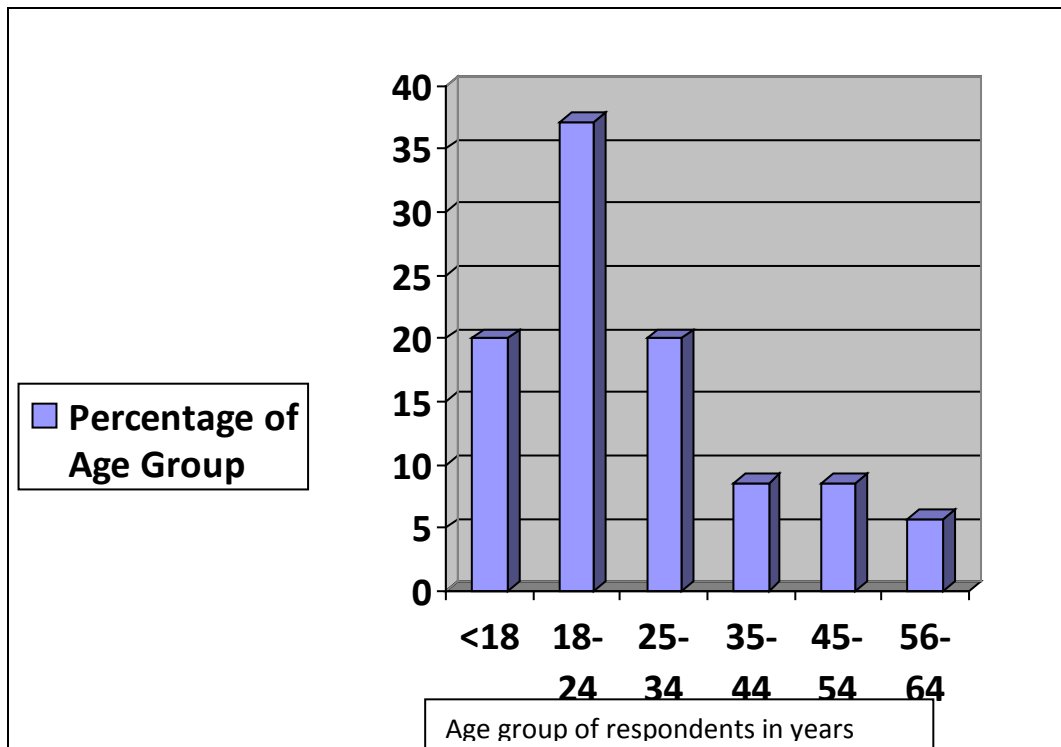


Figure 6.1: Age distribution of respondents

Source: Survey Questionnaire, October 2013

### 6.2.2 Gender Distribution

This section illustrates the gender distribution of the sample of community members who are users of the ICT community centre in Dwesa. The researcher emphasises gender distribution because it is at the core of the South African gender policy, and gender distribution is also a significant factor in rural development.

The figures for gender distribution from this study indicate that females comprise 45.7% of the population which is actively making use of the ICT community centre, as compared with 54.3% for males. From this finding it would appear that there is a

very small difference between the percentages of the population making use of the ICT community centre for males and females respectively. This small disparity in the gender distribution implies that any development approaches involving the use of the ICT community centre will benefit both women and men equally. The findings also illustrates that access to the ICT community centre is beneficial for both females and males.

### **6.2.3 Educational Level of Respondents**

The study recorded the highest level of education achieved by each of the respondents, in order to determine the level of human capital which each participant possessed, and his or her ability to analyse and interpret information. From the research findings, 20.6% of the community members who participated in the study had no formal education of any sort. The results also indicate that 23.5% of the respondents had attended primary school as their highest educational level attained, and 47.1% had attended school up to secondary level. Very few had obtained qualifications in tertiary education, and those who had were teachers at the local schools in Dwesa. Those who had achieved tertiary and high school education were expected to be able to access information concerning the development of livelihoods and agricultural development. The research found that those with lower, or no formal education were also able to use the ICT community centre, although some of them were not using it to look for information concerning rural agricultural development, or for information which might help to improve their livelihoods, but only for the purposes of social networking, using Facebook, Twitter and so on. Figure 6.2 shows the educational levels of the respondents.

In South Africa all citizens have a right to basic education, which includes adult basic education and further education. The constitution of the South African's Bill of Rights states that the state has an obligation to make education progressively available and accessible through implementing reasonable measures. Education is regarded as,

“So fundamental to growth in developing countries, has been seen as key to building a dynamic labour force, one that is capable of accessing and integrating knowledge into their economic and social livelihood activities, and thus able to participate in the global economy.” (McNamara 2003: 50).

The research found out that education improves rural communities' access to information and expertise, which can help to overcome the factors which have impeded the development of their livelihoods, to date. The research agrees with Pade-Khene et al. (2010) that, there is a great need to improve the quality of local education in the Dwesa area, particularly with curricula which equip learners to find employment.

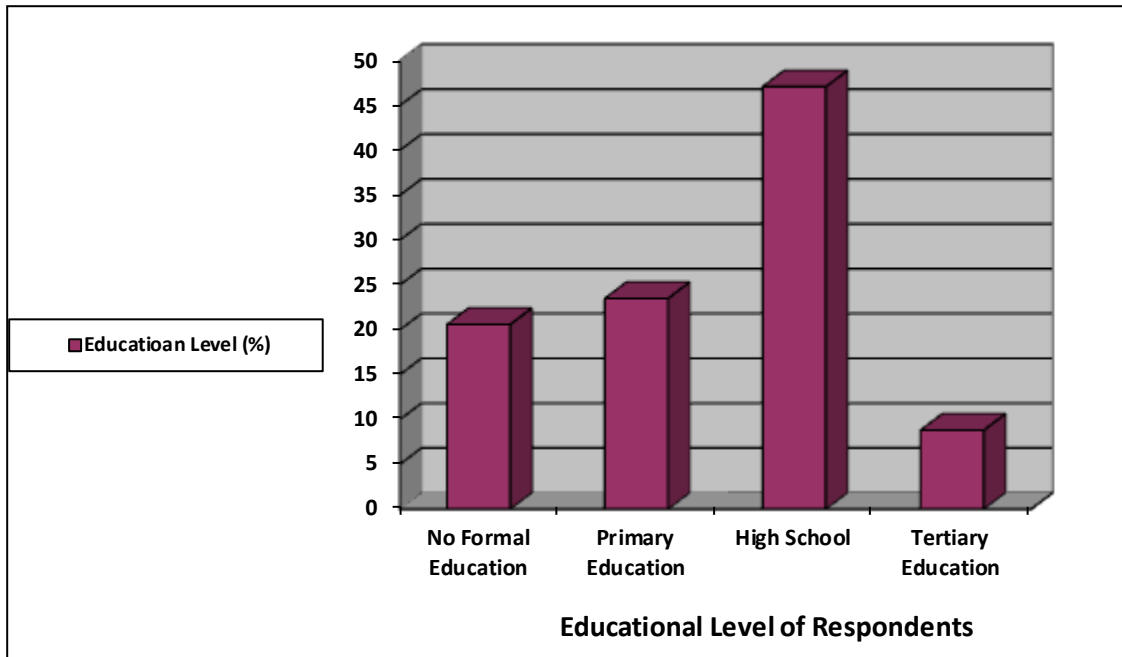


Figure 6.2: Educational Level Distribution of the respondents.

Source: Survey Questionnaire, October 2013

#### 6.2.4 Employment Status

In Dwesa those who were formally employed who participated in the research were teachers, who were not local residents of the Dwesa rural area. They came from urban areas such as East London and Mthatha. From the research findings, 14.3% of the respondents were formally employed, whereas 28.6% of the respondents were informally employed as shown in Figure 6.3. Some of the informally employed community members worked as domestic workers and petrol pump attendants in nearby towns such as Willowvale and Dutywa. The results from the study shows that 42.9% of the respondents were unemployed, reflecting the high rate of employment in the Dwesa community area. The unemployment rate is, to a large extent, owing to the low levels of education in the area. One of the respondents said, *“There are no*

*job opportunities in our community (Dwesa). I am not in employment, it is only my husband who is working in our family, but he is working in Mthatha, one of the closest towns to us. He is working as a petrol attendant”.*

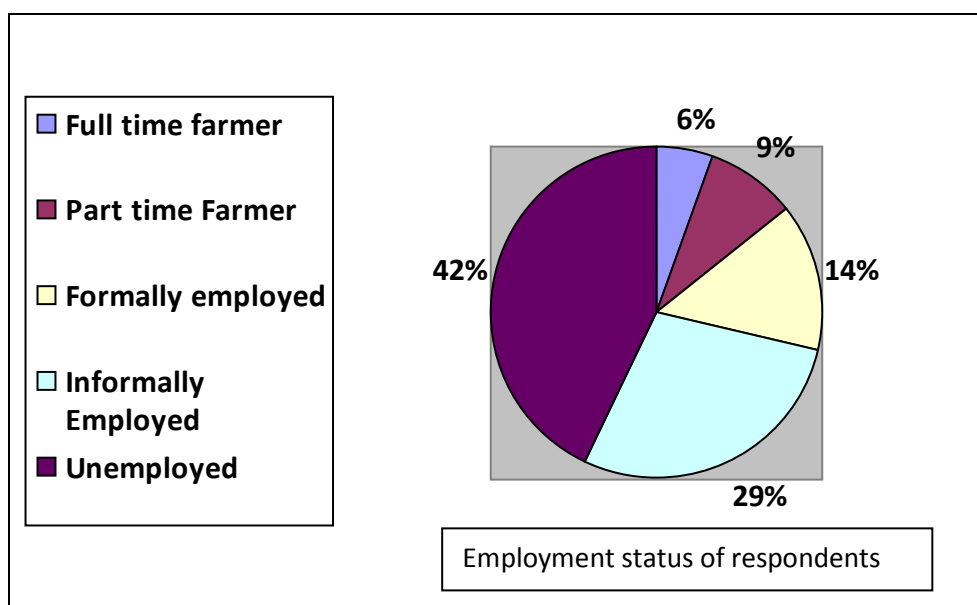


Figure 6.3: Employment status of respondents

Source: Survey Questionnaire, October 2013

According to Perold and Jooste (2004), if a person has engaged in any kind of economic activity for at least one hour in the previous week, he or she is considered to be employed. Employment can take the form of informal employment, formal employment, working as a small-scale farmer, a domestic worker and so on. In South Africa there has been an increase in the unemployment rate, particularly in the rural areas. The unemployment rate for youths has increased at a faster rate than it has for other age groups of working age. According to Stats South Africa (2012), the unemployment rate in South Africa stands at 25.2%, where the black African

population group has the highest unemployment rate, followed by the coloured population. The agricultural employment sector in South Africa has the lowest percentage of employment at approximately 5%, whereas formal employment has the highest rate at 70%. The employment rate for private households, which includes domestic workers, stands at 9% and for the informal sector it stands at 16%. Figure 6.3 illustrates the employment status of the respondents.

### **6.2.5 Income Level**

In Dwesa generally the majority of the inhabitants of the community are poor; they have very little or no income, mainly as a result of the high unemployment rate. At least 72% of the community members of Dwesa migrate to urban areas, small town and other rural areas in search of employment (Cross, 2006). An estimation of 70% of the residents in the community survive on government social security grants, such as child support grant, disability grant and older person's pension grant. The results of the study from the participants indicated that 42.4% of the respondents had incomes below poverty line and were surviving on less than R700.00 per month. The findings of the research show that 12.1% of the respondents indicated that their incomes ranged from R10 000.00 and above. The respondents with the highest incomes were teachers from the local schools. The research findings show that 15.1% of the respondents had incomes ranging between R3 000.00 and R5 000.00, as in shown in Figure 6.4. 30.3% of the respondents were found to live on a monthly income of R700.00 to R1 500.00. Most of these respondents were informal workers and some of them relied on government grants. One respondent said, *"I do not work*

*and so does my family, the only income that we have is the older persons' pension that I receive every month from the government".*

Farming is also vital for generating income in the Dwesa rural area, and it contributes to the food security and the livelihood of the community. Agriculture has the potential to contribute greatly towards the employment of the rural poor population and, in so doing, to generate incomes for them. The World Bank (2002) concurs with the finding that poor rural households derive their income from natural resources-based activities which include cultivation, making use of wild natural resources and livestock husbandry. Low income contributes to poverty in rural areas. Reardon and Barrett (2000) maintain that small-scale agriculture promotes the alleviation of poverty by creating employment and reducing food prices. These farmers are able to earn some income from selling their agricultural produce, and, as a result, improving the welfare of their households. In rural areas small-scale farming enables households to be self-sufficient, thereby providing a more equitable distribution of income as a result of less money which is being spent on purchased food (Dorosh and Haggblade, 2003). Figure 6.4 illustrates the research findings concerning the income classes of the respondents.



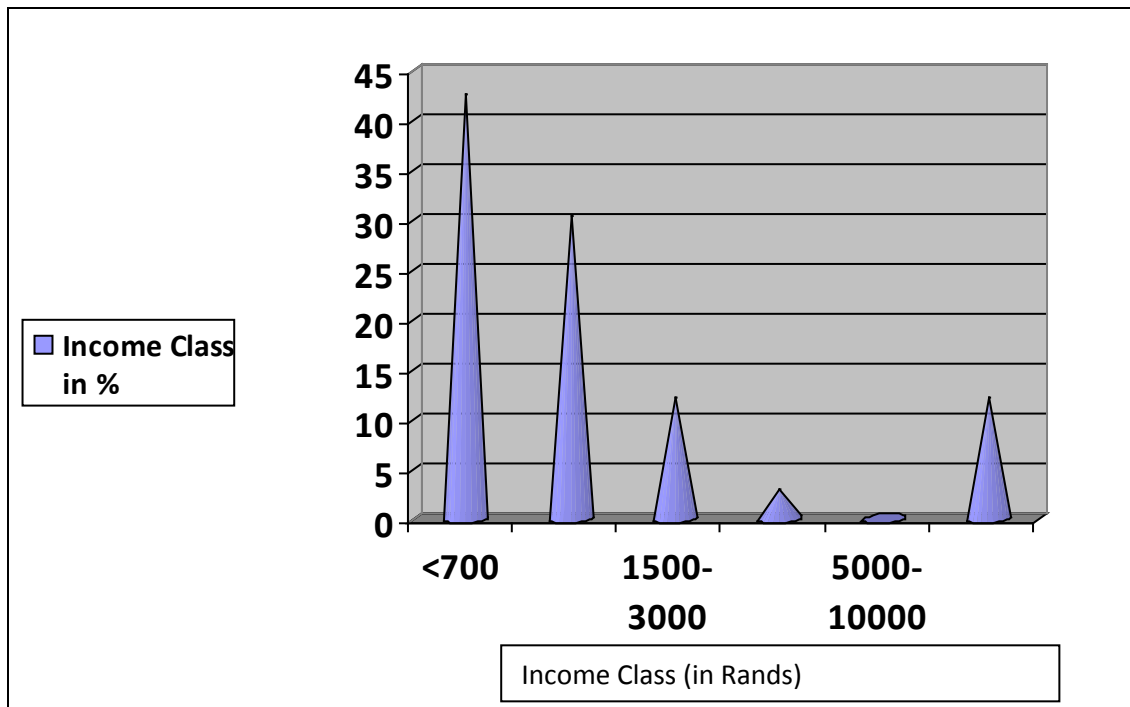


Figure 6.4: Income classes of the respondents

Source: Survey Questionnaire, October 2013

In Dwesa most of the inhabitants of the community are poor and have very little or no income for their households, which is mainly owing to the high rate of unemployment. There is a great need to implement programs and approaches for the development of skills to generate better incomes for the rural poor in Dwesa.

### 6.3 Access to ICT Training Services for Rural Agricultural Development

In Dwesa rural community, a small number of members of the community know how to gain access to information concerning agricultural development, although they were not actually receiving any agricultural training of any sort at the time at which

the study was conducted. In rural agricultural development ICT training services can be used by community members to enhance agricultural development by improving their knowledge and skills concerning agriculture. Agricultural training services help them to become aware of the availability information concerning markets, soils, pesticides and many different types of agricultural production and approaches to production. Even though 88.6% of the community members who participated in the study indicated that they had received training from teachers, students, facilitators and monitors, none of them had received any ICT training for rural agricultural development. The findings from the research show that 11.4% of the respondents indicated that they had not yet received any training of any sort.

In this study one participant said,

*“ICT is the most important source of information in our lives; for us to find the desired information, it requires us to have good skills and training services on ICT especially on rural agricultural development”* (In-depth interview, October 2013).

It is therefore important to initiate ICT training for the specific purpose of promoting and encouraging agricultural development in rural areas. This training needs to be designed in a way which takes into consideration the fact that the inhabitants of rural communities tend to have little in the way of ICT skills. The rural poor need also to be given training on how to use various types of software, and the ICT training needs to be aligned to their needs as ICT users. This would help to improve efficiency and knowledge and allow these people to participate in, and contribute towards, agricultural development. Although the ICT community centre has been offering

continuous training services to the community members, no training for the use of ICT to facilitate and expedite rural agricultural development has been offered yet. It is not yet part of the community centre's curriculum. At present, the centre offers basic computer training only, as is indicated by one of the respondents in the study: *"We have not yet received any specific trainings on rural development. We are only receiving basic computer training from the students and facilitators of SLL, which we are using to access information on agricultural development"* (In-depth Interview, October 2013).

Figure 6.5 illustrates how often the respondents receive training at the ICT community centre in Dwesa. The findings shown in figure 6.5 indicate that 40% of the community members receive training monthly. Only 3.3% of respondents receive training yearly.

The findings of this study is agreeing with Balakrishna (2002) and Jones (1997) in that access to ICT in Dwesa rural community is improving rural livelihoods and the wellbeing of the inhabitants of the community and that it brings agricultural improvements to rural communities and increases the productivity of small-scale farmers. ICTs are helping rural inhabitants in accessing cheaper means of communication, cheaper means of sending information on agricultural activities. As a result, there is reduction in transport costs for community members which allows them improving their standards of living. It is therefore important for the Dwesa community to receive ICT training and to participate in ICT initiatives to enable them

to become involved in the various measures to be implemented to bring about rural agricultural development and the improving of livelihoods. Communities require knowledge and new skills in order for them to recognise and make full use of development strategies, and for this reason there is a great need for ICT training. Training in internet browsing helps rural communities to recognise the internet as an informal learning tool, which removes the need to leave rural communities, in order to join the larger modern world. ICT services, such as the internet and e-mail, improve access to information of all types, including government and non-government services. Basic computer training allows members of rural communities to prepare documents such as business plans and also to keep records of farming activities, business transactions and the storage of information.

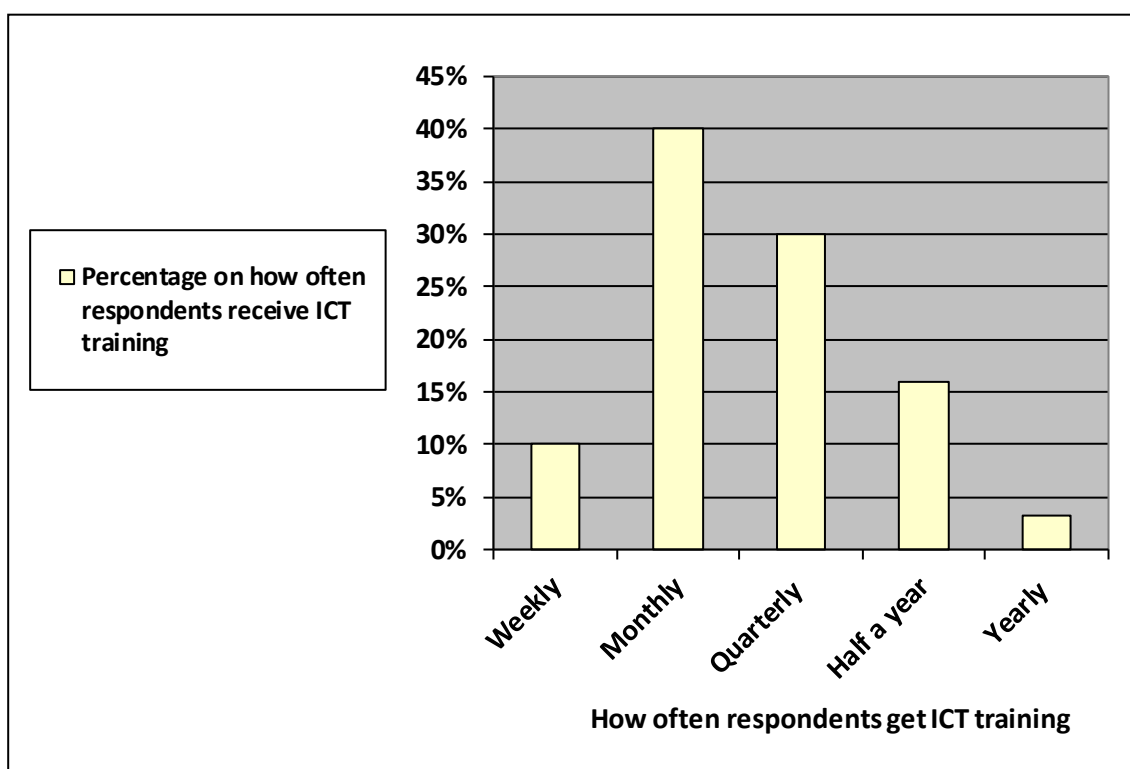


Figure 6.5: Frequency with which respondents receive ICT training

Source: Survey Questionnaire, October 2013

#### 6.4 The Importance of ICT in the Dwesa Rural Community

As the telephone did before, the internet is saving money by reducing expenditures for the rural poor by acting as a substitute for travel to Dwesa rural inhabitants. The results from this study are in agreement with Harris (2001) in that accessing internet from ICT community centres is increasing the flow of information and communication for small-scale farmers in accessing agricultural information such as prices pet control chemicals and prices on different seed at lower cost. In the Dwesa rural community the internet has become a useful and a priceless means for the community members to make contact with, and become aware of, the improvements in the agricultural development. The findings of this study confirm that the internet is regarded as a valuable tool, which was confirmed by one of the respondents from the in-depth interviews, who said: *"For us the youths, the SLL is very helpful to us; we can use the internet to read about our homework and research on our school projects and on what is happening within our communities"* (In-depth interview, October 2013). The internet is also allowing communities to communicate with people in other areas through internet browsing on social networks for example, agriculture Facebook pages on farming information. One of the participants said: *"At the ICT community centre I am able to browse the internet and apply for jobs in both the non-governmental and governmental sectors around the country. By using the internet we are also getting information on weather and news that is happening in all parts of the world"* (In-depth interview, October 2013). Internet browsing as an ICT tool can provide solutions and services for e-agriculture, e-government, e-education, e-commerce and e-health to community members.

In rural agricultural development, Dwesa small-scale farmers are using the internet to access information pertaining to agriculture, such as weather reports and modern ways of farming. In the in-depth interviews, the participants indicated that they do obtain information concerning agriculture, such as weather reports, from their televisions and radios. They also indicated that they use cellular phones to communicate with their peers in order to obtain particular information on agricultural productivity. One respondent said: *"If I have problems with my livestock that I do not understand, I always use my mobile phone to call my friend who is working at a nearby farm for help"*. In rural areas, poor small-scale farmers are able to use ICT in their farming activities to overcome various farming problems and to improve their livelihoods. Internet technologies such as internet banking, internet marketing and internet calls are generally accessible and cost-effective to farmers and community members.

These findings tend to concur with those of Donovan (2011:56), in that ICT "reduces agriculture's significant transaction costs, displaces costly and time-intensive travel, and facilitates innovative interventions, especially in service delivery". The community members of Dwesa indicated that they no longer have to travel to nearby towns to have access to particular services such as banks and postal services. They are using the internet to access their bank accounts and also to communicate via e-mail, saving them transaction costs and also postage costs. Rural inhabitants and small-scale farmers can access banking facilities through internet banking, as one participant explained: *"I do not have to travel to Willowvale or Mthatha to deposit*

*money and pay for my accounts. I can just do it online at any time”* (In-depth interview, October 2013).

ICT is making it possible for members of the community to take part in the exchange of knowledge and skills. Some of the respondents said that they were using ICT to read about the experiences of other people in the world. The results indicate that access to the ICT community centre is helping to bridge the digital gap between the rural and urban areas, in that it is contributing to the reduction of transport costs and the costs incurred by financial transactions, and by making a positive contribution to rural development in the community. A few community members are using cellphone banking for agricultural purposes nonetheless, most of the professionals in the community, such as the teachers, use cellphone banking and online banking facilities.

Several of the community members interviewed have shown that the centre is improving communication between community members and their relatives in other communities, and also empowering them with knowledge concerning various aspects of their lives. With the availability of the community centre, instead of depending on hired transport or unreliable transport owing to the poor roads, to travel to urban areas to attend to matters such as banking, the community members are able to perform these tasks and to have easy access to information at the centre. Despite the fact that a low percentage of the respondents indicated that they use ICT to obtain weather reports, market prices and for other agricultural purposes, a larger

percentage of the community members is benefiting from the opportunities which are provided for communication and social interaction.

In addition, ICT has significant implications for development strategies. In the study the participants were asked to rate the effectiveness of the ICT community centre as a means of improving their livelihoods and 47.1% indicated that they were satisfied with the ICT community centre. Only 8.8% found it to be unsatisfactory, as is shown in figure 6.6, which illustrates how the ICT community centre was rated by the respondents.

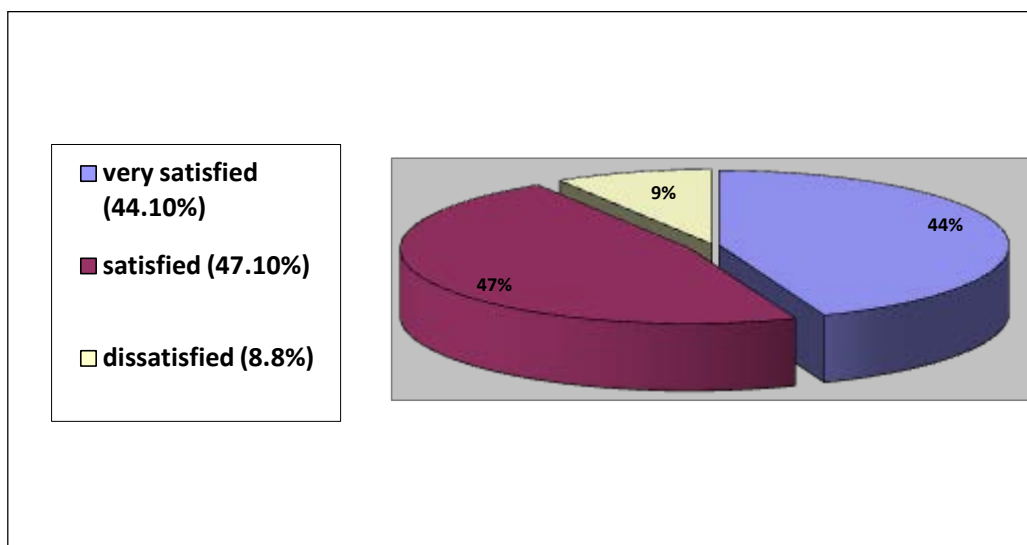


Figure 6.6: How the respondents rate the ICT community centre

Form the study, participants felt that there was insufficient access to information on land management and agricultural development owing to a lack of ICT training for



rural agricultural development, which points to the fact that in the Dwesa rural community there is a need to introduce ICT training, in order for members of the community to have access to information concerning agricultural development. Services, such as online forums, need to be introduced to the communities to enable to share skills and knowledge pertaining to both rural agricultural development and the improving of livelihoods.

The study found that in the Dwesa rural community distances tended to limit the ability of some community members to have access to the ICT community centre. At least 20% of the respondents indicated they did not go to the ICT community centre because it takes a long time for them to walk to the centre, and that as a result, they tended to make use of other alternatives, such as cellular phones, radios and televisions, but others maintained that they could not afford such alternatives. Seven of the respondents reported that they found it difficult to use computers.

The low rate of literacy in the Dwesa rural community is another factor limiting the use of ICT. Some of the community members struggle to use computers and the internet owing to a lack of education. At least 24.5% of the respondents indicated that they had never received any formal education in their lives. As a result, it is very important to educate and train the members of a community before introducing ICT.

One respondent said: *"I do not see the usefulness of using ICTs in my life. These cellphones are making people anti-social, we do not visit each other anymore we just call and sms each other"* (In-depth interview, October 2013). One consequence of

bridging the digital gap is that farmers friends tend not to visit one another as regularly as they did before, reducing direct interactions on manners of agricultural development for example discussing disasters that may affect their soils, plants or livestock. Instead, interaction of small-scale farmers tends to take place to an ever-increasing extent on radio programmes and social networks such as Facebook pages for farmers, Twitter, and Whatsapp group applications. As a result, there tends to be a decreasing sense of community, owing to a lack of in-person interaction for issues regarding rural agricultural development in Dwesa rural community. It is therefore vital to increase the farmers' and community members' capacities through the use of ICT, which will help them to research the prices of products and also in other farming activities. Through ICT, farmers are able to network with other farmers, government sectors and other stakeholders, and as a result, social segregation among community members is reduced.

Individual problems were also encountered at the ICT community centre. One respondent said: *"I am very much interested in using the computers, but if I sit in front of the computer for a long time, my eyes become itchy and I also get headaches"* (In-depth Interview, October 2013). These findings indicate that there are potential health problems to be encountered by using ICTs such as computers. Excessive amounts of time spent in front of a computer screen can harm the user's eyesight. Physical and mental stress can also result if computers are used for long periods of time, without taking breaks thereby hindering their performances on agricultural productivity.

In this chapter, the demographic characteristics of the respondents were successfully outlined: these are the age distribution, gender distribution, educational levels, income levels and employment status. The results indicated that the majority of the community members who are using ICT are young. The gender distribution results of the community members who were sampled are almost equal.

Most of the members of the Dwesa rural community are making use of the ICT community centre for various purposes, such as communicating with other community members and with their relatives in other communities, availing themselves of the vast amount of information to be found on the internet concerning every conceivable subject, and so on.

Although the community members have access to continuous ICT training at the Siyakhula Living Lab, the results revealed that they are not yet receiving specific training in the use of ICT for the purposes of rural agricultural development. The ICT community centre is increasing the flow of information and communication to the Dwesa rural community, and it has already become a very valuable asset for the community, all the more so when the great potential which it has to educate, train and improve the lives of the members of the community is considered.

The results identified several obstacles preventing the universal adoption of ICT by the community at present, including the fact that some members felt that they did not trust ICT tools such as computers, and found it difficult to use them, but succeeding

generations will inevitably adapt more quickly and the possibility of even a fairly remote rural community such as Dwesa having a completely computer-literate population is, by no means, a pipedream.

Chapter 7 presents a summary of the study as a whole and the conclusions and recommendations emanating from it, emphasising the link between the research questions and the results of the study.

# **Chapter 7**

## **Summary, Conclusions and Recommendations**

### **7.1 Introduction**

This chapter provides summaries of the study as a whole, which include the methodology and the results of the study. It presents the conclusions of the study and the recommendations which are made on the basis of them, emphasising the link between the research questions and the results of the study.

The emergence of ICT community centres in South Africa including the ICT community centre in Dwesa rural area has the potential to contribute to the development of both agriculture and livelihoods in the rural areas. ICT empowers the rural poor by giving them skills and a “voice”, which should help them to express their individual and community needs. ICT empowers small-scale farmers to negotiate better deals with marketers and to receive practical agricultural benefits from ICT services, which help to prevent small-scale farmers from being exploited and to make the transition to becoming commercial farmers. ICT connects communities with one another and facilitates networking between farmers and marketers, leading people to joint and interdisciplinary strategies for problem solving and sharing knowledge. ICT community centres allow the rural communities to

create a knowledge base and to document and store information and knowledge pertaining to various aspects of their lives. As a result of access to information being made quick and easy, communities will be able to gain skills and find solutions to their problems in spheres such as disaster management, control of pests and diseases and market prices.

Unfortunately, the full potential for rural communities to make use of ICT and ICT community centres, to advance the development of both rural agriculture and livelihoods, remains untapped owing to a lack of access to ICT infrastructures and a lack of ICT skills and knowledge. In rural communities there is a great need for small-scale farmers to boost their participation in market agriculture, in order to achieve sustainable livelihoods and agricultural development, and also to increase their productivity sufficiently to enable them to make the transition to commercial farming. The progress of small-scale farmers in rural areas is affected by a number of factors, which include both institutional and technological factors, such as poor infrastructure, lack of transport, low incomes, lack of education, and computer-illiteracy, among others.

The main objective of this study was to assess the impact of ICT community centres on rural agricultural development and to identify the challenges of adopting and expanding ICT use for rural development in the Dwesa rural community. The study focused on the contribution made by ICT community centres to the improvement of agricultural development in rural areas. It considered the factors which guide rural communities towards reacting effectively to the benefits of ICT, which can enhance agricultural productivity and improve livelihoods. It assessed how accessible and

available information and training are to the rural communities and whether they are used in appropriate ways. The study outlined the key factors which are involved in using ICT to respond to the needs of communities and farmers in order to provide services to rural communities effectively.

The study's empirical results concur with the literature which recognises that ICT benefits communities, and that communities and small-scale farmers face a number of obstacles in adapting the use of ICT for agricultural development (Pade-Khene, et al. 2010). Rural communities require training and skills to use ICT effectively for agricultural development and land management. A lack of information and knowledge forces them to sell their agricultural produce through informal markets where prices are very low, and also encourages them to practise subsistence farming. The study offers some suggestions and recommendations concerning how communities and small-scale farmers could overcome these challenges and improve their livelihoods and boost rural agricultural development.

## **7.2 Summary**

This section summarises the chapters of the study, including the summary of the methodology and the key findings from the study.

This study was carried out in the Dwesa rural community, which is located in the former Trankei, in the Eastern Cape Province of South Africa. The researcher used a case study sampling technique to select the users and non-users of ICT. Twenty community members were interviewed and thirty-five participated in the survey

questionnaires. The survey questionnaire was designed as an instrument for collecting data, and in-depth interviews with community members were also used as a means of collecting data for the study.

After the data had been collected, the Statistical Package for Social Sciences (SPSS) version 20 software was used to analyse the data, which was collected by using a survey questionnaire. By using the SPSS, parameters such as ranges, frequencies and percentages were identified and used to analyse variables such as the age ranges of the respondents, their educational levels, their income classes, the sizes of their households, the access to ICT which they had, the ICT services which were used, the benefits and challenges associated with using ICT, the impact of ICT on agriculture and land management and the contribution of ICT to rural livelihoods and agricultural development. The data which was collected through the in-depth interviews was translated and transcribed before being analysed thematically and in a way which did not cause the data to become distorted. The researcher made sure that the themes were linked to the main objectives of the study.

### **7.2.1 Key Findings**

This study was conducted in the Dwesa rural community where the community members have access to an ICT infrastructure and have received basic training in ICT. A large number of the respondents in the study indicated that they were computer-literate, but some of the respondents still had difficulty using computers. The findings indicate that most of the community members who participated in the



study were young. An analysis of the data showed that representatives of all age groups, including older persons, made use of ICT and that its use has been beneficial for the community of Dwesa. The community members have access to knowledge and information concerning various aspects of their lives through the use of ICT, which has had a positive overall impact on their livelihoods development, and community members have been able to use ICT to obtain information for their school projects, to do research for their school assignments, to look for employment opportunities and to access government services and information on land management online.

The in-depth interviews indicated that a large number of the community members were using the internet at the ICT community centre for social networking as compared to agricultural development. In addition, they were found to be using e-mail and the internet to communicate with their family members and friends who had migrated to urban areas. They were found to be using the ICT skills which they had acquired from the training which they had received at the SLL ICT community centre to improve their standards of living, which has positive implications for the alleviating of poverty, which in turn contributes towards rural development. The rural poor are using their ICT skills to create businesses and income-generating projects with the aim of enhancing their livelihoods, and they are also starting to market their products online and to look for information concerning markets on the internet by using computers.

In agricultural development, information and communication have always been important. Farmers have always looked for, and obtained, information from one another, but the use of ICT is helping small-scale farmers and communities in rural areas to obtain up-to-date information. It is also helping them to cope with various changes in weather patterns, soil conditions, pests and climate change in their area.

### **7.3 Recommendations**

This section outlines the options which can be considered in South Africa, in an attempt to assist the rural poor to improve their agricultural productivity and their livelihoods. With regard to the obstacles limiting the use of ICT for agricultural development outlined in Chapter 5, certain recommendations can be made.

In the literature review, the vital role played by ICT in rural agricultural development became apparent. In this study, the results show that there are obstacles hindering community members in their use of the ICT community centre to improve agricultural productivity. It is important for the rural inhabitants to be able to react positively to technological changes and accept the new technology. By so doing, the rural communities will be able to make progress in their agricultural productivity and improve their food security, which in turn contributes to the development of sustainable livelihoods for the rural poor.

People such as ICT facilitators and ICT mentors, who are providing ICT training at ICT community centres, need to be equipped with knowledge of agricultural development and land management to enable them to include training in the use of ICT, for agricultural purposes, in their curriculum. They need to be given adequate training on how to incorporate ICT in agricultural production to enable them, in turn, to provide small-scale farmers and community members with skills which will encourage rural agricultural development, rather than offering only basic computer training to the communities. If the rural poor acquire the skills and knowledge needed to harness technology to facilitate agricultural development, they will be able to include ICT in their agricultural activities in a way which will bring change to improve their agricultural productivity.

There is need to establish and maintain higher standards of ICT skills and knowledge for rural agricultural development, for the people offering ICT training, and doing so will improve the essential skills which are necessary for rural agricultural development. ICT can promote rural development in the Eastern Cape if the province reduces the barriers to information and knowledge and the information gaps, and increases access to ICT use.

Institutions such as schools, governmental and non-governmental organisations need to work together to mobilise resources to equip communities with more ICT services and information programs which are related to rural agricultural development. They need to create efficient partnerships among themselves to

encourage the adoption of ICT, and innovative technologies for attaining developmental goals for agriculture. These stakeholders need to instil optimistic attitudes towards using ICT to improve agricultural productivity in community members. They also need to implement the information programs and training in a user-friendly way, which will permit communities to develop ICT skills and knowledge for agricultural development. The stakeholders need to empower the rural poor and link them with resources and markets for agricultural products.

In rural areas and communities small-scale farmers find it difficult to obtain up-to-date information concerning markets. Updated market information is important to farmers and it needs to be made available to the rural poor. The ICT community centres need to educate and empower the communities to gain access to and use the information for effective agricultural development. The various stakeholders, particularly the governmental organisations, need to be able to disseminate information programs in a way which will be understandable to the members of the rural communities, taking their educational and literacy levels into account. The strategies which are implemented need to be explained to the members of the rural communities in their local languages. This can be done in the form of videos, voice information systems posted on the internet, via computer-mediated networks, mobile applications and by installing relevant computer software.

As much as ICT infrastructures are improving the development of rural agriculture and livelihoods, the governmental and non-governmental organisations need also to

develop other infrastructures such as transport facilities and market places in the rural areas. The creation of infrastructures of this sort would assist the small-scale farmers to grow into commercial farmers, which would in turn also create jobs for the unemployed rural residents, and in so doing, enhance individual and community development.

#### **7.4 Areas Needing Further Research**

From the findings of the study, it is apparent that there is a need to investigate the aspects of the facilities and the training, which the ICT community centres provide, which need to be developed to enable them to play an even more vital role to improve agricultural productivity.

Most of the community members in the study sample indicated that they had not yet received any training in using ICT as a means of improving rural agricultural development and land management. More research is required to refine the role to be played by the ICT community centres to lift the rural communities from subsistence farming to commercial farming to increase productivity and provide full employment to these communities, in order to attain the levels of sustainable income which will guarantee the prosperity denied to these marginalised communities by the previous regime, and truly create a better life for all.

## **7.5 Conclusions**

The study focused on how the use of ICT can enhance rural agricultural development and livelihoods in the rural communities. It also analysed the contribution made by ICT community centres to land management, and how the training and access to ICT, which they provide, can accelerate agricultural development in rural areas. The study has established that in order to make agricultural information more readily available, SLL and community leaders need to come together and hold awareness campaigns to promote the gaining of access to information for agricultural activities through the use of ICT.

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## Appendixes

### Appendix 1: Survey Questionnaire for Information Communication Technology (ICT) Community Centre Users and Non Users.

My name is Tafadzwa J Mukasi, a student at University of Fort Hare, Alice. I am undertaking a research in fulfilment of Master of Development Studies. My study intends to assess the impact of ICT community centres on rural agricultural development and identifying the challenges of adopting ICT use for rural development.

#### BACKGROUND INFORMATION

Date.....

Interviewer.....

Name of Area.....

Name of respondent (Optional) .....

#### A. DEMOGRAPHIC INFORMATION

1. Please indicate your gender with an X.

Gender	
Male	Female

2. Fill in the relevant information and where possible mark with an X.

<b>Age (years)</b>						
<18	18-24	25-34	35-44	45-54	55-64	≥65

3. What is your highest educational level? (Mark with an X)

No Formal Education	Primary School	High School	Tertiary Education	Other (specify)

4. Please indicate your language with an X.

English	IsiXhosa	Afrikaans	Other (specify)

5. How many members are in your household?

.....

6. What is your employment status? (Tick✓ where appropriate)

<b>Employment Status</b>	<b>Tick ✓</b>
Full time farmer	
Part time farmer	
Formally employed	
Informally employed	
Pensioner	
Unemployed	
Other (specify)	

7. Which income class do you fall in? (Mark as appropriate).

Income class (in Rands)	Tick ✓
<700	
700 – 1 500	
1 500 – 3 000	
3 000 – 5 000	
5 000 – 10 000	
>10 000	

## B. ACCESS TO INFORMATION COMMUNICATION TECHNOLOGY (ICT) COMMUNITY CENTRE

1. How long have you been using the ICT community centre?

Please mark with an X.

1 Weeks	2-3 Weeks	1 Months	2-3 Months	4-6 months	1 year +

2. How often do you use the ICT community centre? (Mark with X)

Every day	Every week	Every 2-3 weeks	Every month	Every 2-3 months	Every 4-6 months	Once/twice a year

3. How many people in your household use the ICT community centre? Indicate with a Tick ✓.

0-2	3-4	4-6	7-8	9-10	11+

4. Which ICT tools do you frequently use to access information from the ICT Community Centre? (Tick✓ where appropriate)

ICT tools	Tick
Computer/ internet	
Telephone	
Fax	
Television	
Video	
Radio	
CD-ROM / DVD ROM	
Other (Specify)	

5. Which ICT services do you use? (Tick✓ where appropriate).

ICT Service	Tick✓
Internet browsing	
Information dissemination (i.e. photocopying, printing, storing information CDs, cassettes, and electronic data base)	
Telephone and Fax	
E-mail service	
Online help services	
Training Services	
Assessing local government services	
Reading newspapers	
Online banking	
Other (specify)	



--	--

6. From the services that you use, which one is more important to you and the community?

.....

.....

.....

.....

.....

7. Do you get training to use the ICT tools like computers? (Mark with X).

YES
-----

NO
----

8. If your answer is YES, how often do you receive the training?

Every Week	Every 2 - 3 weeks	Every Month	Every 2- 3 months	Every 4 -6 months	Every Year	Other (specify)

### C. BENEFITS AND CHALLENGES OF ADOPTING INFORMATION COMMUNICATION TECHNOLOGY COMMUNITY CENTRES FOR RURAL AGRICULTURAL DEVELOPMENT

1. Please rate the ICT community centre on the following attributes. (Mark with X).

Very satisfied	Somewhat satisfied	Neutral satisfied	Somewhat dissatisfied	Very dissatisfied

Comment.....  
 .....  
 .....  
 .....

2. Please indicate advantages of using the ICT Community Centre. (Tick✓)

Advantage	Tick✓
Enables knowledge and skills exchange	
Helps in identifying solutions easily	
It reduces costs of transport and transactions of finances	
It gives with up to date information	
It provides with all kinds of information such as weather, market prices, financial services, governmental and non-governmental services	
It strengthen communication among community members and empowers them	
It increases the efficiency of production	
Other(specify)	

3. Is the ICT community centre convenient for you?

YES

NO

Please justify your answer.

.....

.....

.....

.....

.....

4. What are the challenges you have found in adopting ICT for agricultural development? Tick where appropriate.

Challenges	Tick✓
Lack of trainings	
Inaccurate information (such as weather reports)	
Lack of time	
Lack of trust in ICT	
There are better alternatives than ICT Community Centres	
Too hard to use	
ICT markets offering unnecessary information	
Irrelevant problems such as poor internet connections	
Other(specify)	

#### D. RURAL AGRICULTURE

1. What do you use ICT Community centres for, in agricultural development?  
(Tick where appropriate).

Use	Tick✓
For market prices and trade of agricultural produce	
For online provision of natural resources management and monitoring	
For information on government programmes and rural development	

programmes	
To find solutions to improve efficiency and productivity in agricultural development	
To find Information on financial services	
To find knowledge which will help to participate in agricultural development	
To access information on quality inputs such as pesticides and sowing seeds	
For information on weather patterns	
Other(specify)	

2. Have you received any training on using ICT community Centre for rural development?

YES

NO

If YES, indicate the type of trainings received with a Tick ✓.

Training Received	Tick✓
Data processing	
Internet marketing	
Online transaction processing	
Collecting Information	
Information Exchange	
E-mail and fax use	
Other(specify)	

3. Who is offering the trainings?

.....  
 .....

4. Which skills have you acquired from using the ICT community centre?

Please tick where appropriate.

<b>Skills acquired</b>	<b>Tick✓</b>
Finding and selecting information	
E-mailing	
Browsing Internet	
Printing	
Photocopying	
Presenting Information	
Sending and Receiving information	
Other(specify)	

5. How is the ICT Community Centre improving livelihoods of the community members?

<b>How ICT Community Centre is improving livelihoods</b>	<b>Tick✓</b>
Increases the efficiency, productivity and sustainability of agricultural development	
Empowerment and capacity building (strengthening community members' involvement in livelihoods development)	
Improved up-to-date market information on commodity and inputs prices and consumer trends	
Other(specify)	

6. Is ICT helping to improve land management (e.g. soils) and land use planning

YES

NO

If YES state your reason(s)

.....  
 .....

.....  
.....  
.....  
.....

7. Do you have any suggestions for improving the ICT Community Centre for agricultural development?

.....  
.....  
.....  
.....  
.....  
.....  
.....

**THANK YOU FOR YOU PARTICIPATION.**

## **Appendix 2: Interview guide: ICT community centres for rural agricultural development**

Age:

Gender:

Educational Level

1. How do you feel about using your ICT community centre?
2. How often do you go to the Siyakhula Living Lab ICT community centre?
3. What tools are available at the centre (such as computer with internet...)?
4. What ICT services do you use?
5. Among the ICT services, which one is important and why?
6. How comfortable are you in using ICT?
7. Have you received any training concerning the use of ICT?
8. If yes how was the training conducted?
9. How was the training conducted?
10. Did you learn anything useful?
11. What challenges did you face in receiving the training?
12. Can you describe how access to ICT has changed your lifestyle?
13. Has your lifestyle changed compared to previous years? If yes, How?
14. How important is the use of ICT in agricultural development?
15. To what extent is ICT bridging the gap between urban and rural areas?
16. How can we improve ICT use to benefit the community?
17. What are the least valuable ICT tools that you don't like?

Do you have any comments you would like to add?

## Appendix 3: Ethics Research Confidentiality and Informed Consent Form

### Ethics Research Confidentiality and Informed Consent Form



University of Fort Hare  
*Together in Excellence*

#### **Please note:**

**This form is to be completed by the researcher(s) as well as by the interviewee before the commencement of the research. Copies of the signed form must be filed and kept on record**

#### **(To be adapted for individual circumstances/needs)**

Our University of Fort Hare / Department is asking people from your community / sample / group to answer some questions, which we hope will benefit your community and possibly other communities in the future.

The University of Fort Hare / Department/ organization is conducting research regarding Information Communication Technology (ICT) Community Centres and Agricultural Development. We are interested in finding out more about the impact of ICT community centres on rural development. We are carrying out this research to help community members in understanding how they can generate information to sustain and increase agriculture production

Please understand that you are not being forced to take part in this study and the choice whether to participate or not is yours alone. However, we would really appreciate it if you do share your thoughts with us. If you choose not take part in answering these questions, you will not be affected in any way. If you agree to participate, you may stop me at any time and tell me that you don't want to go on with the interview. If you do this there will also be no penalties and you will NOT be prejudiced in ANY way. Confidentiality will be observed professionally.



I will not be recording your name anywhere on the questionnaire and no one will be able to link you to the answers you give. Only the researchers will have access to the unlinked information. The information will remain confidential and there will be no “come-backs” from the answers you give.

The interview will last around 30 minutes (*this is to be tested through a pilot*). I will be asking you a questions and ask that you are as open and honest as possible in answering these questions. Some questions may be of a personal and/or sensitive nature. I will be asking some questions that you may not have thought about before, and which also involve thinking about the past or the future. We know that you cannot be absolutely certain about the answers to these questions but we ask that you try to think about these questions. When it comes to answering questions there are no right and wrong answers. When we ask questions about the future we are not interested in what you think the best thing would be to do, but what you think would actually happen (*adapt for individual circumstances*).

If possible, our organisation would like to come back to this area once we have completed our study to inform you and your community of what the results are and discuss our findings and proposals around the research and what this means for people in this area.

## INFORMED CONSENT

I hereby agree to participate in research regarding ..... I understand that I am participating freely and without being forced in any way to do so. I also understand that I can stop this interview at any point should I not want to continue and that this decision will not in any way affect me negatively.

I understand that this is a research project whose purpose is not necessarily to benefit me personally.

I have received the telephone number of a person to contact should I need to speak about any issues which may arise in this interview.

I understand that this consent form will not be linked to the questionnaire, and that my answers will remain confidential.

I understand that if at all possible, feedback will be given to my community on the results of the completed research.

.....

**Signature of participant**

**Date:**.....

I hereby agree to the tape recording of my participation in the study

.....

**Signature of participant**

**Date:**.....

## Appendix 4: Ethical Clearance Certificate



**University of Fort Hare**  
*Together in Excellence*

### ETHICAL CLEARANCE CERTIFICATE

Certificate Reference Number: MON011 SMUK01

Project title: **Information Communication Technology (ICT)  
Community Centres and Agricultural  
development in the Eastern Cape Province of  
South Africa: A case of Dwesa Community**

Nature of Project: Masters

Principal Researcher: Tafadzwa J Mukasi

Supervisor: Dr PB Monyai

Co-supervisor:

On behalf of the University of Fort Hare's Research Ethics Committee (UREC) I hereby give ethical approval in respect of the undertakings contained in the above-mentioned project and research instrument(s). Should any other instruments be used, these require separate authorization. The Researcher may therefore commence with the research as from the date of this certificate, using the reference number indicated above.

Please note that the UREC must be informed immediately of

- Any material change in the conditions or undertakings mentioned in the document
- Any material breaches of ethical undertakings or events that impact upon the ethical conduct of the research

The Principal Researcher must report to the UREC in the prescribed format, where applicable, annually, and at the end of the project, in respect of ethical compliance.

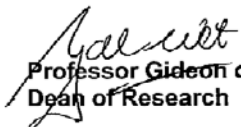
The UREC retains the right to

- Withdraw or amend this Ethical Clearance Certificate if
  - Any unethical principal or practices are revealed or suspected
  - Relevant information has been withheld or misrepresented
  - Regulatory changes of whatsoever nature so require
  - The conditions contained in the Certificate have not been adhered to
- Request access to any information or data at any time during the course or after completion of the project.

The Ethics Committee wished you well in your research.

---

Yours sincerely

  
Professor Gideon de Wet  
Dean of Research

28 October 2013