The potential and reality of the Living Lab model of ICT for Development (ICT4D) in the rural development context: The case of Siyakhula Living Lab, Dwesa, Eastern Cape, South Africa.

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TEBOHO PRISCILLA MOSUOE

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Abstract

This thesis explores the contribution of Information and Communication Technology (ICT) in rural development processes. Within the framework of social capital theory, and in the context of the information society, the study examines how the collaborative and innovative model of ICT for Development (ICT4D) can enhance social networks and information channels in rural communities, thereby enabling the active participation of rural community members in their own development processes. The study examines networks and information channels both within the rural communities under investigation and between these communities and other sectors in the society. The thesis studies the case of the Siyakhula Living Lab (SLL), an ICT4D initiative in the Mbashe Municipality of the Eastern Cape Province of South Africa.

During the investigation, four types of networks were identified: local organisations, social institutions, collective community projects and social ties. It was found that the Living Lab has so far influenced the creation of new forms of networks through the common spaces (computer labs) which have been made available by the Living Lab. The study further showed that the use of computers has enabled other community members to partake in the wider community of online/virtual social networks, allowing them to communicate and share information with those outside their own communities. The study also showed that the Living Lab has enabled the networking of these communities with other sectors such as academia. It was, however, found that so far the existence of the Living Lab has not influenced the already existing local networks in these communities. Also, the study showed that the relationship between these rural communities and their government and industry partners as stakeholders in the Living Lab is currently ineffective. Nevertheless, this situation has a potential to change in the future as there are ICT applications which have been developed through collaboration with rural community members, which will assist in enhancing communication between these rural communities and other stakeholders. The study finally revealed that social networks do contribute to the functioning of communities by providing both monetary and social support to community members, even though, in effect, the monetary benefits are somewhat limited by a number of factors. It is revealed that the engagement of ICT could go a long way in improving social and economic activities, governance and service delivery, as well as education in these communities.

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TABLE OF CONTENTS

CHAPTER THREE

CHAPTER SEVEN

CHAPTER EIGHT

CHAPTER NINE

List of tables

List of figures

List of graphs

CHAPTER ONE

Introduction to research

1.1 Introduction

Information and Communication Technology (ICT) is increasingly recognised globally as not only the medium of communication and information dissemination but also for its role in enabling development (WSIS, 2005: unpaged). Today the field of ICT for Development (ICT4D) is an emerging and exciting area of research and practice (Kleine and Unwin, 2009:1045), as it seeks to find ways of engaging ICT at the different levels of development. Rural communities have, however, long been excluded from the global knowledge economy, which regards information and knowledge as key ingredients in development processes. However, the trend is slowly shifting as more and more ICT4D initiatives seek to find strategies for including rural communities to ensure inclusiveness in the information society.

This research aims to explore the potential and the influence of a model of ICT4D, the Living Lab model, in driving rural development processes. The Living Lab model is an innovative, user-focused model that enables the design, development and validation of new technologies in a collaborative manner that is applicable in real life environments (Almirall and Wareham, 2008; Bergvall-Kareborn, et al., 2009; van der Walt, et al., 2009). This model creates an environment suitable for information access, capacity building and improvement of networks and collaboration between sectors in the society.

Based on this logic, and within the framework of social capital theory, the study will explore how the two forms of social capital – networks and information channels – can be strengthened by the Living Lab model; and how that can, in turn, contribute to participatory, innovative rural development. The study will explore networks and information channels, both within the selected rural communities and between these communities and other sectors. This is to establish how rural communities can be integrated with the rest of the society through ICT, enabling them to actively partake in development processes.

1.2 The research background and objectives

As has been highlighted in the introduction, this research aims to explore the place of ICT in rural development processes. The literature will later show that the concept of development has come a very long way to where it is today. Development has been practised since the inception of the idea of life improvement, and has evolved through different phases over time. However, rural communities have not always been active partakers in development processes even when such processes were aimed for their own improvement. The practice had always been to make initiatives for them, without them (Korten, 1980).

Over the years this trend changed with the realisation that rural populations are, by right, not just consumers of development interventions, but should also be regarded as major agents of change in their own lives. In fact, it subsequently became clear that rural communities are not necessarily being helped significantly by interventions that exclude their contribution. With the top down approach to development, little progress was made in translating the objectives into substantial outcomes (Korten, 1980). Consequently, there was a consensus among development practitioners, that if development is to be extended to rural areas, there has to be a consideration of the contribution that the rural people themselves can offer in the pursuit of their own betterment of life (Korten, 1987). Gradually, participation of rural communities in rural development processes became a recognised, well-acknowledged practice and a central concern (Roodt, 2001).

In the late 1990s and the early 2000s, there was a new shift in development processes, based on the recognition of the potential of ICT in catalysing these processes (Kleine and Unwin, 2009:1045). The extensiveness of the use of ICT in society marked the history of what Castells (2000a: 696) refers to as the 'information age'. At the beginning of the information era, history repeated itself. Societies began to progress faster towards becoming 'information societies', leaving rural communities behind, as though they are not part of the globe. The engagement of ICT in rural development processes is being significantly apprehended by development practitioners only in recent years. Because this practice is still in its infancy, there have been a lot of challenges in relation to how rural ICT interventions can be implemented in a sustainable manner (Heeks, 2010; 2002). Different models and strategies have been tried and tested with only a slight progress so far.

As indicated earlier, this research explores the influence of the Living Lab model of ICT4D in rural development processes. The study will first establish the influence of the Living Lab

model in strengthening social capital in selected rural communities, then it will examine how the increased social capital can contribute to participatory, innovative rural development. The two forms of social capital on focus in this research are networks and information channels. The study will be guided by the following research objectives:

- To identify the kinds of networks available in selected communities
- To establish the methods of communication within the communities and between these communities and other sectors
- To establish how the Living Lab approach contributes to:

  - creating and strengthening networks

  - improving communication and information channels

- To establish how the improved networks and information channels contribute to participatory, innovative development

1.3 The context of the study

This research was undertaken in the Dwesa region of the Mbashe Municipality of the Eastern Cape Province of South Africa. The study explored a case of the Siyakhula Living Lab (SLL). The SLL was established at the beginning of 2006, as a joint venture between the University of Fort Hare and Rhodes University, the government, private organisations and rural communities in the Mbashe Municipality. Four communities within the Dwesa region – Ngwane, Lurwayizo, Nondobo and Nqabara – were selected as the study areas. Dwesa is a rural region representative of many rural African realities, characterised by lack of infrastructure, lack of services, high rates of unemployment and poverty.

1.4 Theoretical framework

Human relations have always been a fundamental asset possessed by all societies. It remains the way in which societies are organised in terms of values and expectations, and the way in which, arguably, production and service delivery can be increased through social organisation, social structures, and complementary initiatives and efforts (Sorensen, 2000). Rotberg (2001:1) argues that "societies work best and have always worked best, where citizens trust their fellow citizens, work corporately with them for common goals and thus share civic culture." Civic culture exists where citizens have acquired a substantial volume of

social capital (Rotberg, 2001:2). The concept of social capital has existed ever since communities formed and human beings interacted (Rotberg, 2001). However, in its present form and associated meanings, it is relatively a new concept in the social sciences field (Portes, 1998). It is the concept that social scientists have developed to distinguish social resources from others, namely, financial, physical and human capital (Rotberg, 2001:3).

This research will be predicated upon the framework of social capital theory. The concept of social capital has become one of the most commonly used theories in the field of sociology and in everyday life (Portes, 2000:43). It is often used theoretically in development literature and practically in community development projects, as one of the indicators and enablers of sustainable development (Ledwith, 2011; Gilchrist, 2009; McClenaghan, 2000). It has also been used in matters of civic participation as one of the strong enablers (Putnam, 1993; Harris, 2002). The recognition of the concept of social capital in development initiatives has increased remarkably with the realisation of the need for people's participation and human-centred approaches to development. Due to the failure of the International Monetary Fund (IMF) and The World Bank (WB) propelled neo-liberal, macro-economic approaches to development (Dollar and Svensson, 2001), the efforts have largely been on shifting initiatives towards more comprehensive, people-centred approaches to development.

The significance of building cohesive, sustainable communities and ensuring the well-being of the vast majority of the people is increasingly regarded as the ultimate purpose of development (Qureshi, et al., 2009; Gaude and Peek, 1976; Chenery, et al., 1975). The essence of social capital, as asserted by Putnam, is to build cohesive societies and true communities, where citizens are sustained by being connected to each other (Putnam, 1995). Social capital is further regarded by Lin (1999:30) as "the investment in social relations with expected returns." Bayat (2005:6) indicates that even though social capital does not constitute all the resources needed by human beings, it can create opportunities for people to access resources from various groups of people. On the same note, Woolcock and Narayan (2000:226) add that "the basic idea of social capital is that an individual's relationships with family, friends and associates constitute an important asset," which can yield significant benefits. Bourdieu argues that "the volume of social capital possessed by an individual or a group by virtue of belonging to a network, determines the resources, actual and potential, that they can accrue" (Bayat, 2005:6; Bourdieu and Wacquant, 1992:119). In this context, social capital is generally seen as a non-physical, non-economic asset through which non-monetary but also monetary benefits can flow in society. It constitutes an important part of human

relations, whose effects can translate into human well-being. This research will, therefore, place social capital within the sustainable development agenda in the South African context.

However, not all theorists believe that the concept of social capital is entirely useful, or that it is a panacea for all social ills. Navaro (2002) argues that social capital can bring about competitiveness and division in communities by producing what he refers to as 'social capitalists'. He argues that an individual's ability to compete for resources and rewards is enhanced by the networks of which he or she is a part, and the volume of social capital that he or she is exposed to (Navaro, 2002:426). Thus, social capital in communities can subsequently be reduced to accumulating more capital for individuals to compete more (Navaro, 2002). Also, Gertler, et al., (2006) in their article entitled "The Role of Family and Community in Helping Insure Living Standards against Health Shocks," find little support for the hypothesis that social capital is beneficial to the poor. Furthermore, Woolcock and Narayan (2000) argue that social capital does not only have benefits but it also has costs.

Nevertheless, these criticisms do not suggest that social capital is not useful at all. That social capital can have benefits for individuals, groups and communities can no longer be denied. There is substantial evidence that social capital can yield benefits for people in real life situations.

1.5 Research methodology

This research used a combination of both qualitative and quantitative approaches to research. Qualitative methods – interviews and focus group discussions – were used as the methods of data collection in a case study as a qualitative inquiry. A survey using questionnaires, and documents review were adopted as the methods of data collection in a quantitative inquiry. These methods will be discussed in detail in chapter six. The undertaking of the research was informed by both qualitative and quantitative research paradigms – interpretivism and positivism respectively. These research paradigms will also be discussed in chapter six. Both probability and non-probability sampling methods were adopted in the selection of the study sample. The study sample size and sampling methods, together with the general research methodology, will be reflected in detail in chapter six.

1.6 Chapter outline

This first chapter provides the introduction and general background of the study. It includes the objectives of the research and the context of the study. It also introduces the theoretical framework upon which this research is predicated. The next chapter, chapter two, consists of the discussion of the place of ICT in rural development processes. It first provides a brief history and evolution of the concept 'development' and then discusses the role of ICT in development. It further discusses how ICT can be integrated in rural areas in an attempt to catalyse rural development processes. Chapter three focuses on an alternative model of ICT4D, the Living Lab model, and shows its potential in addressing some of the shortcomings of ICT engagement in rural development processes, which are reflected in chapter two.

Chapter four provides the discussion on social capital as the theoretical framework that provides the premise for this research. The chapter also links the Living Lab model with social capital, exploring how the Living Lab model can influence social capital. Chapter five then incorporates the literature in chapters two, three and four into the South African context. It explores the place of ICT4D and social capital within the South African sustainable development agenda. Chapter six describes the methods, procedures and techniques adopted in carrying out the study, in order to respond to the objectives outlined in section 1.2.

Chapters seven and eight both present and analyse data, and discuss the findings in responding to the objectives of the study. The discussion of findings will give reference to the literature relevant to the findings, as well as the theoretical framework as discussed in chapter four. Finally, chapter nine will draw conclusions based on the findings of the study against the objectives. Recommendations will be provided at the end based on the findings of the study.

CHAPTER TWO

Information and Communication Technology (ICT) for Rural Development

2.1 Introduction

Information and knowledge are two of the key aspects in development processes. The global knowledge community recognises and supports the use of ICT, such as computers, the Internet and mobile phones for communication, information access and knowledge creation. Rural, marginalised communities have, however, long been excluded from this global knowledge economy. This is partly because the use of ICT requires certain resources, including infrastructure, networks and the ability to utilise the devices, which are usually inadequate in rural areas. Furthermore, the use of ICT in rural communities is restricted by socio-economic, cultural and geographic characteristics. The field of ICT4D explores ways of engaging such technology at the different levels of development, and how this can be applicable at grassroots level.

This chapter will explore the need for ICT in rural development processes. Ultimately, this study explores the influence of the engagement of ICT in rural areas in the creation and cultivation of social capital and how this can, in turn, contribute to participatory and innovative rural development. This chapter will begin by discussing rural development, beginning with a brief history and evolution of development as a concept. It will then discuss how there has been a transition towards a human-centred approach to development, followed by how there has been a shift towards the inclusion of rural communities. Finally, the chapter will look at the background of ICT4D, in order to eventually come to the discussion on the engagement of ICT in rural development processes.

2.2 Rural development

Development is a complex concept. The literature and agenda of development continuously evolve as human beings pursue alternative approaches to improving their way of life. The basic idea of development is ‘life improvement’, and that in itself is inclusive of very complex dimensions such as social, economic, political, environmental and health aspects of society. Hence, it is critical that the focus of discussion in this section be clearly outlined. While the background and progress of development as a concept and initiative will be discussed, the focus of this section will ultimately be on rural development.

2.2.1 The history and evolution of development

The idea of development, which is the betterment of life, became significant in the period following the Second World War (Rapley, 1996). In the years leading up to this War, "development was considered largely synonymous with industrialisation" in European countries, which meant that it was solely measured by the production of goods and the accumulation of money (Rapley, 1996:1). After the Second World War, the challenge was to rebuild the countries which were shattered by war. The Western countries confronted this problem by adopting reconstruction policies, which led to the establishment of multilateral financial institutions such as the International Bank for Reconstruction and Development (IBRD) – which later came to be known as the World Bank (WB); the International Monetary Fund (IMF); and the International Trade Organisation (ITO) – now known as the World Trade Organisation (WTO) (Samasuwo, 2006; Rapley, 1996). These institutions were created to help these countries in their transformation process after World War II.

The transformation process involved changes in social, economic and political systems. This transformation process proved to be significantly successful in bringing about the desired changes in the Western world. The Western countries then decided to introduce their transformation policies into the newly decolonised countries of the 1960s in Africa, Asia and Latin America with the aim of helping them also to move towards 'modernisation' (Coetzee, 2001:28). The concept of modernisation refers to "the total transformation that takes place when a traditional society changes to such an extent that new forms of technological, organisational and social characteristics appear" (Coetzee, 2001:30). During this period, referred to as the 'development era', the so-called under-developed countries would be assisted in making the transition from their social, political, technological and economic traditions into the new Western ways of life (Coetzee, 2001:30). Modernisation theory, therefore, became the template upon which the newly decolonised countries would predicate their structures for transformation (Coetzee, 2001:29).

Modernisation theory incorporated a very radical transformation that these traditional societies had to undergo in order to become 'modernised'. This transformation process included dimensions such as "the political (the search for democracy), social (a vibrant civil society) and economic (true capitalism)" (Coetzee, 2001:30). Even though modernisation incorporated multiple dimensions of society, the economic spectrum seemed to dominate most of its processes (Coetzee, 2001:31). Economic stabilisation was regarded as the driving

force for transformation in all other aspects. According to Coetzee, modernisation was characterised by the following economic aspects: "extension of markets, expansion of business interests, broadening of formal and informal trade sectors, credit facilities, improvement of infrastructure and new technologies" (2001:37-38).

The under-developed countries did not have the economic capacity to even begin such an extensive economic shift, and so the Western, so-called developed countries, established a system which was meant to help under-developed countries move out of poverty into growth. The foreign aid system was then put into place in order to assist these poor countries in their pursuit of transformation (Moyo, 2009). The promotion of economic stability would then be translated into 'development' in the post-war period. In this context, the most dominant theories and initiatives of development were based on economics and its activities, conceptualising development in terms of financial stability. Development was commonly measured by the Gross Domestic Product (GDP), which is the value of all goods and services produced for consumption by the country in a given period of time, usually a year (Baumol, 1986:1075). While modernisation resulted in a successful transformation in most of the Western countries, it did not bring the same outcomes in African, Asian and Latin American countries due to delayed differentiation, integration and adaptation processes (Hamilton, 1992).

In the 1980s, development promotion shifted from "financing investment to endorsing policy reform" (Dollar and Svensson, 2001:896). This orientation arose out of the belief that developing countries' development challenges could be accounted for by their poor policies (Dollar and Svensson, 2001:896). The IMF and WB, therefore, propelled the establishment of neo-liberal, macro-economic policies, among which was the Structural Adjustment Programmes (SAPs) (Dollar and Svensson, 2001:894). SAPs are financial loans tied to IMF/WB conditionalities (Reed, 1992). The conditions of the SAPs included: "reductions in government spending, privatization, higher interest rates, currency devaluation, reduction of tariffs and other trade barriers, and liberalization of foreign investment regulations and labour laws" (Mazur, 2004:65). These SAPs, together with their conditions, are criticised for not only being unhelpful to the poor but also adding to the structural causes of poverty (Mazur, 2004). The SAPs effects on development have thus been profound and controversial (Reed, 1992). For many years since the establishment of SAPs the affected countries have still not managed to stabilize their economies (Rodrik, 1990:933). Instead, SAPs were criticised for

creating dependency on the developed countries, and not necessarily improving the lives of the vast majority of people in developing countries.

The conventional development practice emphasises "capital transfers, formal planning, specialization and central government control," and argues that increasing financial transfers is a panacea for poverty and other problems of under-development (Korten, 1987:146). However, the empirical reality reflects the continuous debt crisis in poor countries, and unimproved livelihoods of the masses. In the 1980s, debt crisis intensified largely in developing countries, where many countries were unable to meet their repayments (Gasper, 2004:11). Between the mid-1980s and early 1990s, developing countries paid out about $209 billion more in interest payments and principal repayments than they received in loans (Gasper, 2004:11). These countries' debt crisis rose from 5% in 1970 to 139% in 1990 (Gasper, 2004:11).

This led these countries into more economic turmoil than they were in before the intervention of the SAPs. Studies show that many developing countries entered the 21st century with extremely low levels of income poverty, measured by "international purchasing power standards of $1.00 per person per day" (Mazur, 2004:62). Furthermore, these countries are characterised by high rates of inequality, unemployment and illiteracy, which reflect the failure of neo-liberal development policies.

Critics argue that the SAPs were designed in a way that did not take sustainability into cognisance, and that to correct this there should be sustainability in development rather than just economic liberalization (Rodrik, 1990). In addition, in her book 'Dead Aid', Moyo (2009) argues that foreign aid has been a disaster in developing countries, and it is actually the structural cause of the dysfunctionality of developing countries' governments. Moyo argues that foreign aid has caused governments in developing countries to abdicate their responsibilities of actively striving for development in their own countries (2009). In order to bring an end to this disaster, the call to the global community has been to move away from one-sided economic, capital-centred approaches to more human-centred approaches to development, and to realise that developing countries themselves have a lot to offer for not only their own development but for human development progress in general (UNDP, 1990; 2013).

2.2.2 From economism to human-centred development

The failure of market-based, macro-economic approaches to development led to the shift toward more comprehensive approaches. Development specialists began to challenge the prevailing view that GDP measures are the major determinant of development (Bebbington, et al., 2004; Keita, 2009). Some critics even labelled development as a failed industry (Steyn, et al., 2011). This led to the refocusing of development strategies onto the emergence of people's participation as a central concern (Roodt, 2001:474). It led to an increasing recognition of the need for development strategies which were not primarily capital-centred, seeking, instead, to involve people more directly in development processes (Oakley, 1995). Initially, these strategies emphasised the idea of human resource development as an alternative to existing economic and capital-centred methods (Oakley, 1995: unpaged). However, in the late 1980s the argument was refocused to more people-centred development strategies (Oakley, 1995). In 1990, "the United Nations Development Program (UNDP) brought out the first Human Development Report (HDR), prepared by a distinguished team of economists" (Bhanoji Rao, 1991:1451). The fundamental message of this report is that while it is essential to measure economic development in GDP terms, it is also imperative to consider how this translates into human development in a more holistic manner (Bhanoji Rao, 1991:1451).

Gasper (2004) uses the term 'economism' to refer to the idea that most of life should be understood, valued and managed in terms of economic calculations, and that 'the economy' is a sphere of life whose growth is the essence of development. He argues that this is a very limited understanding of the term (development) that is used in so many fundamentally distinct ways. This includes: "long-term economic growth and change, societal progress, planned intervention and advanced livelihoods" (Gasper, 2004:18). The economy is, therefore, one aspect of life which should not be regarded as either an isolated aspect or as an umbrella aspect inclusive of all other dimensions of development.

A comprehensive approach to development would thus be one that recognises and acknowledges that development is clearly complex, comprising social, economic, political, and environmental concerns, and that, in any case, conceptualisation and initiatives of development should be able to fully capture this complexity (Bell and Morse, 2003). Therefore, besides well-known economic indicators such as GDP, there are other aspects such as information and knowledge/literacy, social assets (relationships), sustainable agriculture,

land quality, health care, education, governance and security, and livelihoods that, depending on each individual context, should be included in development concepts and initiatives.

According to developmentalists, the following principles should be incorporated in a comprehensive approach to sustainable development (Chapman, et al., 2003:2; Carney, 2003:13):

- *People-centred*: setting the priorities and objectives upon what matters most to the people, and making people's empowerment the fundamental goal that guides actions at different stages.

- *Responsive and participatory*: allowing the target populations to be the key actors in identifying their own needs and priorities. All initiatives should be geared towards helping people set their priorities and respond to them.

- *Multi-level*: development is clearly complex, and it is crucial to recognise and understand that strategies should be structured according to the different stages in the processes of development.

- *Conducted in partnership*: stakeholder analysis and sectorial collaboration can go a long way in ensuring cohesion for sustainable progression.

- *Sustainable*: incorporating several dimensions – economic, ecological, institutional, social and livelihoods – in order to ensure long-term and comprehensive development.

- *Dynamic*: flexibly managing the complex and multi-faceted commitments in the processes of development.

Many writers, including Gaude and Peek (1976) and Chenery, et al., (1975), noted a crucial fact that developing countries did not experience significant change in improving the living conditions of the masses, in spite of the increase, in terms of monetary figures, in the post-World War II period. They came to the conclusion that development involves more than economic growth and changes in economic structures (Gaude and Peek, 1976; Chenery, et al., 1975). This claim is echoed by Qureshi, et al., (2009:3) in their assertion that development is not just about economic calculations but also, or even more, about improving people's lives and their communities.

South Africa's mining sector, for instance, has been profiteering for decades from the mines. While this sector contributes significantly to the economic production (GDP) of the country as a whole, the masses living in the communities surrounding the mines still have poor quality of life (Cronje and Chenga, 2009:413). These communities are characterised by high illiteracy rates, dependence on the mining companies, and are "often exposed to toxic environmental hazards from mine operation waste" (Cronje and Chenga, 2009:414). A comprehensive approach to development thus encourages sectors and organisations to take on social responsibilities, and work towards more holistic and sustainable development in their areas (Cronje and Chenga, 2009). This approach recognises that developing communities comes with developing people as individuals, groups and communities. This means helping people realise their potential and helping them build their capacity. It recognises people's relationships as important assets through which livelihoods can be enhanced. In this regard, this research intends to explore the relevance of ICT in building cohesive rural communities through networks, and how this can contribute to innovative rural development and civic participation.

A sustainable, human-centred approach, as an alternative to traditional approaches to development, puts human beings and their well-being at the centre of interventions and initiatives. It entails "long-term transformation and improvement, and continuous betterment of the livelihoods of the people in a given social context" (Cronje and Chenga, 2009:414). This, therefore, means that the ultimate purpose of development is not just material well-being, but to build a cohesive society which enables the people in it to participate in development matters (Maaga in Cronje and Chenga, 2009:413). This approach to development requires that communities, including rural communities, be recognised as potentially significant, active participants in the pursuit of their own betterment of life.

2.2.3 Inclusion of rural marginalised communities – rural development

Due to the failure of economism in improving the livelihoods of the masses, in the 1980s it was estimated that approximately 800 million people, or about 40 per cent of the population of the developing countries, still lived in absolute poverty, the majority of which resided in marginalised, rural areas (Chambers, 1983:14; Korten, 1980:481). These estimates still apply in the 21st century. Cronje and Chenga (2009) affirm this in their assertion that most third world countries, if not all, have benefited very little or have even become worse off due to capital-centred development. For decades, rural communities have been perceived as mere

recipients of development outcomes, with countries' officials and the urban rich at the front line in development processes. The assertion below is a direct reflection of this claim:

> *"The tragedy of under-development is not that the ordinary people have remained poor or are becoming poor, but that they have been inhibited from developing as humans. Elites have taken over the right to develop society, and by this very act and claim distorted the natural and profound popular notion of development" (Rahman in Oakley, 1991:1).*

As a result, the gap between the rich and the rural poor has been widening, leaving the majority of the people in dire poverty. This top-down approach to development also led to the creation of a dependency syndrome among the rural poor. In response to this challenge, an alternative approach has been to bring rural communities into full participation in development processes (planning, implementation, benefits and evaluation) (Korten, 1980). The table below, adopted from Esman and Uphoff (1984) is an illustration of the two approaches to rural development.

Table 2.1 Approaches to rural development

	I	**II**
Modes of operation	**Top-down**	**Bottom-up**
Principal mechanisms	Bureaucratic organisation	Voluntary associations
Decision makers	Administrators and experts	Leaders and members
Guides for behaviour	Regulations	Agreements
Criteria for decisions	Policy and best means to implement it	Interests of members
Sanctions	State authority backed by coercion	Social pressure

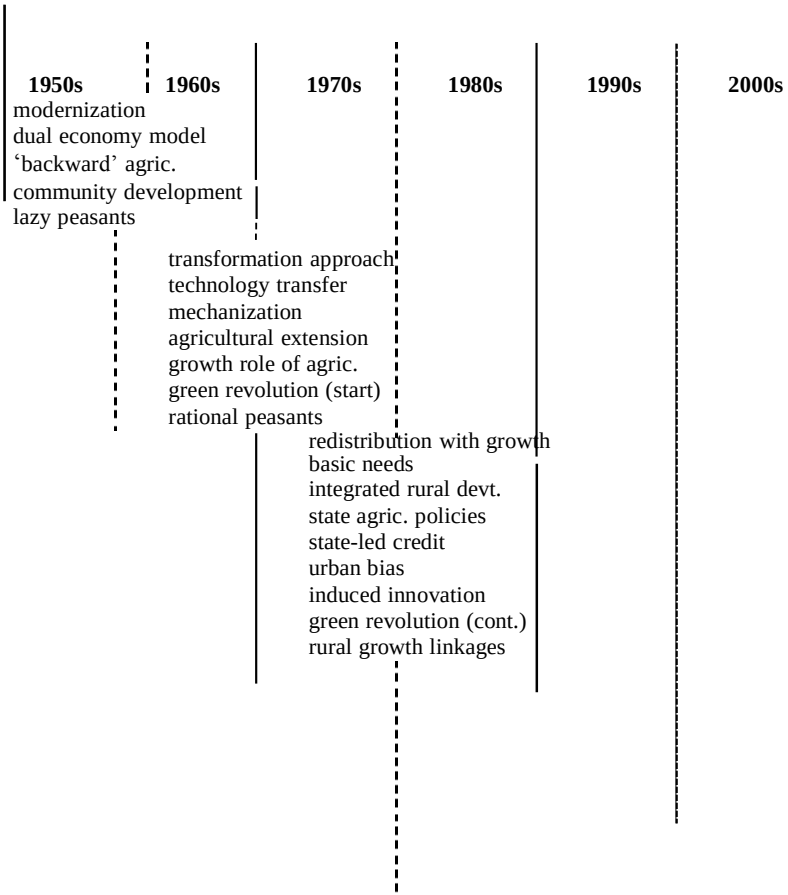
Table 2.1 Approaches to rural development (Esman and Uphoff, 1984).

The first approach is the traditional top-down approach, with governments' administrators and experts at ministry and department levels making decisions for the local people, based on the policies designed and implemented by the same officials. This approach often misses the direction and actual needs of the local people, due to uninformed decisions that are made without the involvement of the local people. The second is an alternative bottom-up approach to rural development. This approach recognises that rural people are experts in their own communities, and in order to come up with workable, effective strategies for rural development, the participation of the local people should be embraced throughout all stages of development. These same principles and assumptions apply in the establishment and

integration of ICTs in rural development processes. Collaborative relationships with communities should be valued by the major sectors of society, such as the private sector and the government, to ensure effective implementation of ICT solutions and services.

The above assertion, however, does not mean that rural development is a new phenomenon. According to Ellis and Biggs (2001:439), rural development has been practiced for over half a century. In the figure below, adopted from Ellis and Biggs (2001:439), an outline is given of the evolving themes in rural development from the 1950s until the 2000s. From the figure, it is evident that the practice of rural development has, indeed, come a long way. However, it was only in the 1990s when the fact that sustainable rural development could not be fully attained without the full participation of the rural people themselves was realised in rural development practices. This realisation came with the establishment of strategies which included "participatory rural appraisal, actor-oriented rural development, stakeholder analysis, rural safety nets," etc. as reflected in the figure (Ellis and Biggs, 2001:439). These strategies required decentralisation of services in order to allow for full participation at grassroots level. Decentralisation and local governance as enablers of participatory rural development were then implemented mostly in the 21st century (Ellis and Biggs, 2001:439). The establishment of ICT4D projects in rural communities is a trend that followed decentralisation of services to grassroots level in the information age.

Figure 2.1 Evolving Themes in Rural Development



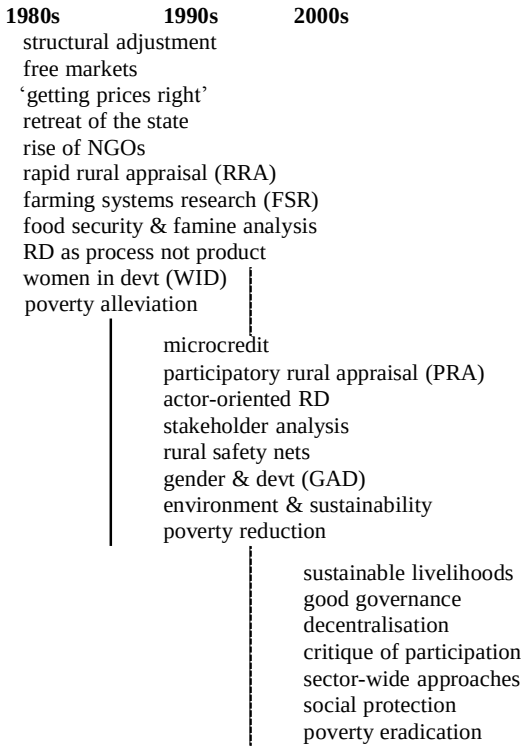


Figure 2.1 Evolving Themes in Rural Development (Ellis and Biggs, 2001:439).

Schumacher (in Oakley, 1991:3) argues that development did not begin with physical goods or financial resources, but with people and their education, organisation and discipline. In this regard, we cannot talk about development without regarding the people who bring about that development. It is against this background that the focus and essence of rural development shifted to rural people as active participants. As an alternative to top-down planning, more efforts are being channelled towards decentralized, local approaches to development (Uphoff, 1980). While rural communities may comprise mostly non-educated, poor people, they do have inherent resources which can be cultivated for their own development. Social networks, social organisations and cultural heritage are examples of some of the assets available in rural communities, which can be cultivated to enable sustainable development.

Oakley (1991:8), therefore, asserts that rural development should be designed for cultivation and reproduction of local resources in order to increase the productivity of rural communities. In addition, Roodt (2001:473) argues that allowing people their freedom to participate in the pursuit of their own development also transforms them as people; it gives them an awareness of who they are and what they are capable of. Thus, participation leads to self-actualisation, which enables the oppressed people to challenge the dominating classes (Roodt, 2001:475).

Rural communities, therefore, need to be allowed to participate actively in the affairs of their own development in order to empower them through increasing their self-actualisation.

At the heart of rural development is self-reliance. According to Hope (1983: 455), self-reliance means "the autonomy of decision-making and full organisation of a society's own resources under its own initiative and direction." Development is a continuous process which is only achievable when people have the opportunities and abilities to participate in their own territories and thus attain self-reliance. However, the important questions which one would ask are: What does it take for a society to actively participate in the affairs of its own development and progress? What does it mean to say the community has the opportunity, ability and capacity to participate?

In this research, it is argued that in this information age, the answers to these questions should be reflective of the global knowledge community context. The global knowledge community sees information and knowledge as key assets in development processes, which makes access to information and knowledge the priority in development planning. It means that people should be able to access information, information that gives them knowledge, knowledge that empowers them, that enables them to design solutions to their own problems. The question of access cannot be over-emphasised in development conceptualisation and processes as it is at the core of what enables development to take place. Sen (1999:3) reflects the importance of access in his definition of development: "the process of expanding the real freedoms that people enjoy." For Sen, development is not a simple question of growth in GDP or individual income, but the removal of major sources of 'unfreedom', that which deprives people of their wellbeing (1997). This, therefore, positions 'access' at the foundational level in development processes. Any form of deprivation which may inhibit the person's wellbeing constitutes a lack of freedom and, therefore, a lack of development. As such, the deprivation of access to ICT can, to a significant extent, explain the marginalisation of rural communities in the information age.

While the inclusion and participation of rural communities has been a considerable practice in the 21st century, the ICT-based information society has not significantly included rural communities in development processes. In fact, the use of ICT as a tool for development in rural communities has not been expressively apprehended by the knowledge society. According to Thinyane and Terzoli (2009:1), traditionally digital marginalisation and exclusion were understood to be "a factor of connectivity to the Internet, affordability of the

technology, and the capability of the communities to utilise the technology." While ICT4D interventions have been undertaken to address these specific factors of marginalisation, it remains evident that rural communities are still excluded from the global knowledge society (Thinyane and Terzoli 2009:1). Unwin (2009:9) asserts that technology has become a tool for isolating the poor, enabling the privileged to maintain their higher economic, political and social positions. Furthermore, the lack of ICTs in poor nations has not been customarily categorised under basic needs such as food, shelter and health care (Pigato, 2001:2). This trend is one of the factors that exacerbate inequalities within societies, which further inhibits development. The following sections will consist of a discussion of the background, the role and the contribution of ICT in development, and how this can be applicable in rural communities.

2.3 A background of ICT for Development (ICT4D)

"At the end of the 1990s and in the early 2000s, there was widespread euphoria about the potential of ICTs to have a significant impact on development" (Kleine and Unwin, 2009: 1045). ICTs have marked the history of what Castells (2000b:696) refers to as the 'information age'. The world has now entered an era in which "human societies perform their activities in a technological paradigm, constituted around microelectronics-based ICTs and genetic engineering" (Castells, 2000a:5). While the theories of information and knowledge societies are not historically new, as Castells indicates that information has always been central to all societies, the information age came with completely new and greater aspects in the history of technology (2000a:6). It came with aspects different from the technologies which prevailed during the Industrial Revolution, or with the previous Information Revolution of the last two decades of the 20th century (Castells, 2000a:6).

ICTs are generally defined as "tools that enable communication between people through electronic means of capturing, processing, storing and communicating information" (Pade-Khene, et al., 2010b:597). Examples of such are mobile phones, computers, television and network applications and services such as e-government, e-commerce and e-learning. E-government is defined as the use of ICT to improve the "efficiency, effectiveness, operations, service delivery and accountability of government" (Mphidi, 2009: unpaged). E-commerce refers to a virtual commercial platform which allows users to advertise, buy, and/or sell products online (Lambert, 2008; Makombe, 2011). E-learning is defined as learning that

utilises an information network – the Internet, whether wholly or in part – for course delivery, interaction and facilitation (Tinio, 2003:4).

ICTs are characterised by networks of knowledge and information sharing, which are not limited by either time or distance. These new technologies have thus transformed the form of information, and have turned it into a commodity to be exchanged, sold, transferred and used within the evolving context of development (Gibbs and Tanner, 1997:766). Today ICT4D is an emerging and exciting area of research and practice (Kleine and Unwin, 2009:1045). Many of the developed countries are building up their economies based on knowledge – education, science and research and development (COFISA, 2010:1). Also, the majority of developing countries are today resource-based economies at an early stage of building their knowledge societies (COFISA, 2010:1). ICTs have become popular tools for communication and information dissemination in the creation of knowledge, which supports development.

In 2003, a report entitled 'Building the Information Society', which was released after the First World Summit on the Information Society that was held in Geneva, identified the significant role that ICT could play in strategies for African development, with reference to the Millennium Development Goals (MDGs) (Padovani, 2004:187; Heeks, 2010:629). The report notes that "the New Partnership for African Development (NEPAD) includes a strong focus on the dual strategies of ICT Development (ICTD) and ICT for Development (ICT4D)" (Colle, 2005:1). This suggests, therefore, that the role of ICT cannot be limited to communication and information access but also to how the enabled communication and information dissemination translates into development. The main goal of this research draws from this very assumption that ICTs are not just I (for information) and C (for communication) but ICTs whose application can contribute to development. Perhaps this can be re-emphasized by what is reflected in the agenda of the Second World Summit on the Information Society, which was held in Tunis in 2005: "ICT4D needs to be placed in the context of the growing importance of the role of ICTs, not only as a medium of communication but also as a development enabler" (WSIS, 2005: unpaged).

According to Brundenius and Mawoko (2010: unpaged), the current economic revolution has partially been enabled by advances in ICT, which enable information dissemination and knowledge creation across the globe. However, in this thesis it is argued that while societies are moving forward in an ICT-based knowledge age, rural communities are segregated and left behind as though they are not part of the global village. This segregation manifests itself

particularly in the area of access to the Internet and computers. Gillwald and Stork (2008:2) affirm this in their assertion that, while there has been a noticeable success of mobile communications in the last decade, studies show that Internet penetration, particularly in rural communities, remains significantly low in Africa. Upon this realisation, the field of ICT4D seeks to find effective ways of engaging ICT at different levels of development, which can be inclusive of rural, marginalised communities. This research explores how effective engagement of ICT in rural, marginalised communities can influence and complement rural development activities in the information age. The following section consists of a discussion on the role of ICT in development, and will be followed by a discussion on how that can be applicable in rural communities.

2.4 The role of ICT in development

The point of departure in understanding the use of ICT in development is apprehending the meaning of development. Prakash and De' (2007:263) argue that while there is no doubt that ICT usage is the answer to many developmental problems, including income growth, governance, education and health, estimates show that many ICT4D initiatives fall short of achieving their intended objectives. They account this failure to "a restricted conception of both development and technology use which limits the nature of the usage and potential of ICTs" (Prakash and De', 2007:263). Therefore, the design of ICT4D projects should be guided by the context of development, making ICT4D projects applicable at different levels of development, including rural development.

ICTs have so far, without any doubt, had an enormous impact on the economy, health care, education, governance, social capital and national security (Shanker, 2008:50; Prakash and De', 2007:263), to different extents in both developed and developing countries. Thompson (2008:822) and Brown and Grant (2010:97) also affirm that ICTs have the potential to act as catalysts for economic and social development by enabling the expansion of "economic opportunities, political freedoms, social facilities and transparency guarantees." Developing countries are engaging information-based strategies in attempting to achieve their vision of building their socio-economic resilience, improving democratic and transparent governance, health care systems and educational systems (Sein and Harindranath, 2004:15). Hence, ICT has an important role to play in national development. According to the UNDP's Human Development Report (2001:1), "all over the world there are high hopes that ICTs will lead to healthier lives, greater social freedoms, increased knowledge and more productive

livelihoods." The discussion on the role of ICT in development in this section will be based on Sen's summary of developmental indicators, classified in four main categories: economic opportunities, political freedoms and transparency guarantees, social facilities and the development of 'knowledge societies' (1999).

2.4.1 Economic opportunities

In this section economic opportunities refer to conditions and tools that aid people to move out of poverty and other forms of lower standards of living into better livelihoods. Castells and Cloete (2011:9) use the term 'informationalism' to refer to the new socio-economic organisation, which has become quite predominant since the turn of the 21st century. For them, this form of organisation is characterised by the widespread use of micro-electronic digital ICTs, which support the acceleration of economic activities (Castells and Cloete, 2011:9). As indicated previously, ICTs are not just a simple question of technology; how they contribute to an economy is reflected through their adoption and application (Wang, 1999). The basic use of ICT in economic development is in its ability to allow for the "creation, expansion, and exchange of information and knowledge of the economy and its activities in the information society" (Castells and Cloete, 2011:9).

Furthermore, ICTs induce flexibility and effectiveness in the economic production, management and distribution processes (Castells and Cloete, 2011; Heeks, 2002a). This can be applied at all levels and in all contexts in the economic chain. ICTs have multi-faceted and direct impacts on poverty reduction and on promoting the standard of living in general (Pigato, 2001; Chapman, et al., 2003; UNDP, 2001). In fact, according to the UNDP's Human Development Report (2001:2) "the 20th century's unprecedented gains in advancing human development and eradicating poverty came largely from technological breakthroughs."

While there is no doubt that ICTs can contribute positively to any society's economy, the Human Development Report states a very crucial factor: "without innovative public policy, ICTs could become a source of exclusion, not a tool for progress, the needs of the poor could remain neglected" (2001:3). What this calls for is an inclusive policy reform, which will enable engagement of ICT at all levels, including the poor and marginalised. This makes government's accountability and transparency, as well as participation of the ordinary people, essential aspects when it comes to the integration of ICT in development processes.

2.4.2 Political freedoms and transparency guarantees

Current trends in local government are increasingly bringing out the relevance of ICT in governance. Of particular interest are three trends outlined by Odendaal (2003:588): the first is "an increasingly developmental role for local government, which extends beyond the traditional role of service provision." Local governments are challenged to be more pro-active and inventive to bring about socio-economic development in their areas (Odendaal, 2003:588). The second is "an emphasis on networks and collaboration between governments, the public and other stakeholders" (Odendaal, 2003:588). The last trend, related to the above, is "an emphasis on consultation with and participation of communities, allowing for continuous two-way communication between governments and citizens for greater government's accountability and transparency" (Odendaal, 2003:588). Central to these trends are three key elements: inventiveness, information sharing and communication. It follows, therefore, that ICT has a noteworthy role to play in governance.

The benefit of ICT in ensuring political freedoms and transparent governance lies in its capacity to enable information access to citizenry, and communication between citizens and the government. Applications such as e-government have become enabling tools for that kind of scenario. Castells (2000:7) believes that ICTs are introducing new forms of relationship between the state and society. For him, societies are gradually – and faster in other parts of the world – moving towards more integration between states and communities (Castells, 2000:6). In this regard, this research attempts to explore the level of communication between rural communities' population and the government, and how that can be strengthened through the use of ICT.

According to Jaeger and Thompson (2003:290), through e-government, not only governments but also the private sector and ordinary citizens can acquire greater benefits. Jaeger and Thompson further maintain that "the core transformative capacities of ICT include its potential for radically shrinking communications and information costs, maximizing speed, broadening reach and eradicating distance" (2003:389). The use of ICT applications and services can enable governments to create spaces of information dissemination, communication with the public and service delivery, as well as participation forums. This can thus support the vision of governments globally, of encouraging citizen participation and increasing governments' effectiveness and accountability, which have in practice only been paid lip service in political manifestos.

Pigato (2001:3) asserts that by having access to information which enables the creation of knowledge, the poor are empowered to comprehend their own circumstances and to articulate their own opinions and needs. While this may be the case, the poor in rural communities are deprived of relevant information and knowledge due to the changing nature of information dissemination and knowledge creation, which is largely influenced by ICTs. This deprivation prevents the rural population from fully understanding not only their circumstances but also their role in development. This becomes evident where there is low participation of rural people in development activities or projects, despite the efforts of other sectors to encourage community involvement. Integrating rural communities into the information society can, therefore, give them access to relevant information which leads to empowerment. This research aims at exploring the relevance of a collaborative model in attempting to engage ICTs in rural communities.

2.4.3 Social facilities

Universally, social networks have remained a space in which human beings interact and form different types of relationships. However, the nature of social interactions and networking has changed noticeably in the information age. As indicated by Smoreda and Thomas (2001:3), the means of communication affects the nature of communication and, to a larger extent, the nature of the networks formed. ICTs have changed the nature in which people socialise. These new technologies allow for the creation of new forms of networks and organisations in all domains of economic and social life (Mansell and Wehn, 1998:8). ICTs have thus changed the ways and the levels at which people interact. Now social interactions are no longer limited to either distance or time. People can exchange information and interact anywhere they are. While ICTs have changed the form and level of interactions within networks, Smoreda and Thomas (2001:3) maintain that the basis for social networks remains the same. Individuals' social relations remain the foundation of all social networks, irrespective of the methods and means of enabling their formation.

According to Mislove, et al., (2007:31), as with traditional forms of social networks, online or ICT-supported social networks "provide a basis for maintaining social relationships, finding users with similar interests, and for locating content and knowledge that has been contributed or endorsed by other users." The advantage, however, of online social networks, is that all these activities do not require physical interaction. Furthermore, virtual social networks are not only limited to micro level interactions. They also allow for the formation of groups and

platforms which enable networking, both at the local community level and potentially among much broader communities (Chapman, et al., 2003:7).

Social networks at the wider community level, such as regional and national levels, essentially help to bring the benefits down to the locally based organisations (Chapman, et al., 2003:7). A good example of such networks is an online-based organisation which enables networking and exchange of microfinance loans between farmers, entrepreneurs and institutions through the use of an online platform (Kiva, 2005). This platform enables connections of people potentially all over the globe, empowering them both economically and socially. According to Chapman, et al., (2003:4), "the reduction in the cost and time taken to travel to pursue social networking goals can also have a positive impact at a household level, with family members spending less time away and less money on transport." This research thus explores how ICT can help to not only strengthen existing social networks but also help people in communities to create new dynamics of social networks.

2.4.4 Development of 'knowledge societies'

Skills and knowledge have always been fundamental to economic production in all societies across the globe (Thinyane, et al., 2007:144). Communities in their day-to-day survival activities have always been supported by their indigenous knowledge. In agricultural production, for instance, "knowledge about farming seasons and different methods of farming supports and facilitates effective utilisation of primary resources (land, water)" (Thinyane, et al., 2007:144). ICTs with their inherent potential to improve the processing and distribution of information can thus support the improvement and cultivation of indigenous knowledge. Incorporation of ICTs in rural communities does not only improve access to information but also creates an opportunity for rural people to participate in the knowledge society.

One of the other ways to develop knowledgeable societies is through education. ICTs, if well incorporated into the education system, have greater potential to enable instant and easy access to information and support the creation of knowledge, as well as increase the effectiveness and relevance of education at different levels. Tinio (2003:6) affirms this in the assertion that "ICTs are potentially powerful enabling tools for educational change and reform. Different ICTs can help expand access to education, strengthen the relevance of education in the increasingly digital workplace, and raise the quality of education by helping to make teaching and learning into an engaging, active process connected to real life" (Tinio, 2003:6).

Broadcasting technologies such as radio and television have been significantly helpful in complementing the facilitation of education in various societies, including those in rural areas (Tinio, 2003:5). With modern technologies and the extended use of the Internet, applications such as e-learning provide a virtual platform, which enables effective interaction and the sharing of information between learners (Rosenberg, 2001). This form of learning is facilitated online through network/Internet-based technologies. This kind of interaction has a greater advantage of not being limited to distance, learners can interact with each other and with their educators anywhere they are. Garrison (2011) describes e-learning as representing a new era of distance education. For Garrison, e-learning has changed the speed and power of communication, and expanded the capacity of individuals to receive and use information (2011:4). Furthermore, the potential to transfer content through digital means to remote locations essentially reduces many of the expenses associated with barriers to information access in rural areas (Chapman, et al., 2003:17).

However, despite the rapid growth of e-learning applications and services (Garrison, 2011), it is worth admitting that most of the students, particularly in rural areas, have been deprived of access to such services. This deprivation is due to the lack of technologies such as computers and the Internet, which are required for the deployment of these kinds of applications. As a result, efforts have been made to find alternative ways of making such services more affordable and easily accessible. Advances in mobile technology, such as mobile phones, have led to more affordable access to such services (James, et al., 2011). This research explores an initiative which has the potential to integrate the schools, as part of the selected rural communities, into the information society, giving them access to ICT-aided teaching and learning.

2.5 ICT in rural development

As has been indicated earlier, the role and contribution of ICT cut across the different levels and spheres of development, and this is inclusive of rural development. In this section, the different aspects/characteristics of rural communities are explored, and how they can be linked to the engagement of ICT in rural development processes. This will include an outline of the opportunities and barriers of ICT engagement in rural communities.

2.5.1 Main characteristics of rural areas

The term 'rural' is often, if not always, associated with illiteracy, poverty, economic disadvantage, marginalisation and, to some extent, dependency (Akca, et al., 2007:405). While this relation may carry an element of truth, a one-sided and superficial approach to the analysis of rural communities may lead to misconceptions about 'rurality'. This one-sided approach is often needs-based, that is, it describes rural communities on the basis of what they need or do not have while, on the other hand, there is an asset-based approach to the analysis of rural communities, which focuses on what they have that can be cultivated. An analysis that focuses on only one of these approaches and neglects the other will certainly not be reflective of the entire truth about the subject. In this sub-section, different aspects of rural areas are indicated, focusing not only on what they are said not to have, but also on their inherent possessions. Ultimately, this provides insight into relating the characteristics to both the opportunities and barriers of ICT engagement in rural areas, which will be discussed in the sub-sections that follow.

A subsistence or domestic economy is one of the characteristics common to many rural areas. Farming and local trading are some of the common survival strategies in rural communities. Meert (2000: 321) highlighted some of the activities rural communities engage in as their means of cultivating a subsistence economy. These activities or strategies include agricultural production, animal husbandry and local enterprises (Cropper and Griffiths, 1994:250). While a significant number of people in rural communities manage to survive daily on subsistence farming and other domestic economic activities, other basic needs such as housing and education may present a more urgent problem. This is because, with a subsistence economy, only the immediate basic needs can be met, with no surplus available for other needs such as education and housing. Aliber and Hart (2009:450) indicate that agricultural production, for instance, is done under difficult conditions where rainfall is unpredictable and soil fertility is deteriorating. If this is done on a small scale level, then the effects of these inconsistencies may pose a note-worthy threat to the survival of those who depend on it.

As a result of the limitations of a subsistence economy in meeting basic needs, people in rural areas are often forced to migrate to urban areas in search of wage-based jobs. According to Barrios, et al., (2006:358), estimates show "that rural-urban migration has accounted for approximately half of urban growth in African countries between the 1960s and 1990s." This rapid rural-urban migration, which increased noticeably since the turn of the second half of

the 20th century, affected rural population densities. Low population density is to date another common characteristic of rural areas. There are a number of factors contributing to rural-urban migration. However, Aliber and Hart (2009:435) maintain that rural-urban migration is underpinned mainly by economic factors: the 'push' from agriculture (particularly subsistence), and the 'pull' of comparatively high urban wages, and this is a matter that both economists and non-economists agree with. This therefore, lowers agricultural production in rural areas and leads to growing unemployment in urban areas.

Due to the push and pull factors of rural-urban migration, the majority of the people remaining in rural areas are uneducated and technically unskilled. This trend, therefore, characterises rural populations as uneducated and/or illiterate. This further suggests that the majority of the people in rural communities are typically unemployed. As indicated by Statistics South Africa's Quarterly Labour Force Survey (2013:10), South Africa's unemployment rates hover around 26%, "with rural unemployment rates being even higher than that." This research explores the potential of ICT to integrate rural communities with the rest of the information society, and thus create opportunities for development in rural areas, potentially making rural areas more desirable places to settle in, not move away from.

Despite the down-side of most rural communities as reflected in the discussions above, there are other positive aspects that build and sustain rural communities. Strong social networks/bonds are some of the positive features of rural communities. Empirical research does reflect that strong social networks are a common characteristic in rural communities as compared with most urban areas. Many scholars and researchers in the fields such as community development and sociology indicate that people in rural communities are more likely to have higher levels of social bonds than people in urban communities (Beaudoin and Thorson, 2004; Hofferth and Iceland, 1998). Research further indicates that people living in rural areas are more likely to share resources with their neighbours than those living in urban areas (Hofferth and Iceland, 1998; Putnam, 1995). This research explores the influence and potential of ICT in strengthening social networks, both within rural communities and between rural communities and other sectors in the society, and how that can contribute to rural communities' development.

Social, cultural and ecological heritage are also some of the assets of rural communities. Reardon and Vosti (1995:1496-1497) outline a wealth of assets that some rural communities possess:

- Natural resources: composed of water (ground and surface), ground cover and its (bio) diversity (trees, bushes), wild fauna and flora, and soil/land;
- Human resource endowment: composed of education, health, nutritional status, skills and number of people;
- On farm resources: livestock, farmland, pastures, reservoirs, buildings, equipment;
- Off-farm resources: local off-farm enterprise capital and migration activity capital;
- Community-owned resources: such as roads, dams and social institutions.

For Reardon and Vosti, all these assets can be used to cultivate the flow of production and/or income (1995:1497). Again, while ICT may not necessarily be the answer to the re-generation and cultivation of all assets available in rural communities, with the growing possibilities and innovation in the technological sphere, a lot of wealth can be produced and/or reproduced through the engagement of ICT.

2.5.2 Opportunities for ICTs in rural areas

Following discussions on some of the aspects or characteristics of rural communities, this sub-section attempts to link these aspects with ICT in order to reflect how ICT can contribute to the development of rural communities. The diagram below, adapted from Akca, et al., (2007: 406), reflects some of the areas of ICT engagement that are applicable to rural communities. The discussion in this sub-section will be guided by the advantages of ICT in rural communities as reflected in the figure below, together with the aspects or characteristics of rural communities discussed above.

Figure 2.2 Likely advantages of ICTs for rural milieu target group

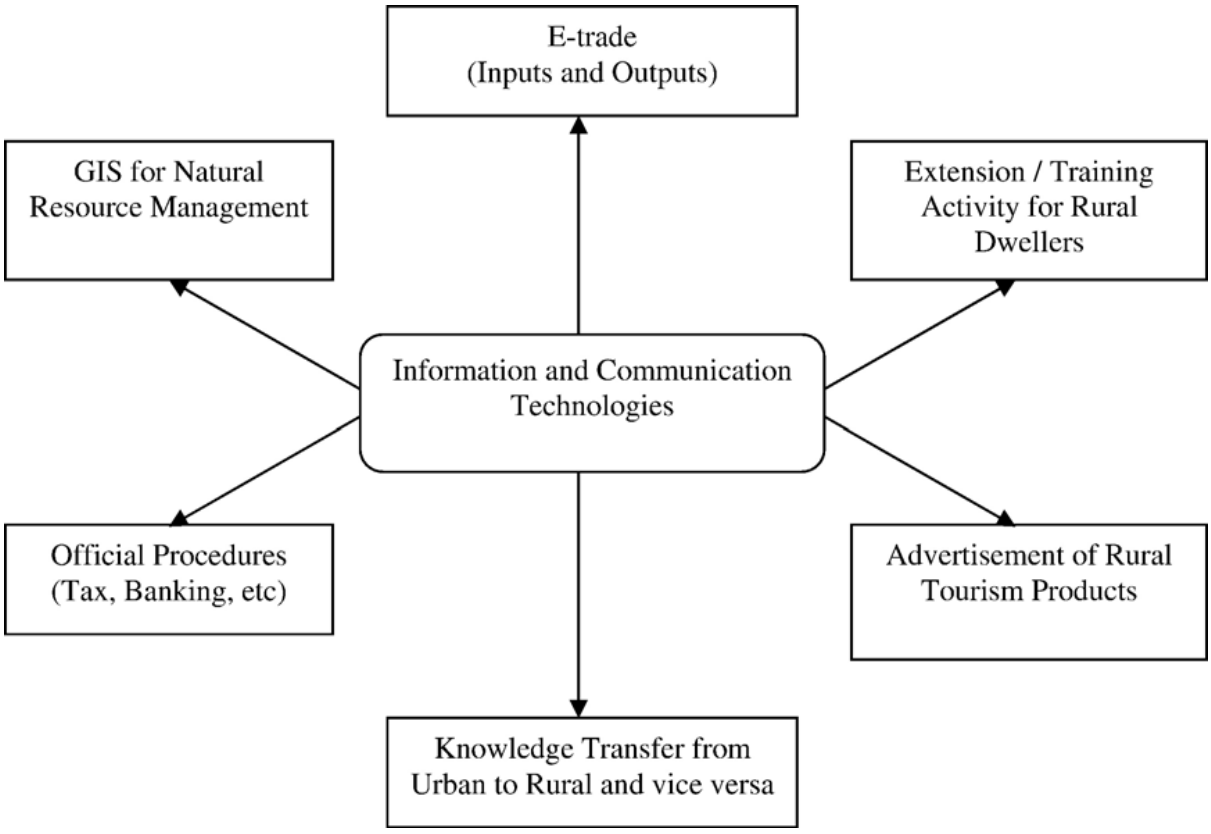


Fig. 2.2 Likely advantages of ICTs for rural milieu target group (Akca, et al., 2007: 406).

As shown in sub-section 2.5.1 above, small scale trading is one of the common survival strategies in rural areas. While this may be a common practice in rural communities, the challenge of rural entrepreneurs is often to expand beyond their territories and reach the surrounding regions or even beyond, in order to grow their local businesses. This is mostly because local rural enterprises are hardly known beyond their own regions, even when their products may be of interest to outside consumers. Akca, et al., (2007:406) affirm this in their assertion that one of the most significant problems of rural dwellers is the difficulty in selling outputs after production due to the limited market.

As a possible solution to this problem, ICT-supported commercial platforms can help break the boundaries and expand the scope for rural communities' economic activities, helping them to be integrated with the global economic society. In the figure above, it is reflected that ICTs can support trading through online platforms and applications such as e-trade, which is similar to e-commerce. This is an online-based market space, which enables users to advertise their products, sell, as well as buy through the use of ICT (Gefen and Straub, 2000:10).

Training and education are some of the other areas in which ICT can be applicable in rural communities. Ordinary people in rural communities can improve their knowledge through the use of ICT such as the Internet and computers. Students in rural communities also stand a better chance to improve their methods of information searching through the use of ICT. Most students in rural communities would often be challenged when it comes to acquiring information, not only because information is lacking but also because they do not know how to search for information. ICTs can help such students through appropriate applications such as e-learning to acquire skills on how to search for information.

Tourism is one other aspect which can help improve the livelihoods of many people in rural communities. Cultural and ecological heritage have been indicated previously as some of the assets possessed by some rural communities which can attract tourists into their territories. According to Buhalis and O'Connor (2005:7), ICTs have been transforming tourism globally. Because tourism is a highly information-intensive industry, ICT can have a great impact on the tourism sector (Henriksson, 2005:64). Zelenka (2009:123-127) outlines four ways in which ICT can be used to support tourism (which may also be applicable in rural communities): web pages, e-tourism, location based services and sustainable tourism development. These technologies and strategies can help consumers to identify, locate and purchase tourism products (Buhalis and O'Connor, 2005:8). Furthermore, these can help communities to better promote their products and services, and to improve local participation and monitoring of tourism flows (Zelenka, 2009:126).

Another advantage of ICT in rural communities as reflected in figure 2.2 above is in banking. The world has come to the era in which banking no longer requires people to carry hard cash to or from the banks. ICTs have made it possible for people to make financial transactions without having to physically go to the bank. This may be even more helpful to rural dwellers, who sometimes have to travel long distances to get to the nearest banking branch. Empirical studies reflect that Internet banking is a useful, easy, convenient and better way to conduct banking transactions than other conventional means (Goi, 2005). It is not only time and cost efficient but can also serve for security purposes as people do not have to carry cash around, transactions are instant, and can be accessed anywhere through the use of mobile ICTs. This can thus improve economic activities in rural communities by allowing rural dwellers to have access to commercial services from their own communities. This research will explore how people in rural communities make or can make use of ICT to connect with other sectors in the society, and how this can improve their livelihoods.

2.5.3 Barriers to use of ICTs in rural areas

While there are a lot of opportunities for ICT in rural communities, the challenges or barriers in the engagement of ICT in rural development processes cannot be overlooked. In this sub-section, some of the challenges facing rural communities when it comes to implementation of ICT4D projects are discussed.

In many developing countries, the role of ICT in economic development does not seem to be duly appreciated (Bayes, 2001:261). This is mostly because, for many initiatives, the expected outcomes are often hard to produce. This makes the whole idea of ICT4D seem to be unrealistic. While there may be good strategies and planning of ICT4D projects, other limitations, including cultural boundaries, lack of skills and lack of infrastructure, may impede progression and sustainability of ICT4D initiatives. The problem of infrastructure limitations is typically extensive in rural communities, and more especially in developing countries. According to Bayes (2001:261) and Bhatnagar (2000:2), in most developing countries "infrastructure is considered to be inadequate in scope, technology and the quality of services." As a result of the inaccessibility of their areas, rural dwellers are prohibited from taking advantage of opportunities that can contribute to their life improvement such as modern technologies (Bayes, 2001:262; Herselman, 2003: unpaged). The limitations of ICT4D in rural communities also extend to the general lack of resources (material, financial and human).

Cultural barriers can be one of the serious obstacles for the implementation and progression of ICT4D initiatives in some rural areas. While some people might take such technology as an opportunity for personal development, others may, on the other hand, see it as a foreign phenomenon unworthy of their acceptance. There has been considerable research on the acceptance and voluntary use of ICT in many rural areas (Mathieson, et al., 2001). Recent advancements in technology seem to be of minor importance to many rural cultures for a number of reasons, such as language differences, cost of adoption, or simply lack of infrastructure within the areas (Beekhuyzen, et al., 2005:1). On the other hand, while some cultures are somewhat resistant to change, for many people resistance might be due to the difficulty and complexity of such technology (Beekhuyzen, et al., 2005:1). This, however, does not remove the need for ICT in rural areas. Evidence shows that technology is a means of achieving development goals; therefore, even within the poorest communities, there are various needs for information and modern technology (Pigato, 2001: iii).

The lack of effective participation strategies for rural people in the implementation of ICT4D projects can be classified as one of the barriers to ICT4D success. Local participation has for a long time been a common subject in community development literature, particularly in rural development. This came with the realisation that exclusion of the local people in the affairs of their development is a counter-productive strategy. While local participation has become a strategy that is well-understood and practiced in community development, the opposite is the case when it comes to ICT4D implementation. Even though ICT has a greater potential to enable the achievement of a participative and inclusive society (Cook and Light, 2006), the engagement of these technologies themselves in communities can, surprisingly, be an exclusive process.

As a result of these limitations in rural areas contrary to the urban areas, the prevalence of the 'digital divide' is much higher in developing countries. The digital divide is a term coined in the 1990s which describes the disparity in access to ICT that may result from differences in social, economic, geographic and/or other factors (Kroukamp in Mphidi, 2009:1; Thinyane, et al., 2006:1). Chapman, et al., (2003:1) asserts that "the digital divide in the current context of an information and communication revolution is threatening to further undermine many developing countries' already fragile prospects for future development." Rural communities are even more prone to vulnerability when it comes to the digital divide due to their marginalisation.

Due to all these disadvantages, many ICT4D initiatives in rural areas often fall short of achieving their intended objectives. In the end, these projects are either abandoned or barely used. By overall analyses, reports on some ICT4D projects reflect that "about one-third of such projects are total failures, about half are partial failures, and only a small minority succeed" (Heeks, 2002b:102). Heeks (2002b:103) accounts this failure of ICT4D initiatives to the fact that in most cases "their model – the rural telecentre – is one drawn from the global north, which incorporates design assumptions and requirements that significantly mismatch local realities in the average developing country village." For example, in developed countries, capacity and resources permit an easy understanding of and adoption of sophisticated ICT, but this may not necessarily be the case in developing countries (Odendaal, 2003:585). The rates of failure of ICT4D initiatives, therefore, call for a more collaborative and user-involved model of ICT4D to enable the incorporation of specific user requirements and capacity building. The following chapter will consist of a discussion of an alternative

model of ICT4D – the Living Lab model – which has a greater potential to address some of these barriers.

2.6 Conclusion

This chapter has briefly discussed the history and evolution of the concept of development. It has shown how development has predominantly been studied and practiced within the theoretical perspective of monetary stabilisation. It reflects how this is a very limited understanding of the complexity of the term and practice. It shows, therefore, how there has been a transition from the limited monetary perspective of development to more comprehensive approaches to development. These comprehensive approaches incorporate a human-centred element into the process of development. The chapter shows how rural communities as part of society have also been increasingly included in development processes. For decades now the practice of rural development has been part of the conversations and initiatives in the development arena. Different themes have been evolving overtime since the inception of the practice – rural development. The use of ICT has also been evolving tremendously since the 1990s. The theme and field of ICT4D has expanded largely in the 2000s. The chapter reflects that societies are moving fast in the information age, towards becoming ICT-occupied societies.

However, while there has been a noteworthy movement towards the inclusion of rural communities in development processes, the chapter shows that it has not been a common practice when it comes to ICT engagement in rural development courses. In fact, ICT for rural development is a relatively new movement. As discussed in the chapter, even when ICT for rural development is introduced, the approach has often been to do it without the active participation and involvement of the local people. The chapter has, however, reflected some of the opportunities of ICT which can also be applicable in rural development processes. This leads us to the discussion in the next chapter on an alternative model which offers alternative ways of engaging people at grassroots level in a collaborative manner, in the design and implementation of ICT innovations for rural development.

CHAPTER THREE

The Living Lab: an alternative model of ICT4D

> *"About two decades ago, ICT advancements such as portable computers enabled usage-laboratory experiments to move out into 'real-life'. Utilizing these ICT advancements, users could now research in continuity and be interacted with at any time in their natural life. Early such experiments were conducted where users were invited to live and work in environments with new architectural elements. Equipped with ICT devices, these environments became real-life laboratories. Gradually, research in such 'life laboratories' was, as expected, proven to generate knowledge that was more valid and practically useful for development of new, better products and services for real usage, the Living Lab (LL) concept was born" (A Trans-national Nordic Smart City Living Lab Pilot study, 2011:unpaged).*

3.1 The Living Lab model (a collaborative, user-focused model)

The Living Lab model refers to an innovative environment that enables community members, in conjunction with other stakeholders in the society such as academia, government and private organisations, to collaborate in the creation and exploration of new avenues for sustainable economic and social advancement (LLiSA, 2011). This model enables the design, development and validation of new technologies, products and services by users in real life environments (Almirall and Wareham, 2008:22; Bergvall-Kareborn, et al., 2009:2; van der Walt, et al., 2009:421; Eriksson, et al., 2005:4). The model is suitable for collaborative relationships between sectors in their attempt to support the development and utilisation of ICT in development activities. This can be applied to all types of services including social, educational, economic, ecological and health. It also creates an environment suitable for information access, capacity building and improvement of networks.

Historically, the Living Lab was a model designed for the business or corporate environment. The model would bring together various organisations that utilise technology with the aim of "creating innovative applications based on existing technologies as well as on the creation of new technologies" (Niitamo, et al., 2006:27). Living Labs then became innovation areas where users co-create with developers and researchers for effective incorporation of user requirements (Almirall and Wareham 2008:22). It soon became clear that this attempt had a greater capacity to "structure and provide governance to user involvement in a way that can be addressed by companies, research institutions, public organisations and policy makers" (Santoro and Conte, 2009:3). This enabled expansion in the applicability of this model, making it relevant for all types of services, including economic, health and social services.

Hence, the adoption of the Living Lab model in ICT for rural development became a highly attractive idea, subsequent to the reflected failure of ICT for rural development projects. The model, because of its collaborative, user-focused features, has a greater potential to address the gaps, reflected in sub-section 2.5.3 above, on the barriers to use and adoption of ICT in rural areas.

The Living Lab model's characteristics are not unique in themselves, but the combination of these aspects into one approach is what makes the Living Lab model unique (Stahlbrost and Bergvall-Kareborn, 2008:6). For instance, within the Living Lab approach, it is believed that the development and innovation processes should be open to encourage and enable engagement of all relevant stakeholders (Stahlbrost and Bergvall-Kareborn, 2008:6). This is not by any means a new idea. It is an idea influenced by "the 'open innovation' approach coined by Chesbrough (2003) and by the emerging Web 2.0 approach, aiming to facilitate creativity, information sharing and collaboration" (Stahlbrost and Bergvall-Kareborn, 2008:6). Furthermore, Living Lab activities are carried out in real life contexts, which is also not a new approach. Ethnographic approaches such as field studies and contextual design have long been practiced (Druin, et al., 1998) and they have influenced real life contexts models such as the Living Lab model (Stahlbrost and Bergvall-Kareborn, 2008:6).

The development and adoption of ICT in rural areas have often failed as has been indicated earlier, due to the out-of-context approaches and strategies that have previously been adopted. The Living Lab model offers a great opportunity for users and targeted users to be involved in the early stages of development, as well as in the later stages of evaluation (van der Walt et, al., 2009:422). This approach enables the users to influence the design processes of the products, ensuring that they are suitable for the context in which they will be deployed. The model brings together four main actors within the development cycle: communities, government, academia and the private sector. Each of these stakeholders has a complementary role to play from the very early stage within the context of their own mandate, resources and anticipated benefits. Part of the aim of this research is to explore the influence of this model in strengthening networks between these stakeholders for effective, relevant and sustainable implementation of ICT in rural communities. The figure below, adopted from Preece, et al., (in Stahlbrost, 2008:10), is an illustration of the user-centred (user-involved) process within the development of ICTs.

Figure 3.1 The user-centred process within the interaction design

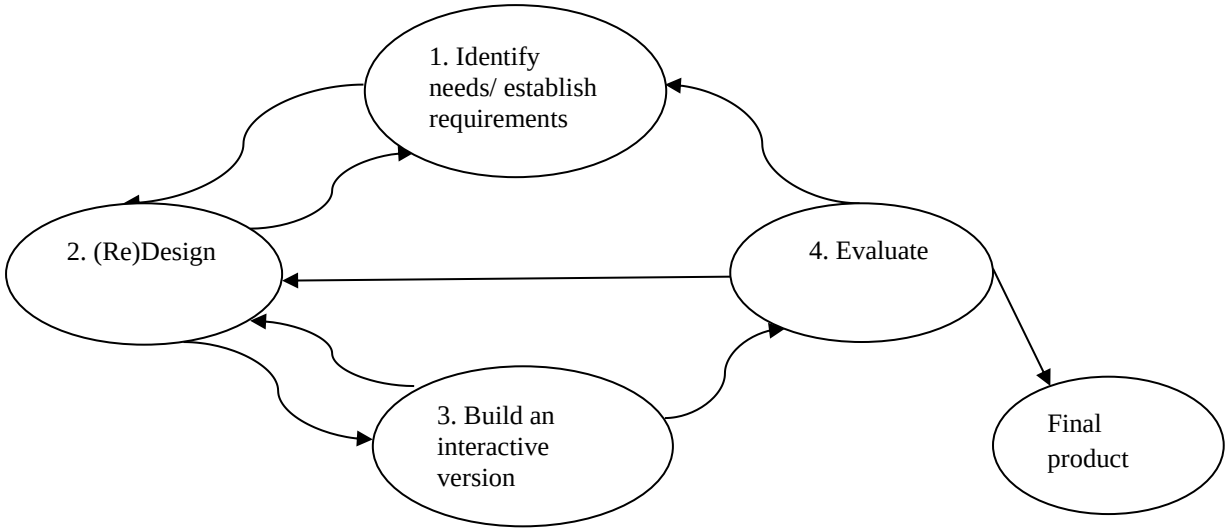


Fig. 3.1 The Interaction Design Process (Preece, et al., in Stahlbrost, 2008:10).

The user-centred development process involves four basic activities (Preece, et al., in Stahlbrost, 2008:10) as illustrated in figure 3.1 above:

- *Identifying needs and establishing requirements*: To be able to design something that supports people, it is important to identify the specific, personalised needs of the users and what kind of support interactive products and services could and should provide. The identified needs then underpin the product features and the design and development of the ICT system to make it more relevant for all stakeholders.
- *Developing alternative designs*: This is the core activity of designing where different ideas aiming to meet the established system requirements are suggested by all stakeholders or their representatives. This activity might consist of two sub-activities: conceptual design and physical design. This is where co-creation occurs between stakeholders.
- *Building interactive versions of the design:* Interactive design involves designing interactive products. The most rational way for users to evaluate such designs is to interact with them. This activity requires an interactive version of the system to be designed.
- *Evaluating designs*: This is a process of determining the usability and acceptability of the product, which can be measured in relation to a variety of criteria, including the number of errors users make when using it, how appealing it is, how well it matches the requirements, etc.

All these stages of activities should involve uncompromised stakeholder collaboration if effective and sustainable engagement is to be achieved. The Living Lab, as a highly user-involved model, has a greater potential to enable adoption of ICT in an interactive manner which, in turn, eases the human-technology interaction process.

The key principle for successful community level ICT initiative implementation is co-ownership. According to Abras, et al., (2004:4), in order to have a successful development of a product, all stakeholders should be taken into account. These stakeholders should collaborate from as early as the identification stage, where needs are identified and user requirements are established. In the next section, the collaborative roles of stakeholders within the Living Lab approach are discussed.

3.2 Stakeholders within the Living Lab model – collaboration and roles

Stakeholders form all the active members that collectively build towards expected outcomes in the Living Lab environment. Fox and Meyer (1995) define a stakeholder as "a person or group of people, such as shareholders, customers, suppliers, trade unions, government and the community, who have an interest in the operation and outcomes of the organisation or initiative."

3.2.1 Researchers and developers in academia as stakeholders

The principal role of researchers and software developers in ICT for rural development within the Living Lab model is to create informed, innovative products suitable for rural contexts. In their assertion, Eriksson, et al., (2005:5) indicate that Living Labs are more than just about ICT, but rather a greater focus on customisation and personalisation of products and services. By collaborating with rural communities during the design and development processes, researchers and developers attempt to reduce the chances of mismatching products with rural settings. Within the Living Lab model, researchers follow the basic principles of user-involvement approaches discussed above, which are: "identifying needs and establishing requirements, developing alternative designs, building interactive versions of the design and evaluating designs" in close collaboration with the local people (Preece, et al., in Stahlbrost, 2008:10). This has the potential to address the high rates of failure and abandonment of ICT4D initiatives, which result from irrelevant products, services and implementation strategies, as has been indicated before.

Similar to participatory research projects, researchers and developers engage in participatory approaches with communities: background studying, on-site observation, role playing and usability test (Abras, et al., 2004). However, unlike other time-limited projects, the collaborative relationships between stakeholders in the Living Lab model, together with the initiatives that result from the collaboration, are meant to be on-going, long-term/permanent, development-tied initiatives. Ultimately, the idea of the Living Lab model is not to have ICT4D projects to meet short-term goals, but to have projects tied to the existing development goals in order to improve their implementation and sustainability in the information age. Hence, collaboration of sectors in the society is central to the Living Lab model.

3.2.2 Rural communities as stakeholders

The role of rural communities within the Living Lab model goes beyond the provision of ideas and interacting with the products to test their usability and appropriateness, but further to ensure the sustainability of such initiatives. Integrating ICT into an existing social system is a complex, multidimensional process that requires more than just technology. According to Tinio (2003:3), "given enough initial capital, getting the technology is the easiest part, but pedagogy, grassroots readiness, human capital and long-term maintenance," among others, are, in fact, the major challenges. Exposure and incorporation of the local people from the very beginning of the integration of ICT initiatives increases readiness, lessens complications and provides a learning and skills development opportunity for the local people. This, in turn, creates a sense of co-ownership – a very important component of the Living Lab model.

The idea of ICT for rural development is not just about having technology in rural areas, but about the incorporation of technology into long-term rural development processes. In this era, information has become the latest currency, where a community's access to ICT and its products and services defines its ability to participate in the global economy (Thinyane, et al., 2006:1). This research, therefore, seeks to explore the integration and participation of rural communities in the information society through their networks and collaboration with other stakeholders in the society. However, this kind of approach can be very costly, both in terms of resources and time – two essential aspects for any initiative. Frequently, rural communities lack financial and material resources, which are essential ingredients for the implementation of ICT4D projects. This is where private organisations and government institutions come in.

3.2.3 Private sector as stakeholder

Findings from other studies indicate that "in a sufficiently competitive and liberalised market (i.e. with a transparent legal framework, liberal entry and pricing policies), the private sector is effective in providing commercially viable ICT services, even in rural or less accessible areas" (Pigato, 2001:7-8). In the information society, rural areas are surely potential markets for businesses and companies in the ICT industry (Mulvenna, et al., 2010). Private companies and businesses may fund suitable, personalised ICT interventions for rural areas within the parameters of their commercial interests and, in turn, gain profits from costing the on-going services provided to the local people. Hence, the private sector only gets to provide the initial funding to enable the development and deployment of ICT products; then from the services provided on a daily basis they earn on-going returns. In the end, this is a win-win strategy: the rural people gain access to essential services in their own areas and the industry people have an opportunity to expand their businesses.

Evidence shows that even poor people are willing to incur at least a small amount of the commercial cost if it means that they will have local access to basic services (Pigato, 2001:3). A simple example could be the provision of banking services locally in rural areas. As has been indicated in sub-section 2.5.2, banking is one of the opportunities for ICT in rural areas. In some rural communities, people have to travel long distances to get access to the banks. Banking industries, therefore, in collaboration with researchers (and software developers) and rural communities, can fund the development and deployment of innovative, personalised, suitable ICT products to enable the provision of banking services within the rural milieu. This strategy could go a long way in supporting local enterprises and farmers through the provision of loans, financial advice, and savings and investment opportunities in order to improve socio-economic conditions in rural areas. The same approach could be adopted for different kinds of services and ICT products, including health, legal and many other services.

To enable proper implementation of all these possibilities, the important missing piece is regulation; legal frameworks and policies are essential to govern and regulate such interventions. This makes the government an essential stakeholder within the Living Lab model. Government comes in not only as the policy maker but also as an entity mandated with the protection and assurance of human rights through basic service delivery.

3.2.4 Government as stakeholder

The reflected rates of failure of ICT4D interventions in rural areas, together with the increasing global role of ICT as the medium of social and economic exchange, bring a growing need for informed policy formulation to guide the "way in which such technology is planned and implemented within 'developing' country environments" (Thompson, 2008:822). Unfortunately, in developing countries the adoption and deployment of ICT for development has not been an exclusively independent process. Chiumbu (2011) maintains that, although African countries have gained their political independence, when it comes to ICT innovations, they are still trapped in asymmetrical economic and power relations with the Western countries. These Western countries continue to dominate the process of innovation and knowledge production in developing countries.

State intervention is, therefore, crucial in ICT4D initiatives in developing countries, particularly if rural ICT interventions are to be personalised and specified. ICT4D policies should not only serve to provide for ICT adoption but also to govern the domestication of such initiatives. Furthermore, policies also serve as instruments that lay the foundation for mutually beneficial collaborative relationships. For instance, "in areas where providing services is not financially viable, the government can use a number of instruments such as special financing mechanisms and investment subsidies to provide incentives to the private sector to promote public access" (Mulvenna, et al., 2010:7).

In addition, the role of government within the Living Lab model is to take advantage of ICT to improve its service delivery to citizenry. Technology in government institutions is not a new invention. Governments have always taken advantage of technology to improve their own administration and governance. However, ICT advancements within the Living Lab model provide an opportunity for government to improve not just their administration of services, but also their communication and relationships with citizens. Ultimately, this improves the engagement and participation of the masses in development matters. One of the objectives of this research is to explore the methods and level of communication between rural communities and other stakeholders within the Living Lab model (inclusive of government), and how that can contribute to participatory, innovative rural development.

Governments in many countries have engaged ICT in order to improve rural development initiatives and public service delivery. India is one example where a wide range of initiatives including "government computerisation schemes, satellite communications, and distance

education and training through the Internet" have been implemented (Pigato, 2001:3). While some of these ICT4D projects have been successful, demonstrating that ICT can have an enormous impact on development (Pigato, 2001), it is difficult to replicate success on a large scale bases (Shakeel, et al., 2001). According to Gerster and Zimmermann (2003:12), one of the major reasons for this difficulty is that there is often unwillingness on the part of governments to identify and support the development of suitable ICT applications and to re-engineer bureaucratic work accordingly. Therefore, the central message of the Living Lab model is that bringing the government on board (as part of the stakeholders) is highly likely to address their lack of willingness and to get them to engage ICT advancements in order to improve their effectiveness. Technology alone does not create change; it takes commitment by all sectors in the society and requires a long implementation period.

This, however, does not suggest that the Living Lab model is a panacea for all implementation and sustainability problems of ICT4D initiatives, but the rationale is that incorporating stakeholder collaboration holds a greater promise for effective implementation and the possibility of sustainability. In the next section, some strengths, weaknesses, opportunities and threats of the Living Lab model are discussed.

3.3 SWOT Analysis of the Living Lab model

While there are many opportunities and promises carried by the Living Lab model, there are certainly limitations and weaknesses associated with this model, even though, in effect, it has the potential to address many short-comings in ICT engagement at different stages of development. The table below, adopted from Schuurman and De Marez (2009:7), reflects a summary of strengths, weaknesses, opportunities and threats associated with the Living Lab model.

Table 3.1 SWOT analysis of the Living Lab model

Strengths	**Weaknesses**
User involvement Future market Natural setting Collaboration-enabling	Drop-out risk Outlier problem Lack of studies No incremental innovations
Opportunities	**Threats**
Cooperation Awareness Using feedback	European lag External funding

Table 3.1 SWOT analysis of living labs (Schuurman and De Marez 2009:7)

An obvious strength of the Living Lab model is the active involvement of users in the innovation process which, in turn, benefits all stakeholders involved (Schuurman and De Marez 2009:6). Furthermore, because Living Labs operate in real life environments, they tend to generate solutions for real life situations. Also, Living Labs can create opportunities for the expansion of markets which, in turn, increases business opportunities and contributes to economic improvement.

One of the main weaknesses of Living Labs is that they require a significant amount of time and financial resources (Schuurman and De Marez 2009:6). Additionally, there is a risk of other stakeholders dropping out when the outcomes of the initiatives provide less than the intended or anticipated results. Furthermore, even within the Living Lab model there is a possibility of inequality in the collaborative relationships between stakeholders, particularly if other stakeholders are more inclined to interact, either physically or otherwise, with some more than others due to their respective roles. Also, if governments do not take up ownership, or are limited by other factors to fully support domestication of ICT4D interventions, incompatible Western perspectives and influences on ICT4D can continue to fail or delay progress of ICT4D projects in developing countries.

The main opportunities that the Living Labs bring are collaboration between sectors and active user-involvement. This can lead to greater awareness, and the development of suitable and relevant solutions, as well as positive changes in innovation policy (Schuurman and De Marez, 2009:6-7).

One factor that continues to threaten the success of the Living Lab model is a continuous dependence on external funding, even though by bringing the local private sector and businesses on board, the model attempts to address this very factor. Dependence on external funding has the obvious disadvantage of distorting policy making which, in turn, affects sustainable development measures or strategies. However, having mentioned these limitations, it still remains that, if all the components of the Living Lab model are fully incorporated, there is a greater opportunity for sustainable, desirable change.

3.4 ICT4D Projects in Africa using the Living Lab model

This section provides examples of some of the ICT4D initiatives in Africa which engage in a collaborative model of Living Labs. The discussions will reflect the opportunities as well as the limitations of these initiatives. Then in the final section that will follow, the discussion will focus on the specific Living Lab which forms the case study of this research – the Siyakhula Living Lab. According to Mulder, et al., (2008), within the African rural context, Living Labs have the potential to provide community-based solutions that can be scalable and replicable.

3.4.1 Sekhukhune Living Lab (Limpopo, South Africa)

Sekhukhune is one of the six districts of the Limpopo Province of South Africa which has approximately 1,076, 840 people living in it (Sekhukhune District Municipality, 2013). It is located outside major towns in South Africa, such as Pretoria which is approximately 200km to the south, Nelspruit about 150km to the east, and Polokwane about 180km to the north (Sekhukhune District Municipality, 2010). It is estimated that only 5% of the Sekhukhune inhabitants lives in urban areas (Sekhukhune District Municipality, 2010). Sekhukhune rural Living Lab is the Living Lab rooted in this rural area which is representative of an African context (Merz, et al., 2007:2). "It concentrates on incubation mechanisms on the basis of experimenting with new business practices, such as collaborative procurement and collaborative planning, to support small to medium micro enterprises" (SMMEs) (Merz, et al., 2007:2). SMMEs have a great potential to support socio-economic development in South

Africa (Sekhukhune Living Lab, 2008). The main economic activities in Sekhukhune are mining and irrigated agriculture (Ziervogel, et al., 2006:17). About 30% of the land area in the district is cultivated for commercial farming (Greater Sekhukhune District Municipality, 2004/2005).

However, despite large-scale mining and commercial agricultural activities in the area (Ziervogel, et al., 2006:17-18), this region is confronted, like many other African rural regions, by wide-ranging socio-economic problems that hamper development. Poverty rates are very high in this region, with 84% of its residents defined as poor (having less than R1500 per household per month), and 66% of those, defined as very poor (having less than R550 per month) (Ziervogel, et al., 2006:18). The scarcity of rainfall and high temperatures limit the success of subsistence farming activities (Department of Water Affairs and Forestry, 2005). Employment levels in Sekhukhune are very low, and large numbers of people are not economically active (Ziervogel, et al., 2006:18). It is estimated that 2800 jobs need to be created annually, if the unemployment rate is to be reduced by 1% per year (Greater Sekhukhune District Municipality, 2005). Around the year 2005 it was estimated that the government employs approximately 16% of the population (Greater Sekhukhune District Municipality, 2005). A small portion of the population engages in informal economic activities with varying degrees of success (Ziervogel, et al., 2006:18).

Following all these factors, it is clear that socio-economic development in such an area is much more complex and requires coordinated efforts. The Living Lab approach, as characterised by sectorial collaboration, is relevant in this area. The Living Lab in Sekhukhune is integrated as a "concept for user-involvement, experimental and contextualised research for identifying, designing, testing, piloting, validating and refining complex solutions in multiple and evolving real life contexts" (Friedland, et al., 2008:3). The 'community of practitioners' "consisting of a micro-franchise network of social entrepreneurs, called Infopreneurs, run start-up enterprises at different levels of complexity and sizes (hubs, nodes and satellites) within the local communities of Sekhukhune" (Guzman, et al., 2008:24). The so-called System of Innovation (SOI), consisting of different sectors with different mandates, mainly research and technological development, get extensively involved in real life environments and co-design suitable business model applications (Guzman, et al., 2008:24).

According to Guzman, et al., (2008:1), this applied Living Lab approach in the African context in Sekhukhune leads to distinct results in terms of identifying needs, suitable case design and the development of supporting business models and applications. The proposed solutions, such as collaborative procurement and planning, can cultivate local development in a sustainable manner through entrepreneurial and technological interventions (Friedland, et al., 2008:4). The Living Lab approach has been strongly driven by engaged end-user communities and social entrepreneurs, as well as researchers and developers (Merz, et al., 2007:3). Guzman, et al., (2008:2) maintain that collaborative procurement innovations have the potential to generate revenue through a combination of decreased procurement costs and increased returns on products.

While supporting local enterprises can be a constructive strategy for a region with extensive social problems like Sekhukhune, there are limitations that can be associated with this initiative. The limitations include failure to capitalise on already existing resources and survival strategies in the region. It has been shown that mining and farming are some of the major economic activities in the region (Ziervogel, et al., 2006:17-18). Yet there is no mention of how innovative strategies within the Living Lab can be channelled towards strengthening these already existing economic activities in the area. According to Schaffers, et al., (2008:2-3), rural areas have unique features and innovations that are targeted at rural development should be directed towards specific sectors such as agriculture. Farming in most African countries is one of the best ways to engage rural communities in development processes, particularly if it is already an established survival strategy. It is, therefore, essential to seek innovative methods of improving agricultural activities in areas where they are already predominant. Focusing mainly on SMMEs may potentially benefit the middle class, leaving the majority of the rural poor in unimproved livelihoods.

3.4.2 Limpopo Living Lab (Limpopo, South Africa)

The Limpopo Living Lab is an initiative mandated to set up and manage technology and innovation developments in the Limpopo Province (LLiSA, 2010). The main focus of the initiative is to create an information/knowledge driven society and innovative entrepreneurship and incubation (LLiSA, 2010).

According to the Living Labs in Southern Africa (LLiSA) Network (2010), the Limpopo Living Lab was founded upon four pillars:

- innovation Solutions in line with the Limpopo Integrated Innovation Strategy (LIIS);
- community projects (focusing on technology and innovation);
- training and development as part of the Limpopo ICT Institute; and
- business development and incubation of technology and innovation businesses.

The Limpopo Living Lab, working in close collaboration with the Sekhukhune Living Lab, also in Limpopo, adopts a stakeholder collaboration model of the Living Lab in developing technology and innovation solutions (LLiSA, 2011). Four sectors – businesses, research institutions, communities and the government – are brought to the co-creation platform by this initiative. An open innovation framework, which allows open participation of relevant software developers, is adopted as a cost-efficient model of innovative development (LLiSA, 2010). This Living Lab fits well within the Limpopo Integrated Innovation Strategy (LIIS), developed through the partnership between the Office of the Premier and the Department of Science and Technology (DST) in the Limpopo Province (Limpopo Provincial Government, 2009). The framework is tied to the creation of employment within the Province, and through collaborative measures, the Limpopo Living Lab initiative has the potential to support growth of businesses which, in turn, can create employment opportunities (Limpopo Provincial Government, 2009).

However, while there is no doubt that there are opportunities which can be tied to this intervention, there are some limitations associated with it. One of the possible limitations is that the Living Lab is driven mainly by government institutions. Although this can be an opportunity, as it can be translated into government's commitment, it can also be a limitation as it can be easy for an intervention with that much government influence to be politicised. Generally, the collaborative relationships within the Living Lab model should be based on mutual, equal and equally beneficial relationships. In this particular case, given the silence on the role and contribution of communities for example, as part of the stakeholders, it is quite possible that the co-ownership of the initiative is asymmetrical or even completely ineffective.

3.4.3 The Community Empowerment Programme (CEP), Mauritius

This initiative was established in February 2009 with the aim of "empowering local communities and Non-Governmental Organisations (NGOs) to use ICT for development, democratise access to information, stimulate the development of local content and creativity on the Internet , and to develop capacity and partnerships at grassroots level" (Cunningham, 2012b:unpaged). The CEP incorporates a multi-stakeholder approach of the Living Lab model in carrying out multiple complementary interventions including the establishment of regional computer clubs, the development of a Community Web Portal, the establishment of Public Internet Access Points (PIAPs) in Post Offices, empowering local communities with ICT skills through the Universal ICT Education Programme (UIEP), the Cyber Caravan Project, and stimulating the development and production of local Internet content (IST-Africa, 2011).

The implementation of this initiative is done in collaboration with government institutions, NGOs, the private sector and local communities (Cunningham, 2012a). The programme is financed as a public-private-partnership (PPP) with contributions from international agencies and the local private sector (Cunningham, 2012a). The ICT services provided through this initiative extend to welfare institutions and day care centres (IST-Africa, 2011). The design and development of the Community Web Portal is carried out with the full participation of the locals who provide the overall content (IST-Africa, 2011). The Portal also serves as a marketing platform for local businesses (IST-Africa, 2011). Furthermore, the Universal ICT Education Programme (UIEP) and the Cyber Caravan project are focused on promoting computer literacy to individuals across the region through an internationally recognised computer literacy programme (IST-Africa, 2011). These literacy trainings are conducted in welfare centres, community centres and on civic association premises to ensure open access for everyone (IST-Africa, 2011).

According to the report by Cunningham (2012b), this is an extensive programme which, to date, has benefited thousands of people in Mauritius. The strength of this programme lies in active participation by the citizens, as well as in the commitment from government institutions and the private sector. However, dependence on international funders may pose a threat to the sustainability of the programme, particularly given the magnitude of its impact.

3.4.4 @iLab Africa Living Lab, Kenya

@iLab Africa, a research centre at the Strathmore University in Kenya, was established in 2009, aimed at spearheading research and innovation in ICT for the development of an ecosystem towards the attainment of the Millennium Development Goals (MDGs) and Kenya's vision 2030 (IST-Africa, 2011:unpaged). The centre had realised that the spread of ICTs in developing countries remains noticeably slow, and the increasing digital divide continues to subject a large portion of Africa's population to ignorance, poverty and disempowerment (Cunningham, 2012a). To address these challenges, the focus of @iLab Africa is on ICT innovation and research, entrepreneurship and incubation (IST-Africa, 2011). The ICT innovation and research themes of the centre include solutions aimed at addressing public sector issues such as health, education, agriculture and capacity building in achieving the MDGs (IST-Africa, 2011).

For the past one and a half years, the centre has, in collaboration with rural communities' schools, other government institutions and the private sector, been promoting ICT access in education in marginalised secondary schools in Kenya (Cunningham, 2012a). This project aims at developing Open Educational Resources for secondary schools, improving ICT infrastructure in schools and enabling Internet /Web access (IST-Africa, 2011). Some of the activities of the project include weekend school visits to supplement and support high school students and creating an e-Learning site (IST-Africa, 2011), which enables learners and teachers to interact anywhere they are, anytime.

3.5 The Siyakhula Living Lab

The SLL was initiated at the beginning of 2006 (Dalvit, et al., 2007:1), as a joint initiative of the Telkom Centres of Excellence at the Universities of Fort Hare and Rhodes, as well as rural communities in collaboration with the private sector and the government. The SLL is based in the Mbashe Municipality of the Eastern Cape Province of South Africa.

3.5.1 Mbashe Municipality and the Dwesa-Cwebe area

The Mbashe Municipality is a rural area along the Wild Coast of the Eastern Cape Province of South Africa. According to the latest official census statistics, the Eastern Cape is the second largest province in the country in terms of the geographical land area, and is in third

place in terms of the population size with approximately 6.5 million people (Statistics South Africa, 2011). The Province is divided into six district municipalities, which consist of forty five local municipalities (Statistics South Africa, 2011). The Mbashe Municipality is one of the local municipalities of the Eastern Cape Province. Similar to most rural African areas, the region has a wide range of socio-economic problems related to under-development. Some characteristics of poor development in the area include: "severe local limitations of the regional road network, limited access to government services and delivery, inadequate education and health care facilities, lack of national grid electricity and poor/vandalised telecommunication (land-line telephones) infrastructure in some areas" (Sieborger and Terzoli, 2010:2).

Despite its wide-ranging social problems, the region also possesses a variety of natural resources. Within this municipal region is the Dwesa-Cwebe area, comprising the protected area (the nature reserve) and the frontline rural communities, situated in an amazingly resource-rich land-scape, extended over a land area of approximately 153 square kilometres (Timmermans and Naicker, 2002; Sieborger and Terzoli, 2010). Areas of vegetation growth in cultivated fields, forest coverings, grasslands and dune forests all confirm the fertility of the land in the area (Timmermans and Naicker, 2002:2). As it might be expected following the fertility of the land and the summer rains, the working inhabitants in the area are predominantly subsistence farmers (Emmanuel and Muyingi, 2010:58; Timmermans and Naicker, 2002:2).

The nature reserve also serves to provide local economic activities to support development in the area (Sieborger and Terzoli, 2010:2), from tourism activities to arts and craft materials produced by a minority of the people in the community. The artistic materials produced by the local people in the area symbolise their unique Xhosa culture. The community is rich in preserving their customs and traditions, and it is characterised by a strong cultural and social life (Thinyane, et al., 2007:144). This research aims at exploring the potential and influence of the Living Lab model in cultivating this strong social life and also enabling the creation of new dynamics of social life.

3.5.2 The relevance of an ICT4D initiative in the Mbashe region

The nature reserve in the Dwesa-Cwebe area, together with the local craft centre situated in the Nqabara community within the area, as well as the naturally verdant land scape, all serve a common purpose of attracting tourists in the area. Tourism has thus become one of the major sources of income generation and survival strategies in the area, concurrent with agricultural production. According to Binns and Nel (2002:236), tourism has been identified as one of the key factors that, if well incorporated, can result in poverty alleviation and economic growth in the developing world. Following one of the immediate priorities of the government of South Africa – to improve the quality of life of the poor (Viljoen and Tlabela, 2006:2) – tourism has been one of the key areas of development. Among the various tourism policy frameworks developed by the government to support and improve tourism, the most important is the 1996 White Paper on the Development and Promotion of Tourism in South Africa (Rogerson, 2006:46). The vision set out in the white paper is "to develop the tourism sector as a national priority in a sustainable and acceptable manner, so that it would contribute significantly to the improvement of the quality of life of every South African" (Viljoen and Tlabela, 2006: 6).

While this is certainly a positive outcome to aspire to, the important questions which may follow are: How will the vision be achieved? What factors need to be taken as key in order to make this aspiration a reality? The constant argument in this research is that, in the information era, empowerment strategies should not overlook or undermine the significance of information and knowledge at grassroots level. Information access and the ability to easily distribute information form priority areas in the promotion of tourism and its changing roles. ICTs have been identified as the supporters and enablers of the knowledge and information revolution in the information society.

ICT engagement in rural communities which are potential tourists' destinations, such as the Dwesa-Cwebe area, is essential if tourism is to be promoted in the globalisation era. Tourists should be able to access information on tourism activities and products available in this area as a potential destination, and the rural people, on the other hand, should be able to advertise and expand their markets through the use of ICT innovations. According to Thinyane, et al., (2007:2), exclusion of rural, marginalised communities from the ICT domain deprives them

of access to information that could make a difference in their daily lives, and isolates their local knowledge from the global knowledge economy.

3.5.3 The Siyakhula Living Lab – an ICT4D initiative in the Mbashe Municipality

It is, therefore, not surprising that the promotion of tourism in the Dwesa-Cwebe region was one of the specific objectives of the SLL initiative, given the potential of the nature reserve as a tourism destination. 'Siyakhula' is an isiXhosa word that means 'we are growing'. This is aligned with the objective of the project, as it aims to grow in its innovation and sustainability (Pade-Khene, et al., 2010a:266). Generally, this initiative was aimed at engaging ICT to contribute to the enhancement of local rural innovations, such as improved communication and distribution of information (Roux, et al., 2009). The initiative was implemented following the recognition that rural, marginalised communities are typically excluded from the global knowledge economy, but do have potential as growing and important emergent markets in developing countries such as South Africa (Thinyane, et al., 2007; Dalvit, et al., 2007).

The SLL exists as a platform to develop and field-test a distributed, multifunctional community communication platform, using personalised and localised ICT innovations, for deployment in marginalised rural communities (Khene, et al., 2011; Jere, et al., 2009; Pade-Khene, et al., 2010b; Ranga, et al., 2010). The initiative aims to empower the community with appropriate innovations and services to actively participate in tourism and other development activities. When it started in 2006, the SLL was set up at five local schools, which were its base in the community and the network access points for community members. The five schools are situated within the Dwesa-Cwebe area in the Mbashe municipality. These are: Mpume, Ngwane, Mtokwane, Nondobo and Nqabara. Eleven more schools were later added to be the hosts of the SLL in the community, to include other areas within the Mbashe Municipality.

The SLL embraces "collaboration of research projects that aim to expand and add to the vision of the Living Lab to support new and existing rural development programmes in the Mbashe Municipality" (Pade-Khene, et al., 2010b:598). Examples of such projects include "software engineering of an e-commerce platform for disadvantaged communities, project management techniques for sustainable rural ICT, the local wireless connectivity to connect to the Internet and potentially support e-health, e-government and e-learning platforms in the

future development of the Living Lab, Internet Protocol (IP) phones, and backhaul connectivity options for ICT deployment" (Pade-Khene, et al., 2010b:601; Wertlen and Terzoli, 2009:2). Desktop computers and fixed line telephones are so far the means of service delivery in the SLL. However, there are plans to integrate mobile phone technology through a "Village Connection platform," which will enhance service delivery for these specific rural communities (Pade-Khene, et al., 2010a:278).

The development and engagement of ICT products and services in the SLL is based on the approach of the Living Lab model as a collaborative, user-involvement model, and is tied to the following themes: "user requirements elicitation, networking and collaboration, monitoring and evaluation, and sustainability" (Gumbo, et al., 2012:5-6). Rural communities within the Mbashe Municipality, as part of the stakeholders, have an opportunity to participate and influence the design and development of innovative products. Through this platform community members also have an opportunity to interact and possibly establish new forms of social networks.

Strong social networks or ties form an important asset for rural communities, as they are more empowered to actively take on new developmental activities when they are joined together in one purpose. Historically, rural communities have always been empowered by their unity to overcome their common challenges. Collective community development projects, social groups and local organisations, are a few examples of empowerment platforms which have been predominant in many rural communities. Therefore, even with ICT for rural development initiatives, strong social ties still play a key role in enabling smooth integration. ICTs, on the other hand, have the potential to strengthen social ties in all kinds of communities, given their dynamic nature of enabling social interactions. It thus forms an interest in this research to explore the potential and influence of ICTs on the creation and cultivation of social capital in rural communities, and how that contributes to innovative development.

3.6 Conclusion

This chapter discussed the Living Lab model as an alternative approach, through which many ICT implementation and sustainability problems in rural communities can be addressed. The chapter focused on user-involvement and the collaborative nature as the key strengths of the Living Lab model. It also considered some of the limitations and weaknesses which can be associated with the model. However, in the end it is reflected that there are more benefits that can be yielded from the adoption of the Living Lab model in ICT engagement, particularly in rural communities. The chapter identified a few examples of some of the ICT4D projects in Africa that engage the Living Lab model. The chapter concluded by discussing the Siyakhula Living Lab, which is the focus of this research. In the next chapter, the discussion will ultimately be on how this model can contribute to the creation and cultivation of social capital. Before that, social capital as a concept and the theoretical framework upon which this research is based will be discussed, in order to create an understanding of the concept and its relevance.

CHAPTER FOUR

Social capital and the Living Lab model of ICT4D

4.1 Introduction

Following the discussion in the previous chapters on ICT4D, this chapter explores how the Living Lab model of ICT4D can contribute to the creation and cultivation of social capital in rural communities. Two elements of social capital form the basis of the objectives of this study – networks and information channels. There are two main objectives that will guide discussions throughout this thesis: first, how the environment created by the existence of the Living Lab contributes to the creation and strengthening of social networks and information channels, both to date and potentially in the future. The second is how the increased social capital can contribute to innovative, participatory rural development. Social capital as a concept will first be discussed in this chapter.

The concept of social capital is often used theoretically in development literature and practically in community development projects as one of the indicators and enablers of sustainable development (Ledwith, 2011; Gilchrist, 2009; McClenaghan, 2000). It has also been used in matters of civic participation as one of the strong enablers (Putnam, 1993; Harris, 2002). One of the focus areas of this research is to explore how social capital can contribute to civic or participatory development in rural communities.

4.2 Conceptualisation of social capital

Social capital as an idea of relationships has existed since the formation of communities and human interactions (Rotberg, 2001:1). The concept of social capital does not embody any idea that is new in the field of sociology (Portes, 1998:2). The underlying notions of the concept date back to some of the first and predominant theorists in the field of sociology. The idea that, "group involvement and participation can have positive results for individuals and communities, is a staple notion, dating back to Durkheim's emphasis on group life as a remedy to anomie and self-destruction" (Portes, 2000:44). Marx also discussed the power of class relations and how they have been used as a base for structuring societies (Lin, 1999; Portes, 2000). Social capital was, however, developed into a concept in the twentieth century when social scientists and economists tried to distinguish social resources from financial, physical and human assets (Rotberg, 2001:2).

According to Portes (2000:43), the concept of social capital has become one of the most commonly used theories in the field of sociology and in everyday life. In general, capital refers to "stock or factors of production that can be expected to yield productive services" (Solow, 2000:6). Traditionally, when people talk about 'capital' they refer to economic and physical assets. So what is 'social capital'? According to Solow (2000:7), "even though such things as trust, the willingness to cooperate and coordinate and the habit of contributing to a common effort are not tangible in nature," they all constitute an element of expected productivity. Such factors can be lumped together as social capital (Solow, 2000:7). Bayat (2005:6) indicates that even though social capital does not constitute all the resources needed by human beings, it has the potential to improve access to other resources among and across various groups of people. On the same note, Woolcock and Narayan (2000:226) add that "the basic idea of social capital is that an individual's relationships with family, friends and associates constitute an important asset, which can be leveraged for material gain."

Pierre Bourdieu, an economic and cultural sociologist, was one of the first to popularise the concept of social capital. He produced a systematic, contemporary analysis of the concept of social capital (Portes, 1998:3). The term had been used by a number of authors including Light (the sociologist) and Loury (an economist) in the 1970s, Jacobs (1961), Seely, Sim, and Loosely (1956) and Hanifan (1916), but Bourdieu pointed out its broader relevance to society (Portes, 1998; Paxton, 1999; Woolcock and Narayan, 2000). In his article "A conceptual History of Social Capital," Farr (2004:11) quotes Hanifan (1916):

> *"In the use of the phrase social capital…I do not refer to real estate, or to personal property or to cold cash, but rather to that in life which tends to make these tangible substances count for most in the daily lives of a people, namely: goodwill, fellowship, mutual sympathy and social intercourse among a group of individuals and families who make up a social unit. In community building as in business organisation and expansion there must be an accumulation of capital before constructive work can be done."*

Bourdieu thus argued that the conventional use of the term 'capital' is overly restricted as it often refers, as mentioned earlier, to material and economic assets (Portes, 1998; Field, 2008). For Bourdieu, capital includes all factors that can accrue benefits to individuals; hence it can be expanded to include assets formed by cultural symbols, ways of life and social networks (Biggart, 2002:19-20). In a broader sense, what Bourdieu was critiquing is an economic perspective that conceptualises society as the outcome of economic transactions (Biggart, 2002:18). Contrary to popular belief, he argued that capital can also appear in non-monetary

forms (Anheier, et al., 1995), and that social forms of capital are, in fact, as significant as other forms of capital – financial, physical and human.

In his book, *The Forms of Capital (1986),* Bourdieu makes a distinction between two forms of non-monetary capital, cultural and social capital. The former he refers to as assets such as long-standing habits, values, culture and norms acquired in the socialisation process, and formally acquired knowledge (Bourdieu, 1986; Anheier, et al., 1995). The latter he defines as "the aggregate of the actual or potential resources that accrue to an individual or a group by virtue of belonging to a durable network of more or less institutionalised relationships of mutual acquaintance and recognition" (Bourdieu and Wacquant, 1992:119).

From his conceptualisation, Bourdieu reflected that social capital can yield greater non-financial benefits to those who possess it. The more network of connections an individual or a group can accumulate, the more benefits of social capital they can yield from their networks. This Bourdieu summarises clearly: "The volume of social capital possessed by a given agent...depends on the size of the network of connections that he can effectively mobilise" (Bayat, 2005:6). It is, therefore, the aim of this research to explore whether through the collaborative features of the Living Lab model, rural communities who form part of the stakeholders in the Living Lab can mobilise the network of connections with other stakeholders/sectors and accumulate volumes of social capital.

While Bourdieu expressed the significance of social capital in society, he saw it as social power and resources restricted to only the rich to enhance their position and status (Field, 2008:18-19). He associated social capital with class stratification and the exercise of exploitation, and argued that social capital is, in fact, a tool for reproducing dominance in society (Lin, 1999; Fine, 2002; Field, 2008). Bourdieu is thus criticised for his restricted conceptualisation, which indicates that the returns of social capital are limited only to the elites (Field, 2008:19). His analysis led to further interrogation and debates about the concept. After Bourdieu's undeniably valuable analysis came many other influential writers who were mostly in favour of the concept as a solution for many social ills. Notably, some of the most predominant writers on the concept of social capital are Putnam and Coleman who, contrary to Bourdieu, hold a positive view of the concept of social capital, and see it as a theoretical tool capable of enabling development. Both Putnam and Coleman argued, against Bourdieu's analysis, that the benefits of social capital are not limited only to the elites, but social capital

can be beneficial to all kinds of communities, including the powerless and marginalised (Putnam, 1995; Coleman, 2002).

Putnam, following Coleman, argues that social capital refers to "features of social organisation such as networks, norms and trust that facilitate cooperation and coordination for mutual benefit" (1995b:664-665). Putnam maintains that social capital is a moral resource which plays a significant role in resolving collective problems easily, increasing individual benefits by mutual cooperation and ensuring conformity with established norms (Kapucu, 2011:25; Uslaner, 1999:122). Putnam's theories on social capital became more popular with his well-known study in the regions of Italy, *Making Democracy Work: Civic Traditions in Modern Italy (1993),* as well as his exploratory research on social capital in *Bowling Alone: America's Declining Social Capital (1995)*.

In *Making Democracy Work*, Putnam compared the southern and the northern regions of Italy in an attempt to explain the disparities in the effectiveness of regional governments. His detailed study revealed that the differential effectiveness of the regional governments, their speed of action, the efficiency with which they worked, and their perception by the public, could not necessarily be accounted for by the size of their budget or policy frameworks (Putnam, 1993:48). This was based on the fact that, while both regions shared similar policy frameworks, political structures and the size of the budget, there was a disparity in their effectiveness (Putnam, 1993:48). From his study, he was able to conclude that the critical factor in the effectiveness of the more successful regional government, the northern region, was "the vitality of the associational life and the level of trust between strangers in their region" (Putnam, 1993:54). Putnam's study reflects a very crucial factor, a factor that is customarily neglected in development processes, that financial capital and policy frameworks are only part of the solution in development problems, and can only achieve so much. Social organisation and the associational life within societies (or collectively social capital) is another important component that has the potential to answer many questions on the subject of sustainable development.

In *Bowling Alone*, Putnam was concerned with the decline of the general societal connections, such as participation in social organisations, active church membership, and even ties with family and friends, which came with urbanism in America (Putnam, 1995a). He conducted an investigative research on social capital. His investigations led to the conclusion that the decline of social capital has resulted in a social crisis that needs to be addressed to strengthen

the connections of people in their roles as neighbours, co-workers, family members and fellow citizens (Putnam, 1995a). Putnam strongly maintained that social capital is significant in building cohesive societies, where citizens are not seen as 'islands in their own worlds', but as interdependent human beings, who are sustained by being connected to each other. He summarises this in the assertion that social capital is "the meaningful human contacts of all kinds that characterise the true communities" (Putnam, 1995a:134).

Putnam's theories arguably build on Bourdieu's ideas. Bourdieu sees social capital as an important form of capital which has often been unnoticed in society, and Putnam also shows the significance of social capital in the pursuit of social cohesion and sustainable development. Whether the prevalence of strong social capital can aid in the facilitation of participatory and sustainable development is no longer a question, given evidence from the literature and many development projects (Buckland, 1998; Woolcock, 1998; Woolcock and Narayan, 2000; Ledwith, 2011; Gilchrist, 2009; McClenaghan, 2000; Putnam, 1993). There is a considerable consensus that while social capital is not a panacea for all development problems, there is certainly a wide range of development problems which can be addressed by measures of social capital. The question that this research attempts to answer is how social capital can contribute to participatory and innovative development, within the context of the information society.

Coleman, one of the most influential American sociologists, also contributed a lot to the concept of social capital. He used it to give a human and more collective social face to the theory of rational action (Gauntlett, 2011:128). Through his analysis, the important question which Coleman was attempting to answer is: What influences social action? He realised that the approaches of the two disciplines, sociology and economics, provide contrasting analyses to the same question and, according to him, both of these analyses are flawed (Coleman, 1988; Gauntlett, 2011:128).

On the one hand, the sociological intellectual stream provides that the actor of an action is shaped by the social environment, which reflects that the actor has no internal influences that give purpose or direction (Coleman, 1988; Gauntlett, 2011:129). On the other hand, the economics intellectual stream provides the rational or purposive theory of action which flies over the face of the observed reality on the influence of social environment (Coleman, 1988; Gauntlett, 2011:129). Coleman therefore argued that, in order to correct these defects, the economics' principle of rational action can be used in the analysis of social systems without

discarding social organisation in the process (Gauntlett, 2011:129). Coleman, hence, believed that the concept of social capital can be used as a theoretical tool in attempting to correct and bridge these flawed intellectual streams.

Coleman thus defines social capital by its functions "as a variety of different units with two elements in common: they all consist of some features of social structure, and they facilitate certain actions of actors" (Coleman, 1988:96; 2002:112). Then social capital is not necessarily a resource possessed by an individual actor, but it constitutes a resource available to an actor (Coleman, 2002:112). What can be drawn from Coleman's analysis is that an enabling social environment should be available to motivate individual and group actions. In the light of Coleman's analysis, one of this research's aims is to explore the influence of the Living Lab model as a resource and an enabling environment available within a rural community setting which can facilitate social actions for development initiatives.

In his original article, Coleman defines social capital as social relationships within the family and the community which generate support for the development of individuals (Coleman, 1988, 1994; Sun, 1999). Coleman's conceptualisation reflects that the success of individuals does not depend entirely on their inherent abilities and capabilities but also, on the social support that motivates them to translate their abilities into achievements. Coleman used the concept of social capital in, among other areas of focus, explaining educational performance and achievement. He conducted comparative studies in different categories of schools – catholic, public and private – in which he compared the measures of social support possessed by the students from such schools, whether within or outside their own families, against their academic performance (Coleman, 1994; Teachman, et al., 1996).

According to Sun, within the family, social capital includes interpersonal relations among family members, which signify "a social bond that facilitates the activation of other forms of family-based capital (material, cultural and human)" (1999:404). Outside the family, social capital includes social organisations and interactions that provide social support to individuals. Through his detailed study, Coleman discovered that students with more social support system are more likely to perform well academically, and are less likely to drop out of school in comparison with those with very limited social support (Coleman, 1994). His findings provide strong evidence that a significant volume of social capital possessed by the students serves to enhance their academic achievement (Sun, 1999; Teachman, et al., 1996). Therefore, it can be argued that intelligence in children is not just an innate characteristic but

it can be cultivated by means of the social support available to an individual. This research aims to explore how the increased social capital can contribute to community development through empowerment of individuals.

4.3 Components of social capital

Based on conceptualisations of social capital by Bourdieu, Putnam and Coleman as discussed above, it is evident that social networks are an important form of social capital, through which the benefits of social capital can flow. Networks are one of the two specific forms of social capital that this research explores. The second is information channels, which denotes the flow of information in the networks. Woolcock (1998) explored social networks by developing a theoretical framework that explains the three components of social capital.

First he identifies bonding social capital, which refers to strong social ties between people in similar situations such as family members, close friends and neighbours (Woolcock, 2001; Schuller, et al., 2000). Stone and Hughes (2002: unpaged) refer to bonding social capital as an exclusive social capital which describes ties between people "who already know each other and have a sense of common identity based on such things as family, culture and ethnicity." Bonding social capital tends to reinforce homogeneity, and it is due to this homogenous nature that these strong ties can become walls for excluding those who do not qualify (Schuller, et al., 2000:21). These strong ties, however, can provide strong social and psychological support for those who are part of them (Stone and Hughes, 2002: unpaged).

Secondly, Woolcock (2001:13) identifies bridging social capital, which signifies more distant ties between heterogeneous groups of people but who could be in similar settings such as colleagues, loose friendships and classmates. Schuller, et al., (2000:21) argue that due to the heterogeneity of this type of social capital, it is more likely to foster social inclusion. Stone and Hughes (2002: upaged) also refer to it as an inclusive social capital. Unlike bonding networks, bridging networks are more useful in providing access to external resources and for information dissemination (Stone and Hughes, 2002: unpaged). Halpern (2005:19-20) asserts that bridging social capital enhances access to information and supports professional advancement. Both Bonding and bridging social capital enable the formation of networks among people in similar socio-economic situations, hence they are referred to as horizontal forms of social capital (Mignone and Henley, 2009:129).

Lastly, there is linking social capital which brings together different people in dissimilar situations such as those from different communities (Woolcock, 2001:13). Woolcock claims that this allows members to mobilise resources beyond their own communities (2001:13). The networks in this category of social capital are with the people who are further up or lower down the economic and social ladder, and are entirely outside the community, hence, it is referred to as the vertical form of social capital (Mignone and Henley, 2009:129). This research explores whether, through the use of ICT within the Living Lab model, rural community members can mobilise information outside their own communities from other sectors in the society. All these types of networks will be taken into cognisance during the exploration in this research. These different types of networks can manifest at the different levels of social capital, the micro, meso and macro levels. The levels of social capital will be discussed in the next section.

4.4 Levels of social capital

According to Putnam (1995), social capital can be viewed on individual, community and institutional resource fronts, and has been studied at the micro, meso and macro levels. At the micro level, social capital refers to networks and relations between individuals (Beugelsdijk and Smulders, 2003:3). These include neighbourhood, family, friendships and colleagues. Ozmete (2011: unpaged) indicates that at the micro level, individual relations are organised by factors such as "biological factors, age, work, religion, education and geographical settings." People tend to relate with those who share similar situations and interests with them. Ozmete (2011: unpaged) further sees social capital at the micro level as "an investment in social relations with an expected return" in different aspects of an individual's life. For him, the fundamental aspect in defining and discussing social capital is resources needed to sustain and enhance human life, and interpersonal relations are the way in which individuals mobilise these resources (Ozmete, 2011: unpaged). Individuals derive benefits from associating with those who form part of their networks: family members, neighbours, friends and colleagues.

According to Ozmete (2011: unpaged), "by expanding the units of observation and introducing a structural component to social capital, Coleman (1988) engaged a broader or meso interpretation of social capital." His definition considers relations among groups rather than individuals. Hence, meso social capital refers to structures that facilitate collective actions (Grootaert and Bastelaer, 2001; Coleman, 1988) such as communities, local

organisations and social groups or clubs (Mignone and Henley, 2009:130). It is, however, worth noticing that even at the meso level, it is individual relations that form networks of groups or organisations. Nevertheless, the level of intimacy, personal interactions, as well as the purpose of interactions, and sometimes the frequency of interactions, are the factors that describe the major differences between the micro and meso levels of social capital.

At the macro level, social capital refers to networks between institutions, sectors and even international organisations, such as the United Nations (UN), the African Union (AU) and the European Union (EU). Woolcock and Narayan (2000:229) provide a comprehensive definition which describes the macro level social capital: "social capital refers to the institutions, relationships and norms that shape the value of a society's social interactions. It is not just the sum of the institutions which underpin a society; it is the cement that holds them together" (Woolcock and Narayan, 2000:229). At the macro level, individuals' informal relations are less significant. The principal goal of institutional relations is the resources embedded in them which can be mobilised for more complex societal benefits.

This research explores social capital at the three levels: the individual, and the community as well as the institutional or sectorial levels, which together form the micro, meso and macro levels respectively. This means that the research will explore networks between individuals: neighbours, colleagues, friendships and family members. It will also focus on networks at the community level: groups, collective projects and local organisations. Then, lastly, it will focus on the networks between institutions: communities and other sectors, such as government institutions, the private sector and academic institutions.

4.5 Forms of Social capital

As has been indicated previously in section 4.1, there are two forms of social capital that form the basis of this research's objectives. In this section, the discussion will be on these two forms, networks and information channels. These forms of social capital also reflect its function, which is that it constitutes useful resources for individuals, groups and communities.

4.5.1 Networks

Networks are considered as fundamental to people's lives and a significant resource in the living together of the people (Boeck, et al., 2006:9). Wind, et al., (2011:2) assert that social capital is the ability of actors to secure benefits from belonging to a network and other social structures. According to Ashida and Heaney (2008:873), the provision of social support is one of the important functions of networks and relationships. In fact, Boeck and Fleming (2005:262) state that the practical use of social capital is manifested through a variety of networks and relationships in communities, associations and organisations. Furthermore, belonging to a network is essential, not only for the benefits embedded in them, but also because "networks are intrinsic to self-identity" (Boeck, et al., 2006:9). Putnam realised the significance of social ties in building sustainable, cohesive communities when he declared the erosion of social ties and the associational life as "a social crisis that needs to be addressed to restore the essence of true communities" (1995a:133). This research will explore networks in communities, such as local organisations and associations to local institutions, and how people yield benefits from the networks for the improvement of their socio-economic situations.

People use networks for a variety of benefits in their different spheres of life. As indicated by Boeck and Fleming (2005:265), people use social capital within their networks for material gain and economic improvement in their day-to-day living. People in communities have often used social safety nets, such as social groups, local organisations and social security programmes, to insure themselves against poverty and disasters. Coleman (1994) showed that children can use their networks as support system to help them enhance their educational achievement. Halpern (2005:20) believes that having a family that supports and encourages an individual from a young age has a considerable impact on one's educational attainment and subsequent earnings. Similarly, people use their networks in the labour market. In some cases, people's opportunities in the labour market are determined not so much by their skills and qualifications, though that matters too, but also by whom they know. Halpern (2005:21) confirms this in the assertion that "indicators of more limited supportive social capital in childhood significantly predict the risk of unemployment in adulthood." As indicated earlier, this research will explore how individuals and communities use their networks to their benefit, and how that can, in turn, translate into development, both at the individual and community levels.

One of the areas in which networks have proven to be beneficial is health. Irwin, et al., (2008:1935) argue that "the relationship between social capital and health is the most well-established of all social capital connections." They believe that the more connected people are to their communities, the less likely they are to experience heart attacks, depression, strokes, and many other causes of premature death (Irwin, et al., 2008:1935). Cattell (2001) also maintains that solid evidence links networks and participation in organisations with better health chances. Irwin, et al., (2008:1937) indicate that the influence of social capital on health is more evident on preventive measures and behaviour change.

The Global Health Action (2011) realises direct, but also indirect benefits of networks on people's health. In the research conducted in two communities in California by the Global Health Action (2011), a different dimension in which people can use social capital for health benefits was identified. The two communities were compared in terms of important preventive behaviour. The disparity in the results was relational to the differences in the availability and effectiveness of networks and structures that support the promotion of good health – anti-smoking campaigns for example (Global Health Action, 2011). The results from this research led to the conclusion that networks can aid the facilitation and diffusion of health information within communities (Global Health Action, 2011). The flow of information through improved information channels is one of the areas which will be explored in this research.

Some meso level networks are established in order to empower or support individuals when their micro level networks fall short of providing the necessary support. This, Vanhaute and Lambrecht (2011) confirm in their research entitled "Famine, exchange networks and the village community – a comparative analysis of the subsistence crises…" which was aimed at analysing the local coping mechanisms in communities. This study was undertaken at both the individual or household level, as well as at the community level. The study looked at how people make use of collective projects for food production and other survival purposes (Vanhaute and Lambrecht, 2011). The study revealed that collective projects within communities are able to provide long-term support for individuals within the networks, when they are unable to produce enough at the family level. Narayan (1997) also confirms that individuals use networks at the meso level to increase their resource mobilisation. This research explores how the meso level networks can be established and strengthened by the environment created by the existence of the Living Lab in the communities.

Although it is clear that networks have a significant role to play in society, networks can also have negative implications in communities and families, and even in society at large. The conflicts that arise within the networks can sometimes be counter-productive in solving individuals' or collective problems. Furthermore, it is within the same networks that people can sometimes be exposed to oppression and be denied the privileges of being in those networks. Some networks are actually formed by deviants to empower themselves in their mission of robbing others of their rights and freedoms. The formation of gangs is a good example of such networks, which are not necessarily contributing towards building a cohesive society.

Because networks are not always resistant to conflict and destruction, Field (2003:63) indicates that trust is one of the factors upon which the foundation of networks can be laid in order to sustain them. He believes that trust is one of the various ways in which social ties essentially work to stimulate significant effects (Field, 2003:64). Field argues that people can cooperate effectively and achieve their goals only if they not only know each other but also trust one another (2003:63). People naturally become more hesitant if they think that at any point they will either be exploited or defrauded, hence they will withhold their participation. Field further showed the significance of trust in the formation of networks; in families, for example, he argued that people who intermarry can only do that on the basis of trust (2003:64). People who club together in order to expand their useful connections essentially base their associations on trust.

Collective action is naturally a fragile process, because it brings together individuals who are totally different to a common goal and, as such, conflicts are bound to arise. Fukuyama (1995) believes that within the networks there should be an element of 'enforceable trust', which is a mechanism that encourages mutual commitment among individual members, despite their differences for their mutual security and livelihoods. Ozmete (2011) also indicates what he refers to as 'community customs' as an important component of the meso level networks. These can be used for the enforcement of mutual goals, and in ensuring that individuals within the networks do not always act according to their different preferences, but they take into account the preferences established by the group or community (Ishihara and Pascual, 2008:8). Hence, collective action is made effective in the presence of common goals and mutual trust.

Trust is not only significant at the micro and meso levels but also at the macro level of larger complex networks and organisations. Fukuyama (1995) highlighted the importance of trust in the assurance of social order, for example, declaring that trust is the root of social order. On a more complex level of political institutions and governance, Maloney, et al., (2000) see trust as a key indicator of the health of democracies. For them, the more there is trust between political institutions and the people at the grassroots level, the more healthy the democracy (Maloney, et al., 2000:805). Knack and Keefer (1997:1259) also affirm the significance of trust at the macro level by stating that social cohesion may be the product of trust in society and can strengthen democratic governance in return.

One of the objectives of this research is to explore how the increased social capital can, in turn, lead to civic participation and participatory development. It is believed that trust between citizens (communities) and the government as stakeholders within the Living Lab model has the potential to ease democratic processes. Government's accountability is one of the basic implications of a healthy democracy, and that can only be enabled by open platforms of information flow and exchange between citizens and the government. The next sub-section will consist of a discussion on information channels, which enable the flow of information within the networks.

4.5.2 Information channels

Information is generally essential in providing a basis for actions and solutions. However, accessing information is not always free. Individuals use their networks and social relations which are maintained for other purposes as resources to acquire information (Lin, 1999:36). Evidence shows that belonging to a network leads to "better access to information, influence, social credentials and reinforcement" (Lin, 1999:36). This, therefore, suggests, for instance, that strongly connected communities have a better chance of influencing governments' efficiency. Furthermore, strong relations between governments and citizens, enabled by easy flow of information, are more likely to reinforce accountability. According to Case (1991:66), the use of networks as information sources is a common practice because it is a "typically easier and a more readily accessible means than the most authoritative printed sources." Studies on human information behaviour show that people are selective about whom they get their desired information from (Johnson, 2004: unpaged). People make strategic choices of whom to get information from because they do not only seek information but they also seek relevant information, which can only be obtained from specific individuals.

However, with the prevalence and evolution of ICT, the nature and the level of information flow have changed significantly. People no longer depend purely on others for information access. Even where people rely on others for information acquisition, the nature of interaction and information exchange does not necessarily have to be on a physical or face-to-face front. This is because the nature of networks themselves is changing with the evolution of ICT. This research explores the methods of the exchange of information between stakeholders in the Living Lab model, and how ICT can be used to improve the processes of information flow. This has a potential to go a long way in enabling solidarity among sectors in the society.

Johnson (2004: unpaged) identifies three factors that determine who the information seeker chooses to consult. First, it is the strength of relationship between the information seeker and the information source. Second, the nature of information needed by the information seeker and possessed by the information source. Lastly, there is the hierarchical nature of the network or structure and the position of the information source. Granovetter (1983) uses the network theory to explain that information is possessed by individuals in the network, and access to this information depends on the relationship with the individual in possession of it and where one is located in the social structure.

The network theory is rooted in the concepts of social network analysis, which explain "how the quality of social resources available to an individual within his or her social network influences the success of acquiring information" (Granovetter, 1983:202). Does the Living Lab model as a collaborative model have the potential to enable the establishment and strengthening of networks between sectors in the society, and among individuals within the communities? Can this collaboration aid the processes of information exchange or flow between communities and other sectors in the society? And can ICT-aided information processing help to improve the level of communication between rural communities and other sectors in the society? Based on the theories of information flow within the networks, these are some of the questions that this research is attempting to address.

It has been repeatedly indicated in this research that rural communities are often excluded in the information distribution processes. While information can easily flow within communities, it is not the case when it comes to information outside communities. Rural communities are usually the last to know about job opportunities, civic matters, economic issues, and many other issues related to development. This is typically because of, among other reasons:

a) their weak ties with other sectors and information sources in the society;

b) the methods of information distribution which change the nature of information distributed in the information age; and

c) the geographical location of rural communities.

Collaborative models, such as the Living Lab model, which take into account the inclusion of rural communities, essentially break the barriers of information flow between rural communities and other sectors in the society. In the next section, the discussion will focus on explaining the erosion of social capital in the society, and in the section that follows, the discussion will be on the potential embedded in the Living Lab model to enable the creation and strengthening of the above discussed forms of social capital in the information age.

4.6 Explaining the erosion of social capital

Putnam's study of *Bowling alone* (1995a) attempted to reflect some of the possibilities that lead to the erosion of social capital in communities. This section consists of the discussion of some of the possible causes of the decline of social capital. According to Putnam (1995b:668-669), pressures of time and money is one of the key factors that leads to the decline of social connectedness. People are certainly busier now than they were generations ago. Robinson and Godbey (2005:409) indicate that the proportion of those who feel 'always rushed' jumped by half between the mid-1960s and the mid-1990s in America. While there are disparities in people's life styles from one society to another, with many similar trends in the evolution of societies around the world, this reflection is likely to apply in most parts of the world.

People's priorities are now centred on economic activities for individual benefits over just maintaining the social fabric of societies. This pervasive 'busyness' leads to drop-out from community affairs (Putnam, 1995b:668) which, in turn, affects the organisation of networks. Would one attend community meetings to discuss developments of the community, or rather go to work even on weekends to increase one's earnings? Clearly the latter is more appealing and definitely makes more financial sense in the age when the economy and its activities speak with much volume on what is said to be a successful living.

In section 2.5, it is reflected that migration of the rural people to urban centres has been an on-going and growing trend since the turn of the 1950s. Urbanisation and industrialisation have been criticised for their negative effects on the social fabric of communities (Kasarda and Janowitz, 1974:328). According to Forrest and Kearns (2001:2125), "urbanisation is seen

to be producing a social order in which the traditional ties of community (shared space, close kinship links, shared religious and moral values) are being replaced by anonymity, individualism and competition." Due to economic hard times experienced in majority of or nearly all societies around the world, people are often in constant search for better jobs in urban centres in order to improve their livelihoods. This migration tendency, however, is no longer only from rural to urban, but also within urban areas people move from one place to another in search of greener pastures (Putnam, 1995b:669). Residential mobility is thus one other factor that results in the erosion of social capital. As indicated by Putnam, residential mobility tends to disrupt root systems of social organisation as it takes time to establish new roots of social connections (1995b:669).

The movement of women into the paid labour force is another identified factor that leads to the deterioration of networks. Acoording to Gittell, et al., (2000:124), women form the majority of active participants in organisations and networks in most communities. This is partly because, historically, women have been excluded from public decision-making, and networks are believed to be their platforms of empowerment as they lead to "the formation of coalitions, increased status and increased power to influence decisions and public policies" (Gittell, et al., 2000:123-124). Economic pressures, however, force women to migrate into paid labour, and that affects their participation in local organisations and associations. As a result, traditional networks are slowly declining, and the social fabric of communities is gradually waning.

Studies show that the changing roles and mobility of women does not affect networks only at the community or societal level but also at the family level (Han and Moen, 1999; Putnam, 1995b). Putnam argues that disruptions of marriage and family ties are some of the direct effects of women's migration (1995b:670). Historically, most women invested heavily in social capital formation at the family level. Putnam maintains that "the movement of women out of the home and into the paid labour force is probably the most portentous social change of the last half century" (1995b:670). For Putnam, however welcome the feminist revolution may be, it is unrealistic to believe that it has not affected the social fabric of societies (1995b:670). In fact, Putnam argued that some patterns available in his study on America's declining social capital support the claim that the changing roles of women is the underlying factor for the decline of social capital (1995a). On the other hand, some studies show that as women move into the paid labour force, they become members of formal associations and unions which constitute social capital at another level (Robinson and Godbey, 1997:11).

Circumstantial evidence suggests that another important cause of the erosion of social capital is the growth of the welfare state (Fukuyama, 1995). It is argued that state intervention has destabilised civil society by 'crowding out' private initiatives (Putnam, 1995b:671). Some government policies have had direct effects on the erosion of social capital. For example, while the 'slum clearance' policies have certainly replaced physical capital, they have, on the other hand, destroyed social capital by disrupting existing community ties (Wilkinson, 1998; Putnam, 1995b; Gilbert, 2007). Kaariainen and Lehtonen (2006:37) argue, based on their comparative study on "social capital in welfare state regimes," that "strong welfare states weaken the preconditions for the growth of social capital rooted in close communities such as families, local organisations and in civic engagement."

Some writers, including Putnam (1995b), have attempted to show that the 'technological revolution' has had negative effects on the social fabric of societies. Putnam specifically focused on technologies such as television and their negative effects on family ties, social trust and group activities (1995b:680). Some writers went further to indicate the negative effects of technology on the macro level social capital, such as civic participation and institutional involvement (Patterson, 1993). Patterson attempted to reflect how media undermines and discourages political trust and civic participation (1993). He argued that media tends to use technology and the power it gives to portray political institutions in an overwhelmingly negative front (Patterson, 1993). On the contrary, there is no doubt that political institutions are increasingly taking advantage of the media for their campaigns, calling for citizen participation and civic involvement. Furthermore, the media has become a platform for public and political accountability, which strengthens the relations between citizenry and institutions.

While it may be true that, certain technologies can indeed be disruptive to social and community ties, it is not entirely true for all ICTs. Other forms of ICTs, such as the Internet and phones, have made it easier for people to communicate and form meaningful relationships. Critiques argue that traditional forms of networks and kinship ties are seen to be waning away, and replaced or supplemented by new forms of relations and associations (Amichai-Hamburger and Ben-Artzi, 2003; Kraut, et al., 1998; Putnam, 1995; Patterson, 1993), and this for them, is a sign of the erosion of social cohesion. Virtual networks, for example, are significantly crowding out the traditional associations and networks. But, on the other hand, proponents provide the assurance on the significance of ICTs in building and strengthening networks (Licoppe and Smoreda, 2005; Smoreda and Thomas, 2001; Gaved

and Anderson, 2006; Mignone and Henley, 2009). Wellman, et al., (1996:216) assert that "virtual/online networks sustain strong, intermediate and weak ties that provide information and social support in both specialised and broadly-based relationships."

It may also be crucial to note that the use of the Internet itself has been evolving over the years. People have not always used the Internet heavily for social networking like they have done since the 1990s (Rheingold, 1993; Kollock and Smith, 1998; Wellman, 2001), and even more heavily since the early 2000s. Online social networks (such as Facebook, Twitter, Whatsapp, etc.) were non-existent until the turn of the millennium. Such networks have drastically popularised the use of the Internet for social networking in a way that has never been experienced before.

Although to some it may be easy to get carried away with the claim that technological revolution is contributing to the decline of social capital, there are a number of important questions which are relevant in this ICT-dominated age: are locally-based traditional networks still relevant in this age? Are they more effective in building social connectedness than new forms of social networks? To what extent are traditional networks contributing to development in comparison with new forms of networks? Do new forms of networks contribute to the cultivation or decline of social capital? And, therefore, is it entirely true that the technological revolution is wearing away the social connectedness of societies?

Smoreda and Thomas (2001:2) indicate, based on their research on "social networks and ICT adoption and use," that the Internet users are more sociable and have different personal networks in comparison with Internet non-users. In particular, as reflected by their study, long-term Internet users report more frequent sociability with friends, families and associates (Smoreda and Thomas, 2001:2). However, beyond all these questions and their respective responses, even more imperative is the question of access. What proportion of the population, particularly in rural milieu, has access to these new forms of networks? What factors determine access to new forms of networks? In an attempt to answer these questions, the following section will reflect how the Living Lab model can address the question of access to ICT in rural communities, and how this can also cultivate the two forms of social capital in the communities.

4.7 Living Labs in the creation of social capital

This chapter has discussed social capital as a concept, its relevance and functioning in society, as well as some factors that result in its deterioration. The decline of social capital in the information era, however, is not a claim with which everybody agrees. There are reliable observations that many writers have made that led to their varying perceptions of the erosion of social capital. This section covers the discussion on the potential of the Living Lab model in enabling the establishment and cultivation of old but also new dynamics of the forms of social capital.

4.7.1 Living Labs and networks

Proponents of ICT and its support to social capital do, in fact, agree that some forms of social capital are in a sense declining but they also realise that new forms of social capital are being established in the process (Wellman, et al., 1996; Wellman, et al., 2001; Wellman, 2001). According to Wellman, et al., (2001:437), some evidence suggests that the visible decline of social capital does not automatically translate into social isolation but in communities being shifted to online social networks. Rather than groups and community organisations being established in easily observed public spaces, the formation of networks has shifted to less accessible private environments – the Internet (Wellman, et al., 2001:437). "If people are no longer meeting face-to-face in social groups and local organisations, then perhaps they are online, chatting one-to-one, exchanging e-mails in duets or small groups," and engaging in discussion groups such as listservs, newsgroups and social groups (Wellman, et al., 2001:437). Wellman (2001:2031) sees virtual networks as inherently social networks, linking people, organisations and knowledge. For Wellman, virtual networks are social institutions that should be brought to mainstream institutions and integrated into everyday lives (2001:2031).

Perhaps the most important question one would ask is how applicable this assumption is in less developed communities, especially considering that not a large proportion of people in rural communities, for example, have access to computers and the Internet. As has been indicated earlier in chapter three, the Living Lab model is a typical strategy that can bridge the gap of inaccessibility and unaffordability even in rural, marginalised communities. Through collaborative efforts between communities, the private sector, government and academia, even the most disadvantaged communities can have access to ICT-fitted spaces, giving access to computers and the Internet to the local people. Because the Living Lab

environment is equipped with ICT devices, people are not only enabled to form physical networks as a result of coming together into one space, but are also enabled to engage with the wider community of virtual social network as they use ICT devices and the Internet. This means, therefore, that the coming together of the people within the Living Lab space can strengthen the traditional networks embedded in physical interactions, and also enable the creation of new forms of virtual social networks embedded in the ICT.

Why would people participate on online networks when they fail to be active in traditional networks and associations, as reflected in section 4.6 above? The Internet enables networking between people in a way that is not limited by either time or space. Using the Internet, people do not have to leave their work, for instance, to participate in networks and associations. Furthermore, because the Living Lab environment is an innovative space, people can engage in economically viable activities, while they are, at the same time, establishing or forming networks. The Living Lab environment is not simply a space with ICT devices, or the Living Lab model a mere impersonal, transaction-based collaboration; it is a community. It brings together real-life people to the real-life environment to create real-life solutions. These people can find friends and associates in each other, a place to belong, can find trust in each other, and can certainly participate in common activities.

As has been shown earlier in chapter three, the networks within the Living Lab model can be between individuals, but also between institutions and sectors. Networks enabled by the Internet cut across the micro, meso and macro levels of social capital. Vergeer (2012:9) asserts that the widespread of electronic mass media has enabled political leaders and other politicians to engage with the public in a more effective manner. The Internet has also become an important additional platform of citizen participation (Vergeer, 2012:9; Wang, et al., 2012:782). Within the Living Lab environment, therefore, citizens are able to participate in politically-driven virtual group discussions and hold the government accountable, as well as vote through the Internet in some societies. The Living Lab model, therefore, has the potential to not only cultivate old forms of networks but also to enable the creation and participation in the new forms of networks embedded in ICTs.

4.7.2 Living Labs and information channels

As has been reflected earlier in section 4.5, the flow of information within the networks can be restricted by a number of factors including: geographical boundaries, the strength of ties between the information bearer and the information seeker, the location of both the information bearer and seeker in the social structure, as well as the nature of the information in subject (Johnson, 2004: unpaged). This section attempts to reflect the potential of the Living Lab model in breaking some of the barriers of information flow, and increasing the level of the exchange of information in the networks.

Over the past decade the idea of the Internet as a platform for civil society to thrive has sparked much debate (Himelboim, 2011:634). Much emphasis in the discourse of civil society has predominantly been on freedom and liberation. The flow of information has often been associated with liberation and freedom: freedom of expression, access to information and government' accountability, all of which require unrestricted flow of information. Habermas (2006:416) argues that ideally the public sphere should create open platforms where citizens can voice their opinions and influence decision making in the political sphere. An active and strong civil society produces a wide variety of information, opinions and demands (Himelboim, 2011:637), all which should rightly flow to the government to be incorporated in decision making. While this is ideal for any society, some of the critical questions that need to be asked are: How easily accessible are the information channels between citizenry and the political sphere? Or how unrestricted are these information channels?

Although it might seem like too much credit is given to the Living Lab approach, the model is a missing piece which, technically, has the potential to link sectors in the society, and ease the flow of information between these sectors. There is no doubt that ICTs have an inherent potential to speed up the flow of information. ICTs provide a space where information can flow unrestricted by geographical boundaries. People can access and exchange information wherever they are using ICT devices and the Internet. Therefore, innovative applications which can be co-created, field-tested and deployed within the Living Lab environment can aid in ensuring unrestricted flow of information, by enabling effective communication between communities and the government. Furthermore, because the flow of information can sometimes or often be restricted by the strength of ties between the involved parties (Johnson, 2004:unpaged), the collaborative Living Lab model offers a great opportunity for the

establishment and strengthening of bonds between sectors in the society, enabling effective exchange of information between these sectors. Applications and services such as e-government and e-health are not only applicable within the Living Lab model, but it can be very effective to deploy such applications where there is already an established collaboration and strong bonds between the involved sectors. Such applications are, in fact, the instruments to enable instant, effective information flow.

The location of the information seeker and information bearer in the social structure can also determine the flow of information between the information seeker and bearer (Johnson, 2004: unpaged). In the situation where there is dominance and subordination between the government and citizens, or between other sectors and communities, the flow of information will definitely be hindered. The dominating sector, the government in this case, will not feel obliged to hear the opinions of the citizens and incorporate them. On the other hand, citizens will have no courage to voice their opinions to the government. As a result, this flawed nature of relationship that locates citizens at the bottom of the social structure will inhibit the flow of information. The Living Lab model offers a collaborative platform for all sectors, ensuring that these sectors all become partners, supposedly equal partners. All stakeholders play their respective roles and bring in their corresponding contributions into the partnership. This nature of relationship can help in the reduction of dominance and subordination, and ensure that all sectors are equally located in the social structures so that the exchange of information can easily occur.

4.8 Conclusion

This chapter conceptualised and discussed social capital as the theoretical framework upon which this research is predicated. The chapter showed how social capital has been reflected by many scholars as useful to individuals, communities and even nations all over the globe. It shows that networks and information channels are important aspects of social capital, through which the benefits of social capital can be produced, reproduced and flow. Social capital is useful in facilitating the processes of ensuring sustainable development and cohesive communities. From the discussions, it is quite evident that some traditional forms of social capital are declining but it is also evident that new dynamic forms of social capital are being established in the process. It is, therefore, shown that the Living Lab model has a greater potential in the creation of new forms of social capital – networks and information channels in particular – as well as in the cultivation of some old forms of social capital. ICT, the

Internet in particular, and its influence on social networks, is not a new phenomenon. However, the Living Lab approach has different features that create platforms for networking and information exchange. Hence, the advantage of the Living Lab model is not just ICT, but also the collaborative nature that addresses the question of access and sustainability.

CHAPTER FIVE

ICT4D, Social capital and the South African context

5.1 Introduction

This chapter examines and places ICT4D and social capital as discussed in chapters two, three and four respectively within the South African development context. The chapter reviews the South African sustainable development agenda and shows the place of ICT and social capital within the agenda. The discussion will give reference to Sen's summary of developmental indicators, classified in four main categories: economic opportunities, political freedoms and transparency guarantees, social facilities and the development of knowledge societies (1999), as discussed in section 2.4. In this chapter, however, attention will specifically be given to the South African context. Different policies, legal frameworks, strategic plans and some government programmes, will be discussed against the actual situation on the ground. In each sub-section, the discussion on the developmental indicator will be followed by a discussion on how ICT could be integrated to address some of the challenges that will be reflected in implementing the development agenda.

The discussions will focus specifically on the relevance of the Living Lab model in achieving South Africa's vision of incorporating ICT in development goals. It will be reflected that ICT4D is not just a simple question of technology but the incorporation of ICTs in the national development goals. As such, ICT4D should be viewed from the broader perspective of the complex society not only from the technological perspective. While the discussions will not in any way suggest that ICT is a solution for all sustainable development short-comings, it will reflect how the engagement of ICT for development in the information age, particularly using the Living Lab model, has a greater chance of addressing some of the reflected development challenges. Lastly, this chapter will show the place of social capital as one of the elements that the government embraces in order to achieve a sustainable, cohesive society.

5.2 Sustainable development in South Africa and the role of ICT in the agenda

The emergence of South Africa from the apartheid regime since 1994 has called for a thorough review of policy and planning structures (Patel, 2000:383). Almost two decades beyond its democracy, the South African government is faced with immense and highly complex national challenges. These conditions require complex, integrated processes in order to reduce a significant range of national problems. The concept of sustainable development has been fostered by the post-apartheid South African government, with the aim of addressing factors that underpin wide-ranging problems in the country (Patel, 2000:384). The concept has been adopted in key policies and legislation (including the Constitution) and strategic planning in national development processes (Republic of South Africa, 1996).

The "explicit idea of sustainable development was first highlighted by the International Union for the Conservation of Nature (IUCN, 1980) in its World Conservation Strategy" (Liu, 2003:460; Hopwood, et al., 2005:39). The Brundtland Commission Report later defined sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (Liu, 2003:460; Huesemann, 2003:21; Giddings, et al., 2002:188). Even though the concept was originally viewed from an exclusively environmental spectrum, it later gained recognition because of its potential to support long-term transformation (Patel, 2000:384). As a result, it became favourable in post-apartheid restructuring. Today sustainable development has become the key word in development discourses and processes in many countries including South Africa.

5.2.1 Sustainable economic development in South Africa

In the 1980s, "the De Kock Commission of Inquiry into the Monetary System and Policy in South Africa laid the foundation for monetary policy implementation" (Smal and De Jager, 2001:2). The report proposed a model of monetary policy that was "firmly directed towards maintaining a stable financial environment, which was very much in line with the actions taken in most developing countries during that time" (Smal and De Jager, 2001:2). This monetarist approach to monetary policy did take into account the goals of the country, which included the cultivation of economic growth, creating employment opportunities and the betterment of the livelihoods of average citizens (Smal and De Jager, 2001:2). The monetarist approach in the South African monetary policy was driven by the firm believe that significant economic growth could only be attainable and sustainable in a country where financial conditions are stable (Stals, 1999).

Although these assumptions were based on valid, rational and well informed findings, the outcomes did not correspond with the initial expectations due to the effects of the changing financial environment. The relationship between money supply, the inflation rate and changes in interest rates had now become by far the most unpredictable in the history of the South African economy (Aron and Muellbauer, 2007:709). This inconsistency in the transmission mechanism of monetary policy led "the South African Reserve Bank to move away from formally targeting the money supply, to using a far broader range of economic indicators for the determination of its policy actions" (Smal and De Jager, 2001:3).

The structurally-based economic problems necessitated a re-evaluation of policy measures in an attempt to catalyse transformation growth in South Africa (Ligthelm and Kritzinger-van Niekerk, 1990:629). Policy makers began to realise that economic problems could only be addressed by executing a comprehensive policy package (Ligthelm and Kritzinger-van Niekerk, 1990:629). After the 1994 democratic elections, South Africa was left in an undesirable condition that was created by apartheid, and the biggest challenge was to recover the country's economy and citizens' well-being. According to May and Govender (1998:56), "the activities of apartheid stripped people of their assets, mainly land, distorted economic markets and social institutions through racial discrimination, and resulted in violence and destabilisation."

Some of the priorities of the post-apartheid South African government were to bridge the gap of inequality, alleviate poverty and create a suitable environment for cultivation of employment. The government thus designed and implemented various national, provincial and local level policies, strategies and programmes in attempting to improve the economy and living conditions of the masses. Examples of such policies, strategies and programmes include: Accelerated and Shared Growth Initiative (ASGI-SA), promotion of SMMEs and Black Economic Empowerment (BEE), Integrated Development Plans (IDPs), and rural and urban livelihoods promotion programmes (Department of Economic Development, 2006; Pillay, et al., 2006).

These policies and strategies were meant to foster not just development but also to ensure that development is sustainable through inclusive interventions. ASGI-SA, for example, was established with the aim of addressing some of the binding constraints of the economic

growth in order to curb poverty and unemployment (Republic of South Africa, 2011). It was intended to bring about shared and balanced growth through infrastructure development, education and skills development, private sector investment, etc. (Republic of South Africa, 2011). The fundamental assumption on the establishment of ASGI-SA was that improvement in the living standards is to be shared by all segments of society, particularly the previously disadvantaged (Behar, 2006:2). BEE policy, also, was aimed to be an inclusive policy which could "bring about equitable distribution of wealth in the country that has been torn by inequalities, and to ensure that the majority of the disadvantaged South Africans benefit from the country's economy" (Mpehle, 2011:140). Through the development of the IDPs, local governments were given an opportunity to come up with Local Economic Development (LED) programmes, aimed at creating and cultivating wealth at grassroots levels (Nel, et al., 2009:225).

These efforts of the government, however, did not necessarily result in the intended outcomes when such policies and programmes were established. Critics argue that some of these programmes are essentially counter-productive in as far as the objectives are concerned. Behar (2006:3) argues that contrary to the initial purpose of ASGI-SA – shared opportunities for everyone's benefit – the initiative is evidently profitable at large to the already skilled, middle class, and not the poor and unskilled. Nel, et al., (2009:225-226) contend that even though LED "experienced a radical transformation in its acceptance and credibility within a short space of time of its establishment," implementation has not been without difficulties. Increasing social protests and apolitical social movements are a direct reflection of the failure of LED programmes to provide services and opportunities for all (Nel, et al., 2009:226).

Mpehle (2011:140) also argues that despite the implementation of policies such as BEE, distribution of income and wealth in South Africa remains one of the most unequal in the world. For Mpehle, even though the BEE policy was primarily aimed at offering equal economic opportunities to the black majority that were previously disadvantaged, there are very few black-owned businesses which were developed or empowered through the billions raised for BEE (2011:145). Mpehle maintains that the "people who benefit directly from the policy are those that, in one way or the other, are associated with those in power at the expense of the majority who still live in abject poverty" (2011:140). May and Govender (1998) assert that progress in areas that include education, health, equality and employment in South Africa remains significantly slow. Even though in GDP terms South Africa is a middle-

income country, many of the South Africans still live in absolute poverty (May and Govender, 1998:54). For May and Govender (1998:54), "many households in South Africa still have unsatisfactory access to clean water, energy, health care and education."

To this date, as shown by the South African National Planning Commission (2011:3), three major problems continue to threaten the South African economy: poverty, inequality and unemployment. According to Terreblanche (2002), the South African poverty and inequality problems are rooted in the nature of structural unemployment, defined as the inability of an economy to provide employment. The overall poverty in South Africa is rated at 47.1%; with 54.8% of black South Africans affected, 34.2% coloureds, 7.1% Indians/Asians and 0.4% white South Africans (Stats SA, 2008). Unemployment in South Africa is rated at 24.9%, though this is an improvement from 37% in 2001 (Stats SA, 2011). Even though the government of South Africa envisions a society where all will have basic necessities such as water, electricity, sanitation, jobs, housing, adequate nutrition, education, social protection and quality healthcare, implementation is still the biggest challenge to achieve due to their complexity and the general economic recession (South African National Planning Commission, 2011; Republic of South Africa, 1996). These intricate conditions require integrated, comprehensive policy measures and strategies to address them effectively.

Sustainability has thus become the key component to be pursued in all mainstream policies and development strategies in South Africa. The concept of sustainable development became more favourable as a result of the escalating global socio-economic problems associated with poverty and inequality (Hopwood, et al., 2005:39). Sustainable development challenges conventional economic policies that still maintain that wealth and human well-being can be accomplished through increased global trade and industry (Moffatt, 1996; Reid, 1995). Sustainable development is about equity, which is equality of opportunities for well-being, and comprehensiveness of objectives (Soubbotina, 2004).

This research aims to explore how implementation of policies and other government strategies can be enhanced by the engagement of ICT within the Living Lab model. It aims to reflect how ICT can bring some positive elements in ensuring sustainable and effective implementation of development goals. In the next section, South Africa's sustainable social development agenda will be discussed. Then in the section that follows, the discussion will

examine how ICT can be integrated in sustainable socio-economic development processes in South Africa, in order to meaningfully put a dent to poverty and increase economic growth.

5.2.2 Sustainable social development in South Africa

After 1994, the new African National Congress (ANC) government was determined to address the inequalities inherited from the previous racially divided system (Gray, 2006:53). Civil society also organised itself, on the same agenda, to advocate for social reconstruction and transformation, which had begun with the Reconstruction and Development Programme (RDP) (Gray, 2006:54). According to Gray, the RDP provided "an important backdrop to the evolution of the developmental welfare system, because its principles and philosophy were central to the processes for transforming social welfare" (2006:54). 'Developmental social welfare' is the term given to South Africa's post 1994 welfare system based on the theory of social development (Gray, 2006:54). Social development is a "theory and approach to social welfare that posits a macro-policy framework for poverty alleviation that combines social and economic goals" (Gray, 2006:53). Contrary to the welfare reform in many Western countries, which attempts to reduce government's commitment to welfare, South Africa was modelling a new system by "developing an inclusive welfare system based on the theory of social development" (Gray, 2006:53).

Social development is a concept that has come a long way in the practice of development. Midgley (2003:831) points out that social development emerged in the middle decades of the last century. The concept of social development is now well esteemed in development circles. International agencies such as the entities of the United Nations and the World Bank now employ social development specialists "to assess the social impact of projects, determine the feasibility of proposals, provide technical assistance to social development organisations and evaluate their effectiveness" (Midgley, 2003:831).

Developmentalists argue that social development theory marries social and economic goals, calling for economic planners and policy makers to work in collaboration with those working towards social improvement (Gray, 2006:53). It means "linking social interventions to a comprehensive process of economic development, integrating economic and social policies" (Midgley, 2003:835). In this way, social development was seen as the most effective way of dealing with poverty and other social problems in South Africa. Social development programmes would then be directed by social policies designed by the South African

government. The design of these social policies is guided by the developmental welfare system, which the government adopted in an attempt to achieve social development and equality.

Redistribution of resources, equality, and improved livelihoods and poverty alleviation are the key aspects that drive the processes of social development in South Africa. According to the White Paper for Social Welfare, there is a persistent extreme inequality in the distribution of income among racial groups (Department of Social Development, 1997:3). This means that extreme poverty exists alongside extreme wealth. This inequality has "severely hampered development, particularly that of people in rural areas, who are generally poorer than their urban counterparts" (Department of Social Development, 1997:3). It is no accident, therefore, that equality through even distribution of opportunities and resources form an important part of the South African development agenda.

Some of the specific programmes geared towards rearranging distribution of resources in South Africa are social security services to vulnerable groups of the population. The social security system is a mechanism for distribution that can play a stabilising role in a very unequal society (Institute for Security Studies, 1997:1). According to the Institute for Security Studies (1997:1), "social welfare policies and programmes that provide for cash transfers, social relief, and enabling developmental services ensure that people have adequate economic and social protection during times of unemployment, ill health, maternity, child rearing, widowhood, disability, old age and so on." Social security services in South Africa include: child grants, disability grants, elderly pensions and war veterans grants (Department of Social Development, 1997).

However, like many other practices and theories, the theory of social development has been hugely criticised by many scholars and developmentalists. In South Africa, state intervention based on the theory of social development has been the target of much debate and criticism. South Africa is estimated to have an average 30% per annum growth in social security spending, making it the developing world's biggest welfare economy (Joffe, 2004:unpaged). Critics argue that this kind and extent of the state's intervention is neither sustainable nor "in line with policy directions towards job creation and social development" (Joffe, 2004: unpaged). According to Armstrong, et al., (2009:unpaged), "while the expansion of social security services has brought much-needed relief for many trapped in poverty, lasting

progress in the battle against poverty and its manifestations requires accelerated economic growth and fundamental reform of the South African education system."

This, therefore, means that alongside relief strategies that are aimed at rescuing those trapped in poverty, long-term, sustainable socio-economic strategies should be adopted to address the major issues of poverty, unemployment and inequality. The following sub-section discusses the place of ICT, particularly within the Living Lab model, in complementing long-term socio-economic processes that can go a long way in alleviating poverty and increasing economic growth.

5.2.3 ICT for sustainable socio-economic development in South Africa

As indicated in sub-section 5.2.1, monetary policies of the 1980s which were firmly directed towards maintaining a stable financial environment did not help much in recovering South Africa's economy and the well-being of its citizens. Even though the country has attempted to incorporate sustainability as one of the key components in mainstream policies and development strategies, the three main challenges – poverty, unemployment and inequality – remain a threat to the national economy as reflected by the South African National Planning Commission (2011:3). Furthermore, it does not help that the developmental welfare system which has been adopted by the government seems to have more 'social security' features than to contribute to development as it was the initial justification.

As reflected in sub-section 5.2.2, extensive state intervention for social development is neither sustainable nor in line with policy directions towards job creation and the acclaimed social development (Joffe, 2004: unpaged). The perceived challenge in the South African social development system is the constantly increasing social security spending, which does not correlate with job creation and citizen capacity building. The provision of grants for instance, offers temporary relief to those trapped in poverty but it does not in any way contribute towards capacity building, job creation and social cohesion, which are in line with sustainable development objectives.

Bagheri and Hjorth (2007:84) argue that sustainable development is not a state with an end point but a continuous process with an unknowable end point. As such, "sustainable development should be considered as evolutionary efforts, which have to be oriented towards 'processes and structural change', related to innovations in a social evolutionary perspective"

(Bagheri and Hjorth, 2007:84). Earlier it was shown that social development is about linking social interventions to a comprehensive process of economic development (Midgley, 2003:835). It is argued, therefore, in this research, that socio-economic development is sustainable in nature, and any form of intervention that does not contribute to empowering people and building their capacity should not be qualified as contributing towards socio-economic development. Socio-economic development is attained through forms of interventions that enable a paradigm shift and positive behaviour change. Kemp, et al., (2005:22) argue that "sustainability is best viewed as a socially instituted process of adaptive change in which innovation is a necessary element."

Although the reflected socio-economic problems in South Africa are overall national concerns, rural communities are unfortunately the hardest hit, as they are often the poorer, most unemployed and at the bottom in the social structure when compared with their urban counterparts. According to Herselman (2003:1), a significant proportion of rural populations in South Africa live in relative or absolute poverty, largely because they are inhibited from developing by their lack of access to infrastructure and technology conducive for development. Without electricity for instance, industrial development can hardly be established in rural communities (Herselman, 2003:1). Also, as has been indicated in section 2.5 sub-section 2.5.1, agricultural activities cannot be expanded and maintained beyond subsistence levels without supportive innovations in rural areas. Current market information to support agriculture and other activities is unavailable in rural communities due to lack of information transfer channels such as ICT.

The lack of ICT interventions in rural communities prevails despite the fact that the government of South Africa endorsed access to telecommunications as a basic need. According to van Audenhove (1999:16), the first document to stress the importance of ICT, (referred to at the time as telecommunications and information technology) in the development of the democratic South Africa is the RDP. The RDP Base document treats ICT as a major facilitator in the implementation of many socio-economic development activities (van Audenhove, 1999:16). In this context, ICT can be regarded as an enabler in development processes. The conversations on ICT started with the realisation that it is a resource which can "play a crucial role in South Africa's health, education, agriculture, informal sector, policing and safety programmes" (van Audenhove, 2003:132). As a result, "technology as a contributor to economic growth in the South African economy has become increasingly significant" (Fedderke, 2002:289).

The South African public and private sectors, in their attempt to bridge the rural-urban digital divide, have launched a number of ICT-related initiatives, most of which have been unsuccessful (Conradie, et al., 2003:200). According to Conradie, et al., (2003:200), only a few initiatives have attempted to do more than just the installation of ICT infrastructure, and even those, have only incorporated elements of computer training. Conradie and Jacobs (2003:32) believe that a possible reason for lack of success in these initiatives is that they do not consider long-term strategies that can help to solve specific needs of the targeted populations; instead, they only focus on providing ICT devices and the Internet.

Mansell and Wehn (1998:12) recommend that when ICT is incorporated in developing countries, the following aspects should form the priority objectives:

a) establishment of an ICT infrastructure or network that is reliable and affordable;

b) development of ICT applications that are responsive to local needs; and

c) ensuring local capacity to enable the deployment of ICT applications in local conditions.

The success of ICT initiatives in rural communities depends on sustainability and the deployment of suitable infrastructure (Akinsola, et al., 2005:20). Comprehensive approaches such as the Living Lab model are suitable methods that can incorporate the above recommended steps in ICT engagement. Through collaborative actions, sectors can bring in their financial and non-financial contributions to enable complex ICT interventions in rural communities. Researchers and software developers can use their expertise to develop ICT infrastructure and network that is reliable and affordable, such as open source network and applications. Through collaboration with involved communities, local needs can be identified, and relevant, responsive ICT applications be developed to enable economic development at grassroots levels. The government already has a mandate for the provision of basic services in communities, electricity for instance, as well as for the assurance of local economic development (LED) in general. Also, rural communities are potential markets for the private sector and businesses; therefore, all these sectors can channel their mandates and objectives towards the incorporation of ICT to solve the identified development challenges in rural communities. The potential for sustainability stems from the fact that this model suggests that ICT should not be studied in isolation but be incorporated into the existing sustainable development agenda.

ICT-aided poverty alleviation strategies, as indicated before, can go a long way in breaking the barriers and opening outside markets for rural communities; integrating rural communities into the information society and enabling capacity building for new survival strategies. The advantage of the Living Lab model, which can also be advantageous in South Africa where there is a huge disparity between the rural poor and the urban rich (Mpehle, 2011; le R Booysen, 2003; May and Govender, 1998), is that it helps build local capacity as opposed to sourcing it externally. This can also address the problem of unemployment for rural communities. While South Africa has made progress internationally, making it to the emerging markets group (BRICS), the staying behind and exclusion of rural communities from the information society will certainly impede growth and development in the country. Integrating rural communities into the information society, which is currently characterised mostly by urban dwellers, can help bridge inequalities associated with knowledge and economic status.

5.2.4 Sustainable governance in South Africa

It has been almost two decades now since South Africa gained its democracy. The government has since begun to tackle the complex challenge of putting an end to apartheid in an attempt to consolidate democracy and build a South Africa that is based on a non-racial local government system (Van Donk, 2008:v). Looking back there is no doubt that the government has made progress over the years to foster inclusive local governance. Mufamadi (in Van Donk, 2008:vi) asserts that there is a progressive appreciation of the place and significance of local governance in the South African government system by citizens.

The founding elections of 1994 signalled the beginning of an era in which South Africans could actively take their place as full members of the society (Lodge, 2001:5). This, however, could not be achieved over night, and the establishment of the local government structure by the South African government was a way forward to achieving sustainability and cohesion in governance. According to Van Rooyen (2003:126), "traditionally South Africa did not have a culture of actively engaging communities in government development affairs. Democracy brought new emphasis to transparency in government's activities, greater public accountability and the notion of respect for human rights" (Van Rooyen, 2003:126). Local government is, therefore, a platform to create democratic opportunities and instil democratic values in the society. In 1998, the South African government produced the White Paper on Local Government, which "seeks to facilitate the process of local government transformation

and its role in rectifying social and economic imbalances" (Department of Local Government, 1998).

As stated in the White Paper on the history of local government:

> *"Apartheid has left its imprint on South Africa's human settlements and municipal institutions. Transformation requires an understanding of the historical role of local government in creating and perpetuating local separation and inequity, and the impact of apartheid on municipal institutions. Equally important is the history of resistance to apartheid at the local level and struggles against apartheid local government," (Department of Local Government, 1998: section A (1)).*

The above assertion is a reflection that implementing local governance is clearly complex in a country that has such an extensive historical inequality. Sustainability (which technically means the ability to endure) is, therefore, an essential element in all efforts to consolidate democracy through local governance in order to ensure perpetuation of inclusive local governance and equality. Equality-sensitive, comprehensive policies are essential if the government aims to attain and sustain resilient democratic governance. According to the Constitution of South Africa (section 152) (Republic of South Africa, 1996), listed below are the objects of local government:

a) to provide democratic and accountable government for local communities;

b) to ensure the provision of services to communities in a sustainable manner;

c) to promote social and economic development;

d) to promote a safe and healthy environment; and

e) to encourage the involvement of communities and community organisations in matters of local government.

In its efforts to foster efficiency in the local government system, the Republic of South Africa through the Municipal Systems Act (2000) has made it a legal requirement for municipalities (local government structure) to produce IDPs (Department of Local Government, 2000). The IDPs were aimed at fostering a more relevant and comprehensive planning and service delivery system at the municipal level (Abrahams, 2003:185). The IDPs were meant to correct the historic local level planning which "was very technical, focusing strongly on land use and infrastructure plans but largely unconcerned with the social and economic dimensions

of development" (Abrahams, 2003:185). Many of the IDPs which have been produced have been channelled towards LED as a key strategy through which sustainable development can be accomplished (Abrahams, 2003:186). LED has thus been largely regarded as the core-function of local governments.

As stated in the Municipal Systems Act (2000) the municipalities are also mandated to develop a culture of community participation, and for that purpose they must:

a) encourage and create conditions for the local community to participate in the affairs of the municipality;

b) contribute to building the capacity of:

   (i) the local community

   (ii) councillors and staff to foster community participation.

While all these efforts of the government were rightly intended to foster effective, inclusive governance for a better South Africa, evidence on the ground reflects contradicting outcomes. According to Atkinson (2007:53), in South Africa mass protests, marches, demonstrations, petitions and violent confrontations directed to authorities from unhappy citizens have become frequent occurrences. For Atkinson, there are three main causes of these mass protests: "municipal ineffectiveness in service delivery; the poor responsiveness of municipalities to citizens' grievances; and the conspicuous consumption entailed by a culture of self-enrichment on the part of municipal authorities and staff" (2007:53). This assertion is echoed by Alexander (2010:25) in indicating that "on the surface the protests are about poor service delivery and against the evidently self-serving and corrupt leaders of municipalities." For Alexander, many issues that underpin the protesters' actions include the injustices that arise from the realities of persistent inequality (2010:26).

Table 5.1 below reflects the statistics of protests which occurred between 2004 and 2008 in the nine provinces of South Africa. These, according to Alexander (2010:26), have included mass meetings, petitions, processions, stay-aways, blockading of roads, burning of tyres, destruction of buildings and confrontations with the police. Most of these movements emanate from poorer neighbourhoods (shack settlements and townships), as they are often the hardest hit when it comes to inefficient delivery of services (Alexander, 2010:26).

Table 5.1 Protests by provinces (financial years 2004/5 to 2007/8)

Province	2004/05	2005/06	2006/07	2007/08	Total
Gauteng	1932	2205	1888	1451	7476
Western Cape	557	511	577	642	2287
KwaZulu-Natal	1891	2529	1774	1146	7340
Limpopo	660	915	665	642	2882
Eastern Cape	754	1383	1626	733	4496
North West	1108	1341	1159	1502	5110
Free State	506	728	713	483	2430
Mpumalanga	395	336	337	4	972
Northern Cape	301	489	427	400	1617
Total	**8004**	**10437**	**9166**	**7003**	**34610**

Table 5.1 Protests by provinces (financial years 2004/5 to 2007/8) (Alexander, 2010:26)

While it may be argued that the data presented above is from long ago, evidence shows that the situation as it stands today has not changed significantly. Citizens from poorer neighbourhoods still engage in a noticeable number of protests following poor service delivery by local governments. As reported by the news24 online, in June 2013, Cape Town residents blocked the roads in protest against poor service delivery by the municipality. These protests were about sanitation issues and resulted in burning of tyres, blocking the highway with objects, and throwing of human faeces onto the road (news24, 2013: unpaged). The same month in Alexandra (the township in Gauteng Province), residents protested over electricity tariffs (news24, 2013: unpaged). The Eastern Cape Province is no exception when it comes to citizens' protests against poor service delivery. Karamoko and Jain (2011:23) assert that in 2011 the Eastern Cape accounted for 18% of South Africa's protests, the second largest percentage after the Western Cape which accounted for 23%.

While some protests may be peaceful, a significant number of them are not necessarily peaceful or lawful, and can amount to violent behaviour. According to Karamoko and Jain (2011:2), between 2009 and 2010, 50% to 64% of the protests in South Africa were violent. This, evidence shows, is often the result of the non-responsiveness of the local government to people's grievances (Atkinson, 2007:63; Sebugwawo, 2013: unpaged). Even though most of the protests are about service delivery, activists argue that in some cases there is more to people's violent protests than just the issue of service delivery. According to Sebugwawo

(2013), while protests may be fuelled by lack of services, particularly housing, water and sanitation facilities, they are also propelled by the failure of local governments to engage ordinary citizens in political processes.

Van Rooyen (2003:127) argue that "as municipal IDPs processes are unfolding and LED projects are being launched, local communities should be afforded the opportunity to participate in processes to articulate their expectations and to prioritize their needs." Van Rooyen (2003:127) further maintains that "this would in effect cultivate a process of effective collaboration with local stakeholders and where opinions, needs and expectations vary some form of negotiation should be entered into." This is an indication that local government is quite a complex structure, and there is a strong national belief that it is a suitable entity through which a complex ambition like sustainable governance can be achieved, but there should be enabling, equally complex strategies in place to achieve this goal.

This research, therefore, seeks to explore how ICT and the Living Lab model can be integrated in rural development processes in order to strengthen civic participation and enable governments' accountability and effectiveness. In the next sub-section the discussion will focus on how ICT, mainly within the Living Lab model, can be integrated in governance issues in South Africa. The discussion will take into consideration the South African agenda for sustainable governance as discussed earlier, and show how some of the short-comings could be addressed by the integration of ICT.

5.2.5 ICT for sustainable governance in South Africa

According to Sebugwawo (2013: unpaged), there is substantial evidence the local governments are dismissive of people's concerns, and this creates a danger of building a local government system that is unserious about people's challenges. Despite the outbreak of service delivery protests, the processes of responding to people's grievances remain poorly governed in the absence of appropriate structures, and this suggests that local government authorities do not learn from any of these actions (Atkinson, 2007:53). Poor communication between the local government authorities and members of the communities is one of the factors that exacerbate unresponsiveness and the subsequent inefficiency (Sebugwawo, 2013: unpaged). It is in this context that this research intends to explore the potential of ICT in enhancing communication and collaboration between citizens and the government, in order to improve government's accountability and effectiveness.

All over the globe, the operation of governments is being reformed by two inevitable drifts: "the first is the movement away from centralised, vertical and hierarchical government, towards networks of governance based upon horizontal interactions between local governments, civil society and citizens" (Coleman, 2005:1). The second is the rapid growth of ICT "which can transform the generation and delivery of public services, thereby reconfiguring relationships between governments, citizens and the private sector" (Coleman, 2005:1). According to the HDR (UNDP, 2013:6), "people throughout the developing world are increasingly demanding to be heard, as they share ideas through new communication channels and seek greater accountability from governments and civil society organisations."

Ideally, local governments play a vital role in ensuring engagement of sectors in the society in governance issues and participation at grassroots levels. The South African local government has been mandated, as according to the Constitution of South Africa, to: "provide democratic and accountable governance to local communities; ensure sustainable provision of services to local communities; encourage the involvement of local communities in matters of their own development; as well as to contribute to building the capacity of local communities and organisations." Over and above these ideals, of relevance is the capacity to respond to local challenges, the need for readily accessible government information, and open platforms of communication between government and citizens. In this regard, ICT has a clear role and potential in enabling accountability and transparency between governments and citizens. This can be achieved through "provision of 'Anytime-Anywhere-Access' to government information and services through utilization of ICT tools" (Verma, et al., 2007:374).

As has been shown earlier in section 2.4, e-government is one of the increasingly popular concepts that link ICT with government's effectiveness and accountability. This is an example of many other solutions that could significantly address the challenges reflected above in sub-section 5.2.4, where inefficiency, lack of accountability and unresponsiveness are manifested in local government.

Coleman believes that:

> *"E-government has the potential to improve the performance of public institutions and make them more transparent and responsive; facilitate strategic connections in government by creating joined-up administrations in which users can access information and services via portals or 'one-stop-shops'; and empower civil-society organisations (CSOs) and citizens by making knowledge and other resources more directly accessible" (Coleman, 2005:1).*

Coleman (2005:4) indicates, however, that the complexity of governance in general cannot be overlooked and, that in any case, if ICT is to be successfully incorporated for effective governance, comprehensive approaches should be adopted. Coleman (2005:4) provides some of the barriers of e-government (as an example of ICT applications in governance) derived from the lessons learnt from some African countries that have attempted to introduce and implement e-governance:

a) The adoption of technologies without developing human skills and capacities to manage, integrate and sustain them;

b) The centralised use of technologies by national government departments, without devolving the benefits of technology to intermediary institutions, such as local government, parliament, parties, civil-society organisations and the independent media;

c) A failure to link better governance to broader and more inclusive democracy which gives voice to those who cannot afford technologies, but have needs and ideas to express.

These barriers can be addressed through complex, comprehensive strategies that are able to capture the complexity of both governance and technology. Collaborative models such as the Living Lab model incorporate: empowerment and capacity building of users, decentralisation and involvement of users in development and evaluations processes, as well as engagement of the main sectors in the society, including communities. This model is, therefore, a typical model suitable for complex initiatives such as e-government. The deployment of e-government applications can enhance good governance and strengthen democratic processes through facilitating "access to information, freedom of expression, greater equity, efficiency, productivity growth and social inclusion" (Coleman, 2005:2).

Through the collaborative, sustainable model of the Living Lab, service delivery can be improved and sustained through faster information transfer and the establishment of working relationships between the government, citizens and the private sector. A typical example is the access of basic services such as citizen identity documents, social grants, etc., which citizens have to go all the way to government offices to apply for. Whereas, using ICTs, citizens can have access to such services without having to present themselves physically to the departments. The following scenario is a classic example of such a case: portals can be

developed and maintained by software developers using suitable, reliable and affordable network and infrastructure; the government may then finance the administration and day-to-day operation; the private sector finance the initial development and deployment of ICT infrastructure, and also benefit from the day-to-day earnings through charging users a reasonable amount for the services they receive; then citizens can be able to apply for basic services without having to go all the way to the Departments of Local Government, Home Affairs, Social Development, etc. (Siyakhula Living Lab, 2011).

According to Odendaal (2006:30), "a number of metropolitan councils in South Africa are increasingly adopting some form of ICT policy" to catalyse socio-economic development and enhance service delivery. A number of interventions have already taken off in some provinces. Examples are some ICT interventions piloted in the Eastern Cape. These interventions involve the collaboration of the Council for Scientific and Industrial Research (CSIR), the Department of Arts, Culture, Science and Technology (DACST), and the National Research Foundation (NRF), together with the rural communities including Tsilitwa, Sulenkama and Kimbili in the Eastern Cape Province (Conradie, et al., 2003:201-202). According to Conradie, et al., (2003:202), the "Tsilitwa village is situated in the deep rural north-eastern part of the Eastern Cape; to reach it from the city of Umtata, a traveller first has to travel north-west to Qumbu, and then leave the tarred road and proceed north-east for about 50 kilometres on the gravel road to Tsilitwa."

This is an obvious example of those communities that need interventions which can help them access services from their local communities, while at the same time integrating them to the wider information society. According to Conradie, et al., (2003:202), some of the objectives of these initiatives include:

- Development of relevant capacity within rural communities;
- Provision of a communications platform for the delivery of local content, government and private sector information services as well as for health and education applications; and
- Implementation of business units in order to achieve sustainable, integrated rural development.

Collaboration in this case can certainly go a long way in benefiting everyone; academic researchers, government, the private sector and communities.

5.2.6 Knowledge and sustainable education in South Africa

About a quarter of a century ago, Schumacher (in Tilbury, 2002:7) described education as "the greatest resource for achieving a just and cohesive society." Since then, many reports by international agencies have attempted to show the significance of education in the pursuit of sustainable living (Tilbury, 2002:7). According to McGrath and Akoojee (2009:149), the current 'international convention of globalisation' gives emphasis to knowledge as a principal aspect of sustainable socio-economic development and political systems, both at the national and regional levels. Skills and knowledge build towards employment and increase volumes of national development. As indicated above in sub-section 5.2.3, critics of the welfare system argue that transfer payments to the poor are not a sustainable measure. Instead, the poor are to be empowered socially and economically by improving their employability through education (McGrath and Akoojee, 2009:149). McGrath and Akoojee argue that "improved levels of education bring better prospects of employment, higher incomes and lower propensities to crime and other forms of social delinquency" (2009:149).

In this context, the South African government has made education one of its key priorities. The report on the Millennium Development Goals (MDGs) in South Africa, specific to goal 2 (achieve universal primary education), reflects that primary education in South Africa is characterised by very high rates of enrolment and retention (UNDP, 2010). The report further shows that these rates are indicative of strong gender equity (UNDP, 2010). The adjusted net enrolment ratios show that primary education is hovering on 98% by 2009 up from 96% in 2002 (UNDP, 2010:unpaged). Completion rates of primary education have also improved from 89.6% in 2002 to 93.8% in 2009, which are also accompanied by improving literacy rates that reach 93% (UNDP, 2010:unpaged). Furthermore, the government of South Africa has made it the right of all citizens at school going age to have access to "further education, which the state, through reasonable measures, must make progressively available and accessible" (Republic of South Africa, 1996).

However, the issue in education is not only accessibility and affordability. To be considered should also be the quality of education, which to a larger extent determines the employability of those who acquired it and the sustainability of that education. Enrolment and retention rates, as reflected in the UNDP's MDG Report (2010), say nothing about the sustainability of

education. According to Sterling (2001:3), sustainable education implies four descriptors: sustaining, tenable, healthy and durable.

- Sustaining - it helps sustain people, communities and societies
- Tenable - it is ethically defensible, working with integrity, justice, respect and inclusiveness
- Healthy - it is in itself a viable system, embodying and nurturing healthy relationships and emergence at different system levels
- Durable - it works well enough in practice to be able to keep doing it.

Sterling argues that the only way to achieve sustainable education is to develop and practice "a changed educational paradigm," which encompasses holism, systematic thinking, sustainability and complexity (2001:2). For Sterling, "the concept of sustainable education is not just a simple 'add-on' of sustainability concepts to the discourse of development, but a cultural shift in the way we see education and learning, based on a more comprehensive view of the world" (2001:2).

In this regard, what states should aspire for is a comprehensive, sustainable education, which covers the issues of accessibility and affordability, but, most importantly, the quality of education. The South African government's agenda for education seems to highlight mostly the issues of accessibility and affordability but neglects sustainability measures. The South African Bill of Rights indicates that citizens have the right to basic and further education, to receive education in the official languages of their choice, and the government also subscribed to the United Nations' free primary education goal of the MDGs (Republic of South Africa, 1996; UNDP, 2010). All these aspects are aiming towards ensuring that education is accessible and affordable in South Africa, but they do not say anything about the durability and tenability of that education. Moreover, they do not say anything about making education more relevant for the increasingly digital work environment in the information age. As a matter of fact, South Africa's education is rated nearly at the bottom of the class, coming 133 out of 142 countries that took part in the World Economic Forum study (The Herald, 2012:unpaged).

The education crisis in South Africa is not due to a lack of funding, as the government has "one of the highest rates of government investment in the world, with an allocated expenditure of R207-billion for the 2012/13 financial year" (The Herald, 2012:unpaged). As

stated in the South African curriculum for the twenty first century (Department of Education, 2000:19-21), the following are some of the factors that impede educational success in South Africa, specifically at the primary and secondary levels:

- lack of alignment between curriculum and assessment policy;
- inadequate orientation, training and development of teachers;
- learning support materials that are variable in quality, often unavailable and not sufficiently used in classrooms;
- policy overload and limited transfer of learning into classrooms, and
- inadequate recognition of curriculum as the core business of education departments.

Additionally, inadequacy of teachers and learning materials in schools in South Africa, particularly in rural areas, is a serious crisis which cannot be over-emphasised. The Eastern Cape is especially rated one of the worst performing Provinces in the country, together with Limpopo and Mpumalanga (Department of Education, 2012:24). Lovemore (2013: unpaged) asserts that schools in the Eastern Cape are highlighted by inadequate teachers, while some schools have more teachers than needed. In August 2012, the Legal Resources Centre took legal action against the Department of Basic Education on behalf of the five schools most affected by shortage of teachers in the Eastern Cape (Lovemore, 2013: unpaged). While the Department requested to negotiate an out-of-court settlement, implementation of the agreement had still not been delivered in February, 2013 (Lovemore, 2013: unpaged).

Lovemore (2013: unpaged) further states that "hundreds (if not thousands) of learners are without teachers, the learners are desperate, their parents are angry, their principals are either highly stressed or they have given up fighting, and teaching and learning continue to suffer." As reported by eNCA (2013), in July 2013, residents of Qunu, a rural community in the Eastern Cape, closed all schools in their community following lack of services, particularly proper educational facilities and lack of teachers, as well as other basic needs. According to the Mail and Guardian (2013: unpaged), approximately 12 000 learners in the Eastern Cape have had their schools forcibly closed by their parents during the months of June and July, 2013. The affected areas include Uitenhage, Port Elizabeth northern areas and Grahamstown (eNCA, 2013: unpaged). In such cases, the average teacher-student ratio is one teacher to ninety pupils (Mail and Guardian, 2013: unpaged). All these are clear indications that

financial allocation for education in South Africa is just part of the solution; there are many other serious problems that can be solved using alternative strategies, along with financial allocation.

The following section will discuss the relevance of ICT in aiding the improvement of the quality of education as well as the processes of facilitating education in South Africa. While the discussion will not attempt to indicate that ICT is a panacea for all educational problems, it will reflect the unprecedented potential of ICT to aid educational processes.

5.2.7 ICT for knowledge and sustainable education in South Africa

Access to education is one of the basic rights of the South African citizens as reflected in the Bill of Rights (1996). As a result, education forms one of the key priorities of the South African government. However, as shown in the sub-section above, the South African educational agenda has limitations in so far as educational sustainability is concerned. The limitation of the South African educational agenda is that it focuses mainly on accessibility and affordability, which are only the parts of a comprehensive educational package. The South African Department of Education (2000:19-21) identified some of the weaknesses in their system: "learning support materials that are variable in quality, often unavailable and not sufficiently used in classrooms; the shortage of teachers in many schools; and limited transfer of learning into classrooms."

As has been repeatedly indicated, ICTs have a clear role to play in the transformation of education and knowledge creation. According to Tinio (2003:6), ICTs are essential tools if educational opportunities, both formal and non-formal, are to be extended to disadvantaged, marginalised communities. ICTs have the potential to transform the ways of learning, creation of knowledge and to improve the quality of education acquired, thereby increasing its sustainability.

Given the challenges identified in the South African educational system, ICT has a significant role in transforming education in South Africa. van Audenhove (2003) claims that ICTs "can facilitate an upgrading of education by improving the quality of information available and providing communities throughout the country with access to expertise and usable data." Two main advantages of ICTs make them relevant to the South African context: first, their ability to transcend time and space, which means learning will not be inhibited by delays in the delivery of learning support materials as online information can be accessed anytime (Tinio,

2003:6). Second, still related to the first is the ability to overcome distance-related limitations; learners no longer have to depend mainly on printed materials, which often take time to be delivered in remote areas (Tinio, 2003:6).

In addition, learning through ICT prepares the learners for the increasingly digital work environment in the information age. The EnGauge of the North Central Regional Educational Laboratory (in Tinio, 2003:6) has identified what it calls '21st Century Skills', which include: "digital age literacy, inventive thinking, higher-order thinking and sound reasoning, effective communication and high productivity." Learning through ICT involves not just being told information in a classroom environment, but also searching and synthesising information. This can help learners to be more initiative, inventive and highly productive in their work. It helps them to know, not only where to easily get information but also how to get information.

Through the collaborative Living Lab model, even the schools in rural areas can have access to ICT devices such as computers and the Internet by means of the government-private sector collaboration. As noted in chapter three (section 3.2), even "in areas where providing services is not financially viable, government can use a number of instruments such as special financing mechanisms and investment subsidies to provide incentives to the private sector to promote public access" (Mulvenna, et al., 2010:7). Therefore, this can help bridge the digital divide between schools in urban and rural areas, giving access to even the poorest of the poor.

5.3 Social capital and the South African sustainable development agenda

As discussed in chapter four, the evidence in research shows the link between social capital and development. Historically, the predominant theories of development were based on monetary stability and infrastructure improvement. It was believed that development could only be achieved in a financially steady environment (Stals, 1999). The human-centred approach to development suggests that development is quite complex and should be viewed as such. The approach argues that development is not a state to be arrived at but a continuous process of creating and maintaining an environment where people can flourish. The South African government made a commitment towards ensuring sustainable social, economic and political development through the RDP. This section explores the place of social capital in the South African sustainable development agenda. The section will focus mainly on the role of social capital in sustainable socio-economic development and sustainable governance as discussed in section 5.2.

5.3.1 Social capital and socio-economic development in South Africa

Social networks and information channels have been identified as important forms of social capital through which the benefits of social capital can flow. Studies by Narayan and Pritchett (1999), Grootaert (1999) and Haddad and Maluccio (2000) established a strong association between social capital in communities and households welfare in those communities. As indicated by Haddad and Maluccio (2000:2), research shows that in South Africa social capital, "as measured by an index of formal and informal social networks, has a positive and significant effect on household per capita expenditures." With reference to the work of Putnam and Coleman, Haddad and Maluccio (2000:2) state three mechanisms by which social capital affects household welfare:

1. Reductions in the costs of transactions by improving information flows about new opportunities and potential shocks, improving the diffusion of innovations, and improving knowledge about the comparative performance of local government agents;

2. Promotion of consultative decision making as well as collective action that minimizes negative externalities and promotes the production of public goods; and

3. Fostering of time-sensitive exchanges for mutual benefit by developing norms of civic behaviour, trust and reputation dissemination.

The effects of social capital on socio-economic development have been established across the micro, meso and macro levels. That is, social capital can have benefits for individuals and families, communities and institutions, as well as nations. Halpern (2005:21) suggests that having a rich and varied base of social capital can be associated with higher levels of economic growth at the macro level. According to Maluccio, et al., (2000:56), the "South African anti-poverty policy focuses on the provision and accumulation of a wide range of assets to those previously disadvantaged by apartheid, along with reforms intended to provide opportunities to use these assets." Social capital as reflected in chapter four can be an important resource for South African citizens who were previously disadvantaged as a result of social exclusion. The concept of social capital has some resonance with the traditional South African notion of *Ubuntu*, which means humanity (Kamwangamalu, 1999:24). It is a conceptualization of humanness that means 'I am because you are' (Maluccio, et al., 2000:57).

The *Ubuntu* concept has actually influenced the South African social security system, which is primarily meant for poverty alleviation, social compensation and income distribution (Mubangizi and Mubangizi, 2005:277). The social security system constitutes an important form of social capital through which significant benefits can be yielded. There are formal and non-formal elements in the South African social security system. The non-formal elements include local organisations and collective community activities. As discussed in chapter four, local organisations and collective activities have always been resourceful networks through which local communities secure themselves against poverty and disasters. Furthermore, because formal security services are needs-based and selective, community members who do not qualify for them opt for informal networks to provide them with the needed support. As stated by Mubangizi and Mubangizi (2005:279) the formal elements include:

- Private savings – people voluntarily save for contingencies such as disability, retirement and chronic diseases.
- Social insurance – joint contributions by employers and employees to pension or provident funds, or social insurance covering other unexpected events.
- Social assistance – non-contributory and income-tested benefits provided by the State to vulnerable groups of people.
- Social relief – short-term measures to tide people over a particular individual or community crisis.

These networks and associations form an important resource that can essentially contribute to economic break-through. The Living Lab approach also forms an important network through which individuals and rural communities can yield benefits from associating with those from other sectors. Even though evidence shows that social capital is gradually declining (Putnam, 1995; Fukuyama, 1995; Patterson, 1993), counter evidence suggests that new forms of social capital are certainly being established. Recently there is a growing industry of web-based social networks, which, according to Golbeck (2007), plays a vital role in both the business and social world, contributing to economic development. Web-based social networks have led to new innovations in social networking (Golbeck, 2007). These innovative forms of networks can provide an important platform through which information and opportunities can be shared.

As discussed in section 5.2, LED has progressively become the key function of local governments in South Africa. Because of the socio-cultural component of the LED process, the place of social capital has increasingly become part of the on-going conversations in the

arena of local and regional development (Evans and Syrett, 2007:55). According to Evans and Syrett (2007:55), there is a direct correlation between higher volumes of social capital, and the growth of a dynamic social economy within local communities. For low income communities in particular, "where there is an evident weakness in the private and public-sector dimensions to the local economy, and a relative lack of other sources of financial capital," cultivating the social economy through social capital is a key factor for improvement (Evans and Syrett, 2007:55). Social economy embedded in social networks is thus an important component in the LED processes, particularly in rural communities where other forms of capital are generally scarce.

5.3.2 Social capital and governance in South Africa

Putnam's study of the northern and southern regions of Italy, discussed in chapter four, reflects the link between social capital and sound governance. As indicated by Pye (1999:764), "social capital builds upon the norms of civility; it is the next step up in the development of a democratic political culture." Pye claims that social capital facilitates collective action for the achievement of community and national goals (1999:764). Democracy which is 'the rule of the people by the people' is about government embracing citizen participation; it is an active collaboration between citizens and the government, and this can effectively occur when there are strong ties and organisations within communities. Democracy, also the rule of the majority, can be leveraged by collective action, which is based on the accumulation of compulsory sentiments of trust and reciprocity; therefore, when a society lacks such sentiments, it falls short of capacity for social mobilization and cannot achieve much politically or economically (Pye, 1999:765).

The South African government embraces, as reflected in the Constitution, democratic and accountable governance and local community participation (Republic of South Africa, 1996). However, to achieve this in practice it takes accumulation of shared values and strong ties based on trust, as well as active collective action. As stated by Rotberg (1999:339), "societies work best, and have always worked best, where citizens trust their fellow citizens, work cooperatively with them for common goals, and thus share a civic culture." Social capital has in so many ways played a vital role in the South African society. Expressed in community life and collective action, social capital has played a noteworthy role both during the apartheid regime and in the post-1994 democratic government (Wilson, 2001). During the apartheid regime, many black South Africans fought collectively against apartheid and the exclusion

that came with it (Wilson, 2001). Collective action continues to play an important role in the democratic governance, reflected in a lot of government and civil society initiatives. Trade unions are an example of networks through which citizens supposedly exercise their democratic rights in South Africa. These are associations that give a loud and united voice for employees across the country.

Local government serves to encourage local communities and organisations to participate in matters of their own development (Republic of South Africa, 1996). Social capital as the glue that binds communities together can cultivate collective action and mutual participation for the benefit of communities. According to Kay (2006:196), "social capital can be used to include, support, develop and create, thus helping the development of a community and of society as a whole." Social capital is, therefore, a resource available to individuals and communities to enable them to participate collectively and effectively in civic matters. This research attempts to explore the influence of the Living Lab model in cultivating social capital, and how that can contribute to participatory, innovative local development.

5.4 Conclusion

This chapter has outlined and discussed the South African sustainable development agenda, and looked at the relevance of both social capital and ICT4D within the agenda. From the literature it is quite evident that the South African development agenda is very complex, and rightly so, because development problems are complex in themselves. However, it is also evident that while the country has made reforms in its policies and development strategies to incorporate the element of sustainability in order to cater for the complexity of the problems at hand, in practice the outcomes have not been as comprehensive and sustainable. This is manifested in the four main areas of development as discussed in this chapter: economic, social, political and educational development.

The chapter then showed how the incorporation of ICT, as is one of the goals in the South African development agenda, can go a long way in catalysing the processes of development. It reflects that ICT4D is a complex process in itself and is, therefore, suitable for complex developmental problems across the globe, even in rural communities. It also shows how social capital is a necessary element in achieving a socially sustainable, cohesive society. The place of social capital is extended to economic development and governance as part of the South African development agenda.

CHAPTER SIX

Research methodology

6.1 Introduction

The previous chapter has attempted to incorporate the theme of ICT4D and the theory of social capital into the South African development context. Based on the insights acquired from the literature in the previous chapters, this chapter outlines the methodology adopted in carrying out this research. In essence, the chapter is composed of the methods, procedures and techniques adopted in carrying out the research. It has nine sections: the research objectives, the study site, the research paradigms, the research design, sampling methods and sample size, approach to measuring research objectives, approach to data analysis, ethical considerations and methodological limitations. The research objectives section outlines the main problems the research attempts to address. The study site section describes the location at which the study was undertaken. The research paradigms section describes the methodological theories that inform this study. Both positivism and interpretivism paradigms have been chosen for this study as they are both suited to the field of study. The research design outlines the processes adopted in carrying out the study. The ethical section reflects the research ethics observed during the undertaking of the study. Then the last section outlines some limitations established during the process of the research undertaking.

6.2 Research objectives

The previous chapter highlighted the four domains of the South African sustainable development agenda: social, economic, political and educational development. It has also shown the place of ICT in catalysing development processes in South Africa. The chapter further showed how social capital has played and continues to play a vital role in facilitating development processes towards achieving a cohesive, sustainable society. Chapter four discussed social capital as a concept that has benefits in so many ways in the living together of the people, and in their pursuit for sustainability and the good quality of life. The chapter reflected how the old forms of social capital have been declining, and yet new forms of social capital are being discovered in the process. Chapters two and three outlined the relevance of ICT in development processes, and in particular in rural communities, with the specific focus on the Living Lab model and the advantages associated with it. Eventually it was shown that the Living Lab model can contribute towards enhancing social capital, especially in rural

communities. It was also reflected that ICT4D, particularly the Living Lab model, and improved social capital together can contribute towards innovative, participatory rural development.

This research aims to explore the influence of the Living Lab model of ICT4D on creating new forms of social capital, as well as on cultivating old forms of social capital in rural communities. It further aims at exploring how the improved social capital can contribute to innovative, participatory rural development. The research explores the case of the Siyakhula Living Lab (SLL), and looks at the influence both to date and potentially in the future. As indicted in the literature, the two specific forms of social capital that the research is focusing on are networks and information channels. The research takes place at two levels; first, it looks at the networks and information channels within the selected communities and, second, it explores the networks and information channels between these communities and other sectors; namely the government, the private sector and academia.

The specific objectives that guide the study are:

- to identify the kinds of networks in selected rural communities
- to establish the methods of communication within selected rural communities and between these communities and other sectors
- to establish how the Living Lab approach contributes to:

  - creating and strengthening networks

  - improving communication and information channels
- to establish how the improved networks and information channels contribute to participatory, innovative development

6.3 Study site

The research was carried out in the Dwesa region situated in the Mbashe Municipality of the Eastern Cape Province of South Africa. Dwesa forms part of the site for SLL. The SLL was initially hosted by the five schools situated in the five communities of the Dwesa region: Mpume, Ngwane, Nqabara, Nondobo and Mtokwane. The SLL was later expanded to eleven other schools to include other communities within the Mbashe Municipality. Hence, it is now hosted by a total of sixteen schools within the communities of the Mbashe Municipality.

However, this research is only limited to the four communities in the Dwesa region; Ngwane, Nqabara, Nondobo and Lurwayizo. As has been indicated in section 3.5, Dwesa is representative of many rural African realities, characterised by lack of infrastructure, widespread poverty, lack of services and isolation (Dalvit, et al., 2007:1). The region, however, has a considerable advantage which lies in its potential for ecological and cultural tourism, due to the rich cultural heritage and the nature reserve situated in the area (Dalvit, et al., 2007:1). This is the reason that the promotion of tourism and local arts and crafts through the use of ICT is one of the key objectives of the SLL initiative.

6.4 Research paradigms

In order to fully explore and understand the fundamental relationship between the Living Lab model and social capital and how they contribute to the complex development process, this research is informed by a combination of both the positivist and interpretive social science paradigms. The positivist paradigm is an epistemological approach founded on realism. Realism is an ontological belief that reality or valid knowledge is what can be tested objectively and be proven as true or false (Neuman, 1994:58). Positivism argues that "there is only one logic of science, to which any intellectual activity aspiring to the title of 'science' must conform" (Neuman, 1994:58). Thus the same scientific methods used to create knowledge about the natural world can also be applied for the creation of knowledge about the social world. The justification to this epistemological approach is that social and physical realities contain pre-existing regularities that can be discovered, in other words, the social reality is patterned and has order (Neuman, 1994:59).

This logic, therefore, suggests that quantitative methods can be used as instruments that can objectively and scientifically measure social concepts, producing empirical data that can be tested and subjected to statistical analysis (Neuman, 1994:58). Examples of quantitative methods are surveys, social experiments and scientific observation (Neuman, 1994:58). Most studies on social capital, including those of Putnam (1993; 1995) and Coleman (1994), among others, have mainly used a quantitative approach to measuring social capital. Quantitative methods produce knowledge about people by testing hypotheses through carefully analysing quantitative data (Neuman, 1994:58). One of the objectives of this research, as stated in section 6.2 above, is to identify social networks within communities. A quantitative method, a survey, was used to map out social networks in communities. Quantitative methods usually give answers to the 'what' 'who' and 'how many' questions.

Through this method the researcher was able to gather data such as what networks are there, who are involved in these networks, and what activities are done in such networks. This method was also used to gather data on what information channels people use to communicate within the community and between communities and other sectors. The survey will be discussed in detail later in the next section on research designs.

However, as has been indicated in this research, social networks are not only quantitative but they are also multi-dimensional as they provide some indirect, qualitative benefits to those who are part of them. Furthermore, it has been repeatedly indicated that development is not just about figures but it is also about improving the quality of life of the people. The South African sustainable development agenda, as discussed in chapter five, incorporates issues such as active participation of local communities, creating an environment and a society in which people can feel part of and prosper, and encouraging the engagement of the local people in economic activities at grassroots level. It has been shown that development is much more complex and requires comprehensive measures to fully explore it. Quantitative methods are limited from acquiring such invisible and sometimes indirect information.

As a result, an interpretive paradigm was incorporated to inform the undertaking of this study. Interpretivism is an epistemological approach founded upon relativism. Unlike realism, relativism is an ontological belief that "reality is not objectively determined but is socially constructed" (Kelliher, 2005:124). Contrary to the quantitative approach that believes that knowledge can be produced by measurements and objective observation, interpretivism argues that knowledge is created by the researcher's ability to construe and discover embedded meanings behind human action (Neuman, 1994:62). The fundamental assumption of interpretivism is that "by studying people in their own social contexts there is greater opportunity to understand the perceptions and meanings they attach to their own actions" (Kelliher, 2005:124). This logic, therefore, encourages the use of qualitative methods in order to acquire invisible and indirect information. Qualitative methods enable the researcher to probe and investigate hidden, indirect information.

Based on this assumption, a qualitative method, a case study, was conducted in order to gather subtle and invisible data. Qualitative methods usually give answers to the 'why' and 'how' questions. Therefore, this was the core method that was used to gather data to establish the fundamental relationship between the Living Lab model and social capital, as well as how they contribute to development within the scope outlined in the research objectives in section

6.2. A case study will be discussed in detail in the next section. Complementarily, a quantitative method allowed the researcher to identify existing networks in communities, and the existing relationship between communities and other sectors. It also allowed the gathering of data to establish available information channels. What this means is that a multi-paradigmatic approach to data collection was adopted in this research. This approach allows for a triangulation assessment, an assessment of reality from multiple angles (McNeill and Chapman, 2005:21). A multi-paradigmatic approach to research has become more favourable in sociological research due to the fact that there is no single, entirely advantageous approach to social science research (McNeill and Chapman, 2005:21). Therefore, multiple methods complement each other.

6.5 Research designs

This section outlines the research designs adopted in this research. As indicated in the section above, both qualitative and quantitative methods, a case study and a survey, were adopted in this research. This section will also incorporate the methods of collecting secondary data which was adopted concurrent to other methods of data collection. Documents analysis was carried out in order to gather secondary data which could not be attained using the above mentioned methods.

6.5.1 Qualitative research design

As shown in section 6.4 above, qualitative methods were considered in this research for their ability to allow the researcher to get in-depth information which cannot be obtained using quantitative methods. According to Babbie and Mouton (2001:270-271), qualitative methods are characterised by: research conducted in the natural setting of social actors; a focus on process rather than action; and in-depth description and understanding. As a result, this method allowed the researcher to get information which was not obvious or direct from the units of analysis. A case study as a qualitative research design is discussed in the next part of this sub-section.

Case study

A case study was adopted to explore how the environment created by the Living Lab model influences the creation and cultivation of networks, as well as the improvement of information channels. Furthermore, against developmental indicators discussed in section 2.4, and section 5.2 within the South African context, the research used the case study method to

establish how ICT within the Living Lab model, together with improved networks and information channels, contribute to participatory, innovative development. According to Pickard (2007:85), a case study is "an empirical inquiry that investigates a contemporary phenomenon within its real-life context." This method is especially suitable given that the research explores a contemporary phenomenon, the Living Lab model, and it studies it within the real-life context. This approach began with the establishment of the research problem which describes the focus and scope of the study. Pickard (2007:86) identified three major phases in the research process which were used to inform the designing of this case study process: first, the orientation and overview phase; second, the focused exploration phase; and, last, the member checking phase.

Phase one of case study – orientation and overview: once the research problem had been established, the researcher conducted a site visit knowing very little about the phenomenon. This visit occurred over a period of two weeks. The site had already been selected, naturally because it is the site of the SLL which is the site of this study. The field visit enabled the researcher to gain a better insight into the phenomenon through observing and having conversations with potential participants, and many other questions began to unfold. Potential participants were some of the people from the four selected communities who are involved in the SLL, as well as the teachers from the schools at which the SLL computer labs are hosted. Since there was already an established relationship between community members and the researchers involved with the SLL, the researcher was able to build on this existing relationship to have access to community members. This led to the establishment of specific themes to be explored, social networks and information channels. At this stage it was also possible for the researcher to define and operationalize specific aspects to be explored. The potential units of analysis were identified at this stage, and the possible ways of contacting them, which was through mobile phones and face-to-face interaction as they come to use computers in the labs. This led to the second phase.

Phase two of case study – focused exploration: this phase is characterised by more focused inquiries aimed at achieving specific and narrowed objectives (Pickard, 2007:86). However, there was no rigid structure imposed at this stage, which enabled the researcher to keep an open mind for acquisition of greater knowledge (Pickard, 2007:86). The researcher began to interact with participants and conducted interviews. This was the first stage of data collection.

- *Stage one of data collection – interviews:* interviews have the advantage of being flexible and allowing the researcher to gain a better insight into the topic under exploration. A semi-structured approach to interviews was adopted. The questions were structured in such a way that they would restrict neither the interviewees nor the interviewer. They served to give guidance to the interview process, and the responses given enabled the interviewer to probe for more information. This means that participants were asked the same set of questions, but depending on the responses they gave, more and different but relevant questions were asked (Babbie and Mouton, 2001:253). Sampling methods and sample size will be discussed in the next section. The other set of interviews were conducted with some of the researchers from Fort Hare and Rhodes universities who are part of the SLL team of researchers.

  Access to interviewees: the researchers from Fort Hare and Rhodes universities who participated in the study were already known to the researcher in this study, as I am also part of the research team. The researchers were then contacted and were asked to participate as respondents in this study. The teachers (also contact persons) from the hosting schools assisted in setting up appointments with participant community members who were individually interviewed on scheduled dates and times. The teachers were also interviewed. The information yielded from the interviews let to the formation of an even more structured set of questions compiled into a questionnaire, which was then used in the survey. The survey is a quantitative method which will be discussed later in this section. The second stage of the data collection process was the focus group discussion conducted in the last phase of the case study, discussed below.

Phase three of case study – member checking: this usually is the final phase in the research process which leads to exiting the field (Pickard, 2007:86). However, in this research this was the final stage of the qualitative data collection process, but there was another phase where data was collected using a quantitative method, a survey. Two focus group discussions were conducted as the last inquiry to the end of the qualitative data collection process.

- *Stage two of data collection – focus group discussions:* focus group discussions were held at the school in Ngwane and Nqabara Crafts Centre. The groups consisted of community members from Ngwane, Nondobo, Lurwayizo and Nqabara. Some of the questions which were asked in the interviews with community members were also asked in the focus group discussions to get a more collective discussion on them.

However, the questions asked to respondents in the group discussion at the Nqabara Crafts Centre were more related to the collective projects that they are involved in, and how ICT within the Living Lab model could be relevant in their collective activities. There were twelve people in the group discussion at Ngwane and eight people at the Nqabara Crafts Centre.

6.5.2 Quantitative research design

Survey

Surveys are primarily used for explanatory, exploratory and descriptive purposes. They are more relevant in studies that have individual people as the units of analysis (Babbie and Mouton, 2001:232). This exploratory study, with individuals as the units of analysis, utilised a survey to identify and map out networks within communities. The survey also helped to identify the methods of communication within selected rural communities and between these communities and other sectors. Due to the size of the sample (sampling methods and sample size will be discussed in the next section) and communication barrier, as the researcher is a non-isiXhosa speaking person, which is the native language of the people in the study area, the researcher had to get research assistants to help with data collection. It is very important to note and accept that some people, even if they know English as a second language, express themselves better in their first language. Therefore, in order to get more in-depth and valid information, respondents were to be asked the questions in their own native language.

Four research assistants were sourced through contacts with the teachers at the hosting schools. These isiXhosa speaking research assistants were selected on the basis of their ability to express themselves in both English and isiXhosa, so that they would be able to communicate effectively with both the researcher and the respondents. The research assistants were taken through a one day orientation session, where the purpose of the research was explained to them, and the researcher went through the questionnaires with them, highlighting important points to note when asking questions and writing responses. A pilot survey was carried out with the initial 20 questionnaires, 5 for each research assistant. The pilot survey occurred over one day since it was not a big sample size. A few changes were made to the questionnaire after the pilot survey.

- *Stage three of data collection – questionnaires as the instruments for data collection:* The questions in the questionnaires were structured, that is, they were the same set of questions for each respondent. However, some were closed-ended and others open-ended questions. Closed-ended questions had options from which respondents could choose an answer most appropriate to them. This enabled easy and quick filling of questionnaires, and many of the questions were in this form. On the other hand, in the cases where respondents were asked to provide their own opinion or the reason for the answer they provided in the previous question, open-ended questions were asked. Given that the researcher had already carried out interviews, through which a variety of open-ended questions were asked, it did not constitute a disadvantage to have few open ended questions in the survey. There were a total of 65 questions in the questionnaire. The questions in the questionnaire were based on the indicators reflected in the operationalization of the concepts but there were also additional 'lead-in' questions to help the flow of the questionnaire (Harvey and MacDonald, 1993:109).

  The structure of the questionnaire:

  The questionnaire consisted of seven sections. Section A asked for demographic information about the respondents. Section B consisted of social networks and institutions in communities. Section C focused on collective activities/projects in communities. Section D was about the influence of the Living Lab on networks in the community. Section E focused on the methods of communication between communities and other stakeholders in the Living Lab. Section F focused on the communication of local communities with specifically government institutions, establishing how that influences service delivery to local communities. Then section G focused on civic participation.

Secondary data – documents review

Documentation was reviewed concurrent to other data collection processes. This was undertaken mainly to provide the background to the Dwesa region and the SLL. The background information provided the basis for analysing the influence in relation to the situation before and after the intervention of the SLL. This also helped to explore the potential of the intervention in the future. Documents reviewed include the background research of the Dwesa-Cwebe region by Palmer, et al., (2002), the baseline study of the SLL

by Pade-Khene, et al., (2010), the project proposals and other publications by the SLL team of researchers. Other documentation reviewed included the database for community members in the four communities within the study site, which provided some of the information on networks and collective projects in communities.

6.6 Methods of sampling and sample size

Both probability and non-probability types of sampling were adopted for selection of different categories of respondents. The purposive method, a type of non-probability sampling which is based on the researcher's knowledge of the potential participants, and the purpose of the study (Babbie and Mouton, 2001:166), was adopted in the selection of the teachers from each hosting school, the researchers from the two universities and community members for interviews and focus group discussions. One teacher (also contact person) from each of the hosting schools at Ngwane, Nqabara and Nondobo; three researchers from Rhodes University and two researchers from Fort Hare University were selected based on their involvement with the SLL. Furthermore, seven community members were purposively selected for interviews based on their involvement with the SLL and their ability to express themselves in the English language. In addition, twenty people were purposively selected to participate in two focus group discussions, twelve in one and eight in the other, based on their involvement with the SLL and community collective projects respectively. In total fifteen interviews and two focus groups discussions were conducted.

The simple random method, a type of probability sampling, known for its advantage of allowing everyone in the population an equal chance of being selected (Babbie and Mouton, 2001:189-190), was adopted in the selection of community members for participation in the survey. The survey was conducted to identify existing networks and information channels within communities. Therefore, all individuals between the ages of eighteen and above sixty who live in the communities that fall within the study site had the chance of being selected. The total number of survey participants was eighty – twenty participated in the pilot survey, five from each community and, sixty in the main survey, fifteen from each of the four communities.

6.7 Approach to measuring research objectives (operationalization)

This section outlines the approach used to measure the objectives of this research. The definitions and dimensions of the concepts are framed within the theories of Bourdieu, Putnam, Coleman and Sen as reflected in the literature, within the parameters of the research objectives outlined earlier in this chapter.

Main research goal: To explore the influence of the Living Lab model of ICT4D on the creation and cultivation of social capital in rural communities, both to date and potentially in the future, and how that can contribute to innovative, participatory development.

Theoretical concepts: (networks, information channels, the Living Lab model, development)

- Putnam (1995) and Bourdieu (Bourdieu and Wacquant, 1992) both see networks as the form of social capital through which benefits can be yielded. These networks consist of social organisations, social ties and associations.

- Coleman (2002) sees social structures as having the ability to facilitate certain actions of actors. In this research it is believed that information channels are the means through which information resources that facilitate development actions can flow. Information channels include methods and tools that people use to communicate and exchange information.

- The definition of the Living Lab model as provided for in the literature by Almirall (2008) and Santoro and Conte (2009) reflects the following features: collaborative relationships, user involvement/participation and innovative environment.

- Sen (1999) outlines four developmental indicators which give premise to the concept of development in this research: social, economic, political and educational freedoms.

As mentioned earlier, there are two levels at which the study takes place; first, it explores networks and information channels within the communities; second, it explores networks and information channels between the communities and other sectors: government, the private sector and academia. The table below outlines the objectives, theoretical concepts, dimensions and indicators in measuring the research goal.

Table 6.1 Approach to measuring research objectives

Main research goal: To explore the influence of the Living Lab model of ICT4D in the creation and cultivation social capital in rural communities, and how that can contribute to participatory and innovative development.			
Objectives	**Theoretical concepts**	**Dimensions**	**Indicators**
1.To identify the kinds of networks in selected rural communities	1.Networks	1.Local organizations (groups, clubs)	-Participation in organizations -Activities carried out in organizations -Time spent with members in the organizations
		2.Social ties	-Ties with family and friends
		3.Associations (unions, institutions, collective projects)	-Associated to local institutions and unions -Active participation in local institutions and unions
		4.Collective community projects	-Involvement in local community projects
2.To establish the methods of communication within the communities and between communities and other sectors	2.Information channels	1.Methods of communication	-Ways through which people communicate -Devices that people use to communicate
		2.Level of communication	-Frequency of communication -Restrictions or barriers to communication
3. To establish how the Living Lab model and improved social capital contribute to innovative, participatory development	3.The Living Lab model	1.Stakeholder collaboration in the Living Lab	-Participating sectors in the Living Lab -Collaborative activities between stakeholders
		2.User-involvement in the Living Lab	-The use of computers in the hosting schools by community

			members -Involvement in the activities carried out with other stakeholders in the Living Lab -Involvement in the design and development of ICT products
	4. Development	1. Social facilities	-The use of online networking sites -Social/group activities with others in the computer labs
		2.Economic improvement	-Involvement in collective economic activities/ projects -Improvement of Business opportunities
		3. Political freedom	-Freedom of expression -Participation in civic matters -Improved and easy access to governance-related information
		4. knowledge societies	-The use of ICT to improve education and generate knowledge

6.8 Approach to data analysis

Data was extracted from participants' responses to the interviews, questionnaires and focus groups discussions. Additional data was extracted from documentation as indicated earlier. The process of data analysis was guided by the established indicators shown in the table above. The levels of measurement were taken into account before quantitative data was analysed, taking note of the nominal and ordinal levels. Data collected from the survey was coded and captured into a spreadsheet using the Statistical Package for Social Scientists (SPSS). Coding is a process of assigning numerical meanings to the variables, quantifying them to enable quantitative analysis (de Vos, et al., 2005:220-221); this is sometimes called creating a dictionary for the variables. For qualitative data content analysis was adopted.

Data from the interviews and focus group discussions was analysed qualitatively, noting statements, anecdotes and examples relevant to the research objectives.

The qualitative and quantitative findings based on the above indicators, are presented, analysed and discussed in the following two chapters. In order to incorporate the triangulation analysis, that is, an analysis from multiple angles, both qualitative and quantitative findings are presented in such a way that they can complement each other in each analytic chapter. The findings from the survey (quantitative method) and interviews (qualitative method) provided information on the existing networks and information channels. The survey also mapped out the networks, reflecting who belonged to such networks, as well as what activities are carried out in them. The quantitative method further helped to identify the methods of communication within communities and between communities and other sectors. The interviews enabled an assessment of the networks between communities and other sectors to be undertaken. The interviews further complemented the process by allowing for an analysis of how the Living Lab model can influence the creation and cultivation of networks. Interviews finally enabled the analysis of networks and information channels in relation to participatory, innovative development.

6.9 Ethical considerations

While the researcher built on the already existing relationships with the community, ethical concerns were taken into consideration given the expected intrusion into people's lives, especially in their social context during the course of the research project. The following ethical issues were considered throughout the research processes:

Informed consent: this is the most important practice in social research because social research often represents an intrusion into people's lives (Babbie and Mouton, 2001:521). The people who participate in social research should, in most conditions, be aware of it and be willing and agree to participate (de Vos, et al., 2005:59). Neuman (1994:434-435) asserts that if the researcher uses covert research methods, disguises the research, or uses deception, an individual's right to choose whether or not to participate is naturally being overridden. In this research all participants were informed of the study being undertaken. The purpose of the study was explicitly communicated, giving participants the freedom to make an informed decision on whether or not to participate.

Anonymity: a respondent is considered to be anonymous "when the researcher cannot identify a given response with the respondent" (Babbie and Mouton, 2001:523). Given the qualitative nature of this study, where the researcher collected some of the data through face-to-face interactions from identifiable respondents, it was difficult to promise complete anonymity. Some respondents who only participated in a survey remained anonymous, while others were not. The promise made to identifiable respondents was that their names would not be published.

Confidentiality: during the data collection process, the participants retained their right to say whether or not some information should be disclosed. Only the information agreed to be disclosed was included in the report. According to Babbie and Mouton (2001:523), "in a confidential survey, the researcher can identify the given respondent, but should essentially promise not to do so publicly." Therefore, confidentiality was promised to all identified participants in this research.

6.10 Limitations of the study

The most significant limitation in this study was the language barrier. Because of the researcher's inability to speak the native language of the people within the research area, isiXhosa, the selection of respondents for interviews was limited to those who could express themselves in English, as meanings can be lost in translation. The other limitation was the small sample size, both for the interviews and the survey, as obtaining a larger sample size proved to be too difficult due to the limitations of resources and time. As a result, I cannot confidently assert that I have fully established the kinds of networks in the given communities. However, given the homogeneity of the socio-economic characteristics of these communities, the size of the sample does not necessarily pose a significant threat to the validity of the data. Moreover, the focus group discussion complemented the small sample size of the interviews. Despite the limitations, the study was generally successful and yielded noteworthy results.

CHAPTER SEVEN

Networks and information channels within selected rural communities and between these communities and other sectors

7.1 Introduction

This chapter will present and analyse the findings on the two forms of social capital explored in this research, networks and information channels. The chapter is divided into two main sections. The first one, section 7.2, is composed of discussions on identified networks in selected communities, looking at who belongs to such networks, what activities are carried out in such networks and what contribution they have to the functioning of the communities. Then the second section, section 7.3, will discuss information channels in the selected communities, reflecting the means of communication and information dissemination within the networks and communities at large. The section will also discuss the methods of communication and information dissemination between these communities and other sectors. Then in the next chapter, the discussion will be on the contribution and the potential of the Living Lab model in creating new forms and cultivating old forms of networks and information channels. The chapter will look at the contribution to date and potentially in the future.

As reflected in chapter six, a total of 115 people participated in this study, 15 in interviews, 80 in the survey, and 20 in two focus group discussions, 12 and 8 in each of them. Of the 15 people who participated in the interviews 7 were females and 8 were males. In the survey 44 females and 36 males participated. In the focus group discussions at the Nqabara Crafts Centre all participants were females, and in the one held at Ngwane 4 were males and 8 were females. Those who participated in the survey ranged between the ages of 18 and over 60. 15 were between the ages 18-24, 24 participants were between the ages 25-40, 27 people were between the ages 41-59, and 14 were 60 and above. Participants were from the four communities studied in this research: Nqabara, Ngwane, Lurwayizo and Nondobo in the Dwesa region.

Further demographic information of participants includes their occupation. As has been reflected in the literature in chapter two, the majority of the people in rural communities are unemployed. Evidence shows that higher rates of unemployment in developing countries are in rural areas. This is the case with the Dwesa region. In the given communities studied in this

research, over 70% of respondents are unemployed as depicted in Table 7.1 below. The research showed that only 6%, which is 5 people out of 80 who were studied are employed fulltime. About 14% have part-time jobs and another 6% are self-employed.

Table 7.1 Respondents' occupation by frequency

Occupation	Frequency	Percentage
Employed	5	6.3
Self-employed	5	6.3
Unemployed	59	73.8
Part-time employment	11	13.8
Total	**80**	**100**

The relevance of these occupational demographics will come out in the discussion as the benefits of the identified networks are reflected in the daily living of community members in subject.

7.2 Identified networks in selected communities

In this research, networks are categorised into four dimensions as reflected in table 6.1 in the operationalization section: local organisations, social ties, associations with local institutions and collective community projects. These networks are made up of both individuals coming together forming common, mutually beneficial spaces, and institutions/organisations coming together to form a connected entity. As will be shown later in this chapter, local organisations include social groups (such as cultural dance groups), burial societies, sports clubs and saving clubs (known as *stokvels*). Then there are social ties, which in this research basically refer to families. These are the types of networks that are formed by the coming together of individuals. There are also local institutions, which are established structures in the society, and people associate with them to become part of the network. Examples are churches, political parties and trade unions. Then, lastly, there are collective community projects, which still bring individuals together into a common space but are also formed by the coming together of other institutions such as the government and private organisations.

The fundamental elements that characterise all these entities as networks are that they bring people into a common space, people who actively take part in the common activities carried

out in the organisations, attend meetings, and communicate with one another through various means and platforms. All these will be reflected in the following four sub-sections that engage discussions on the identified four types of networks. In each sub-section, data will be presented and discussed to illustrate membership in these networks. Then there will be discussions on the activities carried out in these organisations to reflect that they are not just organisations, but they are in essence networks that build communities.

7.2.1 Local organisations

Four types of local organisations as named above were identified through the survey and interviews. These organisations differ in terms of their purpose and the activities carried out in them. The Graph 7.1 below portrays the membership in each of the identified local organisations, and Table 7.2 that follows shows the numbers of people who claim they belong to such local organisations. The findings showed that burial societies are more common in communities as they have the largest membership, 38 out of 80 people or 47%, as depicted in the graph and the table. The members in burial societies range between the age categories 2, 3 and 4, with most of them in 3 and 4, interpreted as: 2= 25-40; 3= 41-59; 4=60 and above

The majority of respondents in burial societies are females, more than twice as many as males, as reflected in Table 7.3 below. The organisation with the lowest membership is saving clubs, with 5% which is 4 respondents as shown in the graph and the table. Some people who are not members of the saving clubs showed that they would be interested in joining such groups but they do not have enough money to contribute every month as some of them only depend on piece jobs. 17.5 %, which is 14 out of 80 people, indicated that they do not belong to any of the local organisations. The common reasons shown for not being a member of any organisation are lack of interest and not having time. Some people indicated that they do not belong to any of the local organisations because they are not familiar with them, as they are newcomers in the community. The statements below are some of the responses given to the question on why they do not belong to any organisation:

> "*…some of these clubs are just for fun…I would rather be looking for a job or other ways of making money*."

> *"I am not interested in any of them."*

"Bendi kade mdinmgahlali apha, ngoku ndiyafika andazi kwato ngazo" (I am a newcomer in this community, so I do not really know about them).

"I would like to join the stokvel, but I do not have money to contribute every month…I am not employed I only do piece jobs…"

This confirms Putnam's claim that social networks are declining in communities due to pressures of time and money. People are now more concerned about engaging in economically beneficial activities over purely maintaining the social fabric in communities. Others do feel that even those local networks which are meant to cultivate economic activities are not enough or effective. It will, therefore, be shown in the next chapter how the Living Lab model has a potential of reviving networks in communities as well as creating new forms of networks, which do not only bring people together but can also have economic benefits.

Graph 7.1 Local organisations by frequency in the selected communities

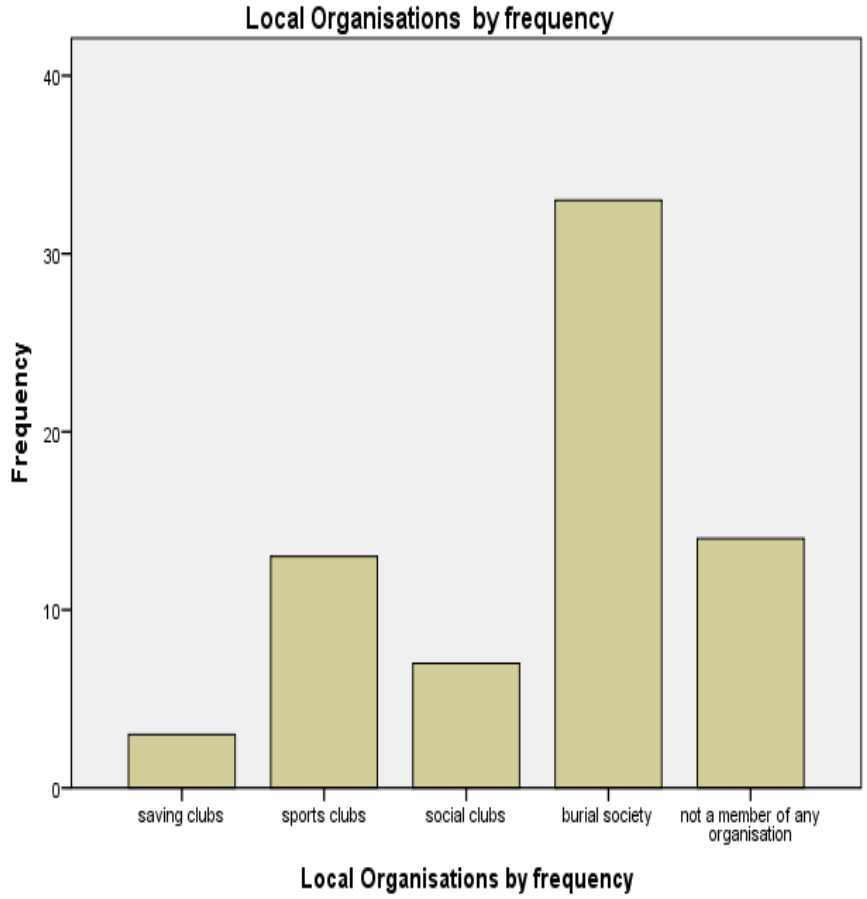


Table 7.2 Local organisations in the selected communities

Local organisations	Number of respondents	Percentage
Saving clubs *(stokvels)*	4	5.0
Sports clubs	14	17.5
Social clubs	10	12.5
Burial societies	38	47.5
Non-members	14	17.5
Total	**80**	**100**

Table 7.3 Membership in burial societies by sex

Local organisation	Membership by sex		Total
	Male	Female	
Burial societies	12	26	38

The findings in Table 7.3 above confirm what has been indicated in the literature in chapter four that women form the majority of participants in local organisations in communities. This is partly because, historically, women have been excluded from public decisions making, and networks are believed to be their platforms of empowerment, as they lead to "increased status and increased power to influence decisions and public policies" (Gittell, et al., 2000:123-124).

While there are those who showed that belonging to some of these networks is a waste of time, others do believe that belonging to these networks have benefits which cannot be attained otherwise. Sub-section 7.2.1.1 discusses the activities that are carried out in the identified local organisations, and that will also bring out the benefits that can be drawn from them, contributing to not only individuals' lives but the functioning of the community as a whole.

The research further established the level of active involvement of members in their respective local organisations. Being active is a reflection of a commitment which can result from realising the importance or helpfulness of that to which one is committed. This is based on the assumption that people tend to commit more to the things that contribute significantly

to their lives, whether directly or indirectly. It was, therefore, significant in this research to establish the level of commitment in these networks, in order to validate their significance in the communities. Table 7.4 below depicts the activeness of members in their organisations, ranging from very active to not so active. More than half (53.8%) of the total respondents indicated that they are very active in their organisations. In establishing activeness of members in organisations, attendance of members at the meetings, frequency of meetings and other methods of communication between members were also taken into consideration. Attendance at the meetings and frequency of meetings are reflected in Tables 7.5 and 7.6 respectively. The methods of communication between the members in the networks will be discussed in section 7.3.

Table 7.4 Activeness in local organisations

Response	**Number of respondents**	**Percentage**
Very active	43	53.8
Somewhat active	10	12.5
Not so active	13	16.3
Non-members	14	17.5
Total	**80**	**100**

Table 7.5 Attendance of meetings in local organisations

Response	**Number of respondents**	**Percentage**
Yes	47	58.8
No	6	7.5
Sometimes	13	16.3
Non-members	14	17.5
Total	**80**	**100**

Table 7.6 Frequency of meetings in local organisations

Response	Number of respondents	Percentage
Almost everyday	3	3.8
Once a week	13	16.3
A few times in a month	5	6.3
Once a month	37	46.3
A few times in a year	5	6.3
Not indicated	17	21.3
Total	**80**	**100**

Over half (58.8%) of the total respondents indicated that they attend meetings in their respective organisations. This figure corresponds with the number of respondents in Table 7.4 who indicated that they are very active in their respective organisations, which is also over half of the total respondents (53.8%). 16% of respondents showed that they are not so active in their organisations and they attend meetings only sometimes. About 8% showed that they do not attend meetings, even though they still consider themselves as members in those organisations.

7.2.1.1 Activities carried out in local organisations and the benefits associated with them

This sub-section forms a discussion of the activities carried out in the various local organisation which are presented and discussed above. These activities are the ones that define the benefits associated with these networks, whether direct or indirect. As will be reflected, the benefits which can be yielded from being part of the networks can either be monetary or non-monetary depending on the activities and the nature of the organisation itself. Table 7.7 below reflects a summary of various activities performed in different local organisations. The discussions that follow will show how members claim that they benefit from being part of the networks and partaking in the different activities, and how that contributes to the function of their communities.

Table 7.7 Activities carried out in respective networks and their benefits

Local organisations	Activities
Saving clubs *(stokvels)*	-Money circulation; where members meet to contribute and give money to one or two individuals each month to be used for an agreed purpose as according to individual needs. They circulate funds until they get to the last person, then they start the circle again. -In some cases the members claim they save money until the end of the year, then they share it equally to use it for the agreed or respective needs.
Sports clubs	Members meet mostly weekly to play different sports such as soccer and netball.
Social clubs	The only social club identified was the cultural dance group. Members meet on scheduled times to perform cultural dances. Members also perform in shows or other cultural events.
Burial societies	These are basically local saving groups, which are meant specifically to assist members with funeral expenses when either they or their family members die. Members contribute an agreed amount on agreed periods, usually monthly. When a member has a funeral, other members also help with cooking and other funeral preparations.

Members of the saving clubs have indicated that their networks are very helpful when one wants to buy big household items which they cannot afford with their own income. Some also showed that by being a member of the saving club, they are able to carry out other responsibilities such as paying for school fees. For them, it helps to have a few people contribute to give one a bigger amount of money, which will be repaid over a period of months by contributing to other members as well. Findings show that because of the restrictions that financial institutions have loaning money to individuals, local networks like these help members to have access to loans by circulating money among themselves. The statements below were given by respondents who are members of the saving clubs (*stokvels*).

> *"We contribute money and give it to one person, sometimes two people if the group is too big, and then the next month we give to another, until we get to the last person."*

> *"…it is like getting a loan because people contribute and they give you money, then the following month we give to another person, until we have given them all"*

> *"It is better than going to the 'loan sharks' because we do not pay interest, we just give back the money as it is"*

Although these saving clubs are mainly for monetary gain, they also contribute to building communities through social connectedness and collective action. Members also enjoy the space where they can form relationships and engage in other personal conversations with other members. In fact, people showed that they form saving clubs with the people with whom they are already acquainted, because they need people they can trust.

> *"All of us already knew each other even before we formed a group…so we just decided to do something that will benefit us financially."*

> *"I joined the group because these are the people that I already know and I trust them…we have to know that if we give the person our money, they will also give it back."*

It shows that trust and reciprocity play a key role in the sustainability of these networks. People give their money because they expect and trust that their actions will also be reciprocated by their fellow members. This essentially is what builds and sustains communities.

Social clubs, though, do not have monetary benefits because of their nature, which is mainly based on cultural and social interactions. For this reason members value them for the sense of belonging they offer and the cultural space common to all of them.

> *"...Siyacula...siyaxhentsa kwaye siyayithanda sonke"* (we dance…we sing and we all love it)
>
> *"I like doing cultural dances…especially when we do it together, it is about our common culture"*
>
> *"The Xhosa culture is very different and we are proud of it that is why we do these activities even if we do not get paid for it, it is not about money."*

This goes to show that networks are not only valued for material gain but even for non-monetary benefits, which is the essence of social capital that people invest in relationships and social bonds. This is a direct reflection of what Bourdieu (1986) was arguing for, that capital can also appear in non-monetary forms, and social forms of capital are also significant for the functioning of communities. It is true that in some cases social capital can facilitate the activation of financial capital, as it is shown by saving clubs, but it does appear in non-monetary forms and can offer non-tangible benefits. By having concerts and open cultural performances when there are community events, community members are able to transfer their culture to the next generations and to keep re-producing their values from generation to generation.

Burial societies also continue to show the importance of social capital through networks. As it was shown in chapter four, communities have always made use of their networks to insure themselves against shock and disasters. These are the kind of networks that serve the very purpose of insuring families against difficult circumstances.

> *"We contribute money each month, then when a family member dies, they are helped with money and other basic needs…"*
>
> *"As members of the burial society it is our responsibility to help each other in times like that, so we go to the family of the deceased to help with cooking and other funeral preparations."*
>
> *"It is very helpful…death is not something we plan, and if we do not save ahead, we will face even more difficult problems when it comes."*

As Ashida and Heaney (2008:873) assert, the provision of social support is one of the important functions of networks and relationships. It is the practical manifestation of social capital through networks. It goes to show that money is not the only ingredient needed to sustain communities but social connectedness as well.

7.2.2 Social ties

As it was shown earlier, in this research social ties refer to ties with families. Families can be classified as networks in themselves, as they are a collection of individuals who share heredity or are joined by marriage, and one family can be part of a bigger or extended family. However, families can also be part of other networks, such as family members being part of the saving club *(stokvel),* the burial society, a church, etc. The primary functions of families are provision and support for their members, and often times families make use of other networks that they are part of to carry out these functions. The sub-section above has reflected how families make use and benefit from being part of other networks. The findings of this research revealed that the majority of respondents, about 88.9%, are living with their families; immediate, extended or both. Table 7.8 below reflects the family composition of respondents.

Table 7.8 Family composition

Family composition	**Number of respondents**	**Percentage**
Immediate family	37	46.3
Extended family	21	26.3
Both immediate and extended family members	13	16.3
Alone	8	10.0
Other	1	1.3
Total	**80**	**100**

Those who showed that they do not live with their families, which is about 10%, indicated that their families do not live in the same area and that they had to migrate for work purposes, as most of them are teachers in the studied communities. Below are some of the responses of those who indicated that they do not live with their families.

"I live on my own in a rented house, but my family lives in King William's town"

"I am originally from Engcobo, that is where my family lives… I have been working and living here for about three years now"

"My family lives in uMthata, so here I live alone"

"This place has become my second home because I have been living here for a very long time, but my really family is in East London"

Even though these people showed that they do not live with their families, they are still part of those networks and still maintain communication with them. They indicated that they communicate with family members quite often using mobile phones and see them at least once a month.

"…at least every week or any other day I make sure I talk to my family with a mobile phone, especially my mother."

"I go home on the weekends if I get a ride, but I usually go at the end of the month."

"I speak to my daughter almost every day on whatsapp" (a mobile phone application)

"I go home every month."

As shown in section 2.5, people in rural communities are more likely to have higher levels of social bonds than people in urban communities (Beaudoin and Thorson, 2004; Hofferth and Iceland, 1998). This proves to be the case as shown by the findings; people still maintain bonds with their families, whether they live with them or not. Putnam (1995a; 1995b) argues that social connections are weakening due to the pressures of time and money, particularly in urban areas, but it appears that pressures of time and money do not necessarily affect the family fabric in these studied communities.

7.2.2.1 The benefits associated with social ties

The findings from this research show that people still believe in the significance of the psycho-social support they get from their family members. As reflected in the sub-section above, a good number of respondents, about 89%, live with their families and they indicated that they would not have the situation otherwise because of the benefits associated with living

together with family. The assertions below are the reflection that people value families for the benefits associated with them:

> *"…I could have not survived my illness without the support of my family."*
>
> *"I do not live with my family here…because of work. It is not easy coming home when there is no one... as a teacher I find my work very stressful, and sometimes I feel like I could talk to someone."*
>
> *"…right now I am still looking for a job, my mother is the only one helping me with finances and other things I need."*

The benefits associated with family ties are not always monetary. However, the statement above confirms what has been reflected in the literature that within the family social capital includes interpersonal relations among family members, which facilitate the activation of other forms of family-based capital (financial, material, cultural and human) (Sun, 1999). This continues to show that the benefits of social capital go beyond tangible things but are more about what people get out of their relationships and social bonds.

7.2.3 Local institutions

From the survey and interviews the following institutions were identified: churches, political parties and trade unions. About 78% of respondents showed that they belong to a local church. Political parties have 26% of membership of the total respondents, and only about 4% showed that they are members of trade unions. As it was established from the findings, some people are not necessarily active in specific political parties, but they do take part in civic matters through activities like voting (this will be reflected in chapter eight). Over 70% of respondents indicated that they are not employed, which explains the low engagement in trade unions. Table 7.9 below shows the number of people who claim that they are associated with the identified institutions. The sum of the numbers in the table is more than the total number of respondents, as some of the members are associated with more than one institution.

Table 7.9 Associations with local institutions in the selected communities

Association	Number of respondents	Percentage
Churches	63	78.8
Political parties	23	28.8
Trade unions	3	3.8
Other	1	1.3

7.2.3.1 Activities carried out in local institutions and the benefits associated with them

Local institutions are established structures in the society that contribute to the making of the community. The activities carried out in these institutions differ depending on the purpose and the role it plays in the society. Churches, for instance, play a significant role as a network to those who are part of it. It is the place where people from different walks of life, who share similar spiritual beliefs, come into a common space. Furthermore, findings showed that respondents who belong to a local church value the church, not only for spiritual benefits but also for the social support that they get from their fellows. Below are some of the responses that people gave to show that the church also plays a supporting and community building role.

> *"We go to church on Sundays but we also have other engagements such as choir, mothers' groups, youth groups, where we meet on other days and do different activities."*

> *"… I don't know exactly what mothers do, but sometimes I know that they hold prayers during the week, they also have conferences on Easter or Christmas times."*

> *"…in the choir members hold concerts with other church choirs…they also do fund-raising activities for the church."*

> *"…the church is our community, it is where we belong."*

> *"Most of my friends are people I go to church with…we do so many activities together even outside church"*

"I come from a Christian family, my family believes in attending church and taking part in the church"

Again, there is a social support element that is associated with the church. People engage not only as fellow church members but also as friends and families, and they do other activities that create a sense of community and solidarity.

About 28% of respondents showed that they are members of respective political parties. These members believe that it is their right to support the political party of their choice which, through their votes and support, is mandated to ensure their development. It is clear that people associate political parties with development and for them, being an active member and supporter of a political party can yield benefits. The excerpts below depict this assertion. These were responses to the question why members feel it is important to be a member of a certain political party.

"I do not want to be left behind when there are developments…"

"I support my party because I want to see it win and bring more developments."

"It is my responsibility as a citizen to be active in politics."

These individuals claim that they take part in the activities of their respective parties such as rallies and meetings. It will be shown more in the next chapter how networks contribute to civic participation.

As indicated earlier, a few individuals, about 4%, claimed that they are members of trade unions. These individuals, all of whom are teachers, believe that trade unions are a platform for their voices to be heard. They believe it is their way of being able to exercise their rights. An example of the ways in which they exercise their rights is through demonstrations, but they also believe that trade unions speak on their behalf with those in authority whenever they encounter work-related problems.

"The unions stand for our rights as workers…"

"The unions help us to communicate our grievances."

It shows that the unions provide the workers with a unified voice which can be heard better by those in authority. Individuals believe that these bodies stand in the gap for them and give them a space to have an effective dialogue with their employers.

7.2.4 Collective community projects

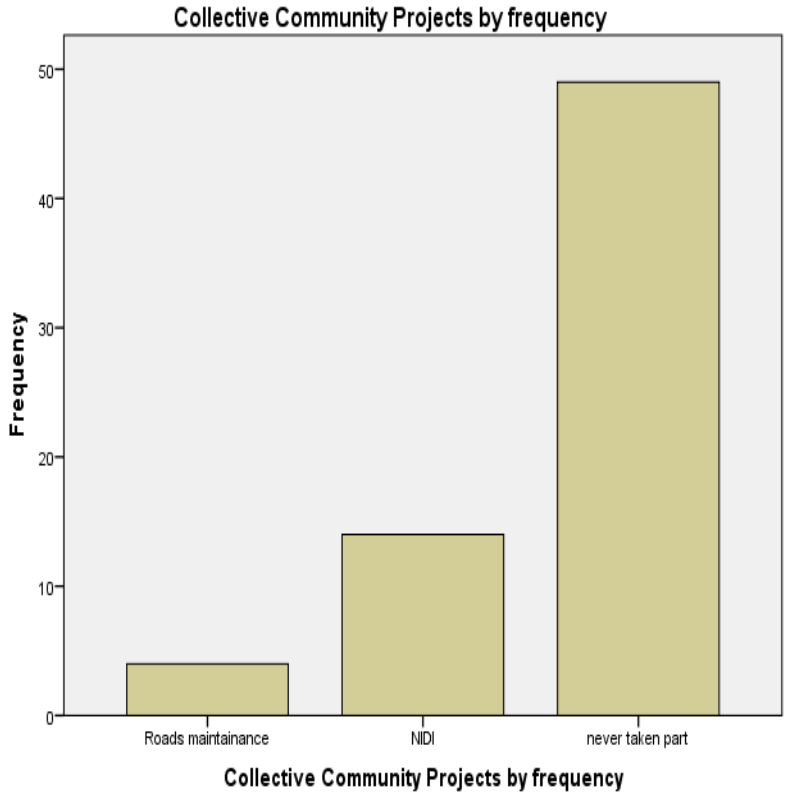
The last dimension of networks was collective activities, indicated by local community projects. Few projects were identified which include local roads maintenance (funded by the local government) and an integrated development initiative called the Nqabara Integrated Development Initiative (NIDI). As shown earlier, some networks are formed by the collaboration of not only individuals but also institutions with a common goal. This integrated development initiative is the initiative of the agency aimed at promoting rural and urban livelihoods (RULIV) based in East London, Eastern Cape, in collaboration with the South African government and the European Union (EU). Just over 20% of respondents indicated that they are members of the NIDI. Members of the NIDI engage in arts and crafts production, maintenance of the local lodge for tourists (called the Nqabara Lodge) and agriculture.

Due to the fact that the roads in the study area are gravel or dirt roads, they deteriorate with time because of rain and the general usage, so the government through the municipality engages the local people who are paid to maintain the roads. This is another way that the government creates jobs within local communities. About 6% of respondents showed that they have been involved in the roads maintenance initiative. About 66% of respondents indicated that they have never taken part in any of the local projects. Table 7.10 below shows the numbers of these respondents who showed that they have either or never been involved in community development projects. The Graph 7.2 that follows also depicts respondents who claimed that they have either or never been involved in community development projects.

Table 7.10 Respondents who have taken part in collective projects

Collective activities	**Number of respondents**	**Percentage**
Roads maintenance	5	6.3
NIDI	17	21.3
Never taken part	53	66.3
Other	5	6.3
Total	**80**	**100**

Graph 7.2 Respondents who have taken part in collective projects



7.2.4.1 Activities carried out in collective community projects and the benefits associated with them

The local roads maintenance initiative is a network that brings a group of community members together for a course of fixing the roads. Furthermore, it is a network between the government and the people with a mutually beneficial purpose. The NIDI project, on the other hand, is the network of individuals from the communities, the government and private organisations. The NIDI is one of the initiatives which are meant to aid the generation of income and to enable development within local communities in designated areas. The strategies adopted in this project are predicated upon the local Integrated Development Plan (IDP), which is the plan designed by the local government structure specific to the local area. As shown in chapter five, IDPs are aimed at fostering a more relevant, comprehensive planning and service delivery system at the municipal level (Abrahams, 2003).

As a result, the activities of the initiative are aligned to the already existing coping strategies in the area. In essence the initiative is meant to strengthen the coping mechanisms which are

already in existence in the local areas, within the parameters set by the funding agency. The areas of development in the case of this specific project – NIDI – include agriculture, arts and crafts and tourism. In agriculture the activities include trees and vegetable planting and animal husbandry. They also make and sell traditional arts and crafts materials. Lastly, in tourism the agency assists in enabling initiatives for the maintenance of the accommodation centre for tourists in the area – the Nqabara Lodge. The accounts below were given by the members of the project, one of whom is also a full-time staff member at the Lodge/craft centre.

> *"We have communally owned agricultural projects, where we grow fruit trees and vegetables. The members meet at least three times in a week at the craft centre, where they sew traditional clothes using the machines here, and make crafts materials. Members also work from their homes."*

> *"We meet here at the centre almost every day…we make traditional crafts materials which we sell here as you can see…we also have agricultural projects which we do together as a group, but those we do from our homes."*

> *"We get financial support from RULIV, which is the implementing agency funded by the office of the Premier, through the help of the European Union."*

The benefits associated with these projects are mainly monetary but it was said, too, that people have also managed to develop their skills from their involvement in this project. In responding to the question on how people felt that they have benefited from being part of such networks – collective community projects – the following were some of the responses that came out:

> *"…of course I got the job as the local administrator…but even other community members benefit from having the place to sell their hand-made materials…once in a while when tourists come here they buy from us."*

> *"I have developed my skills…we come here and work together, so we are able to share our knowledge and skills."*

These individuals also collectively sell their products at the nature reserve situated in the area (the Dwesa/Cwebe nature reserve). The nature reserve is the most attractive destination for tourists in the Dwesa region, and sometimes tourists also visit this craft centre (also known as

the Nqabara Lodge) when they are in the area. Interestingly, when this initiative was conceived, the aim was to ensure an integrated development package in local communities, hence the name – Integrated Development Initiative. The government took into cognisance the fact that development is not just about monetary stability, but a complex process of improving the quality of life. The objectives of the initiative as stated in the proposal are:

- advocacy and partnership building;
- development of an information centre;
- establishing and implementing a culture and care programme;
- leadership development; and
- a series of economic livelihood interventions.

The project is currently at its infancy stage with just a part of these objectives being implemented so far. One of the limitations identified by the members for the delay of the project to fully take off is lack of exposure to the outside market, which limits the benefits gained from the production of crafts materials. This is why in the next chapter the discussion will include the findings of the potential of ICT within the Living Lab model, in catalysing implementation processes in projects such as the NIDI in the communities.

7.3 Information channels in selected communities and between these communities and other sectors

Information channels are a form of social capital that facilitate action (Coleman, 2002). In this research, information channels are the means of communication and information dissemination within the selected communities and between these communities and other sectors in the society. These include both traditional and modern forms of communication. Traditional methods of communication require face-to-face interaction. Improved/modern methods of communication, embedded in ICT, do not require face-to-face interaction, such as the use of fixed and mobile phones, computers and the Internet. In this research it is argued that the Living Lab approach enables an effective integration of ICT even in rural communities. This can, therefore, catalyse the process of integrating rural communities with other sectors outside their territories.

7.3.1 Information channels within selected rural communities

According to the baseline study, which was conducted at an early stage of the SLL in 2009, local residents were at the time still accustomed to using traditional methods of communication rather than mobile phones and other ICTs when communicating within the community (Pade-Khene, et al., 2010a). The study was conducted in one of the communities within the Dwesa region – Mpume. However, because of the homogenous socio-economic characteristics in the region, this fact is more likely to apply to other communities including the study areas in this research. The recommendation from the study was that communities should be made aware that ICTs (mobile phones, computers and the Internet) can complement traditional communication channels within communities, and can also help to connect them with others outside their communities (Pade-Khene, et al., 2010a).

The findings from this research reflect that, while people still use traditional methods to communicate – *imbizo's* (community gatherings), meetings and, of course, the inevitable face-to-face personal interactions – the use of ICT, mainly mobile phones and to a lesser extent computers and the Internet, has spread over the area. According to this research, 90% of respondents or 72 out of 80 indicated that they either own a mobile phone or live with a family member who owns one. Of the 43% of total respondents or 34 out of 80 who indicated that they have used computer labs at the schools, as depicted in Table 8.1 in the next chapter, only 13% confirmed that they use computers and the Internet to communicate with their friends and families through online social networks and emails. Some respondents have also indicated that they do access the Internet from their mobile phones, through which they communicate on online networks. As depicted in Table 8.2, also in the next chapter, 42% of all respondents claim that they are on online social networks. The use of these ICTs has, however, not substituted the traditional methods but complemented them. Tables 7.5 and 7.6 in the previous section depict that members in the local organisations hold meetings in their respective organisations, and that is the main platform through which they communicate and disseminate information. However, the research also revealed that members have other means of communicating such as through mobile phones as a complementary method.

> *"We usually communicate issues of the group at the meetings…but if there are any emergencies, we use mobile phones."*

> *"If it is about the group we talk at the meetings, but of course sometimes we talk through phones when it is necessary."*

"…mostly we talk at the meetings, but sometimes we use cell phones…"

Community gatherings *(imbizo's)* are the main platform through which community leaders communicate with community members about matters of community development. Respondents claimed that it is only in a very few cases where community members are communicated to via mobile phones, and that could only be when the information disseminated does not involve a large number of people. The Graph 7.3 below and Table 7.11 that follows reflect that there are various means through which community leaders communicate with community members, but imbizo's remain the main platform through which such communication occurs.

Graph 7.3 Means of communication between community members and leaders by frequency

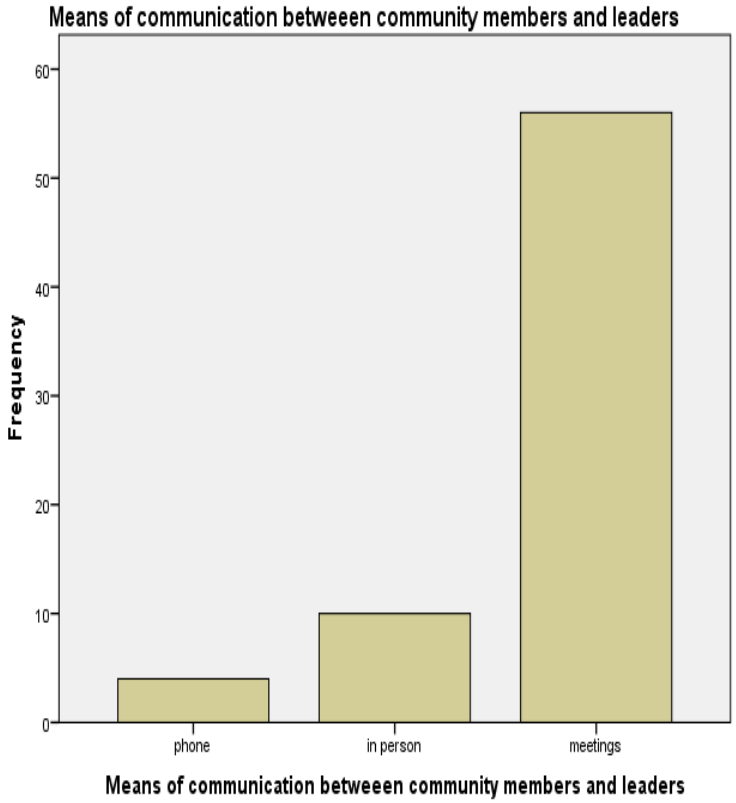


Table 7.11 The means of communication between community members and leaders by frequency

Means of communication	Frequency	Percentage
Phone	4	5.0
In person	10	12.5
Imbizo's (community gatherings)	56	70.0
Invalid	10	12.5
Total	**80**	**100**

It is clear that traditional means of communication still dominate a lot of information dissemination spaces in these communities, even though modern methods of communication are also being adopted. The next chapter will reflect how contemporary means of disseminating information can enhance information distribution in these communities, even if they do not necessarily replace the old forms of communication.

7.3.2 Information channels between selected rural communities and other sectors

The research established the methods of communication between selected communities and other sectors in the society. These sectors are government institutions, academic institutions and private organisations. Then in the next chapter it will be shown how the Living Lab model can enhance communication processes between rural communities and these sectors.

7.3.2.1 Communication with government institutions

First, the research established what kind of services community members need and have requested from the government. Then it established how these services were solicited from this sector. The findings revealed that the services reflected in Table 7.12 below are some of those that have been solicited from the government by some respondents.

Table 7.12 Services requested from the government by respondents at any point in time

Services	Frequency
Passport/ID	46
Social grant	38
A job	11
Others	6

The sum of these numbers is more than the number of respondents in the survey because some people have asked for more than one service from the government. The second finding in this matter was the methods which people use to make requests. It was revealed that the basic way in which community members request services from the government is by personally going to the government's offices and applying for the services they need. It is only after submitting the application that the outcome of the application is communicated through mobile phone text messaging.

These respondents claimed that it is a very inconvenient way as it means that they have to travel over 70 kilometres to the nearest town where they can get access to government's offices, despite transport problems.

> *"…as you can see we have a problem of transport, there is only one bus here, it leaves in the morning and returns late in the afternoon, otherwise people have to hitchhike…but we still have to go to Idutywa…"*
>
> *"We have to travel all the way to Idutywa to apply for anything…"*
>
> *"Imagine traveling this long distance just to apply for something which you are not even guaranteed."*

It was discovered that sometimes government's representatives do go to these communities and administer the applications from the communities. This is certainly a very helpful exercise for those people who find it really difficult to go to the nearest town. The challenge, however, is that this is neither sustainable nor reliable, so people still have to physically go to the offices in most instances.

"Sometimes government official come to the communities and collect applications from those who want to apply, whether it is for grants, IDs… but they only do that once in a while, so people still have to go to Idutywa where the offices are."

7.3.2.2 Communication with academic institutions

The study also established the means of communication between these communities and the academic sector. Respondents indicated that prior to the intervention of the Living Lab, they had never had any form of contact with higher education institutions as communities.

"…no, it was the first time we had people from the Universities come to this community and assist us, we were abandoned…"

"We were so happy that finally, someone remembered us, that is why we decided to take that opportunity immediately"

"Some people had never seen computers before, let alone use them…"

How communities now have interactions with institutions of higher learning after the intervention of the Living Lab will be discussed in the next chapter, which explores the contribution of the Living Lab to networks and information channels between communities and other sectors.

7.3.2.3 Communication with private organisations

The previous section showed that these communities have partnerships with RULIV and the Eastern Cape office of the Premier through the NIDI project. These communities also have a relationship with the nature reserve in the area through the arts and crafts products that they sell to tourists. The research then established how community members communicate with these institutions.

"We have meetings with the people from RULIV every quarter…we talk about the activities of the project."

"We also have annual meetings at the end of every year, where we do evaluation together with the representatives from RULIV and the office of the Premier."

"Sometimes they (RULIV) call the local administrator when there is news that needs to be passed to the members."

"Some of our products we take to the nature reserve and sell them to tourists… so we go there very often."

This continues to show that traditional methods of communication are still dominant but ICTs are used to complement the means of information dissemination. Meetings are the main means of communication but mobile phones complement them.

Findings also revealed that some people would like to get assistance from private organisations and the government to engage in economic activities but they are limited by the exclusion of their communities from the information society, which limits their access to information.

"I was employed part-time by Vodacom, we were installing the towers for connection, but since they left it has been a long time and we have not finished the job…now because I live far I am not able to keep following them up to find out what the problem is, and to hear about other opportunities they have."

In one of the interviews one of the community members, in fact, expressed his desire to expand his agricultural production and make a business out of it, but he showed how difficult it is when one lives in a rural community where the market is very limited. He also showed his understanding of how ICT can support agricultural production:

"I like farming, especially if you talk about animal husbandry, so much that I have already gone to Komga (in Eastern Cape) to find out about their prices and the animals they have…if I already knew how to use the Internet, maybe I would have not needed to go to Komga, I can just search and find what they have…I can even search the Internet for which kind…which breed is good for the climate of this area."

While information dissemination is much easier within these communities where they use both traditional and modern forms of communication and information dissemination, the opposite is the case when it comes to information and communication between these communities and other sectors. People experience difficulties due to their isolation. In the next chapter, discussions will be on findings of how the Living Lab has improved networks and information channels to date, and what potential it has to help these communities be integrated with other sectors more effectively in the future.

7.4 Conclusion

This chapter explored the findings on the networks in the selected communities, showing the membership in such networks, the activities carried out in the networks and how these networks contribute to the functioning of communities. The chapter also explored information channels, reflecting how community members communicate and disseminate information, both within communities and between communities and other sectors.

On identifying the networks, this chapter has reflected that at least four types of networks exist in the studied communities: local organisations, social ties, social institutions and collective community projects. The findings showed that the networks with most members are burial societies with most of the members being females. The research did reflect that the majority of respondents, about 73%, are unemployed, hence they would not qualify for formal insurance. These local burial societies, therefore, remain the only option for the unemployed to insure themselves and their families against tragic circumstances. The networks with the least membership, according to the findings, are saving clubs. Saving clubs involve contributing and circulating money amongst the members. Again, because of unemployment some people claimed that they do not have enough money to afford being members of such groups. Even though the members in these clubs did indicate that the clubs have been very helpful in assisting them to afford things they would have not afforded otherwise, some people claim that they do not have the financial freedom to engage in those clubs.

The research also established that a significant number of those who belong to the networks consider themselves as active members. These members actively take part in the activities carried out in their organisations, attend meetings and communicate with other members using mobiles phones about the activities of the organisation. However, counter evidence also confirmed Putnam's claims that being too busy or time pressures have, in fact, resulted in less involvement in local organisations as shown in the literature in chapter four. Some community members (17% of respondents) have actually claimed that they do not belong to any of the local organisations, and they made deliberate choices not to be, due to being busy or lack of interest. Some of those who claim they do not belong to any organisation showed that looking for jobs and other ways of making money is, in fact, their priority and none of those organisations could fulfil that need.

Nonetheless, the findings suggest that there are benefits attached to these networks and that those who do take advantage of them do yield returns, both monetary and non-monetary. The findings of this research actually contradict the claim of Gertler, et al., (2006). Based on their research, they claim that there is little evidence that social capital is beneficial to the poor. Instead, it is reflected in this research that, as also shown by Putnam (1993; 1995) and Coleman (1994), social capital is beneficial to the poor and marginalised, particularly within their communities. The benefits yielded from the networks differ in terms of the nature of the networks and the activities linked to them. Social ties offer the members with mainly non-monetary (psycho-social support) but also monetary benefits can be cultivated through social ties. Saving clubs are by their very nature based on financial capital cultivation but members also yield social benefits from belonging to a network. These members get to interact and form relationships with others and in the process they exchange psycho-social support. Community development projects are basically aimed at enabling development benefits to those who take part in them. However, it was established that while the intentions are good, the outcomes of the intended benefits are often very subtle and somewhat insignificant. This is due to mainly lack of exposure of rural communities to the outside market. In the next chapter the discussion will reflect how rural communities can be integrated with the outside market through ICT and the Living Lab model.

On information channels, the findings have shown that from the time when the baseline study of the SLL was conducted in 2009 to date, there has been an increase on the use of ICT, particularly mobile phones, for communication and information dissemination in the communities. The chapter also showed that because of the deployment of the Internet and computers in these rural communities, community members now have access to more than just mobile phones but also computers and the Internet. The chapter reflected that the majority of respondents, 90%, indicated that they either own a mobile phone or live with a family member who owns one. Community members further showed that they also sometimes use these mobile phones to communicate in their local networks.

It was, however, established that while community members have largely bought the idea of ICT for communicating with those in and outside their communities, that has not substituted their traditional ways of communicating. It was shown that community gatherings, for example, are still the main platform through which community leaders disseminate information and communicate with the members of the communities. Also, people still hold

meetings as the main platform of communication and information dissemination in their local networks.

The research further revealed that even though communication and information dissemination is easily done within communities, community members struggle to do the same with other sectors such as the government and private organisations. The use of ICT as a means of communication and information dissemination between these communities and other sectors in the society has not yet been significantly realised. Therefore, these communities are still largely excluded from the information society, even though the intervention of the Living Lab has slightly improved this situation. In the next chapter it will be shown how networks and information channels have been and can further be improved by the engagement of communities in the Living Lab.

CHAPTER EIGHT

The Living Lab model and the creation and cultivation of social capital, and the contribution of social capital to rural development

8.1 Introduction

The discussion in the previous chapter was on identifying the forms of social capital – networks and information channels – within selected rural communities and between these rural communities and other sectors in the society. In this chapter the discussion will be on the findings of how the Living Lab model has to date influenced these forms of social capital, and the potential it has in the future. The chapter will further explore how the increased social capital can lead to innovative, participatory development. The next section (8.2) will discuss the influence of the Living Lab on networks, both within rural communities and between rural communities and other sectors. The section that follows, section 8.3, will discuss the influence of the Living Lab on information channels, both to date and potentially in the future. Then the last section before the conclusion, section 8.4, will discuss how social capital in both forms can contribute to participatory, innovative development.

8.2 The Living Lab model and social capital in a form of networks

8.2.1 How Living Labs can create and cultivate networks within communities

The two possible ways which have been identified through which Living Labs can enable the creation of networks are: the coming together of the people into common spaces (computer labs) and the use of ICT by community members to network with the outside world for social and economic purposes. The research first established if community members make use of the spaces that bring them together, computer labs. The research also explored the nature of usage of computers and the possible ways in which people can use such spaces to cultivate their networks. Then it explored the possible ways in which ICT can be used to connect communities with the outside world.

As depicted in Table 8.1 below, of the total participants, 42.5% showed that they have used computer labs. The purposes for which people use computers will be discussed subsequently. Then later it will be reflected whether participants feel that the spaces do help them form networks, both with each other in the communities as well as with other sectors outside their communities. However, it is worth noting that these results are based on a small sample of 80

respondents, 20 in each of the four communities. The research conducted by Osah (2012) on the use of the SLL computer labs, which studied the entire population in two of the communities which are also studied in this research, Ngwane and Nqabara, reflects that 36% and 5% of the entire populations in Ngwane and Nqabara respectively claim that they use computer labs.

Table 8.1 Usage of computer labs in the selected communities

Response	Number of respondents	Percentage
Yes	34	42.5
No	43	53.8
Invalid	3	3.8
Total	**80**	**100**

In establishing the nature of usage of computers in the labs, participants in the individual interviews and focus group discussions indicated that they use them for four purposes: communication, social networking, job searching and research. A small number of people indicated job searching and research, though, as most of them were only getting to know how to use computers and were still familiarising themselves with the search engines. Participants were, however, very excited and seemed eager to learn more about what computers and the Internet can do.

> *"It was my first time to use a computer and I am very happy… I want to learn more…"*
>
> *"Now I have an email address and I can send emails…even to you."*
>
> *"I joined Facebook… I knew about it but I wasn't interested, but now I like it…"*

In establishing whether or not people feel that the spaces help them form networks, both with each other in the communities, as well as with others outside their communities, the interviews and focus group discussions assisted in gathering data. Complementary to these methods, the researcher also engaged in objective observations during computer literacy training to establish if people consider working together and forming relationships. From the observations it was evident that while individuals carry out their exercises individually, most of them did work with each other and helped each other with exercises. Participants actually

seemed to prefer to consult with their neighbours as opposed to their tutors. Some people indicated that they have met people that they did not know before in the computer labs, and that they found themselves forming relationships with them even outside computer labs.

> *"Yes, some of the people I met here I did not know them before…"*
>
> *"…my friend here (points at someone) we met in here and we started talking; now we even visit each other…"*
>
> *"Some people I knew before, but I only started interacting closely with them when I came here to use computer labs…"*
>
> *"It is a good space that brings us together…and we are able to share other important information as well."*

This means that even in the case where people know each other but are not necessarily acquainted, the computer labs offer them a space to come together and eventually form relationships from being engaged in similar activities and interacting. While people may find it time-wasting to join local organisations, computer labs create the same opportunities of networking but also engaging in potentially profitable activities like online job searching, research, etc.

Additionally, the use of the Internet and computers in the computer labs helps community members to join the even wider networking space through online social networks. Some people indicated that they had not been on online social networks before, but since they started using the SLL computer labs, they are now on online networks. This suggests that while some forms of networks may be declining due to, as indicated earlier, people feeling that they are too busy and lack interest, new types of online networks are being formed. Table 8.2 below reflects the numbers of people who claim that they are on online social networks. Table 8.3 that follows depicts the number of respondents who indicated that they joined these online networks either before or after using computer labs.

Table 8.2 Respondents on online networks in the selected communities

Response	Number of respondents	Percentage
Yes	34	42.5
No	35	43.8
Invalid	11	13.8
Total	**80**	**100**

Table 8.3 Respondents who joined online networks before or after using computer labs

Response	Number of respondents	Percentage
Before	15	18.8
After	19	23.8
Never used computer labs	42	52.5
Invalid	4	5.0
Total	**80**	**100**

Online networks were said to be helpful in reconnecting people with old friends and family members. Respondents also indicated the advantages of being able to communicate with friends and families wherever and whenever at a more affordable cost.

> *"My sister that I haven't seen in years, I searched for her on Facebook, and I found her…now we talk a lot."*

> *"…recharging for internet is not expensive like when you are talking on the phone."*

> *"…internet is better (cheaper), you can talk to people on Facebook, is not like sms or calling."*

> *"…what I like about the Internet is that I get to communicate with many people at the same time, and I get a lot of information that is very helpful."*

> *"I was told about Facebook by one of our tutors in computer literacy training…he helped me to join it…now I can even access it on my phone (mobile phone)."*

While some people may have known about online social networks, others only got the opportunity to learn about them as a result of their involvement with the use of computer labs that were made available through the Living Lab. This helps them to not only be able to interact with others from their communities, but also with other people outside their communities.

Some people felt that the space is quite useful as this is where they get to share information and opportunities. In one incidence one of the teachers who also uses the computer labs was going around in the lab informing people about the clerk positions available with the Department of Education. Some of the interviewees gave the accounts below:

> *"…I would go to the schools to use the computers and to teach other people how to use computers. Then I heard from one of the teachers that there is a need for the pre-school teacher. I wrote a CV using the computers in the lab and applied...that is how I got that job…"*

> *"…yesterday I was told by one of the teachers that there are vacant positions at the Department of Education…I have not had a job since I finished my matric in 2010, so since now I know how to use computers I am going to try my luck and apply."*

Networks have been existent in these communities as reflected in the previous chapter. The Living Lab has further influenced the creation of new networks through the common spaces which have been created by available computer labs. These computer labs are, in a sense, enabling networks as they bring people together where they not only learn how to use computers, but they also get the opportunity to meet and interact with new people and old friends. These people also get to share information and other opportunities which may, in turn, contribute to improvement in their lives.

The Living Lab has, however, not necessarily contributed to strengthening the existing local networks. According to the findings of this research, there is no direct link or involvement of the local organisations in the SLL. Community members get involved with the SLL as individuals who form networks through the use of computer labs. However, community members in their local organisations can make use of online networks by forming online groups with their fellow members. Online networks enable members to form groups through which they can communicate, share information and opportunities without having to meet physically together as a group. The advantage of online networks is that they enable members

to access information outside their own communities. As it was indicated in chapter four, rural communities are usually the last to know about job opportunities, development issues, etc. Without overriding the main purposes of the local organisations, members can also strengthen their networking by sharing a variety of useful information from outside their communities. In the next section the discussion will be on how the Living Lab has and can further influence networks between the communities and other sectors.

8.2.2 How Living Labs can create and cultivate networks between rural communities and other sectors

As has been shown in previous discussions, a Living Lab involves the collaboration of stakeholders of which communities are a part. Even in the SLL, the development and engagement of ICT products and services are based on the collaboration of sectors and user-involvement. These rural communities as part of the stakeholders have an opportunity to participate and influence the design and development of ICT products. They also have an opportunity to interact with other sectors and form networks with them. In this sub-section the discussion is on the networks that have been formed between rural communities and other sectors through the Living Lab approach.

The findings have showed that the relationship between the selected rural communities and academic institutions involved (Rhodes and Fort Hare universities) is the most established compared to other sectors (government and the private sector). In this case the discussion does not refer to the relationship of the government and community members as citizens, based purely on service delivery. It refers to the relationship that was formed as a result of both sectors (communities and government) being stakeholders in the Living Lab. The whole purpose of bringing the government and communities into a working relationship within the Living Lab model is that, currently, communities are still not actively engaged in governance matters as was reflected in the literature, particularly in chapter five. Therefore, this platform is meant to help the government to form an equal partnership with these communities, where communities can get to influence policy making and governance issues through the use of innovative ICT products.

The findings of this research showed that at least every month researchers from Rhodes and Fort Hare universities visit rural communities for a period of a week. In some seasons these trips occur on a weekly basis. The researchers who visit these communities adopt the living

style in these communities. They have an all-year-round rented house where they live communally every time they go to the communities.

> *"We go to these communities, I would say every month there is trip of about six people who do community visits…we even have our own rented house, which is owned by a community member. We call it 'the base' because that is where we are based when we are in the community."*

> *"When we visit these communities we live like them, we wash the same way they do using washing basins, we use long-drop outside toilets…we really want them to relate with us and us with them."*

During these visits researchers engage in computer literacy training with community members. They also engage in consultative discussions with them concerning ICT products and applications which are designed and developed for these very communities. In confirming this, below is what some community members said:

> *"They do speak to us about what they do and ask us to give our opinions…"*

> *"Sometimes they ask us what we would like to be able to do using computers and we have discussions about it…"*

> *"In the group discussion that we just had they were telling us about the e-learning application which will help the student in these communities…they asked us what language(s) we would prefer for the application, what kind of learning materials we would like to access in such applications, and many other things."*

As a result of the frequent, active involvement of these researchers with these communities, they are able to elicit and engage user-specific requirements in the development of ICT applications. Furthermore, they are able to develop relevant applications which can be useful for these specific communities. This is in response to some of the lessons which have been learnt about the failure of the engagement of ICT in communities, that is due to irrelevant, mismatched applications and services that are copied and adopted from different contexts as they are.

> "*Because of our understanding of the profiles of these communities, largely influenced by the relationship we as researchers have with them, we are able to create specific applications that will better serve their needs."*

"We do not want to assume that what works in another area can work in the communities that we work with, that is why consultation and user-requirements elicitation are crucial to us."

"The products that we develop are not just imposed on these communities, they are the outcomes of the relationship we have with them, which enables us to know their needs and gather their specific requirements."

As it was shown in the previous chapter, these communities had not had any form of contact with academic institutions prior to the intervention of the Living Lab. Now as a result of being part of the stakeholders in the Living Lab, community members are able to interact and form working relationships with researchers from the involved academic institutions. These researchers do not only want to do their research, but also want to leave something useful for the communities.

The teachers (also contact persons) from the hosting schools also confirmed that they maintain regular contact through mobile phones and the Internet with some of the researchers when they are not in the community, and the SLL Management Unit (SLLMU). SLLMU is the unit responsible for coordination and organisation of activities and logistics within the SLL. This unit was established specifically to be the direct link between the involved academic institutions and communities. Furthermore, within the communities there is also a committee responsible for dissemination of information and organisation of activities from the communities' side. This committee communicates regularly through meetings and mobile phones with the SLLMU and some researchers.

"I am one of the committee members here in the community… we are responsible for organising activities, making arrangements for computer literacy training, we organise meetings…and whenever we have SLL events we organise them."

"The committee consists of members from different communities in this region, so each person is responsible to liaise with people in his/her community who are interested in the SLL."

It was found, however, that direct, active relationship between these rural communities and their private sector and government partners has still not been well-established. Evidence shows that the only time these two sectors – government and the private sector – come into contact with communities is when there are big events that involve all stakeholders. Other

than that, there is no on-going communication and direct information dissemination between communities and their industry and government partners. Even the natural government-citizenry relationship based on on-going service delivery to these communities by the government has, so far, not been influenced directly by the Living Lab. It was established that there is on-going contact through progress and evaluation meetings between the academic sector and their industry and government partners, but rural communities are never represented in these meetings.

> *"We, as the academic sector have scheduled meetings with our industry and government partners, where we do evaluation based on the agreement of terms...unfortunately rural communities have never been represented in these meetings."*

The challenge, as one of the researchers indicated, is that there is still a need for the government and industry partners to fully realise that they are not just policy makers and funders respectively in the partnership, but there is a more long-term and on-going relationship which can and should be pursued with communities.

> *"…there is still a need for government to actually realise that besides providing funding for research and also doing policy making, they can improve their service delivery and accountability to the citizens through some of these applications, and that can provide a basis for a continuous government-citizenry partnership."*

> *"…also our industry partners, we would like them to see themselves as long-term partners in this initiative, by seeing rural communities as their potential markets, and thus seek to extend their services to them. In a sense this would benefit both the communities and the industry partners themselves… For instance, if the company wants to sell services to rural communities, we as researchers and software developers can develop, in collaboration with communities, applications that will help to connect the company with the target market which is rural communities."*

As shown in the previous chapter, these communities have partnerships with private organisations such as RULIV through the NIDI project. The project, however, does not have any direct link or involvement with the SLL. Nevertheless, much benefit can be yielded by the members of this project through direct involvement with the SLL. Some of the applications such as e-commerce can actually be designed and developed to directly suit their

requirements as a project. This can even possibly open more opportunities for them as a group; through potential networks they can build and access to useful information. From the interviews and discussions with these community members it was clear that they see the contribution that ICT can have in their project.

> *"It would be very helpful if people would be able to see the things that we make on the Internet…it would even attract more tourists to our region."*

One of the objectives of the NIDI project is development of an information centre. ICT can thus enable members to have a platform through which they can make available all the information about their projects to potential clients. This can also strengthen their networks with their partners (RULIV) as they can get to have an open platform of communication enabled by ICT. It is clear that there is a need for SLL not only to engage community members as individuals, but also to engage the local organisations through which people are already connected with one another.

The findings have revealed that there are some applications which have been developed so far for these communities. These ICT applications are meant to create and cultivate information channels between these communities and other sectors in the society, including government and the private sector. In the next section the discussion will be on the influence of the Living Lab on information channels between rural communities and other sectors.

8.3 The Living Lab model and the creation and cultivation of Information channels

As shown in the previous chapter, these selected rural communities already have different methods of communication and information dissemination between them and sectors such as the government. For instance, it was indicated that people normally go physically to the government's departments whenever they need to apply for basic services such as identity documents and grants. However, there is a consensus among all the stakeholders, including communities that ICT can aid communities to be better integrated and to better communicate with other sectors and the outside world at large.

The deployment of the wireless network and computers in rural communities was the first step to offering these communities access to affordable Internet and the use of computers for communication and wider information access. The wireless network base has been deployed at one of the schools, and all the surrounding schools that host the SLL computer labs can connect to the network from that base. Rural communities now have the freedom of choice to

use these ICTs to connect to their friends and families outside their communities. The computer literacy training is also the means of ensuring that communities not only have access to ICTs but also the capacity to utilise them. The members of the community can now use these improved information channels to search for jobs through the Internet, do research and to acquire general information. Community members have the liberty to use the computer labs during the school working hours, as the teacher in one of the schools said.

> *"Community members are allowed to use computers during working hours of the school, which is from 8 o'clock in the morning until 3 o'clock in the afternoon…on the weekends they only have access if there is someone at the school."*

According to the researchers the applications which have been developed so far include e-commerce, e-government, help-desk, e-learning and a career portal.

> *"…so far we have developed the e-commerce application, e-government solutions, the help-desk application, e-learning platform, a career portal, and in future we are looking into e-health and e-judiciary solutions as well…We had also developed a website for the communities in the Dwesa region who produce and sell traditional arts and crafts at the nature reserve. Unfortunately this could not be sustained due to financial limitations, but we are still hoping that we can come up with a more sustainable solution to that."*

The research has revealed that because of the isolation of these communities, both geographically and technologically, they are unable to take advantage of the benefits that come with technology. Their acquisition of government and other development information is very limited, as they have to depend on their local government structures. In response to this the researchers in collaboration with community members have developed an e-government application, which will essentially enable community member to access government and other development-related information far more easily and instantly.

> *"The e-government application is meant to work in such a way that community members can be able to access government information and participate in policy making, apply for basic services such as identity documents, social grants, travel documents etc. from their own communities without going physically to the offices."*

It has been realised that rural communities are never actively included in policy making processes; therefore, the e-government solution will include a forum through which community members can express their opinions to influence policy making.

These innovative applications which have been developed can help communities to: communicate conveniently with the government and other sectors, access services more easily, and create better opportunities for enterprises and self-improvement. The statement below was uttered by one of the teachers at the launch of the expansion of the SLL on the 18th April, 2013:

> *"Gone are the days when we have to go all the way to the government offices to submit documents when we can just send them electronically."*

Teachers from the schools that host the computer labs indicated that they have to go to the second nearest town (iDutywa) whenever they have to submit reports to the Department of Education, something that can be done within a few minutes through the use of ICT.

Also, it was established that some community members would like to use computers and the Internet to search for jobs. Therefore, a career portal was designed to simplify the process of writing a Curriculum Vitae and searching for jobs for community members who find it difficult to look for jobs, due to the limitations of information dissemination to rural communities.

> *"The career portal is designed to work in such a way that users can, using the automated application, write their profile and collate it into a CV. This same portal can also link the users with vacancies which are relevant to them, based on their profiles."*

While these applications and solutions have not yet been deployed in these communities, they have a huge potential in relation to improving the communication and integration of rural communities with the rest of the society. For instance, as it was mentioned in the section above, the e-commerce application can be integrated into the NIDI project which has already been established in the community, in order to possibly increase their sales by making them visible in the Internet space. This application, which has been designed to meet the specific needs of the specific rural communities, would allow users to advertise and sell their products online. This also provides an opportunity for banking businesses to collaborate with these

rural communities as potential markets. Other services which can be enabled by these applications include buying prepaid electricity online.

These all mean that community members who have been taught how to use computers will not only have the skills, but will also be afforded the opportunity to utilise their skills and the ICTs for their benefit. In the next section, the discussion will be on how the improved social capital in the forms of networks and information channels, can lead to innovative, participatory development. Some of the discussions in the previous chapter and sections have already indicated how development can be realised through networks and information channels, but the next section will highlight that more specifically.

8.4 Social capital in the forms of networks and information channels in participatory, innovative development

8.4.1 Social capital in a form of networks and participatory development

From the theories of Coleman (1988; 1994) discussed in chapter four, it is reflected that people can use their networks to their benefit in education, job opportunities, businesses, etc. Putnam (1993; 1995) shows the benefits of social capital in civic participation and in the day-to-day living of the people. Bourdieu (1986), in the same manner, showed the significance of networks in providing benefits to those who are part of them. People in communities have often used social safety nets, such as social groups, local organisations and social security programmes, to insure themselves against poverty and disasters. This research has explored the contribution of networks to the functioning of communities. This whole section provides a broader perspective on how social capital can contribute to development. In this sub-section more attention will be given to the effects of networks on socio-economic improvement and civic participation, looking at the three types of networks identified in the given communities: local organisations, associations with social institutions and community development projects. In the next sub-section the discussion will focus on how social capital in the form of information channels can contribute to innovative development in the areas of socio-economic, governance and education.

8.4.1.1 Networks and socio-economic improvement

From the findings discussed above it is shown that people use local organisations such as saving groups *(stokvels)* and burial societies to, among other things, create coping mechanisms and income generation, as it was reflected that majority of the people in these

communities are unemployed. Networks thus play an important role in the survival strategies and economic activities in these areas. From contributing and circulating funds in the saving groups *(stokvels)*, individuals who belong to these networks have shown that they have been able to buy important household items which they could have otherwise not afforded.

> *"I use the money to buy things in the house…most of the blankets in my house I bought them with the stokvel money…sometimes we contribute money which we put aside to buy groceries at the end of the year."*
>
> *"I use it for many things…I bought big pots for my family…"*
>
> *"The money helps us a lot, I am able to pay school fees for my two children who are in high school…the money from the piece jobs is not enough so stokvel (saving club) gives me a lump-sum, then I pay school fees, and I pay it back bit by bit."*

The research also revealed that even though some of these people or many of them are not working, they make use of these networks to capitalise on the little they get from other means such as government grants and piece jobs. In responding to the question of how they get money which they contribute to the saving club *(stokvel)*, some respondents gave the following responses:

> *"I get money from the government grant…"*
>
> *"My husband does piece jobs… I also do piece jobs sometimes…"*

It was reflected in the literature in chapter five that formal security services provided by the government also form social safety nets for those who qualify for them. It was, however, indicated that this is not so much a developmental strategy as it does not incorporate any self-help mechanisms, and it is kept to the possible minimum due to economic implications that it has for the country. So people use informal local networks to increase or make the most of their income. While there has been a controversy in the misuse of grants by some beneficiaries, it seems that other beneficiaries are, in fact, making a considerable use of it.

Members of the NIDI also confirmed that, even though it is very difficult to sell their products because of the scarcity of tourists who visit the accommodation centre, whenever they are able to sell it makes a difference. Some of the researchers from Rhodes and Fort Hare universities also support these crafters through buying their products. The excerpts

below were some of the responses given by the members to the question on who buys their products.

"Some students from Rhodes and Fort Hare come to buy sometimes."

"Sometimes people (tourists) do come and buy from us."

"Yes, sometimes we do sell, especially when there are functions in the community."

"The money makes a lot of difference even if it is not much because it is not often that we manage to sell."

All these contribute to economic activities in the community and assist families in collectively responding to poverty. Small efforts done in cooperation can go a long way in responding to wide-ranging difficulties that are shared by individuals in communities.

8.4.1.2 Networks and civic participation

Putnam (1993) in his study in the regions of Italy showed that there is a direct link between social capital and civic participation. From the findings, there is evidence that people in these communities do have an understanding of civic participation and what it means to be an active citizen, as it will be reflected from some of the responses they gave on why they vote during elections. This was also reflected in the previous chapter in section 7.2. Table 8.4 below depicts the number of respondents who claim that they vote and those who do not and, as shown, there is a significant number of those who claim that they are voters (86%).

Table 8.4 Voting during elections by respondents

Response	Number of respondents	Percentage
Yes	69	86.3
No	7	8.8
Invalid	4	5.0
Total	**80**	**100**

In chapter seven above it is reflected that people showed that they are associated with certain political parties because they want better lives and developments. It is clear that people associate certain political parties with development and better life. This can, therefore, suggest that associations with certain political institutions can motivate civic participation.

Looking at the figures, however, there are many people who claim that they are voters (86%) and yet they are not affiliated by membership with any political party. This is based on the fact that those who showed that they are associated with political parties amount to only 28% of the total respondents, as shown in chapter seven. This provides evidence that people generally do participate on the basis of their own choice, not necessarily because they are associated with political parties. The statements below were some of the common responses provided to the question of why people vote, which essentially reflects that some individuals are not necessarily influenced by association by membership to any political party, but rather by their own understanding of civic participation.

"My vote is my voice."

"Voting is my right."

"I want to vote for the party that promises us a better life."

"It is my right for a better living."

Perhaps the best way to analyse this is that active participation in political associations could contribute to even more activeness in civic matters, as also shown by Putnam (1993) and other studies on social capital and civic participation. However, it is not the only motivation for people's participation in this particular case.

Civic participation was also established by identifying the methods of communication between community leaders and community members, as well as the nature of information communicated between these two parties. Members of the community indicated that community leaders do involve them in decision-making processes. Community members showed that whenever there are matters related to development in the community, they are summoned for community gatherings and such matters are discussed with them and their contribution is incorporated in decision-making. They also showed that this process is not influenced by association or membership in any political party. In responding to the question on whether or not people are ever involved by community leaders in community development matters, the following were some of the responses.

"Yes the councillors do call community gatherings when there are matters to be discussed…and most of the times they take our opinions when making decisions."

"…an example is when people were going to be involved in the fixing of the roads, we were called for community gathering and it was explained to us and people registered to work on the roads…we as community members agreed on those who should benefit first."

"…when there are disagreements on the matters we vote, then we go with the majority."

This, however, does not give evidence that networks, in this case being associations with political parties, do influence civic participation. It simply means that community members do participate in civic matters, but not on the bases of their associational life.

8.4.2 Social capital in a form of information channels and innovative development

The discussions in section 8.3 have shown that the SLL has so far laid a solid foundation through collaboration of sectors together with rural communities, from which suitable applications have been developed and will improve information channels for the benefit of these communities in the long run. In this section, the discussion will be on how the improved information channels can lead to innovative development for these communities. The discussion will focus on socio-economic, governance and educational improvement.

8.4.2.1 Information channels and socio-economic development

From the focus group discussion held with the group of people who are part of the NIDI, it was shown that while the initiative has given them a space through which they can collectively produce and sell their products, getting buyers is still the biggest challenge. The conversations noted in the previous chapter with one of the workers at the Nqabara Lodge, associated to the NIDI project, showed that tourists come to the centre only once in a while. This was echoed in the group discussion by one of the tailors and crafters:

"…sathunga…sathunga, kodwa akukho mntu ozayo azozithenga ezi mpahla, abantu abafane beze apha." (…we sew…we sew, but no one comes to buy, people rarely come here.)

This is a reflection of what has been discussed in chapter two, that economic activities in rural communities are limited by their lack of exposure to the outside markets. The major object of ICT for economic opportunities in this case is exposing rural communities to the outside markets, to help cultivate rural enterprises. Information channels such as e-commerce or even

a web-site for this specific project could essentially create a platform for them to be recognised beyond their territories. The e-commerce platform, once deployed, can help community members to advertise their products, sell and buy other products online while they are in their own communities. Increasing their exposure and ultimately their sales is what can lead to a significant contribution of this project to their economic improvement. In addition, enabling communities to be integrated with their external partners would essentially give them an opportunity to participate in their own development as equal partners.

Furthermore, helping the industry partners to realise that rural communities are their potential markets means that eventually rural communities would have access to improved services in their own communities, services that they need on a daily basis but some of which they cannot access locally, such as advertising their products, buying electricity, banking, etc.

Moreover, there are stark opportunities that come with being able to connect with those outside one's community. It means that one can have access to useful information outside one's geographical area, information that can be utilised for one's benefit. People often hear about civic matters, job opportunities, career opportunities and a lot of other useful information from those outside their communities. Hence, the use of the Internet can have unlimited opportunities for the communities in the Dwesa region to empower themselves.

However, the same benefits of social capital have been criticised by other writers as imposing disadvantageous outcomes. Navaro (2002) argues that social capital can bring about competitiveness and division in communities, by producing what he refers to as 'social capitalists'. He argues that an individual's ability to compete for resources and rewards is enhanced by the networks of which he or she is a part, and the information channels he or she is exposed to. Thus the improvement of information channels in rural communities would subsequently be reduced to accumulating more capital so that the individual can compete better. Nevertheless, there are more benefits that are associated with the engagement of ICT in rural communities than there are disadvantages.

8.4.2.2 Information channels and civic participation and better government' service delivery

The accountability of the government and service delivery can be much more effective through effective collaboration with the government and the use of ICT applications. In the previous discussions in section 8.3, it was shown that one of the ICT applications is aimed at

enabling local community members to apply for basic documents such as birth certificates, identity documents and travel documents without having to go all the way to the Department of Home Affairs or related departments. Moreover, the government already makes available electronically reports on their progress and service delivery and, through ICTs, rural, marginalised communities can also access such information. These rural communities can also participate in a forum that would be enabled by ICT innovations, and engage in conversations about policy making, service delivery, the use of public resources, etc. thus improving government's accountability.

This can further help with monitoring of public resources by providing evidence-based delivery of services. An example is an application which allows users to communicate their problems concerning water, electricity and other basic needs using ICT, such as the Internet and mobile phones (MobiSAM, 2013). This application helps to record users' complaints to the municipalities, how they were addressed and after how long. Such information may then be used at a later stage to monitor and evaluate government's service delivery.

8.4.2.3 Information channels and the improvement of education

Education and knowledge have become less difficult to facilitate and acquire in the information era as a result of ICT engagement in teaching and learning. While distance learning is not a new phenomenon as people across societies for ages have been learning through distance learning programmes, ICT-aided learning platforms such as e-learning makes interactions more instant and convenient. Additionally, e-learning gives learners an opportunity to acquire information widely and faster. This platform is not only limited to students but anyone can essentially use e-learning platforms for their own knowledge gain.

The educational crisis in South Africa, particularly in the Eastern Cape, has necessitated the implementation of alternative ways in which pupils' learning may not be affected by limitations such as lack of teachers and learning materials. In many cases, evidence shows, as reflected in chapter five in section 5.2, that these challenges are not due to financial inadequacy but maladministration and other politically influenced factors. In response to this, the e-learning application has been developed by researchers in the SLL in collaboration with community members who are also stakeholders.

"The e-learning platform will provide access to different types of learning materials, such as notes, presentations, soft copies of books etc…and will also enable instant interaction between teachers and students as well as between students themselves."

This will ensure that learners are able, given minimum guidance, to initiate their own learning and improve their skills of information searching and knowledge creation. Their learning process will no longer be limited to the classrooms, which becomes ineffective when teachers and learning materials are inadequate for a variety of reasons.

Through the SLL, the teachers in the rural communities in the Dwesa region have been integrated into an Advanced Certificate in Education (ACE) programme specialising in ICT, facilitated by Rhodes University. So far about twenty teachers have been exposed to ICT more comprehensively through this programme. One of these teachers in an interview claimed that:

"They are now able to practically transfer their knowledge to their learners more effectively."

One of the issues which were highlighted in chapters two and five was that there is a need to make education more relevant for the increasingly digital work place. This programme is a typical example of the strategies that are meant to ensure that the educational system is adjusted to suit the information society. At the launch of the SLL expansion, the Senior Educational Officer highlighted that the Department of Education is working on officially including ICT in the educational curriculum.

"The aim of the government is to produce 'digital-wise' generations for the information society... we as the department are working on, and are now very close to including ICT in the educational curriculum."

The SLL is already ahead in ensuring that this vision of the government becomes a reality, by providing the Internet and computers to the schools in the rural communities. The inclusion of ICT in the curriculum is crucial as it has been established that the students in the schools that host computer labs are currently not benefiting from this initiative. One of the teachers in the schools declared this in saying that:

"We used to include computer literacy in our time-table, but since last year the Department of Education ordered that we should not include computer literacy in our time-table because it is not included in the curriculum, so at the moment the students are unable to use computers."

This, therefore, means that the next step should certainly be to include computer literacy in the curriculum to ensure that the students also benefit from this initiative. This continues to show that effective collaboration between these four sectors in the Living Lab is a critical matter. The government is responsible for making policies that create an environment for the implementation of ICT for development initiatives. Therefore, when there is a sense of collaboration between the sector responsible for policy making (government), the sector responsible for research and the creation of knowledge (academia), the sector with the interest in making profits and ensuring growth (the private sector) and rural, marginalised communities, then much more can be achieved.

8.5 Conclusion

This chapter has explored the influence and potential of the Living Lab model on social capital in the forms of networks and information channels, both within the communities and between the communities and other sectors. The discussions showed that networks between community members can and have so far been created through the common spaces provided by the computer labs, which have been set up in the schools through the SLL. Through these labs, rural community members are able to come together into a common space, in which they not only learn how to use computers but they also get to interact with one another and share useful information.

Furthermore, people can be associated with even a broader community of online networks, which they can access and join using the Internet and computers in the labs. While some people were already aware of online networks, others only got to know about them and be part of them as they used computer labs. These online networks help community members to interact with each other but also with those outside their communities, as well as reconnecting with old friends and family members.

On networks between these communities and other sectors, the chapter has revealed that so far rural communities have mainly been integrated and formed relationships with their academia partners. Researchers from the two involved academic institutions – Fort Hare and

Rhodes universities – pay regular visits to these communities and maintain contact with them. This relationship goes further to influence the ICT products that result from this partnership.

However, it was established that the relationship between rural communities and their industry and government partners have not been directly and strongly established. The academic sector does have an established relationship with their industry and government partners, but rural communities are not actively involved in this link. Nevertheless, the findings have shown that there is a great potential to address this in the future. Through ICT applications, some of which have already been developed, rural communities can be integrated with other stakeholders and the outside world at large.

It was further demonstrated that rural communities do have a relationship with other external organisations or agencies such as RULIV through a community development project called NIDI, but this partnership is not in any way linked to the SLL. It was nonetheless revealed that there are opportunities that can be realised from engaging this project with the SLL. This may even further open opportunities for more partnerships through exposing rural communities and what they do to the outside world.

In terms of information channels, the chapter showed that the installation of computers and the Internet in these rural communities has enabled rural communities to engage in other methods of communication and information dissemination. Even though these communities still engage in traditional methods of communication as reflected in chapter seven, they now have access to alternative ways of acquiring information instantly. These ICTs will even enable rural communities to acquire information from outside their communities, and be able to communicate with those outside their communities.

Then, finally, the discussion focused on how the increased social capital in the form of networks and information channels can contribute to innovative, participatory development in these communities. In terms of the contribution of networks on participatory development, the chapter has discussed the link between the benefits associated with the networks and socio-economic improvement and civic participation. The chapter has shown that respective members of local organisations, associates of local institutions and community development projects, have indicated that they have experienced socio-economic improvement from being the members of their respective networks.

It was revealed that there is an element of civic participation by community members, indicated by taking part in activities like voting and involvement in community development matters. The findings showed that civic participation in this case is influenced largely by people's choices, based on their own understanding of what it means to be active citizens, but it is also influenced slightly by the associational life of community members.

In terms of the contribution that improved information channels can have on innovative development, the chapter explored the three areas: socio-economic, governance and education. Socio-economic benefits of information channels still go back to expanding the markets for rural communities by exposing their products to those outside their communities. On governance the benefits include enabling rural communities to have access to government information and other development matters, and enabling them to hold the government accountable. These ICTs can also enable rural community members to access services online.

In education the chapter revealed that the greatest benefit of ICT-aided learning is that it uses the forms which are not limited by either time or distance. Learners can access information using ICT at all times. Furthermore, learners can interact instantly with their peers and teachers anywhere, anytime. The chapter finally indicated that effective collaboration of sectors is crucial in ensuring that all these ICT solutions are implemented efficiently and effectively.

CHAPTER NINE

CONCLUSION

9.1 Overview of the research objectives

This research has explored the influence of the SLL on creating and cultivating social capital in the form of networks and information channels in selected rural communities. It further explored how the improved social capital can contribute to participatory, innovative rural development. The research explored the influence both to date and potentially in the future. It explored networks and information channels both within selected communities and between these communities and other sectors, namely the government, the private sector and academia. This chapter forms the presentation of the summary of findings of this research in responding to the following research objectives:

- to identify the kinds of networks in selected rural communities
- to establish the methods of communication within selected rural communities and between these communities and other sectors
- to establish how the Living Lab approach contribute to:

  - creating and strengthening networks

  - improving communication and information channels

- to establish how the improved networks and information channels contribute to participatory, innovative development

Section 9.2 summarises the findings on networks within selected rural communities. It also summarises the findings on information channels. It will focus on the means of communication and information dissemination in selected communities, as well as information channels between these communities and other sectors. Section 9.3 summarises the findings on the contribution and the potential of the SLL in creating and strengthening networks and information channels, both within selected communities and between these communities and other sectors. Then it will summarise the findings on how the improved social capital in the form of networks and information channels can contribute to socio-

economic development, governance and civic participation, as well as educational improvement.

9.2 Networks and information channels within selected rural communities and between these communities and other sectors

The research has established the existence of at least four types of networks: local organisations, social ties, social institutions and collective community development initiatives. It was also revealed that there are community members who do not belong to any of the networks. Being busy and lack of interest were the two common reasons established for why people choose not to participate in any of the networks. These members who do not belong to any of the networks revealed that finding jobs and other ways of making money are, in fact, their priority. These networks were established for different purposes in communities, depending on the nature of the networks. Some networks are mainly for social support, while others are mainly influenced by monetary purposes. This, therefore, determines who can be a member of one network and not the other. There are, however, those networks that are established for the objectives common to most of the community members, such as burial societies. These types of networks, therefore, have relatively more membership in comparison with others. It was reflected in chapter two that rural communities are mostly characterised by high rates of unemployment. The Dwesa region bears the same characteristic. As a result, burial societies have become the only option for most community members who cannot qualify for membership in formal insurance to insure themselves and their dependents against tragic circumstances.

Some community members feel that they are limited by their financial situations to take part in some networks such as saving groups *(stokvels)*. While other people consider it as a means of strategically cultivating income, others feel that one needs to have a certain level of financial freedom to be able to make such savings, and that level of freedom they do not have. Although there are those who do not see networks as viable means of acquiring benefits in any way, there is another section of the population who have confirmed that networks have proven to be beneficial to them. Socio-economic characteristics and personal goals play an important role in the existence of and effectiveness in local networks. It was also revealed that some networks, such as community development initiatives, do not yield as much of the expected outcomes due to the limitations highlighted in chapter seven. Networks also do

enhance the associational and social life of many individuals which, in turn, enhances their well-being and a sense of strong community.

In terms of information channels, the study has revealed that there has been a significant improvement in the use of ICT to communicate and disseminate information in the communities since the baseline study was conducted in 2009. More people now own and use mobile phones to communicate. Additionally, the deployment of a wireless network and computers in the schools in these communities has made it possible for rural communities to use computers and the Internet to communicate and acquire information. However, the study reveals that traditional methods of communication are still in place in these communities. People still hold community gatherings and they still hold regular meetings in their respective networks. This means that ICTs have not replaced these traditional methods of communication and information dissemination, but they have complemented them.

The study also revealed that these communities still depend on traditional methods of communication and information dissemination to communicate with other sectors. For instance, it was shown that community members still go physically to the government's offices whenever they need to apply for basic services. Also, community members depend mainly on meetings to communicate with their private organisation partners such as RULIV. This, the research showed, has the potential to change in the future due to ICT innovations which have been developed by the SLL stakeholders.

9.3 The Living Lab model and the creation and cultivation of social capital, and the contribution of social capital to rural development

The study established that networks within communities can be and have so far been influenced to some extent by the existence of the Living Lab. This is enabled by the availability of computer labs that bring community members into common spaces, from which they can discover social relationships. Furthermore, the use of computers and the Internet in the labs gives community members an opportunity to network on online social networks, thus connecting them with those outside their communities.

The research also established the contribution and potential of the SLL in strengthening networks between these communities and the outside world, thereby integrating them with their potential market. The study revealed that so far rural communities have not yet been significantly integrated with other sectors through the Living Lab except with academia. The

significant level of networking between sectors in the Living Lab is mainly between the three sectors: government, academia and the private sector. Communities are only more connected with their academic partners and not their industry and government partners. However, the study showed that there is a great potential for this situation to improve based on the innovative applications intended for the benefit of these communities, which can help integrate rural communities with other sectors. The important finding on this matter is that there is still a need for effective collaboration to be sought, as integration between sectors in the society is not just a simple question of technology but also one of felt needs and common goals.

In terms of communication and networking with the academic sector, the researchers pay regular visits to communities for consultation and research, and to assist community members with computer literacy training. While traditionally research has been done to the people, for the people and not with them, this is not the case with research within the Living Lab model. The fundamental principles of the Living Lab model are collaboration and user involvement. Researchers engage in consultations with communities during the processes of their research and ICT applications development. This is to ensure incorporation of user-requirements and specifications. Additionally, there is a committee within the communities that has been formed to oversee organisation of activities of the SLL from the communities' side. This committee communicates regularly with the SLLMU and the SLL researchers through mobile phones and meetings.

The study revealed that there is a need to strengthen collaboration between sectors as implementation and sustainability of all products and services within the Living Lab model is dependent on effective collaboration. If collaboration is effectively employed, and communication and accountability improved, there is a significant potential for this to contribute to social, economic, governance and educational improvement. Rural community members will be able to network and socialise easily with those outside their own communities through the use of ICTs. They will have greater economic opportunities due to expanded economic activities through ICT innovations. They will be able to hold the government accountable through enabling innovations. The means of facilitating teaching and learning processes will be enhanced by the engagement of ICT.

9.4 Recommendations

Based on the literature and the findings of this research, this section presents the recommendations for the improvement of the SLL initiative. While this research cannot answer all questions relating to strengthening the networks and information channels, both within the communities and between the communities and other sectors, there are some noteworthy points that can be taken from the findings.

It has been established that through the networks the benefits of social capital can flow easily. These benefits, as shown in the analytic chapters seven and eight, can take both monetary and non-monetary forms. There are already established networks within the Dwesa region, such as the NIDI, which enables the organisation of people from different communities in the region. While communities are generally the stakeholders in the Living Lab model, it would be helpful to also consider direct collaboration with these already organised groups of people – the networks. This could help to establish a more direct and specific context for the design and development of ICT applications that are aimed for the benefit of community members. For instance, if the e-commerce platform is deployed in the future, it can be directly linked to an organised network of people who can make use of it, rather than to individual people. Therefore, it is recommended that researchers seek to establish a more direct collaboration with such organisations, even if the individual members are not involved in computer literacy training or any such activities. As has been shown earlier, the benefits of ICT in rural communities are not limited to whether or not individuals use ICTs, but communities' members can also benefit from solutions that help advertise their products to potential markets outside their communities.

The research also established that even after all these years, a large number of the people still do not know about the SLL, some may have heard about it, but not much is known to them. It is recommended that more awareness campaigns be conducted to ensure that people in communities are aware that the use of computers is not for the individual few but for every willing person in the community.

Also, as it was reflected in chapter three, even within the Living Lab model there is a possibility to have asymmetrical relationships between stakeholders, particularly if other stakeholders are more inclined to interact, either physically or otherwise, with some more than others due to their respective roles. This research does show that rural communities do not interact directly with other stakeholders, except academia. It is, therefore, recommended

that representatives of community members be invited to progress evaluation meetings with other stakeholders (academia, government and industry) to enable accountability and effective collaboration with all sectors, including rural communities.

APPENDICES

Appendix 1: Survey questionnaire: Networks and information channels in the community, and how ICT can influence them, Dwesa region, 2012.

Instructions:

First explain that you are doing a research for a Rhodes student who would like to understand the influence of ICT on networks in the community, and communication between communities and other sectors, such as the government and private organizations. The participation of respondents in this research is voluntary. The information provided is confidential and respondents will remain anonymous (they should not provide their names).

Name of interviewer: _____

Questionnaire no: _____

Section A: Demographic characteristics

1. How old are you?
   - □ 1= 18- 24
   - □ 2= 25- 40
   - □ 3= 41- 59
   - □ 4= 60+
2. Sex
   - □ 1= Male □ 2= Female
3. Where do you live?
   - □ 1= Ngwane
   - □ 2= Lurwayizo
   - □ 3= Nondobo
   - □ 4= Nqabara
4. Occupation
   - □ 1= Employed
   - □ 2= Self-employed
   - □ 3= Unemployed
   - □ 4= Part-time employment
   - □ 5= Other (specify): _____

_____

Section B: Social networks and institutions in the community

5. Who do you live with in your household?

   □ 1= Immediate family members (spouse, mother, father, siblings, own children)

   □ 2= Extended family members (aunt, uncle, cousins, nephews, nieces, grandchildren)

   □ 3= Both immediate and extended family members

   □ 4= Alone

   □ 5= Other (specify): _____

   (If you live with your family, go to question 9)

6. If you do not live with your family, where does your family live?

   □ 1= In the same community

   □ 2= Somewhere else (not in the same community)

7. If you do not live with your family, how often do you meet them?

   □ 1= Almost everyday

   □ 2= Once a week

   □ 3= A few times in a month

   □ 4= Once a month

   □ 5= A few times in a year

   □ 6= Once a year

   □ 7= Never

8. If you do not live with your family, how do you communicate with them?

   □ 1= Phone

   □ 2= Internet (emails, facebook, twitter, mixt, skype, etc.)

   □ 3= Other (specify): _____

   □ 4= Never communicate with them

9. Are you a member of any of the following organizations / clubs in the community?

   □ 1=Income generation clubs e.g stokvels

   □ 2= Sports clubs

   □ 3= Social clubs e.g. cultural dance groups, singing groups, etc

   □ 4= Burial society

   □ 5= Other (specify):_____

   □ 6= Not a member of any organization/ club

10. If not, why are you not a member of any organization/ club?

_____

(If you answered question 10, go to question 18)

11. If you are a member of any organization/ club, what activities do you do in your organization/ club? _____

_____

12. How often do members have meetings in your organization/ club?

- □ 1= Almost everyday
- □ 2= Once a week
- □ 3= A few times in a month
- □ 4= Once a month
- □ 5= A few times in a year
- □ 6= Once a year
- □ 7= Never

13. Do you usually attend these meetings?

□ 1= Yes □ 2= No □ 3= Sometimes

14. If not, why do you not attend the meetings?

_____

15. How long do the meetings take every time?

- □ 1= Less than an hour
- □ 2= One to two hours
- □ 3= More than two hours

16. What do members talk about in the organization/ club?

_____

_____

17. Except for meetings, how else do members communicate in the organization/ club?

- □ 1= Phone
- □ 2= Internet (emails, facebook, twitter, mixt, skype, etc.)
- □ 3= Other (specify): _____
- □ 4= No other means

18. Do you belong to any of the following institutions:

    □ 1= Church

    □ 2= Political organization

    □ 3= Trade union

    □ 4= Other (specify): _____

    □ 5= Not a member of any institution

19. How active would you say you are in these institutions or local organisations?

    □ 1 = Very active

    □ 2= Somewhat active

    □ 3= Not so active

    □ 4= Do not belong to any institution

Section C: Collective activities/ community development projects

20. Have you at any point taken part in any of the following projects in the community:

    □ 1= Road constructions

    □ 2= SURUDEC funded projects (Trust)

    □ 3= Other (specify): _____

    □ 4= Never taken part in any project (***if you ticked 4, go to section D***)

21. How would you say you benefit(ed) from such projects?

    _____

    _____

22. How would you say the community benefit(ed) from such projects?

    _____

    _____

23. How do community members/ representatives in these projects communicate with projects funders/stakeholders?

    □ 1= Phone

    □ 2= Internet e.g. emails

    □ 3= Meetings

    □ 4= Other (specify): _____

    □ 5= Never communicate with them

24. How often do community members/ representatives in these projects communicate with the projects funders/stakeholders?

    □ 1 = Once a week

    □ 2 = A few times in a month

    □ 3 = Once a month

    □ 4 = A few times in a year

    □ 5 = Once a year

    □ 6= Never

25. Are there any problems that you ever encounter in communicating with the projects funders/stakeholders? □ 1= Yes □ 2= No

26. If so, what are such problems?

    _____

    _____

27. How best do you think such communication problems could be solved?

    _____

    _____

Section D: The influence of the living lab on networks in the community

28. Do you know about Siyakhula Living Lab?

    □ 1= Yes □ 2= No

29. How did you know about Siyakhula Living Lab?

    _____

30. Have you ever used computer labs at the schools?

    □ 1= Yes □ 2= No

31. If not, why have you never used the computer labs?

    _____

    _____

    (If you answered this question, go to question 38)

32. If you have used the computer labs, what do you use it for?

    _____

33. Are there any activities that you do collectively in the computer lab?

□ 1= Yes □2= No

34. Are there any new people that you met at the computer labs that you did not know before? □ 1= Yes □ 2= No

35. Do you ever meet with such people/ a person outside the computer labs?

□ 1= Yes 2= □No

36. Do you ever do activities together with such people/ a person?

□ 1= Yes 2= □No

37. Would you say such people/ a person is now:

□ 1= A friend

□ 2= Still a stranger

□ 3= An acquaintance

□ 4= Other(specify):

38. Are you on any of the internet social networks (e.g. facebook, twitter, etc)?

□ 1= Yes □2 =No (if your answer is no, got to question 51)

39. Did you join the internet social networks before or after you started using the computer labs?

□ 1= Before □ 2= After □ 3= Never use computer labs

40. Do you ever use the computers in the computer labs to communicate on internet social networks?

□ 1= Yes □ 2 = No □ 3= Never use computer labs

41. Who do you communicate with on internet social networks? (tick more than one if appropriate)

□ 1= Friends and Family

□ 2= Colleagues

□ 3= Other (specify):

□ 4= Not on internet social networks

42. How often do you use the computer lab?

□ 1= Almost everyday

□ 2= Few times in a week

□ 3= Few times in a month

□ 4= Once in a while

□ 5= Never

Section E: The methods of communication between sectors in the living lab

43. Have you ever attended any meeting about the Siyakhula Living Lab?

□ 1= Yes □ 2= No ***(if your answer is no, go to question 47)***

44. Who else was in the meeting?

□ 1= Other community members, government representatives, representatives from private organizations, and researchers from Rhodes and Fort Hare

□ 2= Other community members and researchers from Rhodes and Fort Hare

□ 3= Only community members

□ 4= Other people I did not know where they were from

□ 5= Other (please specify): _____

45. What do you remember which was discussed in that meeting?

_____

_____

46. How often have you attended such meetings?

□ 1= Only once

□ 2= A few times

□ 3= Regularly

47. Have you ever communicated with any of the researchers from RU and/or FH?

□ 1= Yes □ 2= No ***(if your answer is no, go to Section F)***

48. If so, what did you communicate with them about?

_____

_____

49. How did you communicate with them

□ 1= In person

□ 2= Using the mobile phone

□ 3= Internet (e.g. emails)

50. How many times have/ do you communicate with them?

□ 1= Once

□ 2= A few times

□ 3= Often

Section F: Communication of community members with government institutions

51. What services have you ever requested from the government?

- □ 1= Social grant
- □ 2= Passport/ ID
- □ 3= Scholarship
- □ 4= A job
- □ 5= other (Specify): _____

52. How did you apply for such a service(s)?

_____

_____

53. How long did it take for you to get assistance?

- □ 1= A week or so
- □ 2= A month or so
- □ 3= A few months
- □ 4= A year or more
- □ 5= Never got assistance

54. How many follow-ups did you do before you received such a service(s)?

- □ 1= Just once
- □ 2= A few times
- □ 3= So many times
- □ 4= Never followed-up

55. How did you do the follow-ups?

- □ 1= In person
- □ 2= Using the mobile phone (calling or sms)
- □ 3= Through emails
- □ 4= Other (specify): _____

56. In your opinion, how would you have preferred to do the follow-up?

- □ 1= In person
- □ 2= Using the mobile phone (calling or sms)
- □ 3= Using the internet
- □ 4= Other (specify): _____

57. If it was possible, would you use the computers in the computer labs to apply for services from the government?

□ 1= Absolutely

□ 2= Maybe

□ 3= Not really

□ 4= Not sure

58. If your answer is no, why not?

_____

Section G: Civic participation

59. Do you ever vote during elections (e.g. national, provincial, local government, etc.)?

□ 1= Yes □ 2= No

60. If you have never voted, what is your reason for not voting?

_____

_____

61. If you do vote, what is your reason for voting?

_____

_____

62. Are you a member of any political party? □ 1= Yes □ 2= No

63. If so, why are you a member of this political party?

_____

_____

64. Do community leaders involve community members when they make decisions about community matters?

□ 1= Yes □ 2= No

Explain your answer (give examples if you can): _____

_____

_____

65. Do you believe that community members should be involved in making decision about community matters? □ 1= Yes □ 2= No

Explain your answer:_____

_____

Thank you for your time and participation!

Appendix 2: Interview guide – focus group discussion (Nqabara Craft Centre)

1. Do you as crafters work from your homes or from the Centre?
2. If you work from the Centre, how often do you come?
3. How many hours do you work on a normal day?
4. How else do you communicate with other members about the work if there is a need?
5. Where do you get materials from that you use to make your products?
6. Do you sell the products individually or the products are communally owned?
7. Who do you sell your products to?
8. How do the buyers get to know about the Centre and the products?
9. Do the local people know about the Centre?
10. If so, do local community members buy these products?
11. Except for the working group here at the Centre, are there any other groups or other activities that people carry out collectively in the community?
12. If so, which are they?
13. How often do the people meet in such groups?
14. How do people communicate in such groups or collective activities?

15. Tell me about the Integrated Development Initiative (follow-up questions)

Appendix 3: Interview guide – researchers/software developers

1. What software applications have you developed so far?
2. How do they work?
3. Who are they developed for?
4. Who is incurring the costs of the development and operation of such applications?
5. How long will the funder/ donor incur such costs?
6. How do you decide which applications are relevant in that particular area?
7. How do you establish the communities' need of such applications?
8. Have you established the readiness of the target population for the usage of such applications? If so, how?
9. Did you involve the community in the development processes of such applications? If so, how?
10. If not, why not?
11. How is the sustainability of such applications in that area ensured?
12. Are there any applications in the pipeline? (Follow up with the same questions on procedure, readiness, community engagement, sustainability).
13. Do community members ever get to communicate with other partners?
14. If so, how do they communicate?
15. In your opinion, how do you think the level of communication between the communities and other sectors (including academia) can be strengthened?

Appendix 4: Interview guide for teachers (contact persons)

1. Who comes here to use the computer lab?
2. What do they use it for?
3. How often do the people come to use the computer lab?
4. How much freedom do the community members have to make use of the lab?
5. Do the students here use the computer lab?
6. If so, when do they use it?
7. If not, why not?
8. Do the teachers use the lab?
9. Does the school management make use of the computers in the administration and management of the school? Please clarify how.
10. How does the school management communicate with the DoE in relation to the administration of the school?
11. How often do you as the contact person communicate with the researchers from RU and FH?

Appendix 5: Interview guide – community members (also group discussion at Ngwane)

1. Tell me about the local organisations that you know of in your community
2. Are you a member of any of those local organisations?
3. What activities do people do in the local organisations that you know of?
4. What activities do you do in your organisation?
5. How often do you meet in your organisation?
6. What do you talk about in your organisation?
7. Except for meetings, how else do you communicate in your organisation?
8. What benefits would you say you have gained from your organisation?
9. How often do you come here to use computer labs?
10. What do you use it for?
11. How did you know about Siyakhula Living Lab?
12. Do you think computers could help you to improve your life?
13. If so, how?

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