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Towards the development of a grounded framework of context as tool for linking rural community development needs to ICT policy and implementation in the Dr J.S. Moroka Municipality, Mpumalanga, South Africa

by

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Submitted in fulfilment of the requirements for the degree

Philosophiae Doctor in Information Technology

Department of Informatics
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DECLARATION

I hereby declare that
this Thesis, submitted by me,

is my own work, that I have referenced all the sources that I have used and that no part was previously submitted at any tertiary institution.

M. J Mashinini

Date: _____

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ABSTRACT

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ICT policies instituted over a number of years by the South African Government have clearly failed to establish Information Communication for Development (ICT4D) initiatives amongst rural communities in South Africa. The author of this thesis argues that, for rural South African communities to reap the benefits of ICT4D initiatives, it would be necessary for the communities to empower themselves and to take ownership of initiatives to participate in the planned South African Information Society. Furthermore, the author argues that the success of the ICT4D initiatives depends very strongly on an understanding of the interaction of such initiatives with the social context at local community level. Some of the significant aspects of the social context at community level include an understanding of the roles of leadership, technology, economy, governance, social welfare, and stakeholders in these communities.

Through a grounded methodology approach a theory of context was developed for the rural community in the Dr J.S. Moroka Municipality in Mpumalanga, South Africa. The elements of the framework that emerged were Leadership, Stakeholders, Governance, Social welfare, Economics and Technology (LSGSET). The resulting framework is proposed as a tool that can be used by the community members to interact with the role players who intend to implement ICT4D projects or policies that have an impact on the community. It should also assist policymakers while they develop contextualized policies and improve project managers' understanding of the developmental impact of the implementation of ICT4D projects on communities. One of the contributions made by this thesis is to "bridge" this divide between policymakers and communities by explicitly framing the developmental discourses of the community as a framework for ICT4D engagement by policymakers and communities at local level.

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Keywords: *ICT4D initiatives, ICT policies, policymakers, rural communities, theory of context, South Africa*

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CHAPTER 1
INTRODUCTION

1.1 Background

This chapter sets the scene for the research reported on in this thesis. It firstly demonstrates the tension lines between global development imperatives and local development needs with foci on the need for community empowerment in terms of interaction with Government and developmental agencies, as well as issues related to the implementation of Information and Communications Technologies for Development (ICT4D) projects and policies. Secondly the research focus and the problem statement of the thesis are presented. Thirdly the chapter presents a summary of discourses around the notion of context in the literature that informed the research project. Fourthly the assumptions and the approach followed to create a substantive theory of context for the Dr. J.S. Moroka Municipality are briefly set out and explained. Lastly the chapter provides some brief background notes about the case study undertaken as well as about the study area (i.e. the Dr. J.S. Moroka Municipality).

1.2 The global tension associated with ICT4D initiatives

The ITU supports the achievement of the UN Millennium Development Goals by the promotion of Information Societies through which the establishment of Information Societies (ITU, 2006). Notions such as “globalisation” and “information society” are often used by role players in global development driven by technological innovation. The use of these concepts and their associated ideas are mostly fuelled by ideals such as improving the world order or the eradication of poverty (Avgerou, 2010). Nevertheless Barrett et al. (2001, p.26) caution that there are conflicting forces and interests at work (especially in the developing world) – on the one hand the global agenda that favours change and innovation and, on the other hand, local cultures and traditions that often are focused on stability. The top-down approach with its ‘one-size-fits-all’, MDG, approach restricts the opportunities to incorporate the peculiar requirements of emerging countries.

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Barrett et al. (2001) 26 (4):315–31. *26 (4):315–31.* argue that, within this tension field, there is a requirement for a more nuanced consideration of the development through technological innovation in various ways – not only in the sense that the concepts do not have universal meaning (a notion supported by Prakash and De (2007 p. 20(3): 262-281), but also in terms of understanding that developmental agendas would not necessarily have universal benefits. Given this, Avgerou (2010, p. 26) argues that every technological intervention at local level comes with various assumptions, both around the process of intervention and also regarding the contribution of the intervention to development at local level, that is, within the local context.

In developing countries, nevertheless, the globalised approach largely informs, and according to Barrett *et al.* (2001) has become the dominant context of ICT4D initiatives (Avgerou, 2001) of most of the role players. ICT4D initiatives, i.e. policy and projects, are thus mostly driven by role players at higher levels of society, e.g. central government, developmental agencies and civil society, whose appreciation of the possible powerful contribution of ICT to the development of society especially at local level is often problematic from a local perspective (Avgerou, 2003). As a result, especially in rural areas, this "top-down" (de-contextualized) approach to technology-related initiatives contributes to an increased risk of failure related to ICT4D initiatives (Avgerou, 2003), both in terms of policy implementation, and the execution of the ICT4D projects.

Literature confirms that a significant number of ICT for development (ICT4D) initiatives have failed for various reasons. One of the significant reasons highlighted is indeed the mismatch between these developmental initiatives and "local realities" (Heeks, 2010). The implication is that the outcomes of the initiatives do not necessarily constitute a high priority at the local community level.

> "*From the analysis of the current literature, it appears the main focus on the interventions has been the implementation of ICT4D projects rather than understanding the impact at the micro (community) level. This lack of understanding has led to many failures of ICT4D projects reported in the literature*" (Heeks, 2002:134).

This is supported by Checchi (2011), who argues that ignorance of the special contextual circumstances of the environment negatively influences the ICT projects

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undertaken within rural communities. The lack of understanding has led to the development and implementation of models that are ineffective in the implementation of ICT initiatives in rural communities. Furthermore, Hallberg (2010) indicates that social background influences the ways in which community members engage with projects in terms of employing their own abilities, knowledge, skills and language.

1.3 Importance of local social context

These findings are critical as it should be self-evident that policy and projects aimed at local community development can only be deemed successful if these match the priorities and needs at local community level. The author would therefore argue that for ICT4D policy and projects to be effective, role players need to engage with and understand the local social context in which ICT4D policy or projects will be embedded. Not only is the local social context important, but even more crucial is the perspective of the members of the local community (their own "*lived experience*") of their own context associated with an understanding of community priorities, as this would influence the community's understanding and participation in the local projects and policy implementation. The notion of context has indeed been extensively acknowledged as significant both in terms of technology practice and knowledge creation in socio-technical developmental literature, as well as literature in related research fields (e.g. Avgerou, 2001, 2010; Bamberger, 2008). It has also been acknowledged that the research of systems development practice often does not take context adequately into account (Avgerou, 2001). Instead, researchers often elect to operate on a basis of general and global best practices and assume that these would be universally applicable. An exception to this practice is described by Puri *et al.* (2004).

It should be emphasized that much of this discourse on context in scientific (and specifically Information Systems) literature is centred on knowledge creation, rather than everyday practice. However, Avgerou (2001) argues that at the level of practice, context is equally important. Nevertheless, these knowledge-focused discourses provide important indicators of issues and challenges related to the notion of context. Arguments presented within these discourses are relevant to this thesis and are therefore presented and discussed in further sections of this chapter. Avgerou (2001) views context as the single most important factor when participatory design is considered from a developing country perspective.

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Avgerou (2001) argues that for mainstream IS research the context is the organization, and that the two sides of this interaction is often studied in isolation in IS, rather than in conjunction. Extending this argument of Avgerou to community-based projects, the author would argue that the context in this instance should constitute (primarily) the local community. The author would argue that, similar to organizational interaction, the changes in society at community level cannot be isolated from the innovational disruptive potential inherent to ICT4D policy and initiatives. The community context, however, differs from the "normal" contextual factors in organizations. In organizations they relate to the interaction between technological change and organizational behaviour, and many studies have focused on them (Avgerou, 2001). In community context these factors are therefore less applicable. In this thesis the author argues that the localized developmental discourses amongst community role players constitute the most significant contextual influences that must be considered when technology-related interventions are designed.

1.4 The need for community empowerment

Ultimately the primary changes in the context of rural development are the human-related changes (e.g. social, cultural and socio-economic changes) that take place in communities. Thorough appreciation of the relationships between the proposed intervention and the existing structures is critical for IS innovators in the emerging communities (Avgerou, 2001; Heeks, 2002). For this reason it is essential that ways are found to empower members of the community to voice their developmental needs in interaction with other role players in ICT4D (e.g. government, developmental agencies and others). As previously mentioned, the issue is that, in the case of rural communities, ICT4D related initiatives are mostly driven from the 'outside' – either by government (policies and projects) or civil society and developmental agencies (projects). In the context of critical discourse analysis, Van Dijk (2008) argues that "text" and "context" are mutually constitutive. In the instance of top-down ICT4D interventions, however, it becomes obvious that the constitution is often a one-way (top-down) process through which the technological disruption impacts significantly on the constitution of the context, without adequate counter-constitution of the technological disruption by the local community context. This balance needs to be restored.

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Even though IT innovation and social context are argued to be closely "intertwined" (Avgerou, 2001) the author believes that the discourses are nevertheless not equal – the community developmental needs are the "leading discourse" and ICT4D innovation should follow, even though inevitably the presence of IT innovation in turn would impact on community developmental discourses. The author therefore believes that the human developmental needs within communities can only be appreciated through a thorough understanding of communal discourses around development needs, and that this understanding should feed into all technical and ICT4D policy and project initiatives undertaken in communities. The author would therefore argue that at the level of everyday practice the development needs and discourses around these needs should constitute the "main" context for ICT4D projects and policy, and by implication that conceptual level developmental discourses should constitute the context for ICT4D, or ISDC discourses. The argument that Avgerou (2010), puts forward about the need for diversity of research perspectives regarding technology-related interventions, would also apply to access to the opinions and views of community based role players around "everyday concerns" in local ICT4D initiatives.

1.5 Challenges related to context in ICT4D

In the intersection between the discourses on development, ICT4D, Information Systems in developing countries, and related disciplines, important challenges remain with regard to context. The first issue relates to the need for improved understanding of the nature of the notion of context. As recently as 2008 the notion of context was described as "amorphous" by Bamberger (2008). In similar vein Van Dijk (2008) states that the notion "context" still has no simple, clear definition. In the context of management theory Bamberger (2008) argues that there is a need to move from contextualization to context theory in order to move the contribution of context to knowledge and the understanding of mediation and causes at multiple levels. He goes as far as to claim that a better grasp of context holds the potential for revolutionizing management theory. Bamberger (2008) argues that the next logical development in discourses around context is a move towards a more formal approach to context, i.e. towards theories of context. *Theorization of context* means that context becomes systematically factored into categories within a structure which also shows the relationships of the particular variables (Van Dijk, 2008). Given the

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nature of ICT4D initiatives and the focus on communities, it would be almost inevitable that the identified structure and variables would have social, political and economic dimensions.

1.6 Focus of this thesis and research problem

The arguments in previous sections indicate that the effect of the implementation of the ICT4D interventions on the structure of the community must be anticipated and that it must form the basis on which policies and strategies are formulated. This impact can only be assessed through a balanced view of the technological innovation and the local community context. This thesis adds to this debate by developing a theory of context for the rural South African community of Dr. J.S. Moroka, in Mpumalanga. The author believes that making the community context visible in a systematic manner would assist in allowing for better mutual relationship between community human needs and technology disruptions. Carden (2005) argues that collaboration is of significant importance. The framework developed in further chapters of this thesis has the potential to serve as a collaborative tool for communicative action that would enable community members and other role players in ICT policy and projects at community level to better understand the community developmental needs from a community perspective and to assess the impact of these interventions in terms of community priorities.

Ultimately, as has been previously argued, the long-term impact of ICT4D policy and initiatives are primarily expected to be at community level, and the community view is therefore of primary importance. In order to limit its scope this thesis is therefore limited to the community view. The perspective of the author is therefore "situated" rather than "universalistic" in terms of Avgerou's (2010) distinction. It should be noted that this is not an argument for considering the community context as the sole context that is relevant to ICT4D projects and policy – thus stepping into the pitfalls of single level analysis highlighted by Hitt *et al.* (2007). It is rather an argument for expanding understanding of context to include context at community level with the other contexts (national, global, etc.) that would typically already be informing ICT4D initiatives. The proposed grounded approach that was adopted for creating the theory of context for the Dr. J.S. Moroka Municipality (see discussion of this approach later on in the chapter) is not in principle

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limited to a particular level of analysis (e.g. community) and theoretically it would be possible, as part of future research, to expand the theory to other levels of society.
The intended contribution of this thesis is therefore primarily at community level in that it proposes a way to establish a substantive contextual theory as a framework that represents the community developmental perspective.

At a conceptual level the thesis engages with the discourse on context in ICT4D by experimenting with the notion of a formal theory of context and through documenting the effort of developing this theory within the rural community of Dr. J.S. Moroka. Its point of departure is the assumption of social embeddedness and development from a progressive transformation perspective.

Social embeddedness emphasizes socio-economic advancement based on local empowerment programmes. The primary argument and thrust are that local communities constitute the essential elements in the promotion and participation in local empowerment programmes and that the involvement of communities can create situations that are receptive to any transformation programmes. Social embeddedness revolves around ways and means whereby the capacity of ICT can be used to contribute to changing the life conditions of the communities. This can only be accomplished by engaging the local people and by getting to know their community priorities and needs (Braa *et al.*, 2004; Puri, 2007; Sahay and Walsham, 2005). These authors further concede that achieving the full developmental potential could be hindered by the local social structures and social practices as well as centralised government administration structures and bureaucracy. It is believed that relevant ICT policies and required level of professional practices can address these developmental hindrances.

The research project is qualitative and community-specific and the author therefore would make no claims regarding the generality of the findings of the actual case study. However, as the rural community selected is typical of many others in the country, the patterns that become visible through the creation of a context framework for this community may well be informative to other communities seeking to make their contexts visible for similar reasons.

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1.7 Research question

Given the arguments presented in the previous sections, the thesis thus was guided by the following questions, posed from the viewpoint of the inhabitants of Dr. J.S. Moroka. The main questions are:

From a community perspective, what entities constitute the community context and what are the perceived relationships between the entities constituting the context?

Secondly, how can such a formalized substantive theory of context assist community members in more appropriate interactions with government and other agents who implement ICT4D policies and projects?

In order to achieve the outcomes of the project the following specific objectives were set and are reported on in this thesis:

- To determine the constructs that are the main entities that constitute the community context for Dr J.S. Moroka Municipality from the community perspective;
- To hypothesise the interactions amongst these entities;
- To develop a framework comprising the abovementioned constructs and hypothesised linkages between the constructs to serve as a formal explanation of community context from the perspective of the community;
- To propose how the developed framework and its contribution towards an understanding of context can assist in the interaction between the community and government and other agents who implement ICT policies and projects, to have more appropriate interactions with community members.

1.8 The notion of context in various discourses related to Information Systems and ICT4D

1.8.1 Context, contextuality and context theory

Introductory remarks

Context is core to this thesis. The notion of the importance of context has dawned in numerous and diverse disciplines in the recent past. For the purpose of this thesis, the

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main contextual discourses that informed the research relate to those in management literature in general given the "managerial" nature of much of Information Systems literature, Information Systems literature, ICT4D and developmental literature as well as literature on the specific geographical context. i.e. South Africa as a developing country. The notions in literature around *context* that pertain to this thesis are briefly discussed in the following sub-sections.

Context in management literature in general

The original meaning of the term "context" can be related to the Latin word for "making connections", which implies that the essence of the importance of context relates to the understanding of the "bigger picture" (Rousseau and Fried, 2001). The understanding of the importance of context has been present in management and organizational literature for many decades, and context in knowledge creation has been incorporated increasingly extensively with time in management knowledge and theorization. Thus the contextualist view has become a strong discourse vs. traditional "a-contextualised" management research (Bamberger, 2008). Indeed, management theory is not alone in this - a similar trend is observable in many "major" disciplines, e.g., literature, linguistics, sociology, ethnography and anthropology (Van Dijk, 2008). The argument that Bamberger (2008) advances for contextualised theory is that these theories are better suited to deal with complexity and that these are also more relevant to the role-players involved. He demonstrates that the discourse has progressed from post-hoc descriptions of context for the sake of pleasing editors, to the realisation that theories that incorporate context have the advantage of being able to incorporate multilevel influences and to understand the mediating and causal impacts of various factors on the phenomena being researched. He points out that advantages relate to the consistency of the approaches to contextualisation, and the ability to better link phenomena at different levels of analysis.

Nevertheless the challenges remain that the awareness of the importance of context needs to translate more extensively into context theory, and that a wider array of ways of conceptualisation of context and of context theories needs to become available in management research. Interestingly, even though it is recognized that qualitative research with its focus on context and in-depth understanding should be able to contribute

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significantly to context theory, researchers have been slow to adopt it, even though the implication is that such a line of enquiry would be beneficial for the development of substantive or localized theories, given the effort that it would require to gather the information needed for general contextualised theory.

Whereas Bamberger's arguments (2008) are mostly aimed at researchers and knowledge creators, the argument could be extended to the level of everyday knowledge. Rosemann *et al.* (2007) highlight the importance of context for everyday business management processes, as it constitutes the root cause for any need for changes to be made in business processes and also serves the purpose of understanding cause and effect between need and need satisfaction. They argue that contextual understanding improves the capability of organizations to act proactively. As a result they argue for an explicit meta-model of contextualisation applied to their field of expertise, i.e. business process modelling.

The implication for the discourses in management science for ICT4D would be that although the role players would mainly be practitioners, rather than knowledge creators, a similar argument could be advanced that the policy makers development agencies and other role players whose actions extend across levels of society should not only be aware of context, but should be able to understand and take into account mediation and causality, for example, when assessing the potential impact of policy or projects within a specific context. In this way a structured understanding of context would have significant benefits as a "sensitising device" (Cappelli and Shearer, 1991) which alerts agencies to potential impacts and effects of policies and projects. In addition such a structured understanding would allow for a more consistent approach across projects and policies (Bamberger, 2008).

1.8.2 Context in IS Research (both in organizations and in developing countries)

Avgerou (2001, 2010) has been one of the leading voices on contextuality in IS research as well as for IS in Developing Countries (ISDC), and therefore this section mainly reports significant arguments that she made in this regard. Avgerou (2001) argues that, in a sense, all Information Systems literature (and by implication all ISDC literature) is contextual because it does not happen under laboratory conditions. However, the extent

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and manner in which contextuality is treated varies significantly and therefore does not constitute a consistent and systematic approach.

She cites the boundaries of contextuality as one of the significant topics of discourse within IS research. She indicates that these boundaries often are assumed to coincide with the boundaries of the organization, although some more interesting studies recognise the strategic importance of technology and expand the boundaries to beyond the boundaries of the organization at strategic level through the use of "contingency analysis". The way in which this analysis is undertaken is unfortunately typically not explicitly stated.

Avgerou (2001) argues the need for two axes in contextualist approaches: the need for "vertical" analysis to understand the interdependencies at different levels, and the need for understanding the history of the setting. This links to the argument by Bamberger (2008) that improved approaches would provide the ability to link phenomena more effectively at different levels of analysis. These levels of analysis have also been conceptualised as "concentric circles of effect" (Van Dijk, 2008) and it is therefore recognized that the size and scope of theories of context could vary.

1.8.3 Context in ICT4D

Avgerou (2008) stresses the importance of context at national level for developing countries and that any IS innovation can be considered to be either adopted for or "embedded in" in this context. She also argues that contextual analysis offers potential for new knowledge creation (theory building) in ISDC. Avgerou (2001) argues that context should be as wide as possible – encompassing views at various levels (national/international), should include aspects related to human nature (human psychology and culture) and should be able to account for change in relation to the technological innovations introduced.

1.8.4 Discourses on ICT4D

According to Avgerou (2002) there are various discourses on ICT4D. There are three main discourses that are particularly relevant to this thesis.

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The first discourse views ICT and development as socio-economic advancement based on the dissemination of ICT and the establishment of the requisite institutions. The discourse asserts that developing countries should copy the technologies, related practices and institutions from developed countries as a prerequisite to realising improved conditions (for example, in the health sector, education and agriculture) in their own countries. In most developing countries their readiness to adopt such a vision of institutional conditions may be in doubt and therefore, in addition to adoption, adaptation could be needed (Bada, 2002; Straub *et al.*, 2001).

The second discourse views ICT (from a social embeddedness perspective) and development (from a progressive transformation perspective) as socio-economic improvements achieved through locally situated action. Social embeddedness emphasizes socio-economic advancement based on local empowerment programmes. The primary argument is that local communities constitute the essential active elements by promoting and participating in local empowerment programmes and that the involvement of communities can create situations that are receptive to the transformation programmes. Social embeddedness revolves around ways and means whereby the capacity of ICT can be used to contribute to changing the life conditions of the communities. This can only be achieved by engaging the local people and by getting to know their community's priorities and needs (Braa *et al.*, 2004; Puri, 2007; Sahay and Walsham, 2005). They further concede that the achievement of the full developmental potential could be hindered by the local social structures and social practices as well as by centralised government's administration structures and bureaucracy. It is believed that relevant ICT policies and required level of professional practices can address these developmental hindrances (Braa *et al.*, 2004; Puri, 2007; Sahay and Walsham, 2005).

The third discourse is based on the argument that the dissemination of ICT does not necessarily lead to equitable development. It is argued that, besides the improvements attributable to ICT dissemination, there is unevenness that can be associated with the disruptive nature of any transformation programme on the related organizational structures. The discourse is primarily concerned with partiality of authorities and the social disparities specific to the socio-economic conditions within communities. The arguments for this discourse acknowledge that ICT can be a driver for change in the socio-economic order even though it can marginalize the affected communities, since it brings risks of increasing

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social disparities as well as strengthening the control of the authorities (Ciborra, 2005; Wade, 2004).

1.8.5 Social Context in respect of rural areas in the Republic of South Africa

Djukanovic and Mach (1975) state that, generally, rural communities are characterised by: lack of economic advancement; under-developed farming sectors; shortages of job opportunities; poor quality of life resulting from the scarcity of vital goods, amenities and finances; seclusion due to their location on remote rural land and poor communications facilities in existence. In the face of inadequate healthcare facilities and unhygienic conditions, this seclusion can lead to situations that are favourable for contagious diseases to spread and dietary deficiencies to increase.

The assertion by Djukanovic and Mach (1975) is corroborated by the fact that the rural areas of the Republic of South Africa face challenges such as inadequate access to infrastructure and services. Most rural areas lack basic infrastructure such as sewerage services, communication, road systems, water systems and access to clean water. Inhabitants in rural areas still fetch water, often from the nearest rivers or streams. The water is used for various purposes including drinking. These sources of water often run dry during winter seasons (Development Bank of South Africa, 2004). The provision of electricity is often non-existent - communities still use wood fires for cooking and heating.

The author argues that, against this background, any initiative, including ICT initiatives, has to take into consideration the priorities of the rural community which the initiative is meant to benefit before implementation and commissioning. Any ICT initiative, by government and other agents, should involve participation of members of the local rural community from the onset in order for the people to understand and interpret how the initiatives could be used to address the priorities and the specific issues of that rural community. The local people from a rural community are the ones who should be empowered to articulate their main concerns and challenges in order that these can inform the ICT initiatives. On the one hand their involvement from the inception of any ICT initiative will establish champions who will be able to relate how the associated benefits will be used to address the community's main concerns and challenges, thereby garnering local community support for the initiatives. On the other hand, their participation will offer the government and related agents the opportunity to understand and analyse existing

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capability gaps and to identify the appropriate measures in respect of empowering the community to enable them to contribute meaningfully as well as to ensure a successful delivery of ICT initiatives (Dilley, 2000a; Dilley, 2000b). Furthermore, the contextual framework that has been developed in this thesis provides a formal tool that can conceptually bridge the divide between ICT4D and socio-economic developmental discourses. It can thus assist all parties involved to link community needs to ICT initiatives through better understanding of the community issues and the way in which these interact to constitute the community context.

1.8.6 Suggested principles and methods for developing a substantive theory of contextuality as part of this thesis

The need for consistency

For community development ("everyday") contextualisation to be effective it needs to adopt certain characteristics from "formal" research methods in the development of frameworks, i.e. it needs to borrow from contextualist research at the knowledge creation level. The author would specifically argue that, for contextualisation to be consistent, there must be a certain level of conceptual thinking involved in the identification of entities, their characteristics and the links between these contextual constructs (entities) which constitute the substantive theory of context. Pettigrew (1985) takes as his point of departure the "professional enquiry" processes reported on by Schon (1983) as representing the way in which professionals such as engineers, managers, planners and therapists engage with the context of their object of enquiry. A similar argument could now be made that practitioners involved in ICT4D, whether developmental agents, policy makers, or others, should take their cue from the way in which the discourse around context has developed in the research community at the level of knowledge construction, and apply the same principles and methods at the everyday level in order to allow structured interaction with context by those involved in ICT4D policy and projects.

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The importance of representing the community view

It has already been argued that communities are at the core of community ICT4D initiatives and that communities should be the direct beneficiaries of such initiatives. The author therefore views the community's perspective of its own context as of prime importance for informing the ultimate contextual understanding of projects and policies that directly affect them. Preferably, this view should be systematized to allow a holistic evaluation of the community and its developmental needs and the impact on the community by ICT4D initiatives.

This does not mean that these are the only views and contexts that affect the thinking of developers and policy makers at various levels and/or stages of the analysis. Rather, the author would like to position this thesis within the thought stream described by Avgerou (2008) which considers local context to be significant, and considers the understanding of the meaning and the significance attached locally to ICT4D related phenomena, as significant. The "third stream" that Avgerou (2008) describes is also recognized, i.e. the importance of creating potential for the improvement of local socio-economic conditions given the global socio-economic situation. It has been expressly argued that the technologies employed are linked to development as both could be considered to be socially constructed notions (Prakash and De, 2007). The approach presented in this thesis constitutes a linkage of the developmental and technological discourses. However, the author would argue that from a human-centric perspective the developmental discourse should take precedence, in the sense that the developmental discourse (the one arguing for ISDC as embedded in local meaning) should constitute the context for the other discourse (understanding how ICT4D policy and projects can provide potential for improved socio-economic conditions at local level). The perceptions and preferences of the local community should already, *ab initio*, be inscribed into the policy or project specifications, and that inscription should not be the result of a top-down process, but of a well-founded bottom-up assessment of the initiative. The author would therefore state, in terms of the transformative discourse, that for ICT4D initiatives to be truly transformative, these should demonstrate understanding of the main themes embedded in the local developmental discourses and how these interact and influence one another, in order to understand how the imposition of ICT-related discourses will impact on local socio-economic conditions.

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Furthermore, the approach taken in this study allows for a systematic inductive way of deciding which factors to include and which factors to exclude – a concern raised by Bamberger (2008).

1.9 The importance of relevance (to the lived community experience)

Van Dijk (2008) stresses the importance of the construction of a context that is relevant. His notion of relevance implies that the context would not only be descriptive, but also explanatory – thus providing insight into "conditions and consequences" of an event relative to its situation. He lists the following tenets of a theory of context in order for such a framework to be relevant:

(1) It should reflect the subjective lived experience of participants;
(2) Each context is unique;
(3) Because contexts reflect the subjective lived experiences of participants these are "mental models";
(4) The mental models represent human experience models that ensure that human activity is relevant under particular conditions;
(5) Theories of context represent refined schemas that would allow persons to interpret and react appropriately to complex events within an acceptable time span;
(6) It will serve to focus actions, especially communicative action;
(7) Theories of context are socially founded, dynamic and they have a history (i.e. they have been "planned" and socially constructed).

He further argues that these theories of context often remain tacit and unspoken and become visible through indirect allusion rather than being explicitly expressed.

One of the main objectives of this thesis is therefore to make visible the relevant aspects of the lived experiences that would represent the "community condition" in the Dr J.S Moroka Municipality.

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1.10 Proposed approach for the creation of a substantive theory of context for the Dr J.S. Moroka Municipality

Assumptions (point of departure)

The author took note of Hayes and Westrup's view (2012) that it is problematic to "construct" context, in terms of *what to include* and *what to exclude*, however a way was proposed to ensure that the essence of the local community context is captured. Based on the previous points, the following approach was proposed and it was applied to the case in point.

The approach must depart from the assumption that ICT4D interventions, (whether they are the implementation of policy, or the implementation of projects that impose technological interventions at community level), are complex and socio-technical in nature;

- The community and the development of the community are directly and primarily affected by these interventions. The developmental discourses of the community from the perspective of community members provide the main context that needs consideration, from the perspective of the community.
- The approach followed to establish a substantive theory of context for a local community should be inductive, preferably with no pre-conceived notions prejudicing the community view.
- Pettigrew (1985) argues that a contextualist approach will almost inevitably be qualitative, given the nature of the notion of context and its "situatedness".

A participatory grounded approach based on the approach advocated by Corbin and Strauss (1998) was adopted to construct a substantive theory of context for the local community in the Dr. J.S. Moroka Municipality. The approach allows for extensive consultation as part of the data gathering phase. The democratic nature of extensive consultation and therefore extensive data gathering is in this instance better matched to the grounded approach advocated by Corbin and Strauss (1998) than the classical approach favoured by Glaser (1978).

Furthermore, the methodology provides a mechanism for collecting data and analysing it with the purpose of developing a theory (Charmaz, 2001). The mechanism

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includes the ability to identify patterns in the collected data and the researcher can then derive an empirical theory through the analysis of the identified patterns (Glaser and Strauss, 1967; Martin and Turner, 1986). According to Eisenhardt (1989), the formulation of theory based on such an approach can yield an emergent theory that is aligned with practical observations.

The methodology yields valuable insight into complex social situations and it is based on the number of assumptions, namely:

- That the researcher is in close proximity of the data;
- That the findings are limited both in terms of time and space;
- That, when Grounded Method research is undertaken, the process usually involves high levels of cooperation and discussion. Participants in the process consult others regularly and conclusions and/or theories are formulated through constructive dialogue (Lotriet & Matthee, 2009);
- This method allows for an inductive and systematic way of representing the community developmental context as a series of constructs and interrelationships between constructs in a way that allows for consistent approaches to the developmental discourse in the community.

The construction of a core category allows for an emergent “theory” that would inform those using the framework to assess ICT4D interventions in the community, with the interrelationships allowing for longitudinal assessment of the (horizontal) impact of the intervention on the community developmental path.

Although the author notes the argument by Avgerou (2001) that the implementation of technological innovation tends not to be rational and has the tendency to be improvisational in nature, he believes that the “making visible” of the perceptions of community members around development needs would allow for more meaningful assessment of the impact and outcomes of planned interventions in a practical way.

The author would argue that many of the socio-technical methodologies favoured by researchers, e.g. ANT, are too complex and nuanced for meaningful application by practitioners in the domain of the everyday; this need not be the case where a grounded framework has been prepared with explicit constructs and interrelationships that are clearly communicated. The use of Grounded Theory has previously been argued to be applicable

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to local level in the African context (Khavul *et al.*, 2009). Rosemann *et al*. (2007) highlight that granularity and scope of the data must be determined. The author would argue that these issues are adequately addressed by a grounded approach in that the methodology is focused on highlighting the essence of the phenomenon.

1.11 Background on the case study undertaken and reported on in further chapters

The study examined, from a Grounded Theory approach, those contextual dynamics in a community in Mpumalanga, South Africa, which would affect the success of ICT projects and related policies within that community. This was formalized as a substantive theory of context for that community. The case study that comprises the main body of work in this thesis highlights the challenges pertinent to the Government - Community Model adopted in South Africa. The governance model is three-tiered: national, provincial and local, and it is primarily top-down in approach rather than bottom-up. To compound the challenges, most ICT and ICT4D initiatives are conceptualised at national level by government agencies that are remote from the rural communities.

The author argues that the ICT policies, which were instituted over a number of years by the South African Government, have failed dismally to establish an ICT enabling environment amongst rural people, including the rural community that constitutes the focus of this study. Amongst the failures are included failures of ICT initiatives in South Africa, failures of community ICT centres (telecentres, multipurpose community centres and public information terminals) in rural areas, as discussed in detail in chapter 2 (Benjamin *et al.*, 2000; Snyman and Snyman, 2003).

The author asserts that, given the realities that the top-down approach of Government has failed to deliver ICT advantages to rural South African communities, the communities must empower themselves, to take ownership of initiatives and to participate in the anticipated South African Information Society. In order to propose practical ways in which communities can equip themselves, it is necessary to understand the social context at local community level; that is, understand various factors such as the lack of training, lack of empowerment, lack of participation, lack of skills and so on, that have a negative effect on successful implementation of ICT initiatives.

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The potential benefits offered by ICT interventions have long been realized by role players such as government, civil society and even business enterprises. However, the South African telecommunications policy introduced to achieve such objectives, in spite of having been introduced more than a decade ago, has not delivered significant results, especially in terms of benefits to rural South African communities (Sustainable Villages Africa, 2002). Hence, the author argues that while all these ICT developmental initiatives are of critical importance to all South African communities, rural and urban, rural communities in general are severely marginalized. The author fervently believes that the challenges associated with this state of affairs have to be identified and appropriately dealt with. Hence, the author seeks to make the social context visible and to provide a "formalized" framework for it which could be used to relate the context to ICT initiatives in rural areas.

1.12 High level focus of the case study

Figure 1.1 below reflects the high level focus of this research project and it highlights the two sides that need to be connected from a social context point of view whenever an ICT initiative is launched: the one side is community background and the other side the government/agency initiative itself. In the first place the focus is on the community background whereby three elements (rural community, their main concerns and the enabling landscape) serve as input into the envisaged framework as indicated by the arrows. Then, in the second place, the spotlight is on the requirements of the government and/or other agencies in respect of the ICT initiatives that have to be implemented to empower the rural communities. The author asserts that the connection is through a framework that takes as input the elements from the community background and the requirements of the initiative to be launched and refines them to create a consolidated input for a successful project execution.

As previously explained, a grounded approach was used to produce a framework (substantive theory of context) that explains the rural community developmental context as perceived by the various individuals and interest groups in the area. The framework consists of a number of entities and the relationships between them that explain the perceived developmental concerns from the perspective of community members. It is argued that a process which uses this framework to take into account the background of the

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rural areas (rural community, their main concerns and landscape) when engaging with the initiatives (e.g. policy or projects) of government/agencies, provides, as input, an efficient way to highlight critical considerations at community level. This input is expected to lead to improved execution of the governmental initiatives and, at the same time, lead to a situation where the communities take greater control of the process to ensure that their developmental needs are formally linked to the initiatives, thus improving the sustainability of the initiatives.

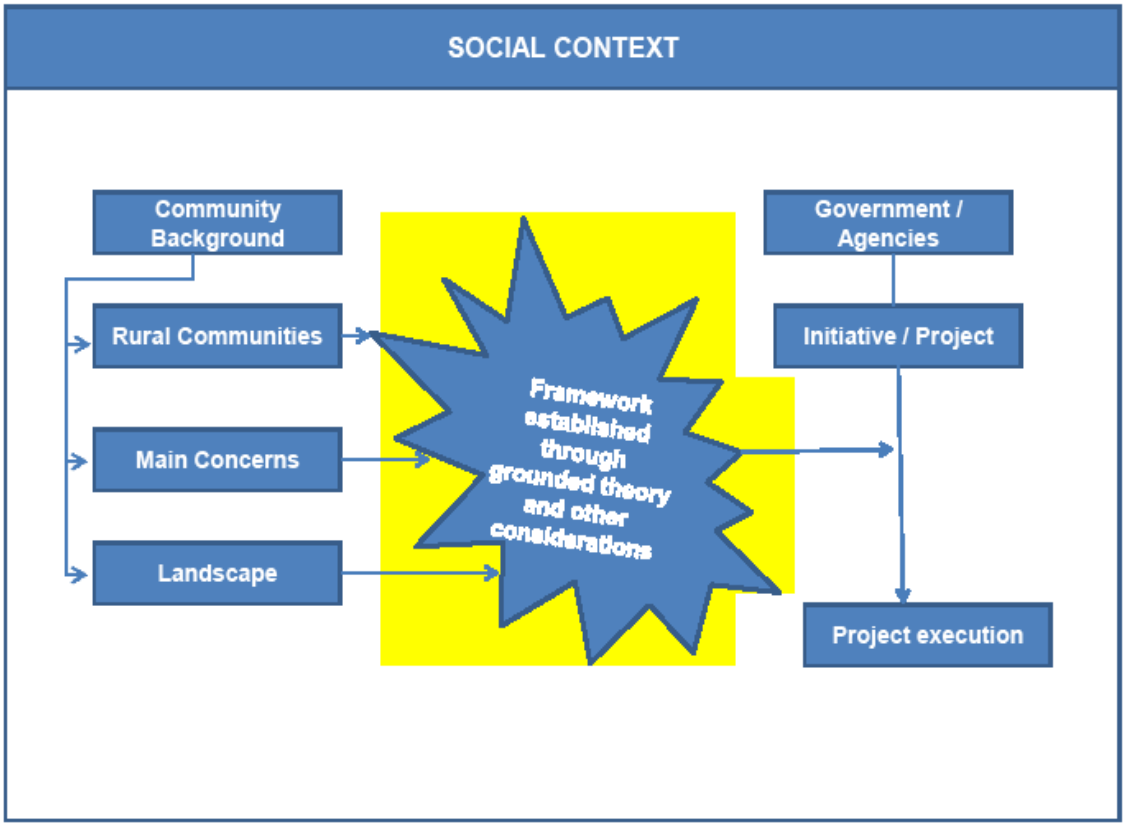

Figure 1.1: Social Context as focal point of the study

1.13 Scope of the research project

Geographically this research is confined to Dr. J S Moroka Municipality, a rural area in South Africa, situated within Mpumalanga province. The research area is a rural municipality with, on the one hand, a number of communities led by the traditional leadership such as kings, chiefs and indunas and, on the other hand, the local government

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led by the mayor, municipal manager and senior executive officers. It is a complex and typically South African situation where a single rural community is subjected to more than one leadership structure within the same area. Hence, the author argues that the establishment of the contextual framework not only provides a means to link the developmental and technological discourses in the community, but it also has the potential to serve as a tool to facilitate more efficient interaction between community members and authorities in terms of the introduction of those ICT initiatives that can potentially raise the standard of living. This is because the proposed framework provides a tool for those involved in technological initiatives, especially government agencies, to take into account the background of Dr. J.S. Moroka (a typical rural area) and to reflect on critical considerations necessary to ensure successful and sustainable execution of the initiatives. This tool also enables the community to take greater control of the projects.

The thesis also proposes a process of engagement around the use of this framework. Engagement at community level will always encourage the levels of participation and commitment from community members as well as promote sustainability of project initiatives. From the community perspective, the framework provides a self-development tool for the community. From a governmental perspective, it provides the framework that can be used as tool to guide all policy developers, politicians and programme managers when implementing any initiatives by providing a better understanding of the community needs. As a result, the initiatives will directly benefit the community as it will be addressing their problems. The involvement of the stakeholders encourages high levels of participation when developing projects and it has the potential to promote greater success rates for projects. Thirdly, there should be better chances for project sustainability from a socio-cultural, institutional, financial and technical perspectives. In many instances when the community needs are truly met there is a high probability that the initiative will be sustainable (Dilley, 2000a; Dilley, 2000b).

1.14 Thesis structure

The structure of this thesis is as follows: Chapter 2 outlines the landscape related to the information society and the ICT4D initiatives in South Africa. Chapter 3 provides the analysis of literature on existing ICT implementation frameworks , Chapter 4 provides information about the research method and the related data collection process. Chapter 5

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elaborates on data analysis using the open axial and selective coding techniques of the grounded theory. Chapter 6 provides information about the triangulation of the findings with the existing literature. Chapter 7 discusses the findings and discussion. Chapter 8 provides a summary of this research and some conclusions that may be drawn from this research.

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CHAPTER 2

THE CURRENT LANDSCAPE RELATED TO INFORMATION SOCIETY AND ICT4D INITIATIVES IN SOUTH AFRICA

2.1 Introduction

This Chapter provides context on the South African ICT landscape and its impact on rural communities. This chapter includes details of the landscape of ICT in relation to the information society in South Africa; the impact of ICT in South African rural communities and the failures of ICT initiatives in South Africa. The following section therefore describes ICT in South Africa within the context of the South African Government's espousal and promotion of the ideals of the Information Society and the policy measures that were introduced by the South African Government.

2.2 Landscape of ICT in relation to the information society in South Africa

2.2.1 Overview of Information Society initiatives in South Africa

Similar to other developing nations, in the "new" (post-1994) South African democratic dispensation the South African Government has always appreciated the potential importance of the information society for supporting socio-economic development in South Africa (Van Audenhove, 2003). The need to align information society initiatives with South Africa's developmental agenda was expressed at an early stage (Naidoo, 2004), with the vision of using technology to improve service delivery in general, and specifically in areas such as e-health, e-education, e-government, e-agriculture and other areas (Van Audenhove, 2003).

In parallel with the use of ICT for service delivery, governments the world over are engaged in public sector reforms to aid improved service delivery (Naidoo, 2004). The "public sector" is a part of the economy which comprises the activities of the government and local authorities (Schacter, 2000). The concept is used in contradistinction with "private sector", which generally refers to organizations or business enterprises whose

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activities are almost wholly financed through private shareholding or equity. The public sector usually encompasses the core civil service, state corporations and quasi-public corporations that are largely financed by the taxpayer. The services that are usually provided by the government components of the public service include education, social services, the police, national defence, health services, transport, etc. This is also the case in South Africa.

The public sector reforms have enabled governments to progress towards e-government, which Millar (2004) describes as the use of ICT to mechanize certain government functions and to improve the performance of the systems. E-government not only enables departments to provide more effective service but it also makes it possible for citizens to participate more frequently and more freely in the governance of the community and the country (Lipchack and McDonald, 2003). Through e-government sustainable development can be achieved; the decision making and service delivery enhanced; the capacity of authorities or customers improved; procedures of government simplified; connectivity increased; global advocacy and communication facilitated and innovative approaches enabled (Multinepal, 2000).

2.2.2 Reforms of e-government in South Africa

The South African Government introduced e-government initiatives to advance the living conditions of its people, for example the Reconstruction and Development Programme (RDP); the Municipal Public-Private Partnership programme (MPPP); and the Black Economic Empowerment (BEE) programme.The RDP focuses on poverty alleviation by addressing basic needs (for example, food, housing, education, water, electricity and health); the MPPP fosters municipal public-private partnerships to facilitate development and service delivery; and BEE aims at the empowerment and the socio-economic upliftment of the communities that were previously disadvantaged by policies and practices of the Apartheid Regime (Niekerk, 1998; Burger, 2005). The South African Government's e-government initiatives focus on making it easier to conduct business with the Government; improving its effectiveness and operational efficiencies; and promoting openness and transparency when interacting with Government entities. The e-government projects also work towards empowering the communities through providing them with access to relevant information.

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2.2.3 South African e-Government successes

Even though challenges and failures were encountered in the implementation of some of the e-government initiatives in South Africa, the following are some of Government entities that delivered successful e-government related projects: the Independent Electoral Commission (IEC), the South African Revenue Services (SARS), National Department of Transport (NDoT) and Department of Labour (DoL). These are discussed in more detail below.

The IEC successfully implemented the following notable projects: the e–procurement project that improved the procurement processes and procedures to facilitate open and transparent tender processing as well as to prevent corruption; the short message service project (SMS) to update voters on matters relating to voting before and after elections; the communication technology project to assist in voter registration, in communication, in gathering and validating ballots and in publishing election results across the country.

SARS successfully implemented the e-filing system, which provided facilities for the submission of tax returns using the internet between government and business (G2B) as well as between government and the citizens (G2C).

NDOT successfully implemented the National Traffic Information System (eNaTIS), an e-government initiative used for traffic related transactions and services. It was observed that the system was able to handle 600 000 transactions daily on average (Segar, 2008). Typical transactions included: applications for learners and driver's licences; registration and licensing of motor vehicles; administration of change of ownership and/or sale of motor vehicles. These transactions and services are provided at most transport offices across the nine provinces in the country (National Traffic Information System, 2008).

DoL was commended by *The UN Global E-government Readiness Survey for 2008* (United Nations, 2008) for its user-friendly and accessible public agency web site, which was well-customised to the needs of various stakeholders. Perry (2008) refers to the DoL's web site as a "one-stop (service) shop" that provided users with easy access to information related to labour issues.

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2.2.4 E-Government Challenges in South Africa

The Digital Opportunity Index (DOI) is an indicator used to determine and assess the opportunities, the extant infrastructure and usage of ICT by governments and their people. South Africa was ranked 86th out of 181 countries in the world in terms of DOI rankings (World Information Society Report, 2006). The DOI evaluation examined developments in respect of new technologies, telecommunication pricing and telecommunication infrastructure bandwidth. Based on the DOI, it was concluded that, although great opportunities existed for most of the member states of the Southern African Developing Countries (SADC) to employ e-government, not much was being done to take advantage of such opportunities.

Some of the challenges in South Africa are exacerbated by high levels of unemployment and poverty. These challenges stand to be influenced by the country's digital divide, for example the access to, and use of modern information technologies, which enable development. Though the economy has been creating jobs over the last decade, the demand still outstrips the supply and the net effect has been an increase in unemployment leaving many people in extreme poverty. This situation means that many people, young and old, are unable to participate fully as respected members of their community. At this stage most members of the community make no contribution in any form, especially people with disabilities, the elderly and so on (Department of Communication (DOC), 2008). Access to ICT services can break down the traditional barriers, which exclude most disadvantaged people in the society, from the benefits of e-services. When e-services are unaffordable, this situation is one of the main factors that contribute to the exclusion of those rural communities from the benefits of e-services. Indigence has a number of insidious side effects. Poor people are more prone to ill health. Their housing conditions are inadequate. They are often excluded from activities and services because they are unable to afford them. (Department of Communication (DOC), 2008). Many e-government projects have failed because they neglected to establish appropriate and adequate support structures for the technologies implemented. National governments tend to centralize the use of ICT and to neglect to roll-out the functions consistently to other associated institutions such as provincial and local government. Thus, the opportunity is lost to create a consistent multi-level management architecture which also allows for inclusive democracy at all levels. It also results in low levels of computer

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and information literacy at the lower levels of the hierarchy (Cloate, 2007; Benjamin, 1999).

The ICT project of the National Welfare Agency (NWA) failed partially at the National Pension Fund (NPF) and the Workers' Compensation Fund (WCF) (Kekana and Heeks, 2008). This project intended to combine and distribute common core system functions from two distinct manual operations of the NPF and the WCF as well as to devolve some of the unique system functions to the NPF and the WCF, respectively. The system was meant to address payment delays, inaccuracies in recording of figures and inadequate communication between the two agencies. One of the causes of the failure of the project was the inability to stick to the project budget. For example, the budget for the project was initially approved at $43 million but it increased to $60 million as the project unfolded. However, the project had some success in that the lead times and processing times were reduced drastically. Funeral grants, for example, that used to take three months to finalise, were now done in 30 minutes; billing information was now accurate and timely resulting in corresponding improvements in debt collection; customer experience improved as the number of complaints declined; and managers were now empowered to make informed decisions as status reports were available on time. So, all e-government initiatives need to serve as a tool in enhancing service delivery.

Service delivery is the process that provides the results which meet the requirements of the citizens (Van Audenhove, 2003). The performance indicators of government service delivery are: service level adherence, quality of service, capacity to handle volumes, continuity of service and availability of service. Other indicators employed are quality of management in general and the quality of the financial management of the service provider (Information Technology Infrastructure Library (ITIL), n.d.). When properly used to support service delivery, Computer Based Information Systems (CBIS) claim to enable users to achieve significant social development objectives, eliminate social issues and enhance democracy (Levin, 2008). In South Africa some of the benefits of ICT and related services had to support the government programmes such as RDP, MPPP and BEE in addressing some of the community’s needs (Naidoo, 2004). For example, the community could use ICT and related services as a tool for the eradication of poverty and for self-development in different activities.

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2.2.5 Broad trends in government ICT policy related to Information Society in South Africa

The South African Information Society Policy brings some order to this area which encompasses a wide variety of policies and frameworks which were developed in isolation by a number of departments and sectors over time. These have now been aligned with other macroeconomic and developmental policies. Examples include the White Paper on Science & Technology (1996), Foresight (1999), South African IT Industry Strategy (2000), Growth, Employment and Reconstruction (1996) and Electronic Communications and Transactions Act (ECT) no. 25 (South Africa, 2002).

The history of ICT policy development went through four distinct periods: a *transition period* lasting from 1989 until the elections in May 1994; a *transformation period* that commenced after the 1994 elections and continued until mid-1997; an *implementation period* from mid-1997 until mid-2000 and *monitoring and evaluation period* which started in mid-2000 and is still on-going (South African IT Industry Strategy, 2000).

During the *transition period*, besides negotiations to do with the new political dispensation taking place, critical discussions were also held on the future of telecommunications, broadcasting and related markets.

The *transformation period* saw the negotiations for the development of policy frameworks aligned to the post 1994 political dispensation. It is noteworthy to note that the work done (policy reformulation) during this period coincided with the ever increasing interest in ICT's and the notion of the Information Society and that these phenomena also gave the transformation process the impetus required for it to forge ahead. The legislative framework for telecommunications was born during this period. This led to the establishment and adoption of the following: the White Paper on Telecommunications in March 1996 (MPTB, 1994); the Telecommunications Act (South Africa, 1996a); and the licence for Telkom (the South African national fixed line telephone operator) in May 1997 (RSA, 1997); the creation of the independent regulator, known as The South African Telecommunications Regulatory Authority (SATRA) (South Africa, 1996b).

In mid-1997 the *implementation period* ushered in the establishment of the regulating and implementation agency, called The South African Telecommunications Regulatory Authority (SATRA) to refine the existing policy frameworks and to introduce

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new policies. The Universal Service Agency (USA), one of the institutions responsible for implementation, had the specific mandate to set up telecentres.

The ongoing *monitoring and evaluation* period, starting in mid-2000, saw the establishment of another institution, the Government Communication and Information System (GCIS) in May 1998. This has particular relevance to Information Society policy since the GCIS is also broadly responsible for the monitoring and the evaluation of governmental electronic communications. Furthermore, from 2000 onwards, the GCIS became responsible for the implementation of Multi-Purpose Community Centres (MPCCs) in South African rural communities.

In January 1999 the second body of importance, the State Information Technology Agency (SITA), was established as a public company to provide ICT-related services to the entire public service community (SITA, 2000).

The Electronic Communications and Transactions Act (ECT) provides for the establishment of a national strategy for electronic communication and electronic transactions (South Africa, 2002). It must also advance general access to electronic communications facilities and the use of electronic transactions by communities. The ECT act promotes proliferation and usage of electronic services (e-services) such as e-learning, e-agriculture, e-commerce and e-health. E-services are a boon wherever they are rendered; in the case of rural communities, they support community developmental needs as well as community priorities. Furthermore, e-services can serve as a platform for collaboration and messaging services. The ultimate benefit for the rural communities will be the reduction in the transportation costs that the rural communities would otherwise have to incur when running related errands (Department of Communication (DOC), 2009).

2.2.6 Public ICT Policy in South Africa

The Department of Communication was commissioned to make sure that information flows freely between the National Government, the Provincial Governments and the local authorities (South African Government Annual Report, 2002). The Department also provides a central "*one-stop service*" information centre for all South African ICT policies. According to a former Minister of Communication, Dr Ivy Motsepe-Cassaburri, "*… the history of ICT policies in SA did not address the needs of all people.*

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Apartheid skewed the manner in which the telecommunication infrastructure was established in South Africa." (South African Government Annual report, 2002).

With the introduction of mobile telecommunication, the telecommunication infrastructure situation has drastically improved the telecommunication options. Almost every household has a mobile communication device, which is easy to use and maintain (Statistics South Africa, 2010). Income levels are still extremely low in the rural areas where the economy is stagnant. Therefore, most inhabitants of these areas will probably not be able to afford telephones without the help of the government. The government attempt to improve commutation on data and voice by implementing Voice Over Internet Protocol (VOIP) technology was considered by government to be a good strategy (South African Government Annual Report, 2002). This approach was intended so save some communication costs between the departments, at national, provincial and local levels. However, there would still be a challenge with regard to government and the community in terms of communication (South African Government Annual Report, 2002).

Recent developments in ICT allow the technology to be used for many purposes, for example a cable that carries data can now be used to transport both data and voice (South African Government Annual Report, 2002). The role played by ICT in different operations of the government was to ensure that technology helped organizations to grow and be sustainable. Hence, most of the government departments have come to realize the benefits of deploying VOIP. The major benefits of which is to improve communication and save costs.

Therefore, the development of telecommunications, broadcast and postal networks services, and policies that promote transparent interactive communications between the government at all levels of operations and to all South Africans citizens, are an imperative (South African Government Annual Report, 2002). The Government has initiated a process for creating the necessary guidelines and regulatory frameworks to encourage the establishment of an environment in which ICT may be applied freely to stimulate economic activity, create employment opportunities and facilitate access to services. Furthermore, there are major projects and programmes that have been initiated by the Government to address some of these challenges. These are discussed in the next section.

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2.2.7 ICT4D Policies in South Africa

The Information Society literature painted interesting views and scenarios for ICT4D. Some viewed ICT usage as a tool that could provide solutions to a plethora of developmental problems (Kodakanchi *et al.*, 2006; Ngwenyama *et al.*, 2006). However, this viewpoint was not supported by all authors. Whilst there was a lack of enthusiasm with some (Ciborra and Navarra, 2005), others observed that there had been a significant number of ICT4D projects that had failed to meet their respective project objectives (Heeks, 2004). Research studies of ICT4D were usually focused on the use of ICT to achieve developmental objectives, especially in developing countries, and the important issues were related to the question of how to leverage the power of ICT to realise the potential benefits (Sein and Harindranath, 2004; Walsham and Sahay, 2006).

South African government policies related to the information society and the development initiatives of necessity covers a broad spectrum. The policy area of government related to information society initiatives has possibly been fragmented because of this. Departments involved in these initiatives include Department of Communication, Trade and Industry, Arts and Culture, Science and Technology, Finance, Education and Public Service and Administration (Van Audenhove, 2003). These initiatives focused broadly on development (growth strategies through the use of technology as well as policies for the ICT sector and e-commerce), infrastructure (the telecommunications sector, universal access and extension of infrastructure, including the establishment of MPCCs to allow for rural access to these technologies), education (including distance education), and content (largely education and audio-visual sector reform).

The Department of Communication's mandate was to establish policy frameworks and legislative environments that guide the work of the government departments, to ensure that the policies were aligned to proven international standards, as well as to ensure that the policies met the basic needs of the communities. Some such policies that promote ICT4D included the Telecommunications Act, Act no. 103 of 1996 (South Africa, 1996a); the Broadcasting Act 4 of 1999 (South Africa, 1999); the Postal Services Act 124 of 1998 (South Africa, 1998); and the Electronic Communications Act (ECA) 36 of 2005 (South Africa, 2005). All these Acts had something in common, namely the endorsement of the principles of universal service and access which underpinned the expansion of ICT services to all communities – rural and urban. As a case in point, the ECA was very

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specific about the fact that the Government had to encourage and uphold universal access to information services for all its citizens through the use of connectivity, telecommunications and broadcasting services. Hence, Government's endeavours in pursuit of this objective made it possible to acquire Under-Serviced Area Licences (USALs), via the Independent Communications Authority of South Africa (ICASA).

The Government's expectations were that small rural businesses would be positioned to access their potential markets through e-commerce; the internet would provide access to market information as well as eliminate intermediaries; the internet would provide the opportunities whereby producers in rural communities would reach global markets at reduced operational cost. However, the prerequisite for this dream to succeed was that the rural communities would have built the capacities and the capabilities to take advantage of the electronic transactions environment. The Government recognised that competent human resources have to be developed to participate in the e-service business environment (Broadcasting Digital Migration Policy in the Government Gazette that outlines South Africa's planned transition from analogue to digital broadcasting (South Africa, 2008)

Hence, the Minister of Communication made a number of policy pronouncements with positive effect on the ICT sector thereby creating an environment which is supportive of the developmental initiatives. Such directives included: (1) the RSA Policy Directives of 2004, the Policy Directives are from the Rehabilitation Services Administration (South Africa, 2004) and is aimed at liberating the ICT sector; (2) the Broadcasting Digital Migration Policy of 2008, Broadcasting Digital Migration Policy in the Government Gazette that outlines South Africa's planned transition from analogue to digital broadcasting (South Africa, 2008) ; (3) the amendment to the Broadcasting Act (South Africa, (1999) to incorporate a new funding structure for Public Broadcasting Services (PBS) in South Africa and to cater for the migration from analogue to digital broadcasting services; and (4) the Broadband Policy to facilitate establishment of broadband infrastructure to service rural areas (Department of Communication, 2008).

Furthermore, there are ICT related policies that could ensure that rural communities also benefit from ICT related services. The policies are discussed in the following sub-sections.

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2.2.8 ICT infrastructure in South Africa

Telecommunication services include services such as broadcasting services (radio and television), landline telephones services, cellular phone services and internet services (South African Government Annual Report, 2009).

In terms of broadcasting services, radio is considered the most influential and dominant as it does not depend on the telephone infrastructure or the electrical infrastructure to reach its intended audience, especially in rural communities. Worldwide, it is acknowledged that telecommunications is one of the fastest expanding industries. The Department of Communication intends to offer South African citizens the benefits of telecommunication services, like tele-medicine, distance education, tele-shopping and tele-banking.

The post-1994 South African regime not only ushered in social and political transformation but also the introduction of the information society and the digital economy, which necessitated the transformation of the telecommunications industry. Telkom's five-year period of exclusivity, whereby the company had to achieve certain targets in terms of compliance and obligations as set out in its licence, ended in May 2002. This paved the way for competition in the ICT space and transformed the company into a competitor in the ICT sector, thereby putting an end to the telecommunications monopoly that Telkom exercised and enjoyed in the past (South African Government Annual Report, 2009).

2.2.8.1. Telkom's infrastructure roll-out in rural areas

Telkom operated landline and cellular communications services and it was the major telecommunications services company in South Africa. The company's presence in terms of ADSL and WiMax had a coverage of around 90% country-wide (Telkom, 2009). Individuals as well as organizations found telecommunication services relatively unaffordable and, therefore, not accessible, notwithstanding the reduction in telecommunication prices. Telkom's infrastructure was mainly installed in urban areas due to high cost of installation and the limited customer base in rural areas.

In terms of information products and services, South Africa was ranked the twentieth biggest consumer in the world; making it a front-runner in Africa (Department of

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Communication, 2009). The country's network was largely (99%) employing digital technology and incorporated advanced technologies in the satellite, wireless and landline communications spaces. Compared to other African countries, South Africa always had a more advanced telecommunications network infrastructure (Kling, 1999).

2.2.8.2. Mobile Communications

Vodacom, MTN and Cell C were the main cellular communications service providers in South Africa. The country was ranked as the fourth fastest expanding mobile-communications market in the world (Department of Communication, 2008). The cellular phone user base stood at 15 million users in October 2003 and the user base was forecast to increase to 31 million users by 2012.

Vodacom was one of the cellular network companies in South Africa and held around 61% of the cellular phone market in the country. It was estimated that about 95% of their user base comprised prepaid customers. Vodacom did not only have a presence in South Africa but also in other African countries such as Tanzania, Lesotho and the Democratic Republic of Congo. The company's mobile communications infrastructure covered about 93% of the South African population.

In contrast, during 2007, MTN rendered mobile communications access to about 94.5% of the South African population; and it was the first to offer prepaid cellular packages in South Africa. Furthermore, it was the first to have a cellular coverage of 60 000 km^2 worldwide, which grew to 900 000 km^2 in South Africa alone in 2008. MTN expanded its operations into other African countries including Uganda, Swaziland, Rwanda, Cameroon and Nigeria. MTN was the first mobile communications service provider to be ISO accredited: ISO 9001 Quality Standard, ISO 9002 Customer Services and ISO 14001 for Environmental Management.

Cell C had a user base of 1.5 million subscribers in August 2003. The company planned to create 2 500 direct jobs and 15 000 indirect ones over a period of four to five years. Cell C employment policy was focused on employing individuals from historically disadvantaged communities.

Due to the growth of mobile communications market, the Telecommunications Act, Act 103 of 1996 (South Africa, 1996a) was amended to include 1800 MHz as well as 2.4 GHz 3G spectrums to facilitate the issuing of frequency spectrums to current operators, the

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newly launched Neotel and operators rendering services in the under-serviced areas. The mobile communication infrastructure was not yet ready to allow the delivery of e-services though, but it had great potential in terms of its pervasiveness and its uptake amongst South Africans (Department of Communication, 2008).

It was estimated that 89% of the South African population were cellular phone users in 2007. In rural communities, Vodacom was one the service providers which encouraged and upheld the extension of access to mobile communication technology. The company deployed well over 90 000 community-service telephones to under-serviced areas in South Africa. Through entrepreneurial efforts most of these community-service telephones developed into community based phone–shops that offered services such as fax, e-mail and internet (Department of Communication, 2008).

2.2.8.3. Undersea fibre optic broadband cabling

The South African Government was involved in three major projects to establish broadband fibre optic undersea cables: the Eastern African Submarine Cable System (Eassy), the West Coast Marine Cable and the South-East Asian Commonwealth Telephone Cable (SEACOM). These initiatives were in addition to an already existing initiative called the South Atlantic 3/West Africa Submarine Cable (SAT-3/WASC). All four of these initiatives were established to form a broadband fibre optic undersea ring around the African continent to connect to the European and Asian continents.

The construction of the Eastern African Submarine Cable System (Eassy) was started in March 2008. This cable system ran along the coast of East Africa. It was aimed at providing an enhanced communication link between South Africa and other African countries, as well as at linking South Africa with other continents (Department of Communication, 2008).

The West Coast Marine Cable project planned to lay an undersea broadband fibre optic cable with the aim of linking the South African communities to European as well as American communities. It was code-named UhuruNet and ran along the west coast of Africa, connecting South Africa to Nigeria and proceeding from Nigeria to Portugal (Hamlyn, 2008).

The South-East Asian Commonwealth Telephone Cable (SEACOM) established a link from South Africa, Mozambique, Madagascar, Tanzania and Kenya to India and Italy

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where further connectivity to existing international broadband fibre optic cables was established.

The three initiatives extended the existing South Atlantic 3/West Africa Submarine Cable (SAT-3/WASC) broadband infrastructure which ran along the west coast of Africa, connecting Portugal and Spain to South Africa with links *en route* to some West African countries. **"***All these developments are expected to provide affordable bandwidth that would encourage volume discounts and large bandwidth growth, which Africa badly needs*" (Hamlyn, 2008).

2.3 The general use of ICT in South Africa

Many remote communities are benefiting from the greater use of ICT. Internet, in particular, has been of great use in the business arena by fostering e-commerce, e-trade and e-governance. Other spheres of life are also making good use of its features, for example health care (telemedicine), manufacturing (business information management), natural resource management (geographic information systems) and law enforcement (communication) (BOTEC, 2001).

Specifically for South African rural communities, the Government adopted some IS developmental priorities, called Vision 2014. The Government's goals with the ICT related services are focused particularly on job creation in the rural communities, through the establishment of MPPCs that serve as information hubs (South African Government Annual Report, 2009). Using these facilities the inhabitants can access relevant information and respond to it. For example, the government is publishing most of the tenders and vacancies through the internet and they are made available on line. Therefore, the community's response to tenders and vacancies is dependent on the degree of its access to that information. Consequently, most community members will be at a disadvantage in terms of their chances of getting jobs advertised through such electronic channels.

The government appointed ICT champions for each community, on a voluntary basis, working with local municipalities and the Department of Education. Champions were appointed in accordance to the level of their studies and ability to play an active role within the community. The mandate of ICT champions was to create ICT awareness and to provide basic ICT training. There were serious challenges in the past when people who were to receive grants did not get their money as it got "lost" during the pay-out process.

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This was caused by the lack of sufficient social security and appropriate authentication tools. The Government then introduced tools such as biometrics to identify each beneficiary through their fingerprints and this approach ensured that the grants were received by the right person. There also were projects to roll-out ICT infrastructure and related systems such as telemedicine to improve health care for patients. Thus, the Government piloted an HIV management system in the Eastern Cape to manage the status of each patient, his/her drug usage, and his/her health conditions.

The Government introduced a project called “one citizen one e-mail”, intending that each and every citizen should have an e-mail address. South African Post Office introduced Public Information Terminals to rural communities to allow each citizen to have access to information. During 2011 there was about 720 PIT installed country wide especially in remote rural areas. However, some of the areas did not have relevant infrastructure and the necessary skills to operate the machines (South African Post Office (SAPO), 2010).

2.4 Failures of ICT initiatives in South Africa

In Africa there is a general lack of infrastructure, related services and technical know-how and, as a consequence, the local economy is severely impaired. Neither sustained industrial development nor agricultural activities beyond subsistence could occur without the existence of electrical infrastructure; also, in the absence of reliable telecommunications infrastructure, neither the transfer of technical knowledge could occur nor could the required market information be made available (Sustainable Villages Africa, 2002). As a result of these, there is very little economic growth and development; hence, South African rural communities are still impoverished.

Some of the basic infrastructural components (reticulation of electricity and communications, to name a few) are essential pillars for economic growth; but there are no proper plans to provide these in many remote areas of South Africa. As a result the youth is leaving rural homes and relocating to the cities to seek employment opportunities there (Acasia, 2000). The internet provides access to information and its power is therefore considered to be an essential prerequisite for the advancement of learning, training and business growth. The fact that a community is remote should not make it impossible for it to have access to internet. (Costello, 2000).

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Hence, in order for the vision of an ICT4D in South Africa to become a reality, all citizens from all walks of life need to become "citizens" of such an Information Society. The creation of an Information Society includes initiatives that are related to community centres such as telecentres, multipurpose community centres, public information terminals and ICT centres. Failures of the ICT initiatives would also mean that the vision of ICT4D in South Africa will fail. Hence, the successful creation of ICT4D relies heavily on creation of structures and processes, through policy and appropriate action, to ensure that the needed initiatives (ICT4D projects) happen at grassroots level. Therefore, it will be essential to fully understand the ICT failures and their causes, especially in rural communities, in order to use the knowledge at strategic, policy and political levels when planning future initiatives.

Problems existed with the delivery of services through harnessing ICT in rural areas (South African Government Annual Report, 2001). A delegation from the South African Cabinet under the leadership of President Thabo Mbeki therefore visited identified rural areas to conduct on-site assessments of the situation. This culminated in the setting up of a commission, led by Professor Wiseman Nkuhlu in the President's Office, to investigate the ICT failures (South African Government Annual Report, 2001). Some of the salient findings of the commission included: low levels of literacy, lack of appropriate ICT awareness, implemented ICT initiatives were not aligned to the communities' priorities and needs, inadequate ICT infrastructure, and the policy formulation processes were not inclusive (South African Government Annual Report, 2001).

2.4.1 Failures of Community ICT centres in rural areas

All ICT centre projects, regardless of their individual scopes and structures, are undertaken to provide ICT services which will be of benefit to the community (Benjamin *et al.*, 2000; Snyman and Snyman, 2003). The unfortunate reality is that some ICT centres, both local and overseas, have failed to link in the communities effectively (Dasgupta, *et al.*, 1999; Heeks, 2002; Conradie, 1998; Van Audenhove, 1999; Snyman and Snyman, 2003). In emerging communities, a number of ICT centres have been abandoned because they were not effective and there were no prospects of success in the longer term (Michel, 1997; Sassen, 2002). Some of the contributory factors are the lack of local skills to maintain such infrastructure, lack of financial support to render the required services, and

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the inability of established centres to meet the user requirements (Benjamin *et al.*, 2000; Snyman and Snyman, 2003).

Below is a table summarizing the different types ICT Centres found in South Africa

Table 2.1: ICT Centres in South Africa

ICT Centre Type	Rendered by	Target Market	Focus	Services
Telecentre	Universal Service Agency / SANGONeT	Urban and rural areas	Commercial or e-government services	1. electronic purchasing / payments 2. e-mail services 3. e-government services 4. internet access
Multipurpose Community Centre (MPCC)	Government Communication Information Systems (GCIS)	Urban and rural areas	Commercial or e-government services	One stop Shop Services: 5. electronic purchasing / payments 6. resource centre / library 7. e-mail services 8. e-government services 9. photocopying, scanning, typing and binding 10. internet access
Public Information Terminal (PIT)	South African Post Office (SAPO)	National, with specific emphasis on rural since SAPO has country wide footprint	e-government services	11. Promotion of One citizen one e-mail address 12. e-mail services 13. e-government services (downloading of government forms) 14. internet access

Outlined below are South African Government ICT initiatives that were introduced in rural areas but were unsuccessful.

2.4.1.1 Telecentres

As mentioned above in section 2.2.6, the Universal Service Agency (USA) had to set up telecentres. According to Van Audenhove (1999), it planned to deploy about 100

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telecentres per year in rural areas to provide the telecommunications services in support of basic developmental needs and of e-government and e-education policies (Universal Service Agency, 2005). The overall USA plan was to establish some 3000 to 4000 telecentres for the entire South Africa (Van Audenhove, 1999). The USA reported as early as 1998 that the project was experiencing serious problems with defective financial systems, insufficiently trained managers, unclear tariff structures, unrealistic salary demands of managers and theft of inadequately insured equipment. This situation was confirmed by Khumalo (1998). Shreiner (1999) also confirmed that the benefits expected from the telecentres were not materializing.

The Southern African NGO Network (SANGONeT) is a civil society based organization, established in 1987 to improve and promote access to information; to facilitate information dissemination; and to create and support ICT awareness campaigns amongst individuals and organisational groupings. The Telecentres, brain-child of the USA, were taken over by SANGONeT to resurrect the projects which struggled under the management of USA (Stones, 2007). The move was inspired by the extensive socio-political experience that SANGONeT demonstrated during the transition from the pre-1994 political dispensation to democracy.

2.4.1.2. Multipurpose Community Centres (MPCCs)

The vision of the Government Communications Information System (GCIS) was to establish one multipurpose community centre (MPCC) per municipality across South Africa (Safrica, 2002). This vision has not been fulfilled. A report of the IDRS (Espitia, 2001) estimated that, in 2001, 47 fully functioning MPCCs existed, of which only ten formed part of the GCIS mandate at the time. In 2002, 20 MPCCs of the GCIS were listed, of which eight did not have a centre manager or general information centre manager, and only two had fully equipped telecentres with telecommunications facilities, including internet access from which information on the government websites could be downloaded. The rest of the MPCCs depended on traditional media such as pamphlets and interpersonal communication for disseminating government information (Snyman and Snyman, 2009).

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2.4.1.3 Public Information Terminals (PITs)

The South African Post Office installed 700 Public Information Terminals (PIT) by 2006 despite the problems encountered such as damaged equipment and the lack of active support in the form of "occasional reluctance on the part of branch management and staff to buy into the idea of having an internet kiosk within their environment" (South African Post Office (SAPO), 2006). During 2010 the contract for the maintenance and support of these terminals was cancelled and, as a result, most of the PIT machines were not functional (South African Post Office (SAPO), 2010). Before the cancellation of the contract, the PIT system was generally stable because of the constant monitoring and maintenance. Its lifespan was therefore somewhat extended as a consequence of the growing user base. At the time of the writing of this document, the support and maintenance issues of the PITs were still unresolved.

2.5 Summary

ICT Policies in South Africa are co-ordinated centrally by the Department of Communication, this being their sole mandate. In terms of policy development, South Africa has excellent policies, but there is a lack of implementation, monitoring and evaluation of the policies on an annual basis. The failed ICT community centres in South African rural communities have a direct and negative effect on the communities. As a consequence, most ICT related services cannot be rendered due to lack of infrastructure. "One stop shop" service centres, in the form of telecentres, were developed with the intention to provide adequate services but these are faced with major challenges. The ICT centres that were deployed shed some light on what needs to be achieved to manage them effectively to benefit the communities. The recognition of the cases of failure to achieve the objectives of the ICT initiatives highlighted some of the issues which hampered the progress, such as lack of awareness, low levels of skills, and inadequate infrastructure - all aspects that would need attention.

Some of the ICT projects sought to promote e-agriculture, e-education, and other appropriate e-services. However, although the government policies aimed to support the initiatives, there was a lack of implementation of these policies. As a result, the inhabitants were still isolated because of the very limited availability of access to ICT facilities. The

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ICT infrastructure in rural areas was not easily accessible at all due to the way in which past policies prioritised the rolling out of the infrastructure. The infrastructure was mainly rolled out in urban areas where there was high economic activity with higher return on investment. As a result of this, in the rural communities, there was extensive reliance on the use of cell phones and radios, primarily for communication purposes. This happened against the backdrop of the reality that many rural indigent people were not able to afford the services.

This chapter provides an understanding of the ICT policies in South Africa, the achievements to date, the successes and the failures of ICT projects and ICT4D initiatives, and it discusses the attempts and their accomplishments to create an Information Society.

The author firmly believes that the rural community members themselves hold the key to the solution of the research problem. This belief led to the choice of the Grounded Theory Methodology as the approach for this study. Furthermore, the understanding of the current landscape directed the author to the selection of an appropriate rural community and the associated community based organizations that were identified as the research subjects. Based on the targeted research groups, appropriately pertinent questions were couched for inclusion in the questionnaire used in the research study interactions and interviews.

The remaining chapters in the thesis detail the research strategy which was informed by the approach presented above.

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CHAPTER 3
ANALYSIS OF LITERATURE ON EXISTING ICT IMPLEMENTATION FRAMEWORKS

3.1 Introduction

This Chapter reviews the nature and extent of existing frameworks for the implementation of ICT4D in literature. It conceptualizes the existing implementation frameworks along the following dimensions:-

1. The name of each framework and its authors
2. Understanding the context under which it was established
3. The conceptual basis of each framework;
4. The focus and intended use of each framework
5. The viewpoint represented in each framework
6. The unit of analysis for each framework
7. Provision of a description of core elements of the framework;
8. Limitations of each framework

According to Cadenasso, Pickett, and Grove (2006) a framework can be defined as a theoretical concept that articulates processes and systems that are included to form that theoretical concept. There are many ICT implementation frameworks that have been produced and implemented successfully in developed countries, but these are not often suitable for developing countries because of the differences in context (Ashraf et al., 2008; Rao, 2007, Mamba and Isabirye, 2004). Hence, there have been some attempts by others to develop frameworks that could be used to improve development in rural areas through the implementation of ICT (Mamba and Isabirye, 2014). The development of these frameworks should be mainly understood against the background of firstly the perceived significance of ICT in terms of supporting developmental objectives, but secondly also the multiple failures of ICT projects in rural areas and the need to find more sustainable technology solutions. Heeks (2008) points out that ICT has been seen as tools for development that could address development needs of the rural community in the longer term. He further argues that ICT can play a role in socio-economic development through a combination of technologies.

In the 2000 Millennium Development Goals (MDGs) as published by the United Nations (UN) the core focus was to address social development issues (Wertlen, 2008). The goals of development brought considerable focus on ICT, because it was identified as

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an important tool that could be used to support social development and to support attainment of some of the MDGs.

Since 2000 when the UN unveiled the MDG's, global efforts have been made on how best to use ICT for the purpose of socio-economic development, especially for developing countries. Kamel, Rateb, and El-Tawil (2009) found that over 500 international corporations implemented more than 1000 ICT4D initiatives in developing countries during the period 2002 to 2004. However, the effort across the developing countries to use ICT as a developmental tool largely failed (Bailu, 2007; Gichoya, 2006; Harindranath & Sein, 2007; Heek, 2009). The researchers especially in the field of ICT4D acknowledged this and agreed that the ICT4D drive has not been entirely successful, but also found that not all ICT4D initiatives failed dismally. Despite these failures the researches are still adamant about the important role that can be played by the ICT4D towards socio-economic development, if applied appropriately in developing countries.

3.2 Some of the contributory factors towards failure of ICT4D

In the context of this thesis, which has as its purpose the development of an ICT implementation framework from a community perspective it is therefore important to understand causes of failures in ICT4D and related implementation frameworks. The main causes of failures are briefly summarised below:

Firstly, formulated policies are poor; Galperin (2010) argues that in developing countries, ICT has proven to be disadvantageous to initiatives that relate to ICT4D as a result of poorly formulated policies. Policies are ideally defined, deliberated on, and supportive of careful decision making that provides guidance for addressing public concerns (Torjman, 2005). However, most state organs in developing countries, especially in Africa tend to be unapproachable in assessing their plans and ensuring that plans are implemented with the greatest success and ensuring that policies are operationalised (Gillwald, 2010). This is mainly due to some threats related to losing political ground. For example if policies being introduced do not suit a ruling party, it will never be introduced even though it could add value to the socio-economic development (Gillwald, 2010). Some of the policies are too vague to allow for implementation - people who are developing policies are in these instances out of touch with local communities (Usman & Said, 2012). As a result of this, ICT4D implementation is not founded on good grounds and on the basis

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of solid research-based evidence. Instead policies are formulated on the basis of the influence of global markets. This bears a relation to the lack of policy development skills in developing countries (Lallana 2010) developing; here there is reliance on the developed world to help in developing policies. But because the priorities of the developed countries are not the same as the developing countries most of the policies do not address the need of local communities and thus are inadequate.

Secondly, there is lack of user participation and poor management of projects. Developing countries still lack many ICT-related skills and this results in the user participation in terms ICT4D projects being virtually non-existent (Walton and Heeks, 2011). Walton and Heeks (op. cit.) further argue that lack of local user participation creates gaps between the different stakeholders. As a result ICT implementations do not address the main needs of the stakeholders. In turn the deployments of the different technologies then do not contribute towards socio-economic development.

Thirdly, there is lack of understanding between role players in ICT and those in development. Rao (2005) argues that there is a divide between role players in ICT and those in development. In the instances where ICT development and implementation is techno-centric in terms of the role that ICT plays there are many instances where the implementation of technology does not considerate targeted development, nor does it take into account the complexity of development (Rao, 2005, op. cit.). In these instances the focus tends to be on what can be accomplished with ICT in general. Given this brief context on current failures, frameworks that are currently reported on in literature for informing ICT4D implementation are discussed in the following sections.

3.3 ICT4D frameworks and related conceptual elements

An extensive literature survey uncovered sixteen major different implementation frameworks. The author's observation is that each of the frameworks was developed for a specific purpose with its own elements; and the frameworks are tabulated in Table 3.1 below:

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Table 3.1: ICT4D frameworks

No	**Framework**	**Author(s)**
1	Actor- Network- Theory (ANT)	Michel Callon 1986, John Law, 1992 Bruno Latour, 1988
2	Capability Approach (CA) (See also Kleine's Choice Framework)	Sen 2000
3	The Choice Framework (to operationalise the capability approach to development)	D Kleine, 2008
4	Technology Acceptance Model (TAM)	Davis, 1989
5	Technology Acceptance Model 3 and a Research Agenda on Interventions	Adams et al., 1992 Agarwal & Karahanna, 2000 Karahanna, Agarwal, Venkatesh *et al*., 2003,2007 Angst, 2006
6	An Extended Design-Actuality Gaps Framework	Heeks, 2002
7	Information Systems and Developing Countries: Failure, Success and local Improvisations	Heeks, 2002; Heeks, 2001 Clemens *et al.*, 1995 Robey and Boudreau 1999
8	Unveiling the modernity bias: a critical examination of the politics of ICT4D (Sen Capability Approach)	Hirscheim & Klein, 1989; Knights & Murray, 1995; Markus, 1983; McGrath, 2002
9	A critical-interpretive analysis framework for ICT4D in government	Alexander & Phahlamohlaka, 2007 Avgerou, 2003; Kunungo, 2004 Odedra-Straub, 2003; Wade, 2002 Young and Ridley, 2003; Walsham, 2001.
10	A framework to guide development through ICTs in rural areas in SA	Mamba and Isabirye, 2014
11	ICT for development (ICT4D) projects in developing countries: A proposal conceptual framework	Ashraf, 2010 Malik, 2010 Mbarike *et al.*, 2005; Meso

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		Datta & Mbarika, 2006
12	A framework for understanding NGOs' potential role in ICT4D Deployment	Gitau, 2009; Diga, 2009; Bidwell & Marsden, 2009
13	A framework and process for designing inclusive technology	Pitula and Radhakrishnan, 2004
14	A holistic e-development framework?	Hanna, 2008
15	ICT4D linking policy to community outcomes	Vaughan, 2006
16	A policy framework to enable beneficial use of ICTs for national and community objectives	Ouna, 2009; Van den Berg, 2009

Appendix F outlines a summarized presentation of the sixteen frameworks that were analysed.

From the analysis of the frameworks it emerged that the frameworks can be meaningfully categorized in terms of their intended application. The grouping of these frameworks can be done based on the following categorization and in no order of prioritization: contextual (environmental) issues, community, politics, ICT projects and technology. For the purposes of this study, a brief discussion of each category and related frameworks is outlined below with the exception of the contextual category which the author would like to discuss comprehensively.

3.3.1 Community

From the fifteen frameworks, only four different kinds of frameworks were associated with the community level.

The “Capability Approach (CA)” as advocated by Sen, (2000) and Zheng, (2009) provides insights in the way in which ICT may promote development (Zheng, 2009). The main development that is enabled (Oxoby, 2009) is that through commodities such as ICT is to build human capabilities; it focuses on individual capabilities in terms of development; the enhancing of individual capabilities through empowerment and knowledge.

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The Choice framework of Kleine (2008) recognizes that Sen's Capability Approach conceptualises development as individual freedom. The framework presents a way of operationalising Sen's Capability Approach and of visualizing the elements of a systematic conceptualisation of the development process (Kleine, 2008).

Vaughan's (2006) framework focuses on the importance of ICT to achieve social community outcomes, rather than being technocentric in nature.

"Actor-Network-Theory (ANT)" as per Callon, (1986), Law, (1992) and Latour (1988) provides a universal theory that includes different actors, human and non-human, and its complexity to form a particular network for a specific action. Furthermore, the use and application of this theory holds the potential to improve the benefits of technology use through enabling communication at local level and influencing political processes as well as establishing appropriate frameworks and processes for designing inclusive technology (Pitula and Radhakrishanan, 2004) to align technology and related tools, resources and skills with the broader socio-economic context of the community.

3.3.2 Politics

During the process of literature review as summarised in appendix "F", three frameworks emerged that relates to policies which are mainly influenced by the politics that shape ICT4D in developing countries.

Firstly, a critical approach is adopted by amongst others Hirschheim and Klein (1989), Knight and Murray, (1995), Markus (1983) and McGrath (2002) Its main focus in on political issues and associated power factors that can hinder ICT4D in developing countries.

The second framework is a critical-interpretative analysis framework for ICT4D in government (Alexander and Phahlamohlaka, 2007; Avgerou, 2003; Kanungo, 2004; Walsham, 2001). Application of this framework facilitates the implementation of ICT policies that can be used to facilitate development in rural areas especially in developing countries.

Lastly, the framework by Vaughan (2006) emphasizes the view that ICT4D reflects a national cascading approach to policy. The policy framework is evident in the national ICT policies and strategies of most developing countries that tend to mimic prescribed approaches formulated by multi-lateral agencies.

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3.3.3 ICT projects

From the fifteen frameworks, three different kinds of frameworks were associated with the ICT projects.

The "Information systems and developing countries: failure, success and local improvisation framework" (Heeks, 2001; Clemens et al, 1995; Robey and Boudreum 1995) focuses on assessing the success and failures of projects in developing countries.

The proposed conceptual framework guiding ICT4D projects in developing countries(Ashraf, 2010; Malik, 2010; Mbarike et al, 2005) examines the information chain model as basis for the improvement of understanding the process of outcome from impact of ICT4D projects from the participants' perspective.

The proposed policy framework of Ouna (2009) and Van den Berg (2009) has as its focus the enablement of "beneficial use of ICTs for national and community objectives" (Ouna, 2009; Van den Berg, 2009). It mainly defines the key elements that will enable and support social development projects in the field of ICT.

3.3.4 Technology

From the fifteen frameworks, three different kinds of frameworks were focused on the technology adoption and use projects.

"Technology Acceptance Model (TAM)" (Davis, 1989) the framework mainly focuses on determining the actual system usage, attitude, behaviour and perceived use of systems. Following on this the "Technology Acceptance Model 3" (Adams, *et al*, Karahanna Agarwal, 2003) has its main focus in on the adoption of IT and its use by all different stakeholders.

"An extended design-actuality gaps framework" by Heeks (2002) was developed to determine the gaps between the design of Information Systems (IS) and the actual for policy makers.

3.3.5 Contextual (environmental) issues

During the frameworks analysis process in the literature, only two frameworks that are associated with context ("environment") were found. As stated earlier, the author will discuss the relevant frameworks more comprehensively, given that the rest of this thesis is focused on a framework that can be used to link context to ICT implementation.

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3.3.5.1. "A framework to guide development through ICTs in rural areas in SA" as advocated by Mamba and Isabirye, (2014).

3.3.5.1 Understanding the context under which it was established and the conceptual basis of the framework.

The framework mainly focuses on highlighting the importance of understanding the local context of the location where ICT4D project will take place as well as the enabling environment. A contextual (environmental) study is intended to assist project implementers in understanding the local challenges, potential risks, success stories, and contributory factors towards failures. In terms of ICT4D, there have been efforts across the developing countries to apply ICT as enabler to various community related initiatives.There is a common understanding amongst ICT4D practitioners and researchers that ICT4D related initiatives had a significant number of failures (Bailur, 2007; Gichoya, 2009; Harindranath & Sein, 2007; Heeks, 2009). The framework will then guide the contribution of ICTs to the development of rural areas, since there is a lack of frameworks to steer development through ICT in developing countries (Mamba, 2014 & Isabirye, (2014).

3.3.5.1.1 The focus area and intended use of the framework.

The framework was mainly developed to help project implementers to steer away from the problems that were found in rural areas such as poorly formulated policies, ambiguous requirements, lack of understanding of the link between ICT and development, lack of user participation and as well poor project management (Mamba, 2014 & Isabirye, 2014). There are three main focus areas of the framework. Firstly, the framework is concerned with goal determination, which represents the initial stage of a project whereby the feasibility study and consultation take place. Goal determination includes interviewing participants, planning and consultation with all stakeholders in order to determine the goal that will be suitable to all of them (Aspire, 2009). Secondly, the framework is concerned with planning for sustainability. According to Aspire (2009) literature revealed that lack of sustainability measures contribute significantly to the short lifespan of ICT infrastructure, even in projects that were implemented successfully. Some of the reasons for planning in terms of sustainability is that ICT infrastructure and equipments need to be maintained and occasionally upgraded. Hence, both funds and skills must be available to ensure sustainability. Due to the level of poverty prevalent in rural areas community members

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cannot contribute sufficient funds to run and maintain ICTs (Mtega and Malekani, 2009). Secondly the authors also suggest that, in order to sustain the interest of the community, a project must involve the imparting of marketable skills. The skills are important in fighting unemployment and providing access to other economic activities that can be accessed through the use of technology. Lastly, the framework deals with implementation itself, which is characterised by the expression on the importance of appointing champions on projects from both rural community and other stakeholder's organization. Hence, there is a requirement for good coordination with all project drivers, community members and related stakeholders. The framework, according to Walton and Heeks (2011), accounts for local context and enabling project environment. Although rural areas shows similar characteristics of unemployment, low literacy, lack of infrastructure, their contexts are not the same and they need to be addressed according to their unique characteristics.

The viewpoint represented in this framework is mainly that of the project co-ordinators who need to ensure project co-ordination and management of main challenges encountered during practical work of each project (Mamba, 2014 & Isabirye, 2014) The project implementers should recognize the importance of user participation in terms of ICT4D project. Understanding the needs of the user is an important factor that contributes to the elimination of design-reality gaps.

The unit of analysis for the framework is based on rural areas in South Africa, specifically projects implemented under the leadership of the municipality (local government) in the Eastern Cape Province of South Africa. For example, the Alice regeneration project was implemented in a local district municipality called Amathola, a rural area with a population size estimated at between 11,000 and 14, 000. The area is faced with challenges which are similar to many other rural communities i.e. poor road infrastructure, a high unemployment rate, a shortage of space for living, commercial and community activities (Aspire, 2009). The project was implemented to combat some of these challenges and to establish a clear vision and implementation strategy for development of the rural area.

3.3.5.1.2 Provision of a description of core elements of the framework.

The core elements are mainly categorised into four different categories such as understanding the community needs, as it might be difficult to articulate what the rural communities need from ICT or what they need ICT to perform. Some of the community

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needs will vary from individual to individual based on different conditions such as job opportunities or better living conditions. In the literature lack of user involvement is frequently expressed as a concern related to application of the appropriate technology, project sustainability and project implementation (Dugmore, 2012). The second concern is usage of appropriate technology. Thirdly, sustainability is important, where participants expressed the need for skills development and industry financial backing in order to enable sustainability. The literature shows that there is a need for skilled people that live in proximity of ICT infrastructure in order to provide technical support. In many instances project managers drive projects far away from their proximity (Mtega and Malekani, 2009). These authors further comment on the issue of skilled people, pointing out that typically such persons do not like to reside and work in rural areas. They conclude that lack of skilled human resources has a negative effect on sustainability of ICT4D initiatives. Lastly, project implementation, the fact that ICT4D initiatives usually have several stakeholders driving projects means that there must be efficient method of collaboration and cooperation. The projects should be well planned and executed - external stakeholders are typically also situated some distance away from the projects and therefore the opportunity to make frequent changes is small.

Limitations of the framework, as advocated by Ashraf, Swatman, & Hanisch, (2008) are categorised into three different structures namely firstly a techno-centric approach which gave little focus on societal perspective, where Heeks (2008) alluded that ICT4D is much about both people and technology. He argues that the framework focus on a digital-divide approach which is misleading as it puts emphasis on delivering technology while less emphasis is put on the social context in which the technology is delivered. He further suggested there has to be a new way of viewing the world of poor so as to make ICT4D to be successful (Heeks, 2008).

Secondly, the unfocused local agenda: the framework did not address the local needs of the community as also alluded to by Gichoya (2006). He further elaborated that developed countries do have frameworks that have shown to be successful but the reason that these are not appropriate in developing countries is because they are not designed for this context. For instance Wills (2012) cited an example where he stated that in rural America the literacy levels are high, the value of technology is widely understood, the communities wanted to upgrade from the old technology into new digital technologies and the funding was more available.

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Lastly, difficulty in operationalizing the theory through the framework**.** In relation to this framework Aspire (2009), cited one of his project that it was difficult to implement the project that was on paper only, because the theoretical approach poses a challenge when it comes to taking action or practical approach. The practical approach that will mean laying down a plan that technology will be implemented throughout the community and then educate the community afterwards. It can be seen that community members were educated from the initiation of the project. Hence, the framework did not achieved this approach.

3.3.5.2. A framework based on social capital applied in the mountain regions of Nepal is reported by Thapa, Sein and Saebo (2012).

3.3.5.2.1 Understanding the context under which it was established and the conceptual basis of the framework as well as its focus and its intended use.

The conceptual basis of the framework is Sen's (2000) Capability Approach. This approach has as its basis the increase of freedom through the enhancement of individual capabilities, thus providing individuals with the autonomy to make decisions that can help in achieving desired goals or purposes valued by the individual (Sen, 2000). The main development as cited by Oxoby (2009) that could be achieved through tools such as ICT is to build capabilities. For the purpose of this framework the authors argue that individual capability is necessary but insufficient. This view is supported in literature, for instance by Ibrahim (2006) and Zheng (2009). In addition, social or collective capabilities need to be added not only because such capabilities in and of themselves can foster development, but also because they influence the enhancement and exercise of individual capabilities. Developing collective capabilities requires collective actions the impetus for which can lie in the strength and level of social capability (SC) in groups. ICT can be a catalyst in building, developing and enhancing different forms of SC. The framework also addresses the link between an ICT intervention in a developing country and human development.

The viewpoint represented by the framework, is that of the different groups within the community that are organised through a collective action process. It requires joint commitment which binds group members through a shared and persisting reason to commit and oblige them to act as agreed upon (Gilbert, 2006). Such commitments are often

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implicit and voluntary. The collective action process become visible through social capabilities in three forms namely: bonding which happens in uniform groups (the authors provides the examples of family, friends and neighbours); bridging which takes place between more distant role players (examples provided by the authors include distant friends and institutions with a social focus e.g. religion or civil rights. Linking takes places between persons who are unconnected or who occupy different social tiers and contexts. (Field, 2003). In the study that was conducted in Nepal there were different groups that existed within the community, for example *Aama Samoh* - a group of mothers that works to increase awareness among villagers, *Yuva Samoh* - a youth club that runs the sanitation programs, cultural and social activities, and works to bridge the knowledge gap between younger and older generations (Thapa et al. 2012).

The unit of analysis for the framework was the rural communities of a mountain region of Nepal. The environment was analysed on the basis of a project called Nepal Wireless Networking Project (NWNP) that was aimed at introducing ICT in these rural mountainous areas. The mountain region where NWNP took place was characterized by very low development and poverty (UNDP, 2004). The socio-economic differences among regions resulted in conflicts among different communities and political institutions. NWNP was established by Mahabir Pun (team leader of the project) to foster communication among the different rural areas using wireless connection. Volunteers were able to donate computers and related communication devices that formed the base of the network. Nepal was involved in civil war when the project started; nevertheless the project was a success despite not being supported by the government.

Descriptions of core elements of the framework as per Ibrahim (2006) are social capability (SC), collective capability and collective action. SC focuses on "*the norms and networks that facilitate collective action*" (Woolcook, 2001, p.70). The main emphasis being the main resources are embedded in social networks, it is an appropriate perspective in general to explore the collective or social level of development (Ibrahim, 2006; Lehtonen, 2004; Oxoby, 2009; Putnam, 2000). In developing countries, SC may be influenced by such contextual issues as the prevailing caste structures, nepotism, multiple languages and difficult geographical setting (Bista, 1991). Consequently the pattern of interactions between ICT and SC and its consequences may be different from those in more developed countries.

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Collective capabilities can be defined as "*the freedom of groups of individual's agents to perform a set of agential distinct actions in combination*" (Carter, 1999, in Ibrahim, 2006, p.404). Also, collective capability is not merely the sum of individual's capabilities (Ibrahim, 2006). Rather, there are properties of groups such as trade movements, political parties, civil organisations and so on which individual alone would neither have nor be able to achieve if he/she did not join a collectively (Ibrahim, 2006. P.404). Hence, developing such a capability would require collective action.

Lastly, in accordance to Gilbert (2006, p.4), collective action can act as an engine for collective capabilities in poor communities for various reasons. It can promote income generation and resource sharing, and encouraging poor people to participate in local decision making. It can also influence the formulation of values and beliefs as an outcome of social context. Collective action and collective freedom are mutually reinforcing, where freedom widens the possibilities for collective action, which again allows individual to exercise their freedom (Ibrahim, 2006). In developing countries collective action is collectively organised to exercise individual freedom especially when the powerful forces oppose them (Evans, 2002).

3.3.5.2.2 Limitations of the framework

The literature highlighted that "*it is difficult to operationalize the theory and it has rejected the notion of collective capability*" (Sen, 2000). Furthermore it was one reason that led to criticism of the Sen's concept, and rejection of the notion of "collective capability". In the context of the developing countries especially, rural development is seen as a major weakness. Some of the reasoning is that building individual capabilities presupposes that the individually is not socially excluded (Oxoby, 2009), she might have access to some resources such as political, economics, or social resources that could help to build her capability. Individuals also depend on the social networks to make up for lack of individual resources (Diaz Andrade & Urquhart, 2009; Ibrahim, 2006; Oxoby, 2009). Also when the individual is developed it is not certain that the entire community will also be developed (Ibrahim, 2006). According to Ibrahim (2006), CA is seen as a powerful lens to study human development; it is termed suitable but insufficient and incomplete, but a good foundation to build upon. Developing capabilities requires (and is influenced by) collective action where individuals act together as a group to achieve a common goals. However,

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collective action is not easily achieved: the main challenge is tension between the individual agency and groups (Gilbert, 2006; Ostrom, 2000).

3.3.6 Argument with regards towards research study compare to other framework

1. Although some of the frameworks presented in this chapter focus on community aspects, no framework that could be found in literature that was developed from a grassroot level that explicitly represents a community perspective.
2. In addition there is the need for a framework that represents a holistic view of community development needs in an integrated manner.
3. Thirdly, there is a need for such a framework to be at a sophisticated theoretical level, in order that the interrelationships of development needs and the impact of technology implementation can be assessed and understood.

Development of such a framework through the use of grounded theory for the communities of Dr JS Moroka in Mpumalanga, South Africa constitutes the focus of the further chapters of this thesis.

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CHAPTER 4

RESEARCH METHOD AND DATA COLLECTION

4.1 Introduction

This chapter explains the research method used in the gathering and the analysis of data. Furthermore it introduces the background of Mpumalanga, a province within the Republic of South Africa, as well as that of Dr J.S. Moroka Municipality, the rural area in Mpumalanga Province chosen for the study. It also focuses on research strategy and a sectoral comparison between municipalities within Mpumalanga.

4.2 Research Strategy

This section addresses the approach taken to conduct this research. A Grounded Theory Method was used to conduct the research. This methodology was used because it readily allows the use of data obtained from other related sources such as surveys and studies. The data may be qualitative or quantitative or measured by a combination of quality and quantity (hybrid) (Glaser, 1978). Furthermore, it enables the researcher to develop a theoretical account and simultaneously "ground" the account in empirically obtained information. In the Grounded Theory everything is important and everything is included since everything happens within a context. This methodology makes it possible to discover the relationships between activities, concepts, theories, etc. (Glaser, 1978; Glaser and Strauss, 1967). It further offers a logically consistent set of data collection and analysing procedures which is aimed at developing a theory (Charmaz, 2001). Data may be included from many diverse sources such as that obtained from conducting surveys, interviewing respondents, observing the study subjects and processes; and the analysis of publications or documents (Glaser, 1978, 1998).

The researcher was swayed by a number of considerations towards the use of GTM:

- The researcher could not confirm the prior existence of a similar framework at community level.

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- There was the desire from the side of the researcher for the framework to reflect the "grassroots" views of community representatives, rather than it being conceptually informed by grand social or development theories.
- The researcher had easy access to a significant amount of empirical data.
- It offers a systematic way of exploring the relationship between the different data sets, categories, properties and dimentions.
- For the contextual framework it was essential that the framework was grounded in order to reflect the empirical data for the area realistically.

The Grounded Theory Method would make it possible for the researcher to deal with the large volume of data effectively. The method urges the researcher to focus on the collected data while consciously guarding against preconceived ideas and imposing theories not grounded in the data (Corbin and Strauss, 2007). There are two different views by the two authors (Sarker *et al.* (2001)and Strauss and Glasser (1992)) with regards to pre-existing theory and preconceived ideas. According to Sarker *et al.* (2001), **"***With the grounded theory, the researcher does not need to ignore pre-existing theories as in ethno-methodology***.** *The methodology could be used to complement other theories."*

Nevertheless, the requirement of the developed theory being essentially inductive is clearly stated by Strauss and Glaser (1992:23): *"a well-constructed theory has to meet primary and central criteria: fit for purpose as the methodology allows gathering and analysis of data without influence from preconceived ideas; workable as it observes a structured approach to data collection and analysis."* The author adopts this view of Strauss and Glaser for the purposes of this study.

This chapter is structured as follows: Definition of the Grounded Theory Method is presented to establish a common platform of understanding of the theory; two different approaches by Glaser and Strauss in respect of grounded theory are reviewed; the building blocks of the theory, the related principles, procedures and techniques are elaborated upon; the coding procedures (open, axial and selective) are outlined; and, in conclusion, the data collection method and summary are presented.

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4.3 Defining the Grounded Theory Method

The Grounded Theory approach may be seen as using "inductive reasoning": examination of specific observations and measures, detection of patterns and regularities, formulation of tentative hypotheses which are to be subjected to further investigation and development of generalizations or emergence of theories (Martin and Turner, 1986).
Other attractive features of Grounded Theory Method include:

- It allows data to be included from many different sources and the methods used to obtain the data are irrelevant (Glaser and Strauss, 1967; Glaser, 1978);
- It is very flexible and offers easy ways of exploring relationships between sets of actions and concepts;
- It facilitates exploration of such relationships with elements of data obtained from empirical sources;
- It provides methods for the identification of the structures emerging from the data;
- Easy formulation of theory based on the data collected and the analyses (Charmaz, 2001:245; Eisenhardt, 1989).

Charmaz (2001) offers a broad description of the process being followed: (1) data is collected; (2) the data is analysed using analytical codes; (3) Memoranda are prepared to record the key points to be examined further; (4) further examination reveals the Major Categories; (5) Theory is developed by linking up some of the patterns in the data. These patterns will each have a unique descriptor/attribute such as "behaviour", "process", "likeness", and "same meaning".

The basic principles which apply to all forms of Grounded Theory are: (1) The aim of the approach is the generation or discovery of theory; (2) The researcher has to avoid any preconceived notions in the emergence of the theory; (3) The theory is fundamentally based in phenomenology; (4) The theory that is derived offers inductively formulated entities interlinked in plausible ways; (5) The sources of data used in the derivation of the theory constitute interviews, observations and documentation; (6) Data analysis and data gathering are concurrent, systematic and interlinked (especially in the Glaserian approach); (7) The analysis entails the identification and interlinking of appropriate categories; (8) The development of concepts happen through constant comparison of data (Glaserian

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approach); and (9) The process ends when theoretical saturation is reached, i.e. no new concepts or insights emerge from further data collection and analysis (Dey, 1999, based on Creswell, 1998).

The Grounded Theory Method requires that all existing theories, notions and preconceptions should be disregarded during the process; the repetitive progressive examination of the data collected will lead to the definition of concepts (Urquhart, 2001). A fundamental tenet of Grounded Theory is that the researcher is not biased or prejudiced towards existing theoretical constructs/frameworks explaining the phenomena under investigation. The specific theory being sought will become apparent as the data is being processed repetitively and progressively as described above.

4.4 Building blocks of the theory

The basic building blocks of the theory are *concepts* (Strauss and Corbin, 1998): concepts can either be *descriptive*, i.e. concepts that form the essential components of the theory; or *relational*, i.e. concepts that indicate the relationship amongst the essential parts of the theory (Locke, 2001).

These concepts can be classified into two: **higher order concepts** that are referred to as *Categories*, (the main category or central idea will emerge from these); and **lower order concepts** called *sub-categories*. Categories are groupings of concepts that are characterised by related concepts (Strauss and Corbin, 1998). Locke (2001) and Pandit (1996) affirm the notion of **core category** or "**phenomenon**". Sub-categories relate to a main category and describe the attributes of a specific category (Strauss and Corbin, 1998). The characteristics of a category are called *properties* and each property has a *dimension* (Strauss and Corbin, 1998; Locke, 2001).

A theory is built through a process of identifying relationships between categories using properties and dimensions (Strauss and Corbin, 1998). A substantial number of relationships can emerge based on the evidence contained in the data. In order to develop a grounded theory containing all these elements, various procedures and techniques have been suggested and they are discussed in the next section.

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4.5 The Glaserian and Straussian Approaches

Grounded theory progressed extensively from the initial combined work of Glaser and Strauss (1967). As time unfolded, the two sociologists proceeded to enhance grounded theory independently and individually; hence, there is the Straussian as well as the Glaserian approaches to Grounded Theory (Stern, 1994). Strauss promoted the use of axial coding (Strauss, 1999) whereas Glaser advocated abstract conceptualisation (Glaser, 2002). Stern (1994) points out that the deviation between their approaches started to emerge when the "Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory'' by Strauss and Corbin (1990) was published. Immediately after the release of the publication Glaser "*claimed that Strauss and Corbin (1990) distorted and misconceived grounded theory*" thereby confirming the divergence (Glaser, 1992).

Glaser's comments on Strauss and Corbin are that "*their approach force data and analysis through a preconceived set of questions, techniques and hypotheses, thus preventing an emergent theory from being formed in a sufficiently objective way*" (Neergaard and Ulhoi, 2007). This also led to Glaser writing that "*if you torture the data long enough, it will give-up! This is the underlying approach in forcing preconceptions of full conceptual description.*'' (Glaser, 1992:123).

The two approaches to Grounded Theory, while acknowledging divergence, both contribute immensely to qualitative research methods (Glaser, 1992). Hence, the comparison of the two approaches greatly influenced the author to make an appropriate choice for this research study.

The approach chosen for this research study is largely similar to the approach advocated by Corbin and Strauss. The researcher decided thus for the following reasons: (a) The research method was mainly focussed on socio-technical issues; (b) The research method allowed respondents to put their viewpoints freely without any constraints; (c) The research method allowed and supported the additional inclusion of data to the analysis process; and it allowed the researcher to deal with voluminous amounts of data.

In respect of the role played by *literature* in the chosen Grounded Theory Method, literature was used to indicate correspondence with research findings after the field data was analysed. Please note that this researcher could not enter the field of this research study without, to some extent, being influenced by his prior experience, e.g. this researcher is well versed in the Ndebele language and culture.

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4.6 Grounded Theory Principles, Procedures and Techniques

Three concepts were identified from the Grounded Theory Methodology (GTM) that agree with the interpretive method of research: continuous comparative analysis, theoretical sampling and theory. This section discusses *constant comparative analysis* (Hughes and Jones, 2003).

4.6.1 Constant Comparative Analysis

Constant Comparative Analysis method is a technique that uses continuous comparison of up-and-coming concepts which are derived from data analysis as part of the technique that can be used to discover theory (Glaser and Strauss, 1967). It is supported by the following features:

a) The data that is being analysed is appropriate and the concepts that emerge are compared with one another during the process of analysis.
b) Restrictions that can be observed generally are defined; possible parameters for generalization are set up to perform the following functions: (1) to assess data behaviour and evaluate similarities in the data; (2) to support any theory that exists; (3) to confirm whether other theory exists; (4) to discover and establish a new theory; (5) formulate a new theory if none is in existence (Glaser and Strauss, 1967). Hence, it is anticipated that the collected data once analysed during the *constant comparison process* should “speak for itself” and not be influenced by any active knowledge (Glaser and Strauss, 1967).

In conclusion, comparative analysis allows researchers: to get an understanding of the meaning of events and their happenings; to be sensitive to possible properties and dimensions; to identify further interview questions or required clarification; to move from description to abstraction; to bring the analysis to a more conceptual level; to scrutinize their assumptions (Strauss and Corbin, 1998).

Fig 4.1 is a view of the process followed in performing Constant Comparison during this study. Constant Comparison featured in all stages of analysis, from the initial open coding up to and including the literature comparison. After each interview, the data

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obtained was reviewed for similarities. The data was also compared every time with the Categories, as they emerged, to determine its fit and to check whether the data was confirming the earlier data. It should be clearly stated that this form of comparison is dissimilar to the approach advocated and favoured by Glaser.

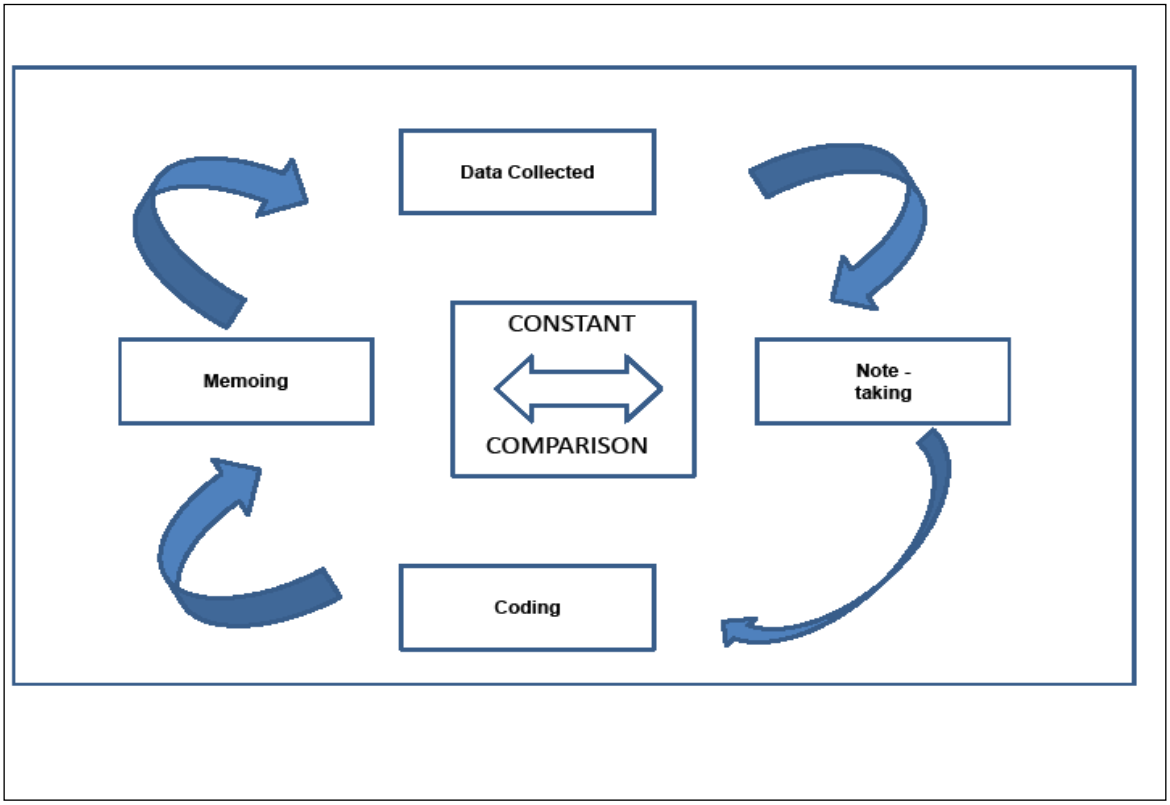

Figure 4.1 Constant Comparison Model (Modified version after Partington (2000))

4.6.1.1 Memoing

Memoing is at the heart of the process to generate the theory (Glaser, 1978). The purpose of memoing is to generate concepts and codify them. These concepts must be defined without restraint, collected in a central store and it must be possible to order them. During the process of memoing reflection is very important because the rule is to write down everything. Hence, Martin and Turner (1986) describe it as a process flowing without restraint and free from critical editing of the ideas.

The process at Dr. J.S. Moroka

Memoing was of great assistance during the process of data collection. As the data was being collected, it was necessary to think over the patterns that became noticeable.

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Therefore, each category was defined after careful consideration of the data and comparison with other information. In this study, the researcher examined the respondents' data that was collected through interviews. Then the researcher looked for inconsistencies. Discrepancies relative to similarities were noted. Each time the questions were asked all respondents' data was analysed and classified according to similarities until all the respondents' data was classified.

4.6.1.2 Classification of Learning Fields

The written matter about a specific field of learning may belong in one of the following three categories (Glaser, 1992):

(1) Non-professional, popular and pure ethnographic description. The written material describes something without offering any conceptualisation or structure. It is of very little scientific value and like raw data must be treated with caution until processed into information;

(2) Professional literature is associated with a substantive study area. It is recommended that the researcher doing a particular study should not to be so deeply focused on the literature before the actual study on grounded theory commences. Strauss and Corbin (1998) pointed out that the researcher should not be constrained by the literature that he or she studied.

(3) Professional literature comprises writings not associated with a study area. It is suggested that the researcher should focus on the literature from the start in order to improve theoretical understanding, elevate the level of awareness that relate to nuances of style, and to encourage sampling theory (Glaser, 1992:31).

He further recommended that professional and the related literature could be perused once the data analysis is underway and the theory has begun to emerge. Then the literature could be consulted and compared with the growing grounded theory. Further, he commented that there could be situations where little has been published on the area of the study or, on the other hand, there may have been lots published.

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For this research study, the researcher noted with interest the three types of literature groupings, mentioned above that were identified by Glaser (1992) and the fact that only the second one was applicable to his study.

Coding Procedures: The three levels of coding proposed by Strauss and Corbin (1990) (open, axial and selective coding) differ somewhat from the two that Glaser and Strauss (1967) initially suggested. In practice the three levels of coding are performed in sequential order (open, axial and selective) and the researcher repeats the process iteratively until a theory emerges. During the articulation of the emergent theory categories are put together with those which have similar patterns in terms of their properties and dimensions, in order to produce an insightful understanding of the research observations (Glaser and Strauss, 1967). "*As one's theory emerges, more useful concepts will remain and less helpful ones will fall into disuse*" (Martin and Turner, 1986). Therefore, theoretical saturation is reached when a researcher has gone through a process of constant comparison and the data has been processed into appropriate categories.

4.7 Coding

Coding involves allocating labels or codes to passages of text/data. These labels or codes identify the emerging concepts and the characteristics of those passages of data (Seaman, 1999). The researcher continues to search for similar or disjointed data until the process is complete. Hence, the process of coding takes time to complete. It requires that the researcher initially reviews sections of the data repeatedly. Finally, the researcher assigns labels to passages of the text. The iterative process continues in order to refine the quality of the codes and to ensure that all relevant data is processed.

4.7.1 Open Coding

Open coding makes use of analytical techniques to allocate identification indicators to the *concepts* that emerged and the associated *categories*, *properties* and *dimensions* (Strauss and Corbin, 1998). Concepts are the basic building blocks used in the construction of the theory. In order to find the concepts in the data to name them, the research data has to be carefully examined, broken down and dissected ("sliced-and-diced"). At the same time, the data has to go through a process of *constant comparison* to allow the researcher

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to get an insightful understanding and to scrutinize differences and similarities in the data occurrences (Strauss and Corbin, 1998). Similar concepts will then be grouped together according to their similarities to form *categories* whereas "*disconnected concepts are used as properties or characteristics of a category or provide a hint for such a characteristic*" (Strauss and Corbin, 1998). One of the most important aspects during constant comparison is to assign names to the concepts and categories for ease of reference. In certain instances the names assigned to concepts and categories are called "in vivo" codes because the names are derived directly from the research data and they are therefore much more relevant (Strauss and Corbin, 1998).

During the process of open coding in this study, 85 different concepts were identified. These were then refined to 36, which were further reduced to the ultimate six main categories.

4.7.2 Axial Coding

After the category and its related properties and dimensions have been identified, two steps follow: (a) fine-tuning of categories and related properties and dimensions; and (b) developing a theoretical framework ascertaining the interrelationships between the different categories (Strauss and Corbin, 1998). Categories play an important role in terms of the frequency of occurrences of data and the conceptualization during the axial coding stage (Locke, 2001).

In order to obtain richer descriptions of properties and dimensions relative to the core categories, the constant comparison process should focus on comparing data occurrences and on the conceptualization of categories, rather than on relating data occurrences with each other. Hence, Locke (2001) supports Strauss and Corbin (1998) in terms of defining axial coding as "*the process of relating categories to their sub-categories*". The term "axial coding" was used by Strauss and Corbin because coding happens "*around the axis of the category, linking categories at the level of properties and categories*" (Strauss and Corbin, 1998). Also, Strauss and Corbin (1998) promote the use of "paradigm model".

According to Brown (2005) and Strauss and Corbin (1998), the *paradigm model* has a core category and regular interactions that provide increments of actions and related consequences. Those categories that have greater influence on the actions/interactions of

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the subject on the phenomenon are called *causal conditions*, while *intervening conditions* are limited to impacting the causal conditions.

"*Contextual conditions are the specific sets of conditions (patterns of conditions), that intersect dimensionally at this time and place to create the set of circumstances or problems to which persons respond through action/interactions*" (Strauss and Corbin, 1998). This can be defined as "*a condition of overriding scope, under which the set of related categories and properties occurs*" (Strauss and Corbin, 1998:65).

In this study, during axial coding, the categories were more clearly defined in terms of their dimensions, properties and relationships. Each category was further analysed for causal conditions, intervening conditions and actions/interaction.

4.7.3 Selective Coding

The main functions of Selective Coding are to develop the categories systematically, to choose a main category, and to kick off the integration of related categories, towards discovering a new theory. Strauss and Corbin (1998) argue that "*part of the process of selective coding is the identification of the central category to which all other major categories relate*".

On the way to integrating the main category with other associated categories, the researcher may resort to using some of the recommended techniques like sorting through the memos, reviewing the data, drawing diagrams or writing a story line (Strauss & Corbin, 1998). A story line may be described as an abstract version of a descriptive story (Pundit, 1996). The refinement of the relationships around the main category may be achieved by the use of a paradigm model (Pandit, 1996; Le Roux, 2001).

Recommended actions to improve the emerging theory: (a) adjust the diagram as part of the confirmation process, (b) close the gaps that were identified during category development, and (c) merge the overloaded categories. These three steps are not executed linearly since there is continuous interaction between the three actions as new data is analysed and new insights surface. The process will come to an end when no further information emerges and that would mean the process has reached a saturation point.

In this study six main categories showed up distinctly during this phase and they were also clearly integrated: Governance, Stakeholders, Leadership, Technology, Economics and

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Social Welfare. These six main categories were revealed by the process of data comparison.

The next paragraph describes the method that was used during the process of data collection.

4.8 The Expanded Lehmann Research Model of Fernandez

The Expanded Lehmann Research Model of Fernandez (Lehmann, (2001) (Fig 4.2), portrays the method of developing Grounded Theory as iterative actions in which the focus narrows progressively on each iteration. The data is collected through the theoretical sampling process, through which the data collection process continues until the research ends. The coding uses three methods, namely: *"open coding"*, *"theoretical coding"* and *"selective coding"*. During "open coding" the categories and processes are identified, the data is decomposed, compared, examined, categorized and conceptualisation takes place. "Selective coding" facilitates the identification of the core categories and the theme of the study. In this phase all the identified categories are linked to the core category via this selective process. The constant comparison of the data and memoing play central roles during the coding processes in all phases (Glaser and Strauss, 1967).

a) Constant comparison, according to Partington (2000), is an iterative process of comparing the data, i.e. a simultaneous and concurrent process of coding. Memoing is the process that generates theory through constant comparison (Glaser, 1978). The emerging theory has a firm basis in reality, and results from the iterative process which exhausts all processing options as it moves towards refining the substantive theory. Hence, the usefulness of such theories is restricted to the knowledge area whence they were derived (Glaser and Strauss, 1967). The extant literature is only analysed once the substantive theory is clear. The extent to which the literature supports the emergent theory will be determined through the analysis of each category (Eisenhardt, 1989; Urquhart, 2001:366).

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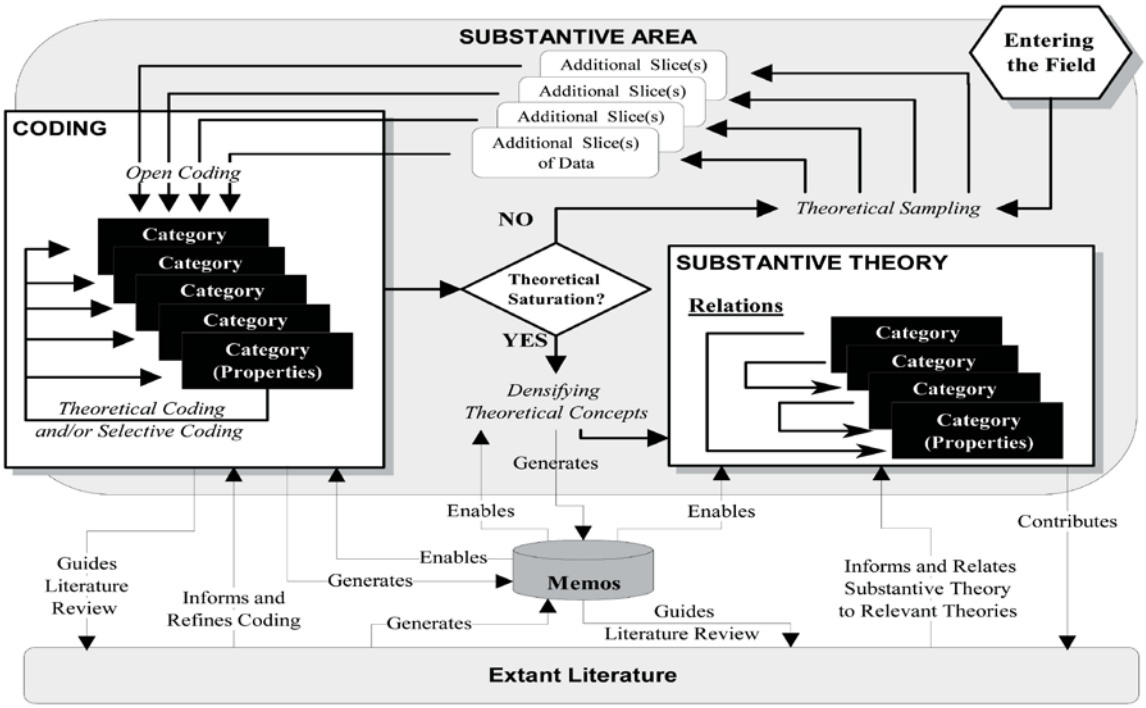

Figure 4.2 Expanded Lehman Research Model of Fernandez (Lehmann, (2001).

The Expanded Lehmann's Model of Fernandez was further adapted to accommodate the needs of this study by adding axial coding as part of the coding processes. Axial coding enables the amalgamation of concepts through the relationships and attributes identified in their properties and dimensions that emerged when the data was decomposed during the analysis or open coding processes.

The addition of axial coding is a result of the fact that, unlike Fernandez who follows the Glaserian approach to GT, the researcher followed largely a Straussian approach and axial coding is part of Straussian approach to GT. The modified version of the expanded Lehmann's research model is shown in Fig 4.3 below. The modified version of the Expanded Lehmann Research Model provides for the following processes to be followed namely: "entering the field", "performing theoretical sampling", "performing coding (open, axial and selective)", "generating theory" and "exploring the extant literature". It should also be clearly noted that data collection was completed prior to commencement of coding procedures.

To derive a theory that is consistent with the empirical evidence, certain association techniques are employed to spot patterns and structures in the data (Glaser and Strauss, 1967; Martin and Turner, 1986). In this whole process the action of producing the theory is closely tied to the data and therefore the product (the theory) should be highly compatible with the empirical evidence (Eisenhardt, 1989).

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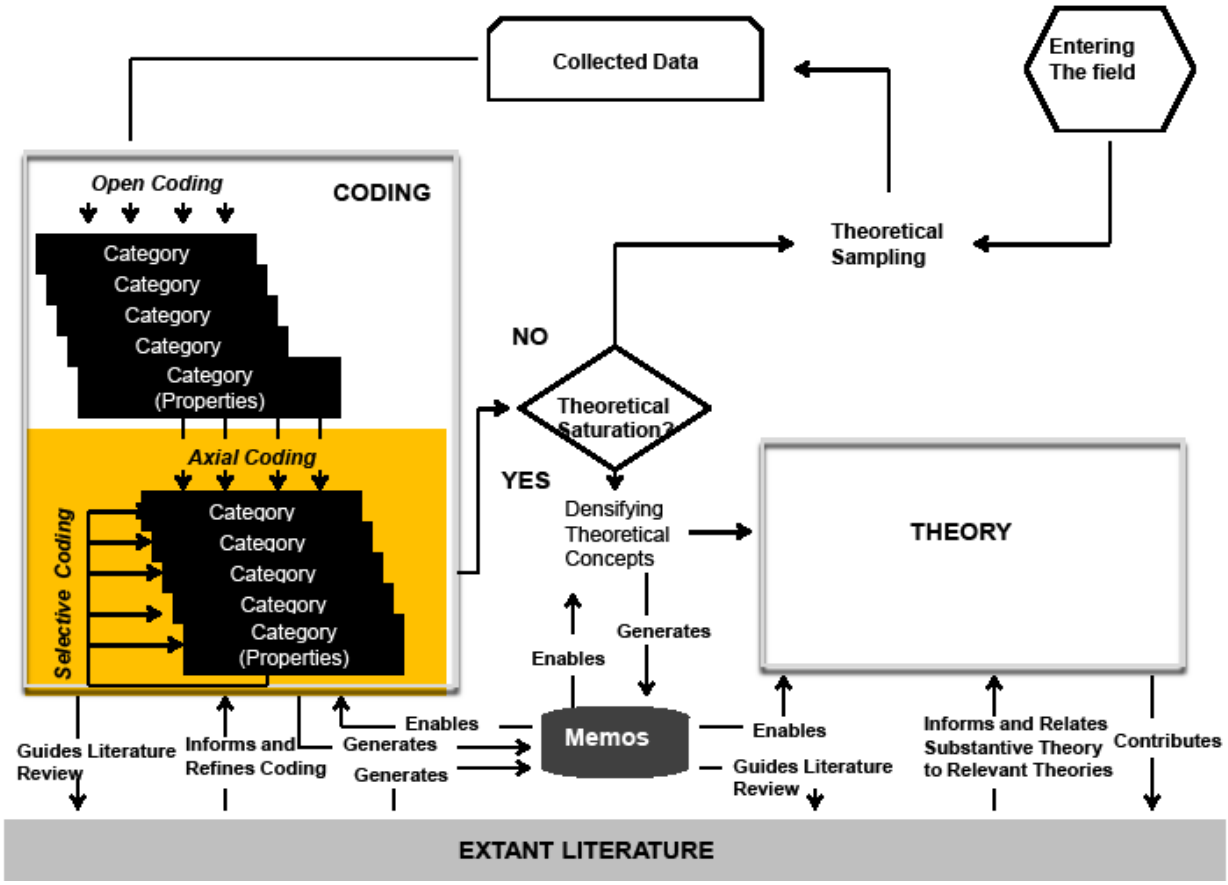

Figure 4.3 Modified version of Expanded Lehmann Research Model of Fernandez (Lehmann, (2001)

4.9 Background and History of the Study Area

4.9.1 Mpumalanga

Mpumalanga, one of the nine provinces of South Africa, is the province in which the focus area for this research is located; eighty percent (80%) of this area is rural. The Department of Economic Development and Tourism studied the ICT sector and found that Mpumalanga had limited access to ICT and that it made very little use of ICT (Government Annual Report, 2009). Only 9% of the households in Mpumalanga had access to fixed line telephones. South Africa has a similar experience to other countries in the world where the number of fixed line telephones dropped. This reduction hampered the growth of the internet and severely restricted the opportunities for establishing general, affordable linkups to information facilities. Mobile communication provided a suitable

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alternative to fixed-lines telephony and that brought some improvement to the communication facilities that were required for creating a connected society with sufficient skills that would be able to participate actively in the economy. By 2007 Mpumalanga only had 4.5% of all the broadband connections in South Africa. According to the Community Survey 2007, published by Statistics South Africa in July 2008, there were approximately 940 400 households in Mpumalanga.

Table 4.1 shows the number of households that had access to communication media such as radio, cellular phones, television, telephone and internet per district in Mpumalanga Province.

Table 4.1: ICT Consumer Penetration within Mpumalanga Municipalities

DISTRICT	Local Municipality	Radio	Cell phone	Television	Telephone	Internet	Total Households
GERT SIBANDE DISTRICT	Albert Luthuli LM	78%	72%	58%	3%	2%	4 636
	Msukaligwa LM	88%	84%	70%	12%	5%	31 751
	Mkhondo LM	80%	76%	60%	6%	3%	29 926
	Pixley ka Seme LM	80%	64%	67%	15%	4%	21 605
	Lekwa LM	86%	81%	76%	16%	7%	26 685
	Dipaleseng LM	80%	68%	69%	14%	6%	12 322
	Goven Mbeki LM	77%	77%	64%	15%	7%	79 191
NKANGALA DISTRICT	Delmas LM	77%	80%	70%	10%	6%	15 129
	Emalahleni LM	80%	81%	62%	15%	5%	105 594
	Steve Tshwete LM	86%	82%	73%	20%	8%	50 449
	Emakhazeni LM	85%	83%	60%	15%	2%	12 127
	Thembisie LM	83%	83%	70%	4%	0%	65 394
	Dr JS Moroka LM	81%	77%	70%	4%	1%	56 874
EHLANZENI DISTRICT	Thaba Chweu LM	70%	77%	54%	8%	4%	28 529
	Mbombela LM	79%	79%	67%	10%	5%	137 353
	Umjindi LM	75%	75%	59%	13%	4%	18 768
	Nkomazi LM	72%	76%	54%	4%	3%	78 252
	MPUMALANGA	**78%**	**77%**	**64%**	**9%**	**4%**	**940 404**

Source: Statistics South Africa (2008)

The situation shown in Table 4.1 indicates that the media that were mostly used by rural communities were radio, cell phones and television. The table shows that in each

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municipality more than 50% of the people used radio, cell phones and television. The majority of the inhabitants of the rural communities owned cell phones with basic features that did not enable them to participate in any internet-related communication. The penetration of the telephone infrastructure deployment in rural communities was limited due to the capital outlay required. The advances in technology encouraged telecommunications companies to concentrate on the deployment of mobile rather than landline facilities to render ICT services. Hence, the internet and the telephone infrastructure were still lagging behind significantly in many municipalities when compared to radio and television.

The next section discusses in more detail the research area where most of the research activities were conducted.

4.9.2 Dr J.S. Moroka

Dr. J S. Moroka is the local authority in the Mpumalanga province that was identified as the ideal rural community for this research. It previously had some unfortunate experiences with unsuccessful ICT projects and its usage of ICT continued to be limited. Organizations such as Siyabuswa Educational Improvement Development Trust (SEIDET) and KwaNdebele Computer Education Centre (KCEC), were, for example, established to introduce ICT related services within that rural community, but with minimal success (Government Annual Report, 2009).

Due to lack of relevant local skills ICT centres were established with the assistance of external consultants such as the University of Pretoria and other relevant institutions. As a result some of the community members were trained in ICT related skills. The establishment of these institutions required that some basic ICT infrastructure was in place, that relevant local skills existed, that related software was installed and so forth. An insignificant number of the community members became acquainted with ICT related services. Hence, the internet penetration was only 1% as indicated in Table 4.1 above.

Some background facts about Dr J.S. Moroka:

Population: The municipality population is about 246 969 people (Statistic South Africa, 2007).

Area: 267 626 hectares;

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Governed by local authority under leadership of a mayor and the Ndebele King

Formerly (pre-1994) governed by Traditional Authorities; the King and local chiefs handled administrative matters;

Formerly, some infrastructure development projects were undertaken under the Apartheid Regime (pre-1994) (Government Annual Report, 2008).

These historical phenomena resulted in a number of challenges that were still in evidence and continued to trouble Dr. J.S. Moroka Municipality: lack of basic services; poor infrastructure; inability to offer attractive investment opportunities owing to its remoteness from major centres of economic activity; inhabitants living far apart; and insufficient competent workers. Roads are in poor condition, in need of repair and upgrading. The absence of reliable transport services meant that it is a problem simply to get to service points like clinics, hospitals and schools. Job opportunities are generally scarce. Inhabitants are forced to depend on state pensions and children's grants. The prevailing poverty meant that inhabitants have little cash to spend and that meant that business is slow and that businesses grew very slowly. Opportunities to attract savings and investments are almost nonexistent and the prospects of establishing a flourishing business sector are dim. Health services are inadequate and competent medical professionals are few and far between.

Patients often travel long distances from clinics to hospitals to obtain medical care. These facilities are usually understaffed and ill-equipped anyway. Communicating with officials is often complicated by inter-personal differences such as language and culture. This reality also affects service delivery and even social development projects (Government Report, 2001).

4.9.3 Sectoral Comparison between Municipalities within Mpumalanga

Table 4.2 below depicts the sectoral growth of Dr J.S. Moroka compared with two other major municipalities within Mpumalanga. It is evident that Dr J.S. Moroka did not compare well with them in most of the sectors including communication services. One of the reasons why Dr J.S. Moroka was chosen for the study was the possibility of exploring the question: "Are there any underlying contextual elements associated with or causing this state of affairs within this rural area?"

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Table 4.2: Dr. J.S. Moroka Sectoral Growth Status

Sector	Moroka	Nkangala	Ehlanzeni
Agriculture	0.4%	1.5%	1.0%
Mining	0.2%	2.8%	0.5%
Manufacturing	0.2%	4.5%	4.7%
Utilities	4.1%	2.9%	2.0%
Construction	1.1%	1.6%	0.7%
Trade	1.4%	2.7%	1.8%
Transport	3.7%	6.8%	5.9%
Finance	2.3%	8.2%	6.6%
Communication services	0.4%	1.6%	0.4%

Source: Statistics SA Global insight 2003, 1(50):172.

A comparison of the employment figures of Dr J.S. Moroka and the same two other local authorities is contained in Table 4.3 below.

Table 4.3: Dr Moroka Employment Status

Labour Force	Moroka	Nkangala	Ehlanzeni
Formal	49.4%	48.1%	18.1%
Informal	14.1%	15.1%	8.2%
Other	6.0%	6.1%	0.0%
Total employed	69.5%	70.2%	26.3%
Unemployment	29.5%	29.8%	73.7%

Source: (Stats SA, 2003)

The comparative employment status table outlined above shows that, in respect of the formal labour force, Dr. J.S. Moroka outperformed the other municipalities; and on the total employed people, the Municipality compared favourably with Nkangala. Given such a situation, the question is: “What could have such a negative impact on the Municipality’s sectoral performance?”

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This consideration supported the researcher's conclusion that this Municipality would be a suitable environment for the research study.

4.10 Data collection

Listed below are the organizations that were included in the study. They were all members of the community and each of them performed a specific role there.

The first group comprised organizations actively engaged in the education and the training of members of the community. Their areas of expertise included ICT skills, community services and general skills. The organizations which were interviewed were Siyabuswa Educational Improvement Development Empowerment Trust (SEIDET), KwaNdebele Computer Education Centre (KCEC), Kusile Self Help Association for the Disabled (KSHAD), Super Web Trust (SWT) and Nogijima CC. At least two directors and one project manager per organization were interviewed. The directorship within each entity varied from a minimum of three to a maximum of five members. Project managers and directors were selected for interviews based on their depth of knowledge about and their understanding of their respective organizations' policies, processes and procedures, and governance.

The second group consisted of religious organizations which were active in church-related activities, such as preaching the Gospel and launching charity projects through the church. The charitable projects included feeding schemes, distribution of clothing and blankets, and training people in self-sustaining initiatives like gardening and sewing. The church organizations included the Apostolic Church, the Methodist Church and the Faith Mission Church. Each of the organizations was represented by the appropriate leader in charge of the specific project and the pastor who was the overall co-coordinator for that organization/church.

The third group included organizations involved in politics in the domain of the study. The secretary general and/or president of each structure provided the information since they were responsible for the overall running of the organization. These organizations were categorized into:

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- Civil organizations which formed part of the labour movement, such as the National Education Health Allied Workers Union (NEHAWU) and the South African National Congress Organisation (SANCO).
- Political parties such as the African National Congress (ANC), the Pan African Congress (PAC), the Democratic Alliance (DA) and other smaller local parties such as Sindawonye MaNdebele.

The fourth group comprised the structures with traditional authority, led by their leaders, i.e. the kings and the chiefs. These structures were the custodians of their traditional and cultural affairs. These structures were combined based on the language they spoke, their cultural traditions/practices and where they were situated. King Ngwenyama Mayisha II, Chief P Mahlangu and Chief S Mgwezani were specifically interviewed.

The fifth group was made up of those economic structures that were mainly involved in business related activities and their main focus was on the agricultural services provided to people who practice small-scale farming in their own backyards. These economic structures also assisted small businesses to grow into big corporate enterprises. The organizations included the National African Federated Chamber of Commerce (NAFCOC), Small Medium African Farmers Union (SMAFU) and stokvels (informal community institutions for investing money on a small scale). Most of them were represented by their managers and/or chairmen who are the main leaders within their structures.

The sixth group consisted of groups of professionals. These were made up of a minimum of two people representing each of the professions: nurses, legal practitioners, medical professionals, law enforcement officers, and administrators. Non-professional individuals were also interviewed, namely, those people who did not have any specific profession/qualification/experience/skill and may in some cases be called “unskilled labour”.

The selection of the different organizations and people was considered to be representative of the community and broad enough for the purposes of the research study. The research was limited to those organisations and individuals that operated within Dr. J.S. Moroka Municipal area.

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During the interviews, the respondents were asked to provide their input in response to the open ended questions. The exact wording of the questions was varied during the interviews based on the particular situation that was being addressed. The collection process continued to collect the data until the end of the research project. As a result of this the emergent themes became gradually clearer, more data was collected continuously, and new opportunities were observed.

The questions were grouped according to categories, for example:

Question:

"Are there any challenges facing policy developers, implementers and monitors when developing ICT policies in South Africa?"

"In your opinion, how can these major ICT challenges be resolved?"

"Are you aware of any specific or formal processes that are followed when developing ICT policies in South Africa and to what extent are the processes effective?"

"When ICT policies are being developed for rural areas, who do you believe decides on what policies need to be formulated?"

And so on.

None of the questions were pre-set: they were asked depending on the responses received from the respondents.

An unabridged version of the questionnaire is attached as Annexure "A".

Interviews were conducted according to the different roles of the respondents and ordinary people (users) impacted by this research. Before the interviews were conducted, the leaders were informed by letter of the investigation, its purpose and the process that was to be followed. The interviewees were people with different backgrounds and cultures, but most of the interviews were conducted in the Ndebele language since it was the home language of most of the interviewees

Since the researcher's home language is Ndebele, he was able to communicate with Ndebele speaking interviewees with ease. Other languages were employed as required to accommodate those interviewees who did not speak the Ndebele language. Table 4.4 contains a list of the organizations interviewed and their roles in the community.

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Table 4.4: Organizations Interviewed

Organization	Roles	Location
SEIDET	Educating community in ICT, general ICT services	Dr. J.S. Moroka
KSHAD	Educating disabled people	Dr. J.S. Moroka
KCEC	ICT training	Dr. J.S. Moroka
Super Web Trust	Community services	Dr. J.S. Moroka
Nogijima CC	General training	Dr. J.S. Moroka
Church Representatives		
Apostolic Church	Church services	Dr. J.S. Moroka
Methodist Church	Church services	Dr. J.S. Moroka
Faith Mission Church	Community and Church services	Dr. J.S. Moroka
Political Structures		
ANC	Political role	Dr. J.S. Moroka
Sindawonye Party	Political role	Dr. J.S. Moroka
PAC	Political role	Dr. J.S. Moroka
DA	Political role	Dr. J.S. Moroka
Other parties	Political and civil society	Dr. J.S. Moroka
Traditional Structures		
Ngwenyama Mayisha II	Traditional role	Dr. J.S. Moroka
Chief Mahlangu	Traditional role	Dr. J.S. Moroka
Chief Mgwezami	Traditional and civil society	Dr. J.S. Moroka
Nduna Sithole	Traditional role	Dr. J.S. Moroka
Economic Structures		
NAFCOC	Business role	Dr. J.S. Moroka
SMAFU	Agriculture services	Dr. J.S. Moroka
Stokvels	Financial scheme	Dr. J.S. Moroka
Community		
Professional individuals	Different professions	Dr. J.S. Moroka
Non-professional individuals	Community needs	Dr. J.S. Moroka
Other	Other	Dr. J.S. Moroka.

Source: Lotriet and Mashinini (2011).

The information obtained during the discussions was treated as strictly confidential and was never shared with other interviewees. The information was noted on

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recording sheets and the whole session was recorded using an electronic recording device. Further follow-up sessions were scheduled as required.

After the session, the information went through a *continual comparison* process. When, for example, the responses being received to a specific question were the same (or very similar) in every interview, then that question had reached the saturation stage. In this way interviews were recorded and the answers compared with the questions asked and other answers received previously, until the saturation stage was reached. The next step then was to analyse the information further by using the Grounded Theory Methodology.

4.11 Summary

This chapter presented the methodology employed in the study and justified the approach to the research project. The study was undertaken to address an apparent need for a suitable theory, based on practical evidence, in the context of the rural community. This study required the use of a scientific research approach and methodology which suited the specific circumstances of the case. The approach to developing such a theory offered by the Grounded Theory Methodology was explained and the way in which it was used in this case was outlined.

The Grounded Theory Method as employed by the author, proved to be highly suitable for studying social issues without difficulty and it guided the researcher to be orderly, well organised and systematic. The method was in no way restrictive as:

- The respondents were able to articulate their viewpoints without any constraints, just as proposed by Myers (1997);
- It proved to be a user-friendly method that permitted the inclusion of various input documents throughout the process of data analysis. It allowed the incorporation of existing theory thereby facilitating and augmenting the emergence of the theory (Eisenhardt, 1989); and
- It easily handled the voluminous amounts of data since the main purpose of the method was to discover the patterns in the data to identify the main concepts (Glaser, 1978).

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The next chapter describes the data analysis of the collected data, presents the research model and discusses several methodological aspects.

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CHAPTER 5
DATA ANALYSIS

5.1 Introduction

This chapter describes the development of the substantive theory and presents the theory and the findings from the fieldwork. The process that was used with respect to data analysis was, as described in the previous chapter, a hybrid one. Figure 4.2 from the previous chapter also depicts the modified version of the Expanded Lehmann Research Model. It also emphasizes the following facts: (1) that data was collected continuously through different groups until the saturation was reached per grouping and it had reached a final stage but, (2) iterative comparison was also done to the point of theoretical saturation; and (3) that substantive theory formulation was part of the data analysis process.

This chapter is structured as follows: application of open coding, axial coding, selective coding and conclusion.

5.2 Open coding

5.2.1 Interviews

Questions were posed during interviews and the responses that were gathered constituted the collected research data. The data was documented on recording sheets together with memos highlighting the insights gained from the replies of the respondents. Below is a typical example of the process that was followed:

Table 5.1: Example of a question asked and the response received (Verbatim)

Question posed:	Question 1: In your view, are there any challenges facing people who are staying in rural areas?
Response:	Yes, there are major challenges that drastically affect people in rural areas, such as lack of employment. There is a lack of technology that could be deployed in rural areas, it is not easily supported and maintained. The daily usage of the related technology also requires money to “make it work”. Food and other basic needs are the key priorities if one had a

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	choice on how to expend funds.
Memo: Concepts captured from the responses	▪ Lack of employment ▪ ICT support and maintenance requires money ▪ Basic needs such as food essential.

Appendix B gives an example of interview questions asked and corresponding responses recorded during the interviews. In total twenty-three organisations were interviewed as outlined in Table 4.4.

5.2.2 Emergence of concepts and groups

During the *open coding* process the data was carefully examined and discrete *concepts* were identified. The emerging concepts were compared and those that appeared similar or related were grouped together and *labels/codes* were assigned to them as is illustrated in Table 5.2 below.

Ten labels/codes and 85 concepts emerged during data analysis. The labels/codes included: infrastructure, community basic needs, community intervention, economics, services, education, governance, stakeholders and leadership in rural areas. Table 5.2 was generated as follows:

At the outset, a concept from the code notes was examined and classified under a label.

Iteratively, the next concept was then picked up from the memos and compared against existing labels or codes. The concept was then put into an existing group of similar concepts or a new label/code was generated in a case where none existed that had similar or related characteristics.

The process continued until all concepts from the cards were considered and linked to appropriate labels/codes.

For example, the code notes relating to Question 1 above in Table 5.1, showed three different concepts, namely:

- Lack of employment which was put under the label/code titled *community basic needs*;
- ICT support and maintenance requires money was recorded under the label/code titled *infrastructure*; and

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- Basic needs such as food are essential was recorded under the label/code named *community intervention.*

Table 5.2 Groupings that emerged from the analysis process. (Verbatim)

Groups	Concepts
Infrastructure	Poor road infrastructure, Poor infrastructure, Lack of electricity, Countering monopoly, Lack of ICT infrastructure, Lack of hardware, Technology deployed, Lack of lighting, No power, no ICT services, Skewness of ICT infrastructure, Technology maintenance and support needs money, Lack of ICT related infrastructure, Monopoly and Telkom.
Community basic needs	Job opportunity, Poverty, Migration of people from rural to urban, Lack of employment, Unemployment, Lack of job opportunities, Inability to create jobs, Poverty, No food, Unemployment impact.
Community intervention	Community acceptance of projects, Priority on needs, Lack of marketing understanding for projects, Children grants don't meet needs, Priority of spending, Project misalignment, Do not address the needs of the community, Basic needs such as food is essential.
Economics	Urban and rural gap, Level of economic activities, Lack of economic activities, Willingness to invest in rural areas, Attraction of investor, Lack of money, Economies of scale and Poor use of technology
Services	Better services, Frequency of usage of technology, Better ICT services, Cost associated with distance and services, Distance to services, Affordability of services, Utilization of ICT services, Product and services relevance, Telephone services.
Education	PIT not used because of literacy level, Level of education (low vs. high), Literacy level is low, Lack of understanding of product and services, Rural people not educated.
Governance	Lack of regulations, Inappropriate structures, Lack of community structures, Lack of proper accountability, Compliance to all laws, Lack of policies, No adhere to ICT policies, Involvement in community project, Well defined roles and responsibility, Information availability.
Stakeholders	Lack of initiation process, Alignment of policies, Involvement of communities in policy development, Non-participation in decision making policies, No overall consultation, Effectiveness of policies, Lack of skill for policy development, Different spheres of policy development, No shared views.
Leadership in rural areas	Interference of political leaders, Lack of participation in decision making,

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	Leadership stability chaotic, Allocation of resources lacking, Diverse political parties interest, No integrated strategy, Traditional leadership dominated, Funds not allocated.

The *concepts* were further broken into sub-groups with their properties and dimensions. Table 5.3 is a typical example that shows the concepts that related to the label/code titled infrastructure.

Table 5.3 Responses and concepts related to the code titled Infrastructure. (Verbatim)

Poor Road Infrastructure	Lack of Lighting
Poor Infrastructure	No Power, no ICT Services
Lack of Electricity	Skewness of ICT Infrastructure
Countering Monopoly	Lack of Electricity
ICT Infrastructure Provider -Telkom	Technology Maintenance and Support
Lack of Hardware	Lack of ICT Related Infrastructure
Technology Deployed	Monopoly and Telkom

Furthermore, all the concepts that were grouped into one label/code, Infrastructure, were further grouped into four sub-groups: *ICT infrastructure*, *electrical infrastructure*, *road infrastructure* and *technology*. Each sub-group then had all the elements that described and qualified the sub-group

Table 5.4 shows the group called infrastructure, all its sub-groups and their related descriptions and qualifications.

Table 5.4 The Group called Infrastructure

Sub-category	Property and Dimension	
ICT Infrastructure	Availability of HW/SW	[Y/N]
	Service Provider	[Monopoly/Not Monopoly]
	Service Provisioning	[Urban/Rural]

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	Service Alignment	[Aligned/Not Aligned]
Electrical Infrastructure	Electricity Available	[Y/N]
	Impact on ICT Services	[Negative/Positive]
Road Infrastructure	State of Road Infrastructure	[Good/Bad]
	Existence of Road Infrastructure	[Adequate/Inadequate]
Technology	Deployed Technology	[Relevant/Irrelevant]
	Maintenance of Technology	[Adequate/Inadequate]
	Support of Technology	[Adequate/Inadequate]

Appendix C presents the full details about all the groups, the sub-categories, their properties and dimensions.

5.2.3 Emergence of Categories

During the first iteration of open coding 85 concepts were identified through constant comparison; subsequently the 85 concepts were consolidated and refined into 36 discrete concepts. There were 13 higher order Categories that were identified: governance, technology, social welfare, policy development, stakeholders, approach, communication, ICT value, compliance, research and development process, human resources, rural society, economics and leadership in rural areas (detailed in **Appendix D**).

Through a process of constant comparison, identification of similarities and careful analysis these 13 categories were reduced to six main Categories: Governance, Leadership, Social Welfare, Economics, Technology and Stakeholders. Sections 5.2.4 to 5.2.9 contain detailed discussions of each of these categories.

5.2.4 Technology Category

Table 5.5: Technology Category, its major properties and corresponding dimensions

Category	Sub-category	Properties and dimensions
Technology	ICT Infrastructure	• Availability (Yes/No) • Service Provider (Monopoly/Non-monopoly) • Service Provisioning (Rural/Urban) • Services (Aligned/Misaligned)
	ICT Systems	• Deployed Technology (Relevant/Irrelevant) • Maintenance (Adequate/Inadequate)
	Electrical Infrastructure	• Availability (Yes/No) • Impact on Services (Negative/Positive) • Telephone Services (Accessible/Not Accessible)

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	Service Types	• ICT Services (Limited/Unlimited)
	Research and Development (R&D)	• ICT Innovation (Existant /Non-existant) • Skills Level (Low/High)

The Technology Category (Table 5.5) emerged as one of the six main categories from the initial 13 high order categories. This category had five sub-categories, twelve major properties and the respective dimensions, namely: ICT Infrastructure, ICT Systems, Electrical Infrastructure, Service Types and Research and Development (R&D). Each of the sub-categories has properties and corresponding dimensions, for example the sub-category ICT Infrastructure had four properties and dimensions:

- Availability – ICT Infrastructure in rural areas could be available or not available;
- Service Provider – ICT Infrastructure service provider could be a monopoly or oligopoly;
- Service Provisioning – Service provisioning through ICT Infrastructure could be available for rural communities or urban communities; and
- Services – Services rendered through ICT Infrastructure could be aligned to priorities of rural communities or misaligned to priorities of rural communities.

The sub-sections below focus on salient sub-categories within the Technology Category.

5.2.4.1 ICT and Electrical Infrastructure

Electrical infrastructure was core in the provisioning of basic ICT services that were deemed necessary by rural communities. For example, telephone services as well as ICT infrastructure were highly dependent on the availability of electrical infrastructure because the devices used need electrical power to operate. Basically, the non-availability of electrical and ICT infrastructure within rural communities resulted in unavailability of ICT services to those rural communities. Thus, the non-availability of electrical infrastructure had a negative impact upon affected rural communities with respect to the ICT services that were needed and had to be rendered to or received by those rural communities.

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The lack of either the electrical or ICT infrastructure or both was sometimes due to monopolistic tendencies of the service provider or service providers, as return on investment was low when such projects were undertaken in rural areas. Rural communities were generally geographically dispersed and spread out and the inherent challenges did not make it possible for economies of scale to be achieved. Therefore, providing ICT infrastructure in the rural communities became challenging or a near impossibility due to the lack of service providers who would provide such services at competitive prices.

5.2.4.2 ICT Systems and related services

In general, ICT systems were there to support and improve the services rendered to rural communities. For example, there were highly advanced systems that could be used by the communities to improve their living conditions such as electronic learning, electronic health, electronic agriculture and so forth. Even though such systems may have been available, it became unattractive to deploy these systems due to the lack of basic ICT infrastructure. In certain instances some of the systems were deployed but proved to be unsuitable due to the initial lack of proper research and development and/or the absence of feasibility studies. In many instances research and development did not consider the needs of the community, related ICT systems, and the skills type that is required to operationalise ICT systems. However, even though some of the systems may have been available, their support and maintenance became an issue due to the lack of local skills and the unavailability of resources to provide such as services.

5.2.5 Governance Category

The Governance category has six major sub-categories and twelve properties and their corresponding dimensions.

Table 5.6: The Governance Category, its major properties and associated dimensions

Category	Sub-categories	Properties and dimensions
Governance	Structures	Relevance (Y/N) Involvement (Y/N)

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	Regulations	Existence of Regulations (Available / Unavailable) Adherence to Policies (Y/N)
	Roles & responsibility	Accountability (High/Low) Defined Roles (Clear/Unclear)
	ICT Regulations	. Accessibility of Information (Y/N) . Compliance to Regulations (Comply / Not Comply)
	Policy Intervention	. Requirements Alignment (Y/N) . Outcomes (Attended/Unattended)
	Compliance	. Culture of Compliance (Y/N) . Adoption of culture (Y/N)

5.2.5.1 Regulations

Governance structures were either irrelevant or non-compliant due to the lack of appropriate regulations. In some instances where the regulations were in existence, they did not support the needs of the community and the regulations were outdated and not applicable to the priorities at hand. As a result, South Africa as a country established many agencies for the implementation and/or enforcement of different policies and regulations. For example, the State Information Technology Agency (SITA) was formed to regulate the procurement of ICT related products and services for the entire government. However, because of the diversity, complexity and uniqueness of the different state departments some regulations were irrelevant as the “one size fits all” approach was not appropriate at all. The fact that a rural community was also very different from the urban communities suggested that regulations that applied to ICT services for the rural community must not be the same as those for urban communities. Hence, some of the policies and regulations were not adhered to at all. As a result the culture of non-compliance was predominant within the rural community and this non-compliance to ICT regulations resulted in information not being accessible to key users or to the community. To alleviate the situation specific policy interventions existed that could have addressed some of the gaps.

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5.2.5.2 Structure and their roles

The community had various structures that were established to perform different roles and activities. Most rural communities had both informal as well as formal structures.

Common informal structures, addressing basic needs, included: stokvels, funeral schemes, social clubs, developmental structures and so forth.

Formal structures that existed within the rural community often encompassed entities such as rural community councils and political councils. In some instances the formal and informal structures were not involved in the establishment of community initiatives and were not engaged by the related structures that drove these initiatives. If and when they were engaged, it was at a minimal level and they were often marginalized. Furthermore, some of the structures that had to deliver these community initiatives did not have clearly defined roles and responsibilities. As a result, there was a lack of accountability for the projects.

In addition, at the ground level, very few inhabitants participated in the community-related projects. The outcome was a lack of support for the established or implemented projects due to the lack of participation from the beginning. Since the roles and responsibilities were not so clearly defined from the beginning a culture of non-accountability was promoted. Also, most of project deliverables were not aligned to the needs of the community and these needs ended up unsatisfied or only partially addressed. Due to some of the above mentioned issues, the community became indifferent to projects that were meant to alleviate their situation.

5.2.6 Social Welfare Category

Table 5.7 shows the category Social Welfare with its eight sub-categories, 20 properties and related dimensions.

Table 5.7: The Social Welfare Category - its major properties and related dimensions

Category	Sub-categories	Properties and dimensions
Social Welfare	Population	Population Growth (High / Low) Mortality Rate (High/Low)

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	Health	Transmission of Disease (Low/High) Awareness campaign (Y/N) Medical support (Available/not available) Doctors (available/not available)
	Social Behaviour	Alcohol Abuse (Low/High) Emotional State (Stable/Unstable)
	Literacy	Literacy Level (Low/High) Use of Technology (Low/High)
	Crime	Crime Level (Low/High) Crime Rate (Low/High)
	Employment	Jobs (Available/not available) Movement (Stay/Go) Location of Opportunities (Rural/Urban) Job Creation (Low/High)
	Education	Level Of Education (Low/High) Location (Urban/Rural)
	Poverty	Food (Affordable/Unaffordable)
	Projects	Community Acceptance (Y/N) Needs- Focused (Y/N) Priorities (Aligned/Misaligned) Strategy (Good/Bad) Spending (Relevant/Irrelevant)

5.2.6.1 Employment

The unavailability of jobs within a rural community encouraged community members to migrate to better employment opportunities. Job creation was at its very lowest level. Some of the jobs that were available were informal in nature rather than formal. Since the rural community was subjected to unemployment, the situation resulted in high rates of poverty and crime. Even those people who were employed received meagre wages and because of their low income, most of the inhabitants could hardly afford food.

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5.2.6.2 Social Behaviour

High alcohol and substance abuse, as a solace, made the social behaviour unstable. Entertainment facilities were minimal, if not non-existent in the rural community, and as a consequence the community members resorted to substance abuse. Teenagers were the most affected, in a negative way, especially with regard to drug and alcohol abuse. For example, the abuse of drugs such as “Nyawupe” encouraged the teenagers to resort to stealing in order to continue to support their addiction. When some of the community members abused drugs and/or alcohol, this led to a rise in the mortality rates (it also had a negative impact on population growth), caused by accidents or their sub-standard behaviour.

5.2.6.3 Education

There were low levels of education for the people who stay in the rural areas. In some instances, there were no schools in the neighbourhood and students needed to travel at least 16 or more kilometres to school. The government took some initiatives to provide free transport from homes to schools. Students were discouraged from undertaking such trips, especially on foot. As a result, there were low levels of literacy which also led to low usage of the ICT related services. Poor service delivery was exacerbated by the lack of supporting ICT related systems deployed. Due to the lack of ICT related infrastructure students could not access E-learning programmes either via video conferencing or via other suitable media. The usage level of technology was also so low because the users in the community did not have sufficient computer skills.

5.2.6.4 Health

Rural communities were often situated in very remote sites where there was no access to health related facilities such as hospitals and clinics. Also, the unavailability of doctors, as well as the doctors’ reluctance to work in rural areas, and the unavailability of medical support within rural communities resulted in high levels of disease transmission. In some instances lack of awareness of family planning and other health related issues resulted in high levels of population growth and high rates of mortality. There already

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existed e-health related services that could be used to improve health related conditions in rural communities, for example tele-medicine. However, due to the lack of ICT related infrastructure and systems, the situation posed serious challenges with regards to the implementation and the maintenance of such ICT dependent initiatives.

5.2.6.5 Community projects

Most of the projects that were established within rural community were not accepted by the members of the rural community because the projects were not seen to address their needs. In many instances priorities by the Government were misaligned with those of rural communities. Some of the strategies that were meant to be the route map for the community's development were not derived from an insightful understanding of the needs of that rural community. Furthermore, the process of developing the strategies did not engage the community members. Therefore, there was no alignment of the strategic objectives of the Government with the needs and priorities of rural communities - thus resulting in fruitless expenditure.

5.2.7 Stakeholders Category

Table 5.8 shows the Stakeholders Category with six sub-categories, 16 corresponding properties and dimensions.

Table 5.8: The Stakeholders Category, its major properties and related dimensions

Category	Sub-categories	Properties and dimensions
Stakeholders	Policy Development	Development (Effective/Non-effective) Initiation Process (Available/Unavailable)
	Policy implementation	Implementation process (Good/Bad) Implementation strategy (Available/not available) Implementation Skills (High/Low) Roles (Defined/Undefined) Accountability (Y/N)

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	Policy monitoring	Monitoring measures (Available/Unavailable) Evaluation measures (Available/Unavailable)
	Capacity to Develop Policies	Capacity Availability (Y/N) Effectiveness (Effective/Non-effective)
	Consultation process	Meetings (Effective/Ineffective) Understanding (Y/N) Consultation (Y/N)
	Approach	Applicability (Worse/Better) Involvement (Bottom/Top)

5.2.7.1 Approaches to policy development

The Stakeholders Category demonstrated the lack of capacity of the Government to develop policies, which resulted in an ineffective policy implementation process. For example, in rural areas the policies were being developed by external consultants that did not have an understanding of the rural communities. Some of the consultants applied a desktop approach to developing the policies: a top down approach that produced policies that were irrelevant to the priorities and needs of rural communities. In certain instances the consultation process, in an attempt to ensuring proper communication, used various channels of communication such as Internet meetings and “word of mouth”. Gatherings such as “imbizo” meetings were used as formal ways of communicating. However, the issue was that such meetings were usually attended by the members of political entities, especially of the ruling party, rather than rural community members. The fact was that the community was made up of different, diverse community structures and political organizations. As a result, the rural community ended up without a common vision and without common goals.

Due process required that some of the policies had to be published in Government Gazettes before promulgation as part of the formal consultation process. In most instances such notifications were put on the internet, an ICT service which was not accessible to many members of the rural communities. The language used was also unfamiliar or even foreign to many rural community members, thereby promoting exclusion of such community members who could comprehend neither the content nor the context of the very policies meant to introduce interventions to alleviate their plight.

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5.2.7.2 Policy development life cycle

Policy development, especially the initiation stage, did not involve all relevant stakeholders. The initiation process where there is a greater understanding about what the rural community required was almost nonexistent. As a result the development process became ineffective by not addressing the needs of the community. Policy implementation strategies were non-existent and this invariably resulted in a bad implementation process. This could have been the result of low levels of implementation skills, roles and responsibilities not having being clearly defined, and a lack of clear accountability. A lack of consultation with the community and the inability to understand the needs of the community resulted in ineffective meetings and because the adopted approach was top-down, uninformed decisions were made. Lastly, policy implementers were unable to monitor and evaluate policies - this situation led to cases of failure in the implementation of the policy.

5.2.8 Economics Category

Table 5.9 shows the Economics Category Economics with six sub-categories and 12 related properties and dimensions.

Table 5.9: The Economics Category, its major properties and corresponding dimensions

Category	Sub-categories	Properties and dimensions
Economics	Economic activity	4 Economic activity (Low/High) 5 Economic Growth (Fast/Slow) 6 Ability to import and export (Existent/Non-existent)
	Investment	7 Willingness to Invest (Low/High) 8 Attraction to Investments (Existent/Non-existent)
	Financial Viability	9 Funds Availability (Y/N) • Funds for Technology (Available/Unavailable)

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	Productivity	• Level of economic activity (Low/High) • Economies of Scale (Existent/Non-existent)
	Proximity	• Distance (Near/Far) • Travel Cost (High/Low)
	Service Costs	• Affordability (Y/N)

5.2.8.1. Investments

The Economics Category (Table 5.9) above shows that low economic activity was prevalent within rural areas which, as a consequence, led to low economic growth. Some of the reasons for the low economic growth were the inability to export products and services. The locations of industrial sites were very remote from the rural areas. There was little production that took place in the rural areas and furthermore many of the production or manufacturing sites that did exist were informal. Rural people mainly did handcraft or bead-work and the products were sold to foreign and local tourists at low prices. Hence, the informal businesses located in rural areas found it difficult to raise capital from financial institutions such as banks. For example, e-marketing technology was employed in other countries to promote and sell products and services. In South Africa, unfortunately, due to the lack of funding, rural areas were unable to deploy and use such technology. Also, in general, within rural communities, funds were not easily available or accessible. If available, the funds were earmarked for specific services deemed critical and essential by government officials. Hence, when there were no funds available within a community there was also no growth. Consequently investors were also not willing to invest in the market which was very low and in which was a serious lack of economic activity and low economic growth.

5.2.8.2. Productivity

The travelling distances from the economic hubs of the country to the rural areas were great and as a result traveling costs became exorbitant. Therefore, some products and the services that can be sourced from these hubs were unaffordable, especially for rural people, thereby denying them access to these products and services. Furthermore, the issues of long distances and the low economic growth combined to discourage foreign

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direct investment as investors were not attracted or willing to invest where there is minimal or no return on their investments. Productivity was very low due to the low level of economic activity and the fact that the economies of scale were so low or non-existent. For example, some semi-production areas or economic hubs within the rural areas produced products that could not be exported to foreign countries because the products did not meet international quality standards. When goods or services were only tailor-made for the local market and did not meet international standards, the business concerned would find it a tough challenge to upgrade itself to enter the international arena since the size of the local market did not warrant the upgrade and development capital was not readily available.

5.2.9 Leadership Category

Table 5.10 shows the Leadership Category with three sub-categories as well as 13 associated properties and dimensions.

Table 5.10: The Leadership Category, its major properties and associated dimensions

Category	Sub-categories	Properties and dimensions
Leadership	Communication	• Feedback to Community (Existing/Non-existing) • Share of Vision (Exist/Non-existent) • Community Participation (Limited/Unlimited) • Media (Accessible/Inaccessible) • Media Affordability (Affordable/Unaffordable) • Interpretation Skills (Low/High)
	Traditional leadership	• Leadership (Champion/Not champion) • Leaders (Born/ groomed) • Followers (Many/Few) • Community Link (Direct/Indirect)
	Roles	• Customer affairs (Managed / not managed) • Allocation of land (Yes/No)

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		• Traditional Policies (Y/N) • Manage community projects (Y/N)

5.2.9.1 Communication

The Leadership Category (Table 5.10) above, shows that one of the fundamental roles of leadership was to ensure proper communication within communities. The media of communication used, for instance internet, was not accessible to a significant number of community members due to the lack of ICT infrastructure. Furthermore, in cases where the infrastructure was available, it was often unaffordable for most community members, due to the fact that they were not employed. Whatever financial resources the rural communities might have had were used to meet their basic needs such as food. The documentation and user interfaces of ICT based services (software) were written in English and many people from rural communities did not have good command of the English language; so effective communication became a challenge. In certain instances the challenge was exacerbated by the lack of interpretation skills within the community.

5.2.9.2 Leadership

Lack of feedback to communities on decisions taken by the leadership promoted a situation in which a common vision and strategy between the community and the leadership was not attainable. In rural areas the traditional leadership dominated: the leaders had a significant number of followers and there often was a direct and effective communication link between them and the community. The community viewed traditional leadership as champions on matters to do with the community, because of their greater understanding of the needs of the community. Some of the areas where the traditional leadership played a critical and champion role included: customary affairs, allocation of land, implementation of traditional policies, ensuring that community projects were being implemented well, and ensuring direct benefit to the community.

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5.3 Axial coding

The six main categories that were identified during open coding were compared to one another to determine the interrelationship among the different categories. Categories were compared to one another at the properties and dimensions levels. Figures 5.1 – 5.6 show the different categories and their interrelationships. Each of the figures has a caption in the centre of a box that represents the category under discussion, for example in Figure 5.1 “Leadership” situated in the centre indicates the category under discussion. Therefore, category Leadership in this case will serve as focal point or basis for comparison. The arrows would then emanate from the Leadership box and point to properties and dimensions of other categories that the Leadership category is being compared with. The same comparison format is applied throughout Figures 5.1 – 5.6.

5.3.1 Leadership Category

Figure 4.1 presents a graphical diagram of the category leadership and the process used in identifying the relationships among the categories based on the labels referred to in the paragraph above. The interrogation of the relationships was conducted at sub-category level.

In the figure, the Leadership Category is used as the basis for comparison. The different colours show the different relationships of the property as it related to another property in another category. For example, in figure 5.1 below *property communication* under the Leadership Category is represented (through the use of the yellow colour) to be related to *properties compliance, regulations, structures* and *policy intervention* under the Category Governance.

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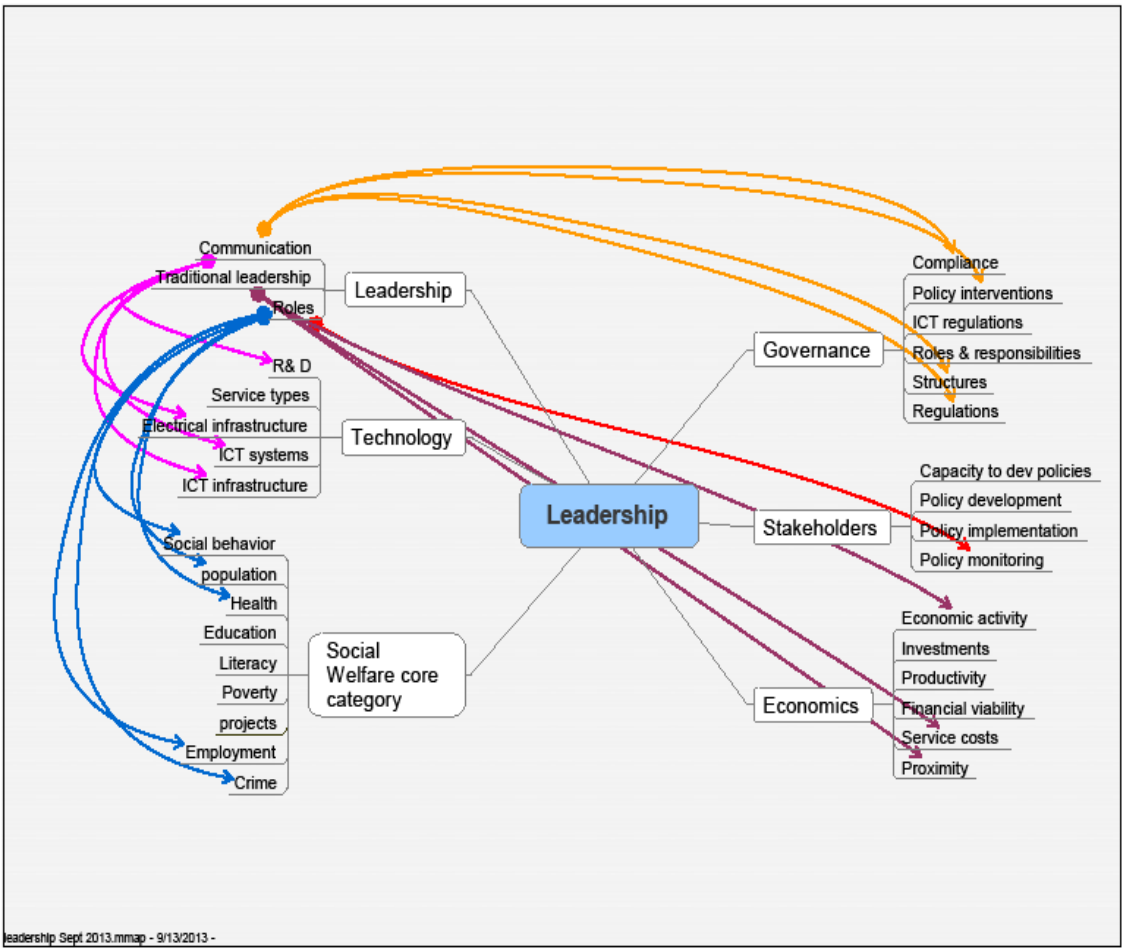

Figure 5.1: Graphical representation of the Category Leadership

For example, the sub-category *roles* under the Leadership Category related to the sub-categories in the Social Welfare Category, namely: *crime*, *employment*, *health*, *population* and *social behaviour* and to the sub-category in the Stakeholders Category namely: *policy monitoring*; the sub-category Traditional Leadership related to sub-categories *economic activity*, *proximity* and *service costs* in the Economics Category; the sub-category *communication* related to the sub-categories *structures*, *regulations*, *compliance* and *policy intervention* in the Governance Category and sub-categories *R&D*, *electrical infrastructure*, *ICT systems* and *ICT infrastructure* in the Technology Category. Table 5.11 below depicts detailed relationships obtained and populated when the Leadership Category was compared to the other five categories.

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Table 5.11: Shows Leadership Category and interrelationships to other categories

Category: Leadership	Relationship	Category: Governance
Sub-categories	Remarks	Sub-categories
Communication	Effective communication to provide feedback to the community must use accessible media of communication and, through policy interventions, must foster participation of relevant structures as well as ensure the adoption of the culture of compliance.	Structures, Regulations, Policy Intervention and Compliance
Traditional leadership	Traditional leadership as champions of the rural communities through relevant structures, with clearly defined roles and responsibilities, needs to ensure adherence to regulations, understanding and implementation of policy interventions as well as ensure adoption of the culture of compliance.	Structures, regulations, roles & responsibilities, policy intervention and compliance
Roles	Traditional leadership roles include: overseeing of traditional policies, management of community projects, allocation of land and management of community affairs through relevant structures, guided by appropriate regulations and policy interventions.	Structures, regulations, policy interventions
Category: Leadership	Relationship	Category: Stakeholders
Sub-categories	Remarks	Sub-categories
Communication	Communication to ensure shared vision, community participation and feedback to community can be accomplished through effective policy development lifecycle.	Policy Development, policy implementation and policy monitoring
Roles	Amongst others, one of the roles of leadership is to manage community projects through effective policy monitoring and evaluation process.	Policy monitoring
Traditional leadership	Traditional leadership, as champions of the rural communities, through effective policy development lifecycle, can ensure adequate capacity of resources as well as effective communication with stakeholders.	Policy Development, policy implementation and policy monitoring
Category: Leadership	Relationship	Category: Technology
Sub-categories	Remarks	Sub-categories
Communication	Effective communication to ensure shared vision, community participation and feedback to community can be accomplished through deployment of appropriate stable ICT systems, stable infrastructure and relevant research and development.	ICT Infrastructure, ICT Systems, Electrical Infrastructure and Research and Development (R&D)
Category: Leadership	Relationship	Category: Economics
Sub-categories	Remarks	Sub-categories
Communication	Effective communication with a shared vision,	Economic activity,

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	community participation and feedback to community can improve economic activity, proximity in respect of the location of transaction and affordability of services.	Proximity and Service Costs
Traditional leadership	Traditional leadership, as champions of their rural communities, can improve economic activity through making availing funds, attracting investors and promoting import and export initiatives.	Economic activity, investment, financial viability
Roles	Traditional leadership mainly focuses on management of community projects, allocation of land and implementation of traditional policies; in addition they must also concentrate on fostering economic activity, investment and productivity.	Economic activity, investment and productivity
Category: Leadership	Relationship	Category: Social Welfare
Sub-categories	Remarks	Sub-categories
Communication	Effective communication in terms of shared vision, community participation, feedback to community and interpretation of community needs can enhance delivery of projects to do with population, health, literacy, crime, employment and poverty in general.	Population, health literacy, crime, employment, poverty and projects
Traditional leadership	Besides traditional leadership's main focus on management of community projects, allocation of land and implementation of traditional policies, traditional leadership have also to concentrate on population, social behaviour, employment, education and poverty.	Population, health social behaviour, employment, education and poverty
Roles	Traditional leadership, as champions of their rural communities, can coordinate and manage projects to do with population matters, health, social behaviour, crime and employment.	Population, health, social behaviour, crime and employment.

5.3.2 Stakeholders

Figure 5.2 presents a graphical diagram of the category Stakeholders and the process used in identifying the relationships among the categories based on the labels referred to in the paragraph above. The interrogation of the relationships was conducted at sub-category level. In the figure, the Stakeholder Category is used as the basis for comparison.

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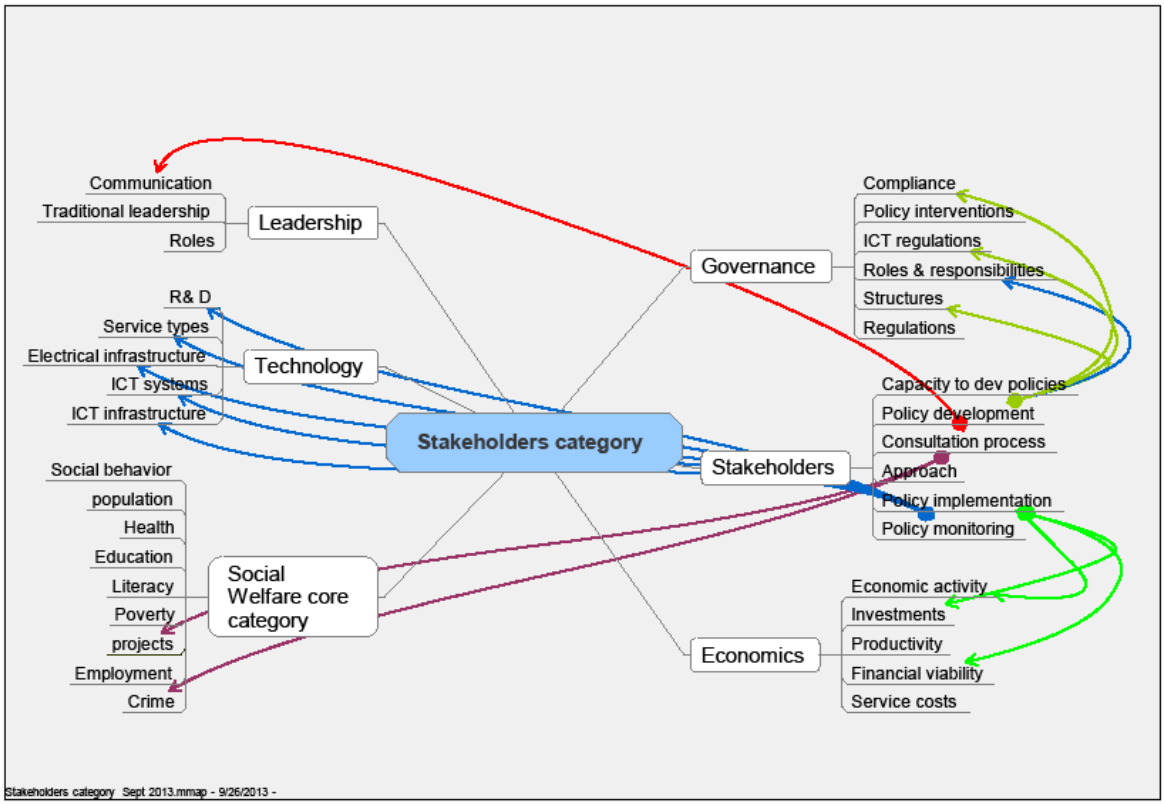

Figure 5.2: Graphical representation of the Category Stakeholders

For example, the sub-category *Consultation Process* under the Stakeholders Category related to the sub-category in the Social Welfare Category, namely: *crime and projects*; sub-category *policy development* related to the sub-category *communication* in the Leadership Category; sub-category *policy implementation* related to sub-categories *economic activity*, *investments* and *financial viability* in the Economics Category; the sub-category *policy development* related to sub-categories *structures*, *regulations*, *compliance* and *roles and responsibilities* in the Governance Category and sub-category *policy monitoring* related to all sub-categories in the Category Technology.

Table 5.12 below depicts detailed relationships obtained and populated when the Stakeholders Category was compared to the other five categories.

Table 5.12: Stakeholder Category and interrelationships to other categories

Category: Stakeholders	Relationship	Category: Governance
Sub-categories	Remarks	Sub-categories
Policy Development	Effective policy development process requires involvement of relevant structures, with clearly defined roles and responsibilities, and ensures compliance with ICT regulations which were set	Structures, Roles & responsibilities, ICT Regulations, Compliance

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	up to ensure proper governance.	
Policy Implementation	Effective policy implementation process requires involvement of relevant structures, with clearly defined roles and responsibilities, and ensures compliance with ICT regulations which were set up to ensure proper governance.	Structures, Roles & responsibilities, ICT Regulations, Compliance
Policy Monitoring	Policy monitoring process has to encourage introduction of monitoring measures, with clearly defined roles and responsibilities, as well as to ensure compliance with ICT regulations and policies.	Regulations, Roles & responsibilities, ICT Regulations, Compliance
Capacity to Develop Policies	Capacity to develop policies is heavily dependent on the existence of relevant structures and their involvement in the policy development life-cycle.	Structures
Consultation Process	Effective consultation process through meetings and other relevant communication channels requires involvement of relevant structures with clearly defined roles and responsibilities, as well as adherence to existing regulations and policies, which were set up to ensure proper governance.	Structures, regulations and roles and responsibilities
Approach	A bottom up approach has to be adopted in terms of involvement of structures which are both relevant and at appropriate levels to ensure proper governance.	Structures
Category: Stakeholders	Relationship	Category: Social Welfare
Sub-categories	Remarks	Sub-categories
Policy Development	Focused policy development initiatives, especially those in respect of social welfare policies to do with projects that relate to population, health, social behaviour, literacy, crime, employment, and poverty projects need to be satisfied.	Population, health, social behaviour, literacy, crime, employment, poverty and projects
Policy Implementation	Focused policy implementation initiatives, especially those in respect of social welfare policies to do with projects that relate to population, health, social behaviour, literacy, crime, employment, and poverty projects need to be satisfied.	health, social behaviour, literacy, crime, employment, poverty and projects
Policy Monitoring	Policy monitoring process has to encourage the introduction of monitoring measures to evaluate the effectiveness of strategies related to population, health, social behaviour, literacy, crime, employment, and poverty projects.	Population, health, social behaviour, literacy, crime, employment, poverty and projects
Consultation Process	Proper consultation with relevant stakeholders can enhance the prospects of reducing the crime rate and the crime levels and improving the understanding with regards to projects.	Crime and projects

Category: Stakeholders	Relationship	Category: Economics
Sub-categories	Remarks	Sub-categories
Policy Development	Policy development process affects the quality of policies produced as well as the policy implementation process to ensure the policies are	Economic activity, investment and financial viability

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	easily transmutable to their practical equivalents. Therefore, an improved level of economic activity, investment, and financial viability underpinned by economic policies that must be clearly worded and articulated.	
Policy implementation	Policy implementation process affects the effectiveness of policies produced as well as the policy implementation process to ensure the policies are easily transmutable to their practical equivalents. Therefore, an improved level of economic activity, investment, and financial viability underpinned by economic policies that must be clearly worded and articulated.	Economic activity, investment and financial viability
Policy monitoring	Sound policy monitoring and evaluation process through monitoring and measurement techniques can identify improvement and gaps that are to be addressed in terms of economic activity, investment and economic productivity.	Economic activity, investment and productivity
Capacity to Develop Policies	High delivery capacity is a prerequisite to develop policies that can improve economic activity, economic growth, productivity and leverage on economies of scale.	Economic activity and productivity
Consultation process	Consultation process with potential investors can promote willingness to invest as well as attract investments.	Investment
Category: Stakeholders	Relationship	Category: Leadership
Sub-categories	Remarks	Sub-categories
Policy Development	Effective policy development can enhance communication in terms of shared vision, participation, media or channel used, level of skills set, affordability and defined roles to provide feedback to the community.	Communication
Policy implementation	Effective policy implementation strategy can enhance communication in terms of shared vision, participation, media or channel used, level of skills set, affordability, roles and leadership to provide feedback to the community.	Communication, roles and traditional leadership
Consultation process	Effective consultative meetings can enhance communication in terms of shared vision, participation, media or channel used, level of skills set, affordability and ability to provide feedback to the community.	Communication
Category: Stakeholders	Relationship	Category: Technology
Sub-categories	Remarks	Sub-categories
Policy Development	Effective policy development process can improve the availability of ICT infrastructure, electrical infrastructure, research and development, ICT services, deployed technology and maintenance and service provision.	ICT Infrastructure / ICT systems/Electrical Infrastructure/Service types/Research and Development
Policy implementation	Effective policy implementation process and strategy can improve the availability of ICT infrastructure, electrical infrastructure, research and development, ICT services, deployed technology	ICT Infrastructure / ICT systems/Electrical Infrastructure/Service types/Research and

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	and maintenance and service provision.	Development
Policy monitoring	Sound policy monitoring and evaluation process through monitoring and measurement techniques can improve on the availability of ICT infrastructure, electrical infrastructure, research and development, ICT services, deployed technology and maintenance and service provision.	ICT Infrastructure / ICT systems/Electrical Infrastructure/Service types/Research and Development

5.3.3 Governance Category

Figure 5.3 presents a graphical diagram of the Category Governance and the process used in identifying the relationships among the categories based on the labels referred to in the paragraph above. The interrogation of the relationships was conducted at sub-category level.

In the figure, the Governance Category is used as the basis for comparison.

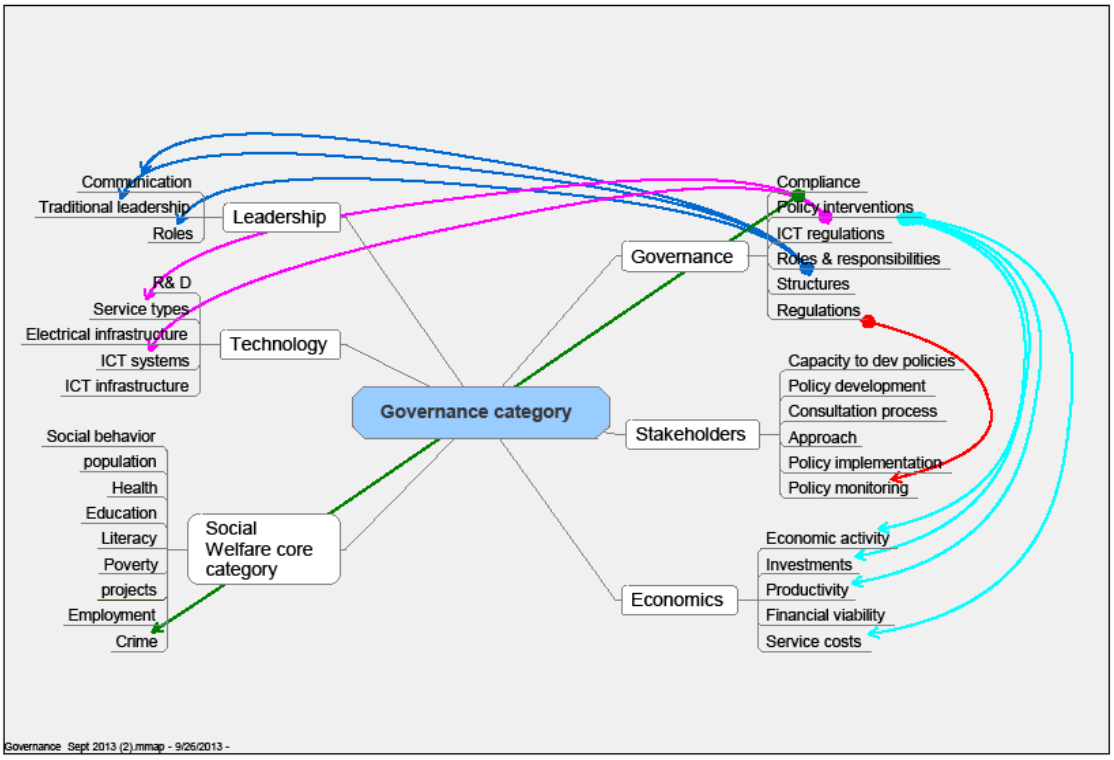

Figure 5.3: Graphical representation of the Category Governance

For example, the sub-category *regulations* under the Governance Category related to the sub-category *policy monitoring* in the Stakeholder Category; sub-category *structures* related to sub-categories *communication*, *leadership* and *roles* in the Category Leadership; sub-category *policy intervention* related to sub-categories *economic activity*, *investments*, *productivity* and *service costs* in the Economics Category; and sub-category *ICT*

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regulations related to sub-categories *ICT systems* and *ICT types* in the Category Technology.

Table 5.13 below depicts the detailed relationships obtained and populated when the Governance Category was compared to the other five categories.

Table 5.13: Governance Category and interrelationships to other categories

Category: Governance	Relationship	Category: Leadership
Sub-categories	Remarks	Sub-categories
Structures	Involvement of relevant governance structures is necessary to provide leadership with clearly defined roles to ensure proper and effective communication.	Communication, Traditional leadership and Roles
Regulations	Lack of regulations impacts negatively on communication, roles and responsibilities of the leadership; and consequently results in ineffective feedback to the communities on matters relating to vision, effective usage of media of communication, projects, land allocation and customary affairs.	Communication, Traditional leadership and Roles
Roles & responsibility	Clearly defined roles and responsibilities can improve the communication process as well as the communication content between the leadership the rural communities.	Communication, Traditional leadership and Roles
ICT Regulations	ICT regulations that promote accessibility to information can improve the communication process as well as the communication content between the leadership and the rural communities.	Communication, Traditional leadership and Roles
Policy Intervention	Policy interventions combined with clearly defined roles and responsibilities can improve management of customary affairs and community projects, allocation of land and implementation of traditional policies.	Roles
Category: Governance	Relationship	Category: Stakeholders
Sub-categories	Remarks	Sub-categories
Structures	Involvement of relevant structures and stakeholders can enhance the policy development lifecycle that will be meaningful to all role players.	Policy Development, Policy implementation, Policy monitoring, and Consultation process
Regulations	Adherence to policies and regulations facilitates effective the policy monitoring and evaluation processes with regards to implementation strategy, implementation expertise, roles and accountability.	Policy monitoring
Roles & responsibility	Clearly defined roles and responsibilities can enhance implementation strategy, implementation expertise, roles and accountability.	Policy implementation
Policy Intervention	Policy interventions can improve on policy implementation, policy monitoring and capacity to develop policies.	Policy implementation, policy monitoring, and capacity to develop

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		policies
Category: Governance	Relationship	Category: Technology
Sub-categories	Remarks	Sub-categories
Regulations	Deployment of ICT systems and related infrastructure as well as ICT services must be aligned to existing ICT regulations.	ICT Infrastructure, ICT Systems and Electrical Infrastructure
Roles & responsibility	Clearly defined roles and responsibilities can enhance research and development in terms of services, ICT innovations and skills set.	Research and Development (R&D)
ICT Regulations	ICT regulations have to promote accessibility to information and compliance to regulations by deployment of ICT systems and related services.	ICT Systems and Service Types
Policy Intervention	Policy interventions can improve availability of ICT services and provisioning thereof as well as ICT innovations and related skills set.	Research and Development (R&D) and ICT Systems
Category: Governance	Relationship	Category: Economics
Sub-categories	Remarks	Sub-categories
Structures	Relevant structures can improve on economic activity thereby contributing to economic growth and the ability to enhance import and export initiatives.	Economic activity and investment
Regulations	Existence of regulations can assist in the coordination of the level of economic activities that can improve on productivity	Productivity
ICT Regulations	ICT regulations must promote access to information in order to impact positively on economic activity and investments.	Economic activity and investments
Policy Intervention	Effective policy interventions can have a direct and positive impact on economic activity, investments, productivity and ICT services costs.	Economic activity, investment, productivity and service costs
Category: Governance	Relationship	Category: Social Welfare
Sub-categories	Remarks	Sub-categories
Structures	Involvement of relevant structures can improve projects that relate to matters to do with rural community population, health, literacy, crime, employment and education.	Population, health literacy, crime, employment, education and projects
Regulations	Adherence to policies and regulations can facilitate successful delivery of community projects that have to do with rural population, health, social behaviour, literacy, crime and education.	Population, health, social behaviour, literacy, crime, employment, education and projects
Roles & responsibility	Clearly defined roles, responsibilities and accountability can improve on the level of education within a rural community.	Education

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ICT Regulations	ICT regulations must support and promote access to information in order to impact directly and positively on matters to do with rural communities as regards population, literacy, crime, education and projects.	Population, literacy, crime, education and projects
Policy Intervention	Policy interventions can be effective tools to introduce positive changes in rural community matters to do with health, social behaviour, literacy, crime, education and poverty	Health, social behaviour, literacy, crime, education and poverty.
Compliance	A culture of compliance promotes civil obedience, a social behaviour that can have a positive effect of reducing crime levels and crime rates.	Crime

5.3.4 Social Welfare Category

Figure 5.4 presents a graphical diagram of the Category Social Welfare and the process used in identifying the relationships among the categories based on the labels referred to in the paragraph above. The interrogation of the relationships was conducted at sub-category level. In the figure, the Social Welfare Category is used as the basis for comparison.

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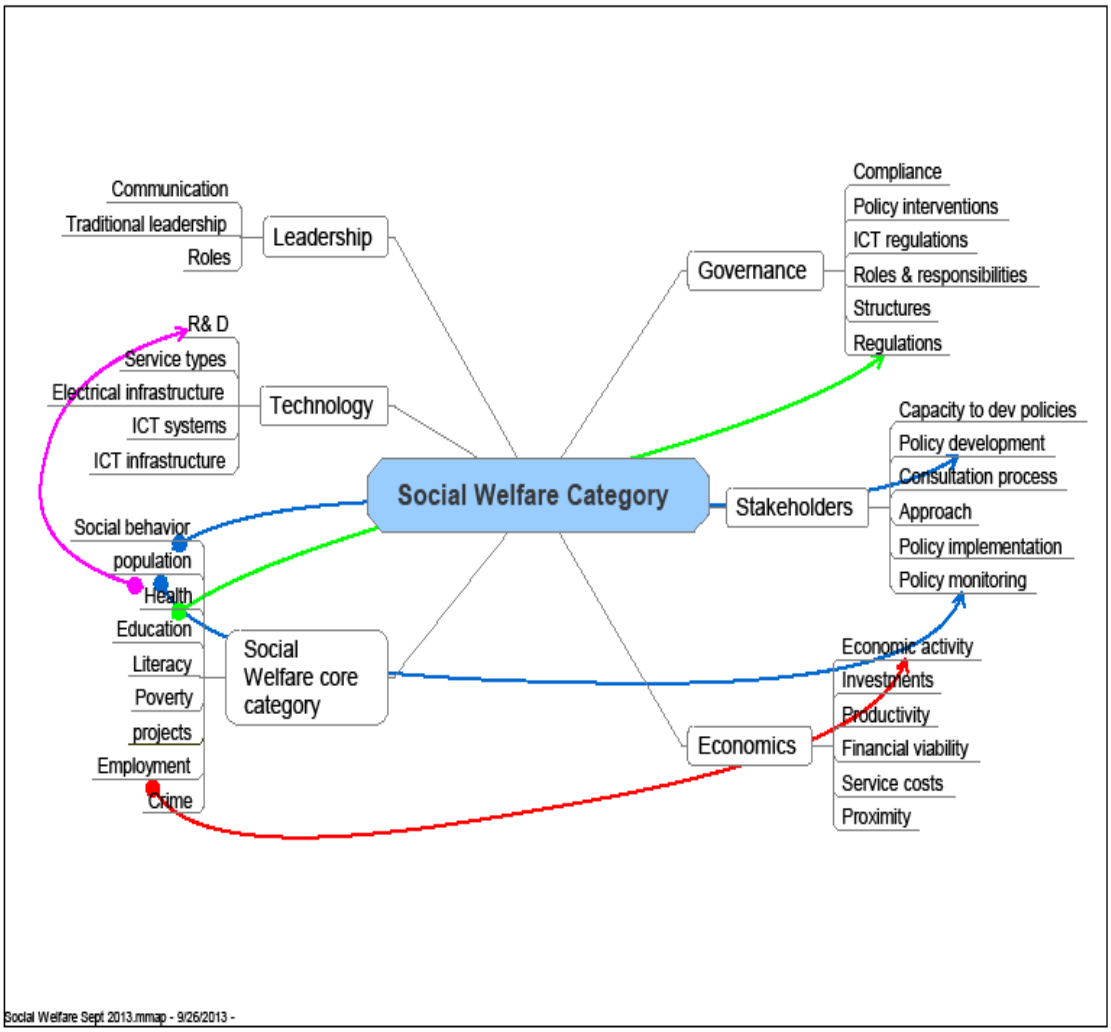

Figure 5.4: Graphical representation of Category Social Welfare

For example, the sub-category *population* under the Social Welfare Category related to the sub-category *policy monitoring* and *policy development* in the Stakeholder Category; sub-category *employment* related to sub-category *economic activity* in the Economics Category; sub-category *health* related to sub-category *R&D* in the Category Technology and sub-category *education* related to sub-category *regulation* in the Category Governance.

Table 5.14 below depicts the detailed relationships obtained and populated when the Social Welfare Category was compared to the other five categories.

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Table 5.14: Social Welfare Category and interrelationships to other categories

Category: Social Welfare	Relationship	Category: Stakeholders
Sub-categories	Remarks	Sub-categories
Population	Population growth and mortality rate can be influenced by policy development and policy monitoring processes	Policy development and policy monitoring
Health	Effective control of transmission of diseases can be positively impacted upon through policy monitoring and evaluation process	Policy monitoring
Literacy	Literacy level and usage of technology can tremendously enhance policy monitoring and evaluation processes as well as the consultation process	Policy monitoring and Consultation process
Education	High level of education makes a positive contribution to the capacity to develop policies	Capacity to develop policies
Projects	Well aligned projects with clearly defined priorities and implementation strategy can easily be subjected to a policy monitoring and evaluation process	Policy monitoring
Category: Social Welfare	Relationship	Category: Technology
Sub-categories	Remarks	Sub-categories
Health	Health awareness campaigns can be improved through research and development by the introduction of ICT innovations and high skills set.	Research and Development (R&D)
Literacy	Low literacy levels and low usage of technology can impact negatively on ICT systems and types of ICT services, a situation which can be remedied through research and development.	ICT Systems, service types and research and development (R&D)
Crime	High crime rate and crime level present a challenge to ICT innovations and skills set.	Research and Development (R&D)
Employment	Job creation can be positively influenced by ICT innovations and high skills set,	Research and Development (R&D)
Education	Rural areas are negatively impacted in terms of ICT service and research and development because of lack of ICT infrastructure (due to service provider being a monopoly).	ICT Infrastructure, service types and research and development
Projects	Well aligned projects with clearly defined priorities and implementation strategy can appropriately profile the requirements in terms of ICT infrastructure, related systems and research and development	ICT infrastructure, ICT systems, electrical infrastructure, and research and development
Category: Social Welfare	Relationship	Category: Economics
Sub-categories	Remarks	Sub-categories
Health	In rural areas health awareness campaigns, medical support and availability of doctors are negatively impacted upon by financial viability, proximity and service costs.	Financial viability, proximity and service costs
Literacy	Literacy level and usage of technology have a direct	Economic activity

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	impact and influence on economic activity.	
Crime	High crime rate and crime level have a direct and negative bearing on economic activity, investment and financial viability.	Economic activity, investment and financial viability
Employment	High levels of job creation can improve economic activity positively.	Economic activity
Education	Level of education in rural areas is directly impacted by service costs and financial viability	Service costs and financial viability
Projects	Well aligned projects with clearly defined priorities and implementation strategy can influence economic activity, investment and financial viability positively,	Economic activity, investment and financial viability
Category: Social Welfare	Relationship	Category: Governance
Sub-categories	Remarks	Sub-categories
Literacy	Literacy, computer literacy and information literacy can be improved by involvement of relevant structures.	Structures
Crime	Level of crime and crime rate can be properly addressed through clearly defined roles and responsibilities as well as relevant regulations.	Regulations, roles & responsibility
Employment	Job creation and availability of jobs can be improved by introduction of relevant regulations and interventions.	Regulations
Education	Level of education can be improved by introduction of unnecessary regulations and interventions.	Regulations
Projects	Well-aligned projects which get community acceptance and approval have to have clearly defined priorities and implementation strategies that are backed by relevant structures and regulations.	Structures and regulations

5.3.5 Economics Category

Figure 5.5 presents a graphical diagram of the Category Economics and the process used in identifying the relationships among the categories based on the labels referred to in the paragraph above. The interrogation of the relationships was conducted at sub-category level. In the Figure, the Economics Category is used as the basis for comparison.

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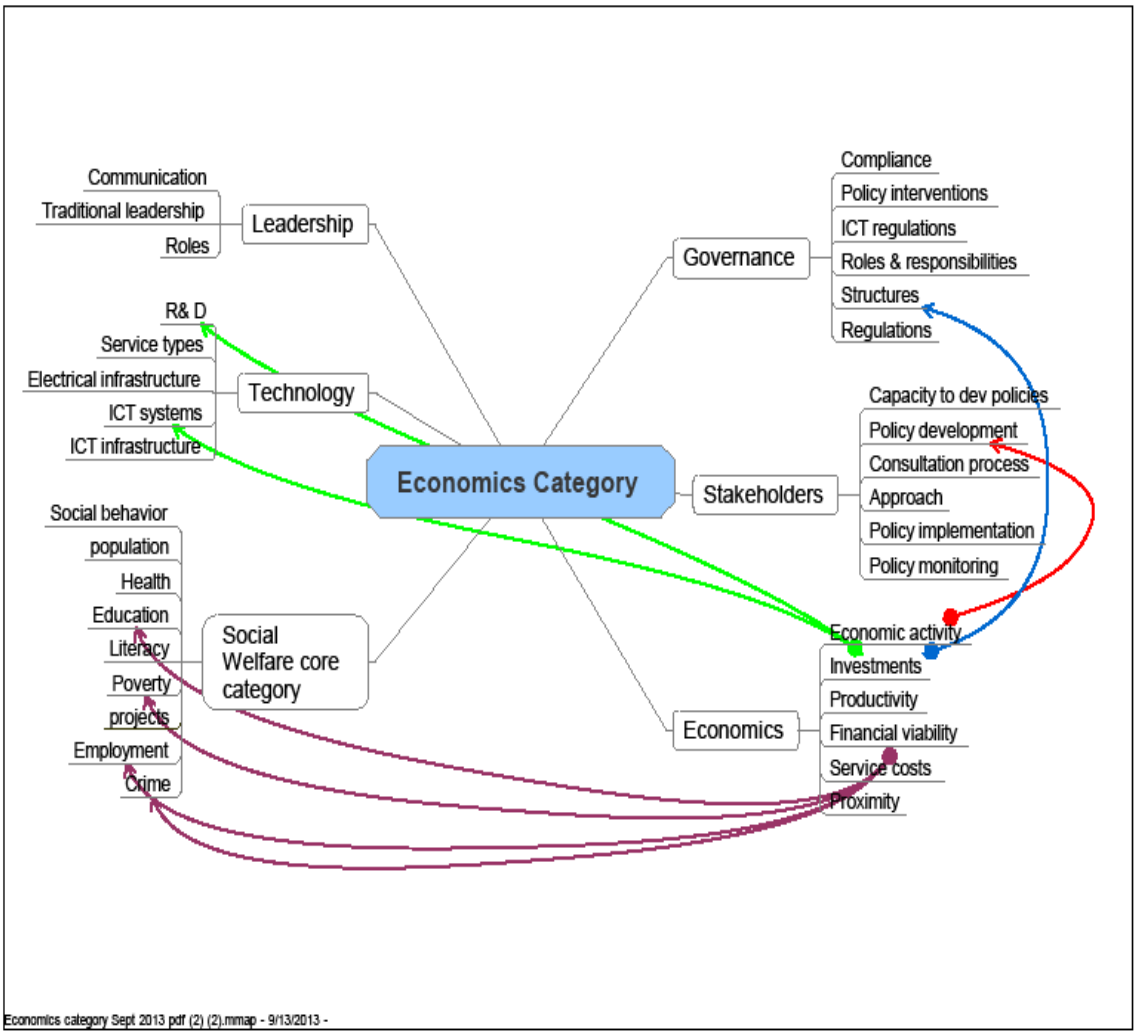

Figure 5.5: Graphical representation of the Category Economics

For example, the sub-category *economic activity* under the Economics Category related to the sub-category in the Stakeholder Category *policy development*; sub-category *financial viability* related to sub-categories *crime*, *education*, *employment* and *poverty* under the Category Social Welfare; sub-category *investments* related to sub-categories *R&D*, and *ICT systems* in the Category Technology.

Table 5.15 below depicts the detailed relationships obtained and populated when the Economics Category was compared to the other five categories

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Table 5.15: Economics Category and interrelationships to other categories

Category: Economics	Relationship	Category: Governance
Sub-categories	Remarks	Sub-categories
Economic activity	High levels of economic activity can be attributed to the involvement of relevant structures that are tasked to produce appropriate regulations; adherence to these regulations will effectively result in a culture of compliance.	Structures, regulations and compliance
Investment	To attract investments it is imperative to engage all relevant structures, stakeholders and communities,, investors included.	Structures
Financial Viability	Financial viability with respect to technology and/or deployment thereof in rural communities requires policy interventions that will ensure availability of funds to finance related technology projects.	Policy Intervention
Category: Economics	Relationship	Category: Stakeholders
Sub-categories	Remarks	Sub-categories
Economic activity	High levels of economic activity foster economic growth on condition that the relevant stakeholders are involved in the policy development processes pertaining to the economy.	Policy Development
Financial viability	Financial viability can be achieved by ensuring effective policy development and monitoring processes through the involvement and participation of relevant stakeholders.	Policy Development and policy monitoring
Investment	To promote willingness to invest as well as to attract investments can be attained by ensuring effective policy development process through the involvement of relevant stakeholders	Policy Development
Category: Economics	Relationship	Category: Technology
Sub-categories	Remarks	Sub-categories
Economic activity	High levels of economic activity can foster economic growth provided that ICT innovations and high skills set are introduced through research and development.	Research and Development (R&D)
Investment	To promote willingness to invest as well as to attract investments can be attained by ensuring effective research and development by utilisation of high skills sets to provide relevant ICT systems and related communication services.	Research and Development (R&D) and ICT systems
Financial Viability	Financial viability with respect to technology and/or deployment thereof in rural communities requires availability of relevant ICT systems and related infrastructure to render appropriate ICT services.	ICT Systems, Electrical infrastructure and Service types
Service Costs	Affordability of technology through deployment of relevant ICT systems and related communication	ICT Systems and Service Types

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	services can improve service costs.	
Category: Economics	Relationship	Category: Social Welfare
Sub-categories	Remarks	Sub-categories
Economic activity	High economic growth can improve social behaviour, reduce crime levels and rates and create employment opportunities	Social Behaviour, Crime and Employment
Investment	Controlled population growth can promote willingness to invest as well as attract investments, thereby introducing a balance between creation of sustainable jobs as well as job opportunities, and job seekers.	Population and Employment
Financial Viability	Availability of funds can improve financial viability of social welfare projects that have to do with literacy, education, employment, poverty and crime.	Crime, Employment, Education and Poverty
Service Costs	Unaffordable service costs can foster high crime levels and extensive poverty due to unemployment and low levels of education.	Crime, Employment, Education and Poverty

5.3.6 Technology Category

Figure 5.6 presents a graphical diagram of the Category Technology and the process used in identifying the relationships among the categories based on the labels referred to in the paragraph above. The interrogation of the relationships was conducted at sub-category level. In the figure, the Technology Category is used as the basis for comparison.

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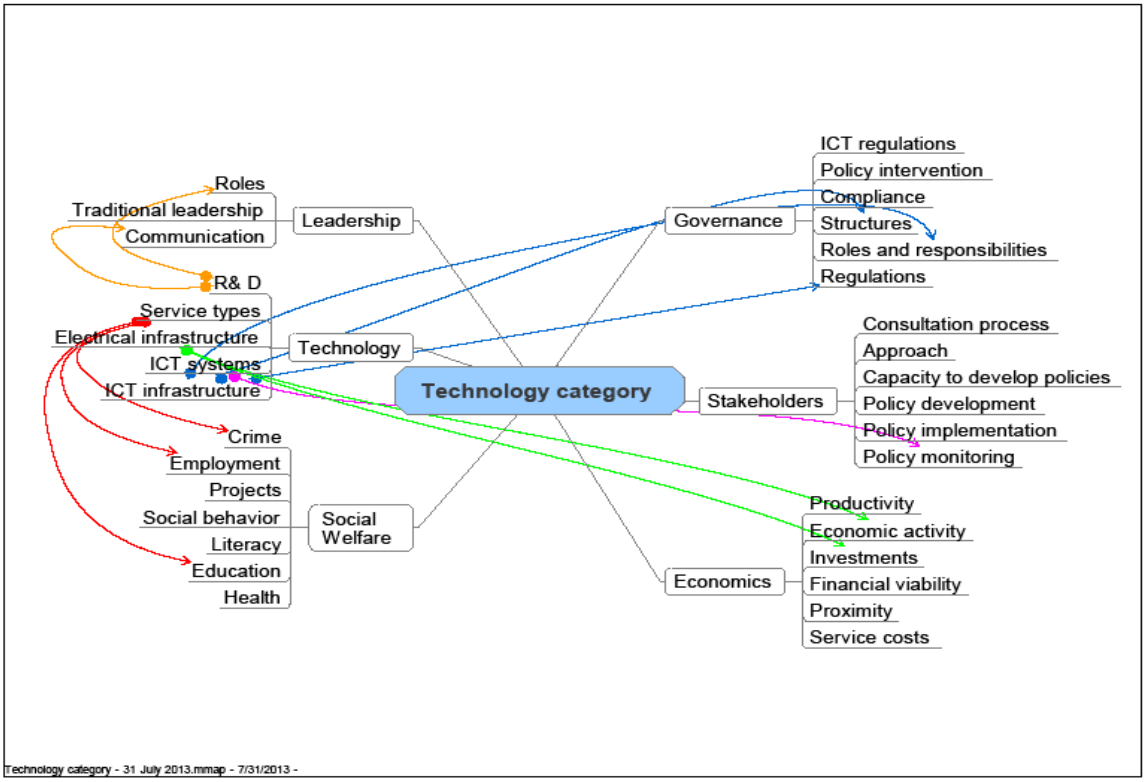

Figure 5.6: Graphical representation of the Category Technology

For example, the sub-category *ICT infrastructure* under the Technology Category related to the sub-categories in the Governance Category, namely: *structures*, *regulations* and *roles and responsibilities.*

Table 5.16 below depicts the detailed relationships obtained and populated when the Technology Category was compared to the other five categories.

Table 5.16: Technology Category and interrelationships with other categories

Category: Technology	Relationship	Category: Governance
Sub-categories	Remarks	Sub-categories
ICT Infrastructure	Well established ICT infrastructure requires involvement of relevant structures with clearly defined roles and responsibilities that will ensure alignment to existing ICT regulations which have relevance to governance structures.	Structures, regulations and roles and responsibilities
ICT Systems	Deployed technologies and adequate maintenance thereof need accountability, clearly defined roles and responsibilities and compliance with ICT regulations.	Roles & responsibilities, ICT regulations
Electrical Infrastructure	Availability of electrical infrastructure needs accountability, adherence to ICT regulations promoting accessibility to information, as well as clearly defined roles and responsibilities.	Roles & responsibilities, compliance and ICT regulations

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Service Types	ICT services need accountability as well as clearly defined roles and responsibilities.	Roles & responsibilities
Category: Technology	Relationship	Category: Social Welfare
Sub-categories	Remarks	Sub-categories
ICT Infrastructure	Unavailability of ICT infrastructure could affect projects that relate to population, literacy, employment, education; this could also lead to low technology usage that could culminate in low technology penetration / deployment in rural communities.	Literacy, population, employment, education, projects
ICT Systems	Relevant deployed technologies could assist in the attempts to improve projects that relate to health, literacy, crime, employment, education; reduce transmission of diseases that could change the social life of rural communities.	Literacy, crime, employment, education and projects
Research and Development (R&D)	Pertinent ICT innovations could be used to reduce transmission of diseases, promote health awareness campaigns as well as improve medical support, reduce mortality and population growth, reduce crime, create employment opportunities, improve the level of education and influencing the general social behaviour in the communities.	Health, population, social behaviour, literacy, crime, employment, education and projects
Electrical Infrastructure	Availability of electrical infrastructure could directly affect crime, employment, education and projects that impact on services which can have an effect on the social welfare of the rural community.	Crime, employment, education and projects
Service types	Unlimited number of ICT services could reduce crime rates and crime levels, creation of job opportunities and improve the level of education within the rural community.	Crime, employment and education
Category: Technology	Relationship	Category: Stakeholders
Sub-categories	Remarks	Sub-categories
ICT Infrastructure	The existence and availability of ICT infrastructure is a precondition for the deployment of technologies that will improve policy implementation, policy monitoring and consultation in respect of processes and strategies; the presence of relevant skills and an environment where clearly defined roles and responsibilities are prevalent to support enforcement of accountabilities.	Policy implementation, policy monitoring and consultation process.
ICT Systems	Relevant deployed technologies could be used to assist in policy monitoring with specific reference to the measurement used for monitoring and validation thereof as well as the evaluation of the effectiveness of policies that were introduced	Policy monitoring
Research and Development (R&D)	Lack of ICT innovations and related skills set in respect of research and development have a	Policy Development, policy implementation, policy

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	direct bearing on the introduction of appropriately designed technologies; thereby impacting negatively on the policy development life cycle and the policy development initiation process - including consultation process.	monitoring and consultation process
Service Types	Limited ICT services might not cover all policy implementation domains, specifically strategy, processes, skills set; the limited ICT services might not adequately provide for the necessity to improve the accountability in terms of roles and responsibilities relating to policy implementation	Policy implementation
Category: Technology	Relationship	Category: Economics
Sub-categories	Remarks	Sub-categories
ICT Infrastructure	The existence of ICT infrastructure facilitates service provisioning: a factor which has direct impact on the economy in rural communities. The availability of ICT infrastructure combined with properly aligned ICT services will support and promote economic activity, investment and economic growth as well as the ability of the rural communities to participate in the import and export industry. Furthermore, the existence and availability of ICT infrastructure will bring the rural communities into the fold of global communities which are connected through communications technologies, thus reducing travelling distances for the community members when they conduct business transactions as well as reducing the costs that would be incurred as a consequence.	Economic activity, investment and proximity
ICT Systems	Relevant deployed technologies and ICT services will support and promote economic activity, investment and productivity and economic growth as well as the ability for the rural communities to participate in the import and export markets. The positive impacts are that distance that is to be undertaken by the community members when they conclude community transactions will be reduced; and there will also be a reduction in travelling costs incurred as a consequence.	Economic activity, investment, productivity and proximity
Research and Development (R&D)	Lack of ICT innovations and related skills set in respect of research and development has a direct bearing on introduction of appropriately designed technologies thereby impacting negatively on the economy especially with regards to economic activity, investment, productivity, economic growth and the ability of rural communities to participate in the import and export industry.	Economic activity, investment and productivity
Electrical Infrastructure	The existence of electrical infrastructure is bedrock for the economy, especially the rural one. Its presence has the potential to increase	Economic activity, investment

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	economic activity, investment and economic growth. The availability of electrical infrastructure will also enable rural communities to actively participate in opportunities presented by the import and export markets.	
Service Types	Limited ICT services alone might not necessarily cover areas that could promote economic activity, investment, economic growth and the ability by the rural communities to participate in the import and export markets. A balanced portfolio of identified ICT services, informed by the priorities of rural communities, is an imperative.	Economic activity, investment
Category: Technology	Relationship	Category: Leadership
Sub-categories	Remarks	Sub-categories
ICT Infrastructure	The existence and availability of ICT infrastructure is a precondition to deployment of ICT services that will improve effective communication; misaligned ICT services have the potential to negatively impact on: feedback to the communities, the ability to establish a common shared vision, community participation, media affordability and accessibility and interpretation skills.	Communication
Research and Development (R&D)	ICT innovations with clearly defined roles are necessary for the introduction of appropriately designed technologies that could promote: feedback to the communities, the ability to establish a common shared vision, community participation, media affordability and accessibility and interpretations skills thereby impacting positively on the communication process between leadership and the communities.	Communication, roles

Technology Category was identified as the main category because it interconnected as well as joined all the different categories together using their properties and dimensions. All the different categories were impacted in different ways by evolving technology.

5.4 Selective Coding

Axial coding established the links between the six different categories namely, Leadership, Stakeholders, Governance, Social Welfare, Economics and Technology

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(LSGSET). The framework (LSGSET) (theory) that emerged could be used as an assessment tool to evaluate the readiness of a rural community with respect to embarking on any initiative. The background and the landscape of the rural community must be compared with elements of the framework to articulate social capabilities, social priorities and enabling/restraining standards in order to identify upfront gaps that have to be plugged to ensure successful delivery of any initiative. Figure 5.7 shows high-level representation of the framework and the storyline. The different boxes with different colours and shapes signify the uniqueness of each category that has emerged. The arrows that points out towards certain directions, illustrated that the different categories do relate to one another in different ways.

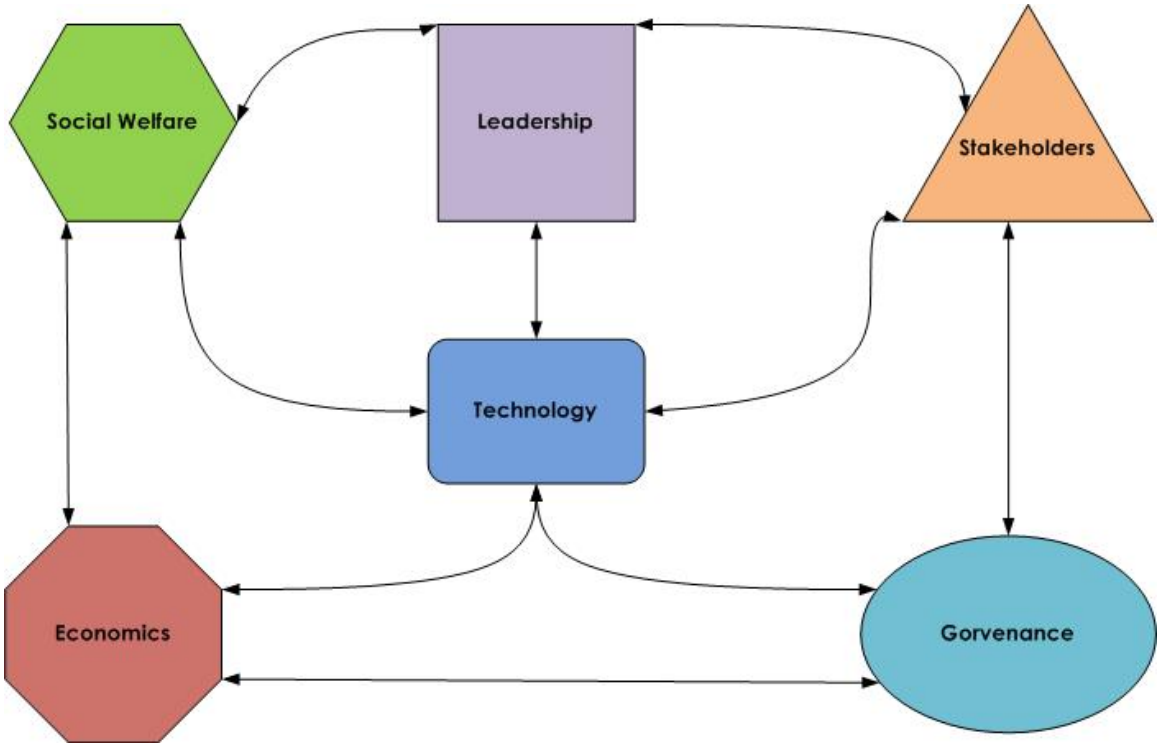

Fig 5.7: Major Findings

Story Line

Effective use of technology within rural community requires dedicated leadership which is recognized by the community, which will ensure involvement of all stakeholders and will ensure the establishment of governance structures that will promote compliance

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with regulations and policies in order to improve economic conditions and social welfare of the rural community.

5.5 Conclusion

In conclusion, the major findings that emanated from the data analysis using the open, axial and selective coding processes indicated the emergence of a framework comprising the six major categories: Leadership, Stakeholders, Governance, Social Welfare issues, Economics and Technology (LSGSET). Leadership plays a pivotal role in the alignment of ICT policies, the identification of stakeholders and ensuring their participation in the policy development life cycle. Furthermore, the alignment of economic conditions to support social welfare initiatives also needs appropriate leadership. External stakeholders should ensure that there are value-added ICT services to the community in general. The internal stakeholders should ensure alignment of processes with the needs of the community that are managed through appropriate governance structures. Relevant governance must set appropriate processes related to the usage of ICT services in the community; on how to deal with economic conditions; the management of the two leadership structures (political and traditional) that exist and on the relationships between the different stakeholders. Social welfare identifies the social needs of the community and ensures that these are met. In order to achieve some of the intended initiatives, economic conditions must be stable. Innovative and value added technology should be deployed in order to improve services. Proper governance structures have to be in place for proper management.

The next chapter explains the corresponding literature that was in line with the emergent framework.

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CHAPTER 6

TRIANGULATION OF FINDINGS WITH EXISTING LITERATURE

6.1 Introduction

This chapter documents the outcome of the last step of the Grounded Theory Method. This step sought to confirm whether the research findings were validated in the extant literature. The literature was examined critically to determine whether it corroborated or contradicted the research findings in each Category. The examination was done Category by Category, reviewing the Properties and the Dimensions of each, as well as, their relationships as observed in the research. It also verified whether the links amongst the categories were corroborated or contradicted in the literature. This chapter also describes the material that constitutes the literature, i.e. the published theoretical and empirical studies that relate to the six main Categories that were identified as major findings in the previous chapter, namely: Governance, Stakeholders, Technology, Leadership, Economics and Social Welfare. The sequence in which the categories are reviewed is not based on any specific order of importance or special preference. Tables 5.1 – 5.6 present the comparisons of the findings of the research study with related evidence in the literature. A brief description/commentary is provided after each table as a high level summary of the comparison.

6.2 Comparison of research study findings with the literature

6.2.1 Governance Category

Kelles-Viitanen (2005) describes governance as a process through which power, authority, influence, decision making and enactment of policies can be effected to empower the society. Melo (1995) views governance as a way by which a range of issues are dealt with. The issues include, amongst others, those that have to do with:

- The government policies which are associated with decision making processes within government institutions;

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- Defining the association and combination of public and private policies;
- Stakeholder involvement and devolution of decision making powers;
- Mechanisms of funding necessary to effect implementation of the policies; and
- Global coverage of the programmes espoused by the policies.

Characteristics of good governance include transparency, predictability, open-minded policy-making where government departments operate on priorities and urgency as regard service delivery matters. Professionalism, compliance with the relevant policies, adherence to the law and the participation of relevant stakeholders are cornerstones of good governance and these must always be promoted and upheld (World Bank, 1994).

Table 6.1: Governance Category: Comparison of research study findings with the literature

Research Study Category	Research Study Properties and dimensions	Remarks	Literature
Governance	Lack of culture of compliance with existing policies and regulations.	The findings of the study in this regard contradict the literature: the literature indicated the *lack of regulations* and the study shows the *lack of compliance with regulations*.	According to Braund *et al.* (2006), there was a lack of regulatory and legal frameworks; and also the literature refers to frameworks which were not complied with.
	Inappropriate formal and informal structures.	The findings of the study in this regard are confirmed by the literature, especially with regard to *inappropriate structures*.	In their case studies of local governance and ICT in Africa, Asingweri *et al.* (2011) found that most local governments lacked institutional governance structures.
	Well defined roles and responsibilities	The findings of the study in this regard are confirmed by the Literature especially with regard to *roles being clearly defined*.	Plantinga & Johanson (2010) observed that the key responsibilities at local government level were the delivery of basic services such as water, sanitation, and electricity

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6.2.1.1 Governance - Brief discussion of the literature pertaining to Governance properties and dimensions

6.2.1.1.1 Structures

Defining a governing body is arguably one of the key requirements for planning and implementing a successful ICT4D. Governance structures and processes provide assurances that decisions are made properly; they also clarify accountability and ensure transparency. They are the vehicles through which agencies, stakeholders and users strategically plan for systems implementation (Harris, 2000). According to Harris (2000), the optimum governance structure will depend on the objectives, the lines of authority and accountability and the culture of a given government and that the most important factor to consider when developing a governance structure is the degree of change required. It is very important to identify the governance structures that will ensure accountability as well as management and control of funds, from both pre and post perspectives, as the organizations and individuals involved from the inception to commissioning are often not involved in the subsequent ongoing operations of the ICT projects (Rohmeyer & Ben-Zvi, 2009). In their case studies of local governance and ICTs in Africa Asingweri *et al.* (2011) found that most local governments lacked institutional governance structures. They concluded that the status of ICT staffing in all governance structures in local authorities in the various countries which existed at the time, suggested that these local authorities were in the early stages of ICT development.

6.2.1.1.2 Regulations

According to the Tokyo Metropolitan Government (2007) regulatory processes are necessary to make sure that transparency and openness exist in the telecommunication sector so that operators, investors and end-users can continue their activities with confidence in the sector. A good and clearly articulated regulatory and legal framework for ICT for development promotes trust in and encourages access to ICT as well as the usage of ICT applications (Braund *et al.*, 2006). Braund *et al.* (2006) and Avila (2009) argued that the establishment of robust regulatory frameworks, with appropriate authority, would create competition in the telecommunication market and keep it functioning. Braund *et al.* (2006) further assert that effective adoption and diffusion of ICT4D are dependent on regulatory stability, on less complex ways of doing business, on a legally protected

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environment with lower incidences of corruption and crime and on the reliability of the ICT processes.

According to the studies reported by Braund *et al.* (2006), regulatory and legal frameworks were lacking and, where ones existed, their provisions were not complied with. This state of affairs created opportunities for governments to play leading roles in establishing complete, open structures to regulate the sector and in formulating electronic strategies for ICT's strategic enabling role in community development.

6.2.1.1.3 Roles and responsibilities

Local municipalities are innately service-oriented and interact directly with the local communities and businesses. As such, local municipalities have considerable potential to assist in the process of integration of ICT into the daily lives of its citizens (Jensen, 2002). Local municipalities have more legal authority to raise and allocate revenue than provincial governments. In their analysis of the governance of the Amajuba and Zululand Districts Plantinga & Johanson, (2010) found that the allocation of time and resources to ICT governance at local government was of secondary importance in both districts. Their observation was that the key responsibilities of the local governments were the delivery of basic services such as water, sanitation, and electricity. Plantinga & Johanson (2010) asserted that the relatively short term political pressure to deliver basic services undermined the more long-term investment in ICT capabilities and resources to improve the delivery of those basic services.

6.2.2 Stakeholders

Lallana (2010) defines stakeholders as anybody or group with an interest in the policies being formulated. According to Worthington and Britton (1994), a stakeholder is anybody affected by or who affects the performance of the organization in which they have an interest. Maylor (2006) defines stakeholders, from project management perspective, as individuals and groups who have an interest in the project processes or outcome(s). Hence, the interests of stakeholders are important considerations for project managers. The World Bank (1996) supports the notion that stakeholders are individuals, groups or organisations that are concerned with, or have common goals and objectives in

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projects or initiatives and their management. From an ICT perspective, this means that not only the direct ICT end-users are included, but also those affected by ICT services, as well as those involved in all the phases of the ICT project life cycle: stakeholder identification, initiation, planning, implementation, monitoring and evaluation.

Table 6.2: Stakeholder Category - Comparison of research study findings with the Literature

Category	Research Study	Remarks	Literature Study
Stakeholders	Lack of involvement of communities in policy development	The findings of the study in this regard are confirmed by the literature with regard to policy development and other related initiatives.	Ruxwana, Herselman and Conradie (2007) point out that some of the salient reasons for project failures, especially in South African rural communities, were inadequate user involvement and limited access to relevant information pertinent to the initiatives.
	The approach in developing policies is top down.	The findings of the study in this regard are confirmed by the literature. The approach employed here by the DPSA (being a top government structure) is top down.	The Department of Public Service and Administration (DPSA) sets up policies and guidelines for all Government departments (Asingweri *et al*, , 2011)
	No overall consultation with various stakeholders	The findings of the study in this regard are contradictory. The study shows *no consultation* with various stakeholders and the literature refers to *inadequate consultation* with the local community.	Conradie and Jacobs (2003) asserted that there serious social challenges resulted when the deployment of ICT in rural areas occurred without adequate consultation with rural community members.
	The policy development life cycle does not produce results that meet the needs	The findings of the study in this regard are contradictory: the study demonstrates the challenge as *meeting the needs of stakeholders* and	Vil-Nkomo (1998) argued that the development of effective mechanisms for: (1) mobilising the necessary resources to address growth and development at the local level

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	of stakeholders	the literature shows the *lack of implementation*.	and (2) for the creation of an appropriate capacity for policy formulation and implementation, was a challenge in South Africa.

6.2.2.1 Stakeholders - Brief discussion of literature on stakeholders' properties and dimensions

6.2.2.1.1 An approach to developing policies

There are various stakeholders involved in developing and executing ICT polices, namely: policy developers, policy analysts, business analysts, community members, etc (South African Government Annual Report, 2006). According to PCRD, Mbumba and eKhaya ICT (2011), stakeholders that are immediately apparent with respect to e-governance in South Africa are those presented in Figure 6.1.

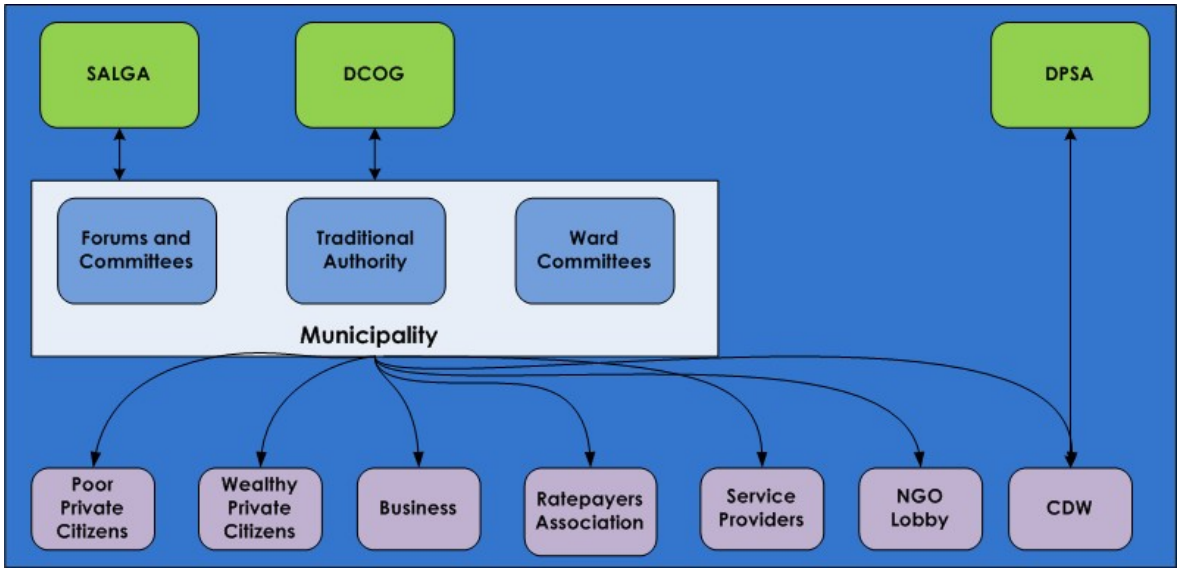

Figure 6.1: E-governance Stakeholders in South African Municipal Context

Source: PCRD, Mbumba and eKhaya ICT (2011)

The Department of Public Service and Administration (DPSA) provides direction to all Government departments. All national and provincial departments are governed and monitored by the DPSA in relation to the services they render. Department of Corporative Governance (DCOG) is responsible for local government and traditional authority whilst

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the South African Local Government Association (SALGA), within DCOG, has the sole mandate to represent local government. SALGA interfaces with all relevant government structures (for example, parliament, the National Council of Provinces (NCOP), cabinet as well as provincial legislatures) in matters and aspects to do with local government. In addition to this mandate, *"SALGA and local government provide the workplace for community development workers (CDWs) and create the necessary environment for CDWs to perform their duties. CDWs are community-based resource persons who collaborate with other community activists to help fellow community members to obtain information and resources from service providers with the aim of learning how to progressively meet their needs, achieve goals, realize their aspirations and maintain their well-being"* (South African Government Annual Report, 2003). Asingweri *et al*. (2011) noted that SALGA did not get adequate support from those institutions (for example, DPSA, SITA and Telkom), which were specifically tasked to promote ICT implementation in government.

6.2.2.1.2 Consultation during the process of developing policies

Conradie & Jacobs (2003) asserted that a serious social challenge resulted when the deployment of ICT in rural areas occurred without adequate consultation with rural community members. The consultation process was meant to identify burning local community priorities and needs. Insufficient consultations led to the misunderstanding of the local community's particular priorities and needs that the technology was to address.

Matodzi (2006) advised against an ICT development strategy that promoted a technology "push approach" rather than a strategy that delivered ICT solutions based on the proper understanding of local community's problems and needs. He asserted that such a technology "push" approach was doomed to failure. According to Adam, James & Wanjira (2007), successful use of ICT in community development would not be possible without substantial active involvement of the communities that are to benefit from it. Support and participation from district and local levels were crucial to ensure service delivery to the local communities. According to Braund *et al.* (2006), to establish sustainable ICT initiatives, it was critical to involve the local communities thereby building knowledgeable local capacity that can assist in deploying, supporting and maintaining the ICT initiatives into the future.

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6.2.2.1.3 Participation and involvement in developing policies

Community exclusion from project conceptualisation, project design and implementation is the main reason for failure of ICT4D initiatives. As a consequence of the exclusion, a common vision is absent to guide the process of transforming the project concept and objectives into their practical outcomes. In short, meaningful participation and contributions from affected local communities are absent.

Mutenda, Mpazanje & Chigona (2011), confirmed that the involvement of the different stakeholders enabled the decision-making on the creation, the content and the conduct of initiatives embarked upon to transform the living conditions of the affected communities. Furthermore, they alluded to the fact that in ICT4D the initiatives were still a major challenge within rural communities. Also, they substantiated that involvement is not only about decision making but setting the scene for the decision-making process that related to the project from inception through implementation and subsequently promoted operational sustainability.

Ruxwana, Herselman & Conradie (2007) pointed out that some of the important reasons for project failure, especially in South African rural communities, were attributable to inadequate user involvement and inadequate access to relevant information about the initiatives.

In their evaluation of the major contributing factors to the success and sustainability of telecentres, Mphahlele & Maepa (2010) observed hostility towards the telecentres and distancing from them by community members, civil society organisations and political structures, since these stakeholders did not participate in the early planning phases of the projects. Heeks (2008) added that applications delivered through ICT4D initiatives must be informed by the requirements that include specifics of resources, capacities and skills sets, as well as the community's priorities and needs.

6.2.2.1.4 Policy development life cycle

Vil-Nkomo (1998) argued that South Africa experienced problems with the development of effective mechanism for mobilising the necessary resources to address growth and development at the local level and the creation of appropriate capacity for policy formulation and implementation.

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Jensen (1997) confirmed that the success for developing countries with regard to development and ICT was underpinned by strong and appropriate policies. According to Farelo and Morris (2006), South Africa did not have an extensive, accessible repository of the history of ICT initiatives to serve as a reference to facilitate programme design and strategic planning for South African rural communities to become part of South Africa's Information Society.

The introduction of new technology in any community will invariably bring new ideas and improvements and it will foster a mind shift in the manner in which things are done by the affected role players (Avgerou, 2009; Ali & Bailur, 2007). The resultant opportunities presented by the introduction of new technology, can be customized and contextualized to provide flexibility in addressing the rural community's priorities and needs.

6.2.3 Technology

ICT is an acronym for Information and Communication Technology. ICTs are used for capturing data; processing the same data into information; storing both the data and processed information for future use and reference; and the transmission and sharing of both the data and processed information, on a need to know basis, with appropriate stakeholders. For example, technology devices can include personal computers and desktop computers whereas communications technologies can include telephones and the underlying telecommunications networks. Michiels & Van Crowder (2001) define ICTs from the viewpoint of its application *"as a range of electronic technologies which, when converged in new configurations, are flexible, adaptable, enabling and capable of transforming organisations and redefining social relations"*. Furthermore they observed that, besides the continuous introduction of new pertinent technologies, *"there is a convergence (voice, data and video) between the new technologies and conventional media"* (Michiels & Van Crowder, 2001:8).

For historical reasons and due to monopolistic practices in ICT the access to ICT services available to the rural communities in South Africa was not of the same standard as that available in the rest of the country (ASGISA, 2006). As a consequence, the Government had to launch different ICT initiatives to improve the socio-economic development of the rural communities. Key role players promoting ICT4D initiatives

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were entities such as: (i) Department of Communications; (ii) Department of Public Service and Administration; (iii) Department of Public Enterprise; (iv) South African Post Office (SAPO); and (v) Telkom. They were all established by acts of parliament and they were responsible for delivering results according to various mandates related to the enablement, the establishment and the promotion of the usage of ICT.

Table 6.3: Technology Category – Comparison of research study findings with the Literature

Category	Research Study	Remarks	Literature Study
Technology	Limited electricity infrastructure	The findings of the study in this regard are confirmed by the literature especially with regard to *lack of electrical power*.	Asingweri *et al.* (2011) confirmed that, as they had observed in rural areas in Uganda, similar challenges were experienced when implementing ICT initiatives where there is poor telecommunications infrastructure due to the shortage or lack of electrical power.
	Limited ICT infrastructure	The findings of the study in this regard are contradictory. The study found the *limited* ICT infrastructure a problem, but the literature mentioned the *lack* of infrastructure.	The lack of ICT infrastructure and related services, and the lack of the ability to use the services, impacted negatively on local economic development in rural South Africa (Herselman, 2003).
	Lack of adequate ICT systems	The findings of the study in this regard are contradictory. The study found the *lack of adequate* ICT systems a	Nawi, Rahman and Ibrahim (2010) emphasized that compatibility and integration between new and old ICT application systems were

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		problem, but the literature showed that the systems that were available were not properly *integrated and compatible.*	major challenges observed in their study pertaining to ICT project failure in local governments.

6.2.3.1 Technology - Brief discussion of literature on Technology properties and dimensions

6.2.3.1.1 ICT Infrastructure in rural areas

Limited ICT infrastructure, the related services and the inability to use the services, impacted negatively on local economic development in rural South Africa (Herselman, 2003). Ruxwana, Herselman and Conradie (2007) pointed out that, despite the availability of ICT solutions, few people in the rural areas knew of their existence and they were not used much because they were not suitable for addressing the rural community's priorities and needs. Ruxwana *et al*. (2007) further cited the incompatibility of the technologies, their complexity and their newness as some of the main aspects that posed serious challenges for the ICT projects; and that these factors constituted constraints to the successful delivery of ICT initiatives.

ICT infrastructure includes the networks for communicating and sharing of data and information, and the platforms for hosting the ICT application systems required to deliver ICT services. TV transmission systems, radio and internet formed the basis for mass media development. The effective development of the ICT infrastructure was reliant on the existence of the associated physical infrastructure such as electricity, roads, and general service utilities (Saikia, 2009). Heeks (2008) asserted that, in developing countries, the pre-requisite technology infrastructure (telecommunications, networks and electricity) was limited and/or obsolete. Ouna and Van der Berg (2009) were concerned that some of the ICT initiatives, for instance telecentres, were deployed and implemented in a "copy and paste" fashion as a direct copy of similar centres in more advanced communities, without regard for the basic needs and priorities of the local rural communities.

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Misalignment of policies was reported with respect to the development and the implementation of the technical infrastructure, since the policies were focused on the telephone services and universal access to them (Kasigwa, Williams and Baryamureeba, 2006). Hence, Girardet (2001) and Conradie & Jacobs, (2003), suggested the establishment of an infrastructure for communications purposes that could serve as a link to the internet and related ICT services. Kasigwa, Williams and Baryamureeba (2006), recommended that the infrastructure development initiatives determine whether the initiated ICT applications are relevant to the problems experienced by the local rural communities. Their position was that technology deployment was not to be done for technology's sake but must demonstrate the potential to meet the requirements and priorities of the affected rural communities. The implementation of ICT was expected to benefit greatly from the presence of other supporting facilities (for example, electrical infrastructure).

6.2.3.1.2 ICT systems in rural areas

Technology deployment always poses tough challenges, especially in developing countries. Critical success factors when embarking on technology deployment initiatives include: reliability, usability, accessibility, supportability, maintainability, compatibility and inheritability. Rohmeyer and Ben-Zvi (2009) asserted that the usefulness of ICT for development was a function of the extent to which the particular ICT solution would address the needs and priorities of the communities for which it was designed. Accordingly, the usefulness of the ICT solution would be reduced if the core ICT application systems were found to be lacking in terms of reliability, usability, accessibility, supportability or maintainability.

Nawi, Rahman, Ibrahim (2010) emphasized that the compatibility and integration between new and old ICT application systems were major challenges observed in their study of ICT project failures in local governments. They attributed the failures to the inability of system designers to design and integrate new technologies with older and obsolete technologies in their attempts to build ICT solutions to meet community needs. Integration of old and new technologies often increased the level of complexity in the deployment of ICT initiatives.

Mphahlele and Maepa (2010) found that, in the case of most ICT initiatives, (for example the telecentres in the deep rural area of Limpopo Province in South Africa), the

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supplied equipment was often inadequate, or there were no backup solutions implemented for the ICT application systems, or there was no contract in place for support and maintenance. They concluded that the state of affairs was the result of the fact that the telecentres were located far away from the centres of economic activity where most of the ICT support and maintenance service providers were based.

Implementing ICT initiatives usually requires complex organizational change management as these initiatives usually introduce new and emerging technologies to enable the transformation of the way governments operate (Nawi, Rahman and Ibrahim, 2010). Even though there was some discernible progress reported in the utilization of ICT in the rural communities, the deployment of ICT proved to be significantly challenging. Lindroos and Pinkhasov (2003), Roberts (2008) and Wade (2002) identified the following issues: the high costs of the technologies, the shortage of local skills to deploy, support and maintain the ICT initiatives and the poor physical security which encouraged vandalism and theft. In some cases armed conflict, diverse political interests and socio-economic challenges also added to the difficulties.

5.2.3.1.3 Electrical infrastructure in rural areas

Limited electrical infrastructure in rural areas presented a barrier to the introduction of the ICT technologies. Mandioma, Rao, Terzoli and Muyingi (2006) pointed out that technology components required electrical power to be activated and to be operated. Herselman (2003) reported that, for the majority of the deep rural areas in South Africa, there were no plans to establish even a basic, reliable electrical infrastructure; a situation which made it difficult to acquire connectivity for ICT technologies there. Asingweri, Muhoozi, and Angeyo, (2011) confirmed that they had observed that similar challenges were experienced in the rural areas in Uganda, when ICT initiatives were being implemented in areas where the telecommunications infrastructure was poor due to the shortage or lack of electrical power.

6.2.4 Social Welfare

Day (1989) explains that of the many definitions of Social Welfare, some definitions are rooted in the particular country's goals of what it would like to achieve through Social Welfare. Makarov (1998) explains that in Poland Social Welfare is about

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compensating those war victims who are unemployable because they have been seriously physically affected. In Sweden, on the other hand, the primary objective of Social Welfare is income redistribution; while in Iran it is about the betterment of employees and the encouragement of people to save. In America, Social Welfare is about providing financial handouts to needy people (Day, 1989).

Walter & Friedlander (2006) describe Social Welfare as "*an organized system of laws, programs, benefits, and services which strengthen or assure provisions for meeting social needs or the basics for the welfare of the population and the social order; to aid individuals and groups to attain satisfying standard of life and health, and personal and social relationships which permit them to develop their full capacities and to promote their well-being in harmony with the needs of their families and the community*".

Table 5.4: Social Welfare Category – Comparison of research study findings and the Literature

Category	Research Study	Remarks	Literature Study
Social Welfare	Poverty in rural areas	The findings of the study in this regard are confirmed by the literature, especially with regard to *existence of poverty in rural areas*.	May (1999), Carter and May (1999), Ngwane, Yadavalli and Steffens (2001), Zegeye and Maxted (2002) and Aliber (2003), confirmed the existence of poverty. An official South African Government Report: "*… despite South Africa being a large country with a wealth of natural assets, a large proportion of the South African population lives in poverty*" (South African Government Annual Report, 2000).
	Migration from rural to urban areas	The findings of the study in this regard are confirmed by the literature especially with regard to people migrating from rural to urban areas.	The rural-urban relocation issue is not unique to South Africa; Pison, LeGuenno and Lagarde (1993) confirmed that countries like Senegal had similar experiences with significant rural to urban migration flows.
	Lack of employment	The findings of the study in this regard are confirmed by the literature especially with regard to high unemployment.	Kingdon and Knight (2007) reported that the level of employment was "concerning" as it was very high and rising. Statistics in South Africa indicated that the unemployment rate was estimated to be 41% during 2003. (Statistics South Africa, 2003)
	Low literacy level	The findings of the study in this regard are confirmed by the literature especially with regard to low literacy level.	Gravett (2012) found that South Africa had a high illiteracy rate and the situation was much more pronounced in rural areas.

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6.2.4.1. Social Welfare - Brief discussion of literature on Social Welfare, properties and dimensions

6.2.4.1.1 Limited job opportunities and employment in rural areas

Kingdon and Knight (2007) found that the unemployment situation in South Africa was "concerning" as it was very high and rising. Statistics South Africa estimated the unemployment rate at 41% during 2003. It also indicated that the employment trends for the period 1996 to 1998 were that, whilst there were job losses in the formal employment market, these were counterbalanced by greater self-employment (Statistics South Africa, 2003). The high rate of unemployment exacerbated the poverty; although Iliffe (1987) pointed out that being employed does not necessary imply that the particular household will not be poor. Hence, Iliffe (1987) proceeded to remark that many South Africans could be referred to as "working poor". The author observed from the research study findings that the term "working poor" described the rural communities very aptly.

Kingdon and Knight (2007) asserted that there were different reactions in the developing countries when it came to responding to the scarcity of formal employment. In some countries, the lack of formal employment led to growth in the informal employment sector rather than creating huge unemployment crisis.

6.2.4.1.2 Poverty in rural areas

May (1999), Carter and May (1999), Ngwane *et al*. (2001), Zegeye and Maxted (2002) and Aliber (2003), supported the official South African Government view "that "*despite South Africa being a large country with a wealth of natural assets, a large proportion of the South African population lives in poverty*". (South African Government Annual Report, 2000)

Vil-Nkomo (1998) remarked that there were three primary contributing factors to poverty in rural South Africa, namely: the lack of resources that can improve the economic conditions in the rural areas, the lack of access to relevant services and the lack of earnings. Heeks (2005) considered unemployment the most salient cause of poverty in rural areas. He was of the view that more than 51% of rural African labour force was unemployed compared to 43% of the African labour force in urban areas in 1999. He also

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thought that the situation in the rural areas was worsened by the lack of production resources. In an attempt to qualify and quantify the levels of poverty, an official report declared that in 1997 about 900 000 African families living in rural areas did not have land suitable for agriculture, 1.4 million households did not have farm animals except poultry, and 770 000 families did not have arable land or livestock or poultry (Statistics South Africa, 1999).

Upliftment and development programmes failed in rural South Africa due to desperation caused by the isolation, poverty and the despair entrenched in the rural communities to an extent of hopelessness regarding possibilities for a better future (Kraus, Puhami and Steiner, 1997). Both Heeks (2005) and Lewis (1994) asserted that the failure to address the matters relating to isolation, poverty, depression and self pity could only lead to the failure of the ICT4D initiatives in the rural areas.

6.2.4.1.3 Migration from rural to urban areas and inability to create jobs

Lewis (1954) and Fei and Ranis (1961) asserted that the relocation of rural people to urban areas was a response to the view that the industrial sector was labour intensive and therefore had a high demand for labourers. Factors that encouraged rural people to migrate included (1) the fact that the rural areas were over-populated and that the people had exceeded their capacity to feed themselves and (2) that their labour output was low and diminishing continually.

According to Harris and Todaro (1970), the wage gap between urban and rural wages was a strong motivator for the migration of rural people. The most interesting observation was the phenomenon that the reverse urban-rural migration happened when there were high levels of urban unemployment. Therefore, one can conclude that the rural-urban migration phenomenon and its opposite (urban-rural migration) were largely influenced by income. The rural-urban relocation issue is not unique to South Africa. Pison *et al.* (1993) confirmed that countries like Senegal had similar experiences with significant rural-urban migration flows.

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6.2.4.1.4 Literacy level in rural areas

Gravett (2012) found that South Africa has a high illiteracy rate and the situation was much more pronounced in rural areas. The country was going through a period of transition and high on its list of transformation programmes was education. Those who previously had fewer education opportunities (or none at all) were high on the priority list. Although the South African Government acknowledged the issue of illiteracy and was focused on addressing it the issues of gender and traditional /cultural beliefs confounded the initiatives in the rural areas. In fact, the Government launched an investigation in rural Mapulaneng area of Mpumalanga to determine the role gender played in adult literacy programmes.

Skilled people from rural areas migrated to the urban areas because of the demand for their skills there and the attractive benefits offered. This also led to a reduction of the literacy levels in the rural communities.

6.2.5 Economics

Table 6.5: Economics Category – Comparison of research study findings with the Literature

Category	Research Study	Remarks	Literature Study
Economics	Urban and rural gaps	The findings of the study in this regard are confirmed by the literature, especially with regard to urban and rural gaps.	Chimanikire (2000) blamed the lack of relevant policies for the gap that existed between rural and urban communities, specifically when it came to the creation of job opportunities
	Lack of economic growth and activity	The findings of the study in this regard are confirmed by the literature especially with regard to lack of economic growth.	According to Rostow (1960), ICT innovation was one of the factors contributing to the widening of the economic gap between developed and developing countries.
	Financial viability	The findings of the study in this regard are confirmed by the literature especially with regard to financial viability.	Obtaining funds for ICT in rural areas was generally difficult with the result that there was a heavy dependency on funds from external donors for the establishment of ICT related

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			technology and services (Benjamin, 2010).

6.2.5.1 Economics - Brief discussion of literature on economics, its properties and dimensions

Britton (1994) explains that the term “economics” is often used in different contexts to describe aspects of human activities such as manufacturing products, delivering them and using them up. It may also feature in discussions about saving and the frugal use of resources. A stricter view holds that these activities are linked to satisfying the needs and wants of people and the society. PAT (2000) defined economics as an attempt to provide ICT services that could directly benefit the community. The role of ICT can be articulated to ensure improvement of services to the people. Consequently, the availability of ICT services and its usage have the potential to increase the awareness of ICT value to the community and thereby encourage job creation. For example, increased usage of ICT services could lead to the multiplying of Internet Cafes, thus providing the ability to overcome challenges such as lack of funds or resources to implement existing ICT policies and projects. Generally, emerging remote communities do not have sufficient funds of their own to establish suitable ICT facilities to provide services to external customers (Moshapo and Hanrahan, 2010) and according to Trusler and Van Belle (2005), community projects depend heavily on extensive external finance for success in the long term.

6.2.5.1.1 Rural and urban gaps

Rural areas, by virtue of their geographical location, are far away from the mainstream of the economy and thus there exists an economic gap. Bell (2000) proposed that the utilization of ICT would be an attractive prime option that could be used as a solution to address this economic condition. ICT would then create a level playing field for marginalized rural communities to participate on an equal footing in economic activities. According to Shelly (2003) ICT would provide quick access to information and the pervasiveness of computers in business and homes would enable users to make informed and timely decisions; this would provide a significant and positive impact on production and economic growth.

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ICT solutions could be designed to tackle the needs of rural or poverty-stricken communities to ensure that ICT usage and its application addressed community based priorities and issues. Chimanikire (2000) asserted that rural communities had serious issues which took priority over any other matters, for example: *"lack of income and productive resources sufficient to ensure sustainable livelihoods; hunger and malnutrition; poor health in general; limited access to education and other basic services; increased morbidity and mortality rates from illness; homelessness and inadequate housing; unsafe environments; social discrimination and exclusion; general lack of consultative participation in decision-making on matters that affect the communities; and poverty"*. Buyham (1996) declared that community based ICT strategies could be formulated to focus on ICT driven production, management and control.

Chimanikire (2000) also criticised the lack of relevant policies to address the gap that existed between rural and urban communities, specifically when it came to opportunities for job creation. Examples of the effect of the inappropriate policies in South Africa include: *"… the state-provided services throughout the country's telecommunications infrastructure were allocated to developed areas with underdeveloped areas almost totally ignored. The historical consequence of political power of whites and the role that the state played in ensuring that adequate provision was made by using criteria that were based on social desirability rather than economic efficiency. This was evident within white rural areas, where almost each household had a telephone line and electricity ..."* to the exclusion of the black rural communities.

6.2.5.1.2 Financial viability

Obtaining funds for ICT in rural areas was a major problem with the result that there was a heavy dependency on external donors for the establishment of ICT related technology and services. In cases where ICT services and technology were deployed in rural areas, it turned out that there was no guaranteed return on investment (Benjamin, 2000), Kenny, Eyles and Halliday (2009) observed that, in addition to being poor, rural communities were situated remotely from economic hubs and as a result there were no economies of scale to leverage upon. Apart from being remotely located, the rural communities were sparsely populated and therefore the costs of establishing ICT

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infrastructure and the maintenance thereof were much higher, thus making the cost of access to ICT services unaffordable.

Funds for ICT related projects and services were often too low to support the priorities and the needs of rural communities; cash flows could not be forecast accurately due to donors defaulting on payment schedules; at times only part payments were made. As a consequence skilled resources were eventually diverted from their real functions to follow up on promised payments. All of this should be seen against a backdrop of modest budgets for fund raising and collection activities (PAT, 2000).

Mphahlele & Maepa (2010) emphasized that no ICT projects should ever rely on sponsorships and aid to carry on with its operations; that it was always important for ICT projects to sustain themselves; and that the ICT projects must also be profitable rather than dependent on donations.

According to Moshapo and Hanrahan (2010) the acquisition of ICT related devices, gadgets and access to ICT services may not be a priority for rural communities, because, being poor, they would prefer that the monies were directed to meeting their basic needs. PAT (2000) supported the view of Moshapo and Hanrahan (2010) by saying that the *"perceived costs of hardware, software and telecommunication services deter people living in deprived areas from accessing ICT services"*.

6.2.5.1.3 Lack of economic growth and economic activity

According to Avgerou (2008), there was a belief that the pervasive usage of ICT would have a significant positive effect on economic growth. Usually the introduction and targeted use of ICT enhanced productivity and the quality of administration and other services rendered as may be seen in countries like Singapore. There were, however, also exceptions in areas such as central Asia, Africa, and some regions of Latin America due the limited ICT infrastructure and the lack of technical resources.

Developing countries were marginalized with respect to participating in the global economy in terms of the penetration of ICT and the use of ICT related services due to the skewness of access to resources such as technical skills and communication technologies. Furthermore, due to the uniqueness of each entity, whether it was business, government or country, whether the ICT services were outsourced or in-sourced, there was no common

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ICT strategy or approach that would guarantee successful economic growth through the exploitation of ICT technologies. Developed countries were economically advanced supposedly through the implementation of those ICT innovations which suited their institutional environment. Hence, there was a tendency to advise developing countries to follow the approaches and/or models of the developed countries to promote economic activity and growth (Rostow, 1960). Therefore the economic gap which was noticeable between emerging communities and established communities was linked to the differences in ICT innovation between them.

Hettne (1990) pointed out that the focus of development was mainly on economic growth based on national income indicators. Based on these metrics only a few countries showed positive economic growth during the 1960's and 1970's; however, *"… the majority was unable to achieve such results as they were plagued by increased poverty, growing indebtedness, political repression, social inequality, displacement of traditional values, and environmental damage …"* according to Conyers and Hills (1984).

Many emerging countries were unable to emulate the developed countries and achieve the same outcomes because (1) the developing societies were unable to take independent decisions within existing global power structures, and (2) they were unable to train their societies to ensure the satisfaction of their requirements for people growth (Rodney, 1972; Amin, 1974). It became clear that development did not necessarily have to be measured in economic terms only, but in non-economic ones as well, for example, *"… social well-being and political structures, as well as in terms of the physical environment …"* (UNDP, 1991). Consequently, since 1992, the UNDP Reports on Human Development comprehensively factored in other aspects of development "… *such as human independence, social impartiality, sustainable development, empowerment, and cultural identity*".

Hettne (1990) highlighted the fact that each of the developing countries had its own unique way of developing that did not follow the trends established by the industrialised countries and which did not address development in terms of economic growth but rather in terms of meeting the pressing needs of the society. Examples were observed in some

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developing countries where policies were introduced to target poverty reduction, but also to ensure that the projects developed, were sustainable.

6.2.6 Leadership

Leadership may be broadly defined as "the behavioural process of influencing individuals and groups towards set goals" (Barrow, 1977). In the context of ICT and community development, leadership would refer to the process of taking decisions, creating an environment in which people are motivated, sound delegation and feedback, effective communication, maintaining sound relationships, and directional management. Northouse (2001) defined leadership as "a process whereby an individual influences a group of individuals to achieve a common goal". Northouse (2001) pointed out several salient aspects of leadership: (a) it is a continuous process which (b) depends on motivating (c) a group of people towards (d) a shared objective According to Piggott, McCarthy and Mitchell (2002), leadership involves accepting the mandate and the accountability and then taking the team to success by empowering, helping, providing direction, advising, coordinating and encouraging the members of the team.
It is important to understand the different leadership groupings that figure in global ICT4D-related literature. These included

- the "community leadership" (Jacobs & Herselman, 2005), which also included the leaders of groups within the community such as women, youth and others;
- the traditional leadership (Byrne and Sahay, 2007; Dagron, 2003) ; and
- the political and governmental leadership within the formal structures of government.

Obviously, there was significant political interaction between these different sets of role players. Their individual goals and objectives as well as their approaches and spheres of influence were often in conflict (Peires, 2000). The ICT Literature recognised the existence of hierarchical leadership systems in traditional communities, in as much as the communities attached significant importance to the decisions of the traditional leaders (Nnadi & Gurstein, 2007).

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Table 6.6: Leadership Category – Comparison of research study findings with the Literature

Category	Research Study	Remarks	Literature Study
Leadership	Traditional leadership dominates	The findings of the study are confirmed by the literature regarding this category but are contradicted when it comes to its properties and dimensions	The ICT literature recognised the existence of hierarchical leadership systems in traditional communities, in as much as the communities attached significant importance to the decisions of the traditional leaders (Nnadi & Gurstein, 2007).
	Roles within traditional leadership clearly defined	The study findings are confirmed by the literature regarding this category, its properties and its dimensions	In newly independent countries, senior government officials typically considered the rural leaders as uninfluential persons whose main concern was looking after local matters, customary affairs, allocation of land and so on. (South African Government Annual Report, 2007).
	Lack of proper communication with and involvement of local leadership	The findings of the study are confirmed by the literature regarding this category, its properties and its dimensions	It was argued that a lack of direct involvement of local authorities in ICT policy formulation would complicate matters and would present a real challenge for policy implementation. Mphahlele *et al*., (2010) found that the support given by the chieftain to the community development projects influenced and inspired project team members. They argued that the example set by the key leaders tended to motivate others because of their prominent social positions.

- **Leadership - Brief discussion of literature on Leadership properties and dimensions**

6.2.6.1.1 Communication and involvement of leadership

Various groups were usually consulted when a technology project was initiated in a rural area (Byrne and Sahay 2007; Dagron 2003). However, the opinions that "outsiders" held of the significance of the traditional leadership differed vastly from those held by "insiders", and this had an impact on the implementation/integration of ICT4D projects within the social context of community. For example, if the technology projects undertaken in the communities eroded the power of traditional leadership in any way, this situation may be detrimental to the design and the use of any ICT in such a community (Nnadi and Gurstein, 2007). The low levels of ICT competency of the leaders was an issue. It could invoke feelings of inadequacy and uncertainty amongst the leaders and this could be detrimental to the progress of any technology project. Alternatively it could lead to

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individuals attempting to benefit from their competency to the detriment of the community at large (Gurstein, 2001). The examples set by prominent leaders were critical success factors for e-government projects. Leaders who were often observed when they publicly supported ICT and the ICT projects were the most effective advocates (InfoDev, 2002).

Mphahlele et al. (2010) found that the support given by the chieftain to the community development projects influenced and inspired project team members. They argued that the example set by the key leaders tended to motivate others because of their prominent social positions.

6.2.6.1.2 Traditional leadership roles

In newly independent countries, senior government officials typically considered the rural leaders as uninfluential persons whose main concern was looking after local matters, customary affairs, allocation of land and so on (South African Government Annual Report, 2007). Some of the most critical issues facing rural South Africa were the role of the traditional leadership in the implementation of Integrated Development Planning (IDP) and the plans to make effective use of the available land. All stakeholders, including the traditional leaders, should have participated in developing the Municipal Integrated Development Plans (IDPs) through a transparent participatory process, Based on their constituencies, the traditional leaders were *ex officio* supposed to advise Government on the development of the particular legislation and the policies affecting the rural communities.

The importance of the acceptance and support by the community leadership of the ICT-related projects was stressed by various authors (Jacobs & Herselman, 2005; Mosse, 1995). The importance attached to the project by the community leaders, inter alia, determined the eventual success of that project (Dagron, 2003). When community leaders had positive attitudes towards the outcomes of a project, this fact generally resulted in better quality involvement of the community overall. Their positive attitudes led to them encouraging others within the community to participate and thus enhancing the project's chances of success (Pade *et al*, 2006). The roles and responsibilities of the stakeholders of such projects needed to be clarified from the outset (Dagron, 2003). Projects also benefited when the positive results obtained from such projects were clearly demonstrated to the traditional leaders (Cecchini & Scott, 2003). This was in stark contrast to the scepticism which normally resulted from, inter alia, the empty political promises of donors and

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developmental agencies and their subsequent short-lived involvement later during the life of the project (Figueiredo, Camara and Salvin, 2006).

It was suggested that more effective demonstrations could have been presented at regional level to groups of community leaders. Similarly, an effective approach might have been to ensure that each project effectively addressed a clearly identified need in the community (Nnadi and Gurstein, 2007). It was also suggested that the projects should not only have supported the goals of the community leaders, but that the projects should also have helped to build leadership capacity in the communities (Skoglund, 2010). This implied that it was vital to understand and appreciate the needs and viewpoints of community leaders if projects were to be successful (Jacobs & Herselman, 2005).

In conclusion, the literature confirms that most of the research findings about the different Categories, their particular Properties and their Dimensions are consistent with it.

The next chapter provides information about the practical application of the frameworks and it also presents the author's views regarding the six main categories.

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CHAPTER 7

DISCUSSION OF FINDINGS

7.1 Introduction

This chapter presents the discussion of the research findings and the author's interpretation of the research findings. The research findings are grouped into six different categories to form a framework. The framework includes the following categories: governance, leadership, technology, economics, social welfare and stakeholders. Each category is discussed in more detail in sections within this chapter.

7.2 LSGSET Framework

7.2.1 Governance

The study showed that governance structures are necessary within a municipality but the ones in place in the studied municipalities were found wanting in terms of their focus and their programmes. It was empirically evident that the municipalities did not have clearly defined sets of roles and responsibilities that correspond to the established structures; consequently accountability became a serious challenge. The inclusion of stakeholders in community projects or initiatives was very minimal, if not totally absent. Basically, the implications were that the stakeholders were not participating in projects or initiatives that were meant to address the communities' priorities and needs.

In general, regulations to manage and direct the usage or provisioning of various services as well as to ensure compliance to statutory requirements were non-existent. Where ICT policies were documented, adherence to the policies was not embedded through good practice within the municipalities to ensure proper management and control whilst facilitating information access by community members.

The study showed that the information was not readily accessible by the community. Despite the introduction of new policies the culture of non-compliance continued widely across all the municipalities due to the lack of documented and appropriate processes and standard operating procedures, as well as due to bad practices

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that negatively impacted on the internalisation of the policies. To legitimise policies, they have to be approved first by the appropriately constituted authorities, namely the councils of the respective municipalities. Delays in the approval process led to serious undermining of the policies.

The author argues that the biggest challenge was that most software packages were sourced from foreign countries and, as a result, the rules that govern their usage are based on international laws. Hence, ICT users were mostly subjected to foreign policies that might not be aligned to the local market or strategies. Once ICT hardware was procured it became an asset of the municipality, but policies did not cater for the usage and management of such assets to ensure that they complied with the official asset management policy.

Furthermore, the author argues that the processes available were inadequate to manage different types of ICT infrastructure components, for example: network, hardware, software licensing, and security and internet usage. So, there were some shortcomings especially in the management structures required to manage different types of processes and procedures. In some instances there was misalignment of the position in the municipalities to the ICT service management, and the ICT governance and government statutory obligations, such as ITIL (Information Technology Infrastructure Library), Control Objectives for Information Technology (COBIT), the Electronic Communication Act 103 of 1996 (South Africa, 1996), and the Promotion of Access to Information Act - Act 2 of 2000 (South Africa, 2000), the Minimum Information Security Standards of 1996 (MISS) and rights such as the right of access to information (Section 32 of The Constitution (South Africa, 1996), the Municipal Finance Management Act No. 56 of 2003 (MFMA) (South Africa, 2003) and the Public Service Act of 103 of 1994 (South Africa, 1994). The municipalities did not have in place the necessary formal ICT methodologies or standards such as Systems Development Life Cycle (SDLC), guidelines and standards for information management, and the processes for ensuring the monitoring and evaluation of the different policies.

7.2.2 Leadership

The findings of this study supported the notion that traditional leaders were the champions as well as the change agents with regard to community issues. They were at the forefront in terms of ensuring that the community's needs were addressed and they were

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staunchly supported by the community members who are their ardent followers. One of the responsibilities of leadership was communication: to constantly seek input about community matters from community members, to provide feedback continually, as well as to promote a shared vision.

Even when the vision was still not crystal clear the traditional leadership could adopt an approach of constructive engagement via community meetings (imbizos). Thus they articulated a common vision and, with the assistance of community members, they were able to formulate a shared vision, which the community members willingly adopted as theirs because the vision was arrived at through participative communication process.

Excluding, marginalizing or limiting the participation of traditional leaders as regards projects and other community-targeted initiatives, was tantamount to excluding all of the community's members.

As a consequence of the digital divide, the minimal exposure to ICT, and/or the lack of adequate infrastructure, the media used for communication was both inaccessible in the rural communities and unaffordable to most of the inhabitants. The prevalence of poverty was exacerbated by the unemployment and the fact that the skills sets of the inhabitants were very low. Hence, understandably, their comprehension of the issues at hand were too limited and inadequate to enable them to give valuable input with regards to policy matters and the policy documents published in the government gazettes.

The allocation of land and protecting the traditional policies were still recognised as falling within the jurisdiction of traditional leadership. Surprisingly enough, the observations from the findings indicated that the management of customary affairs and community projects were not seen as the responsibilities of the leaders, particularly not of the traditional leaders.

The author asserts that the acceptance by the traditional leaders of the proposed course of action is still a necessary condition for them to be able to act as champions of the cause of whatever initiatives are to be undertaken within their respective communities.

The author argues that, within rural municipalities, appropriate leadership structures that would facilitate the implementation, monitoring and evaluation of the policies were not in place. The leadership approach adopted by these municipalities was internally focused and did not address some of the broader community needs.

The leadership endorsed a strategy to ensure capacity building by developing internal ICT skills but most of the ICT operations and services were still performed by

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consultants or were being outsourced. Where internal capacity building was practiced, candidates must have the required minimum academic qualifications, and they have to undergo a security clearance process before they are employed within the municipality's ICT function. The security clearance process was imperative since the municipality was the custodian of very sensitive information. In most instances, the process was so slow that by the time the process is completed the potential candidates had found alternative employment or the job requirements had changed. Such a state of affairs was contrary to the strategy or programme of promoting internal capacity building and assisted to perpetuate the engagement of consultants and/or the practice of outsourcing.

The author attributes this observation to a lack of accountability and responsibility, at senior management level, for the development and implementation of ICT policies as well as a lack of focus on ICT matters; and the required drive pertinent to ICT strategic initiatives. This could be an indication that the ICT division had not been placed correctly in the organizational structure of the municipality.

7.2.3 Stakeholders

Two types of stakeholders were identified within the municipalities: external stakeholders and internal stakeholders.

External stakeholders included third party service providers such as Telkom, which provided the telecommunications infrastructure, and the South African Post Office which renders payment services through the payment point system. The priorities and strategies these third party service providers were mostly driven by government mandates or shareholders' interests rather than the rural community's priorities since their focus was often determined by national or provincial priorities and not the local ones. Therefore, most of their developmental initiatives or programmes were of little relevance to the rural communities and they were often out of alignment with the priorities of the rural people. External stakeholders were hardly ever involved in the policy development processes at the local municipal level; especially in terms of decision-making and buy-in when certain important decisions were made.

Internal stakeholders comprised the internal municipal divisions or departments, such as human resources, finance, logistics and legal. During the research it was observed that there had been very few attempts to involve any internal stakeholders in ICT matters, largely due to the absence of any leadership (Top Management) focus on ICT and the lack

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of ICT strategic direction. Decisions on ICT matters were often finalised externally to the municipalities with the help of external consultants. Hence, strategies and policies that were ultimately established like this were fundamentally internally focused (within ICT) and did not address the broader critical needs of the rural communities. Lack of proper monitoring and evaluation of these strategies and policies resulted in the lack of support from the community members for the ICT development initiatives.

The author argues that the approach to policy development adopted by these stakeholders is a top down one which does not allow any contribution from rural community members. This process of consultation by the stakeholders during the initiation, development, implementation and monitoring of ICT strategies and policies was not effective. This was due to the stakeholders' lack of understanding of the key issues which stemmed from inadequate consultation with the rural communities. The in-house skills required to develop and implement the policies were inadequate - hence, the dependency on external consultants. A contributory factor to this state of affairs was the fact that roles and responsibilities were not clearly defined - the result of a lack of accountability for the ICT matters.

7.2.4 Social Welfare

The observations were that the rural areas, especially Dr J.S Moroka, showed high levels of population growth, which were attributable to inadequate awareness campaigns and social grants. On top of that, the low mortality rate also contributed marginally to the population growth. The health care system in the rural areas where this study was conducted did not have proper support structures. Examples included clinics that did not have telephone and ICT related systems, did not have regular doctors, or sufficient medical support. Contributory factors included inadequate medicine supplies due to the modest economies of scale, the inadequate road network, long distances to be travelled and high travel costs. Also, there was high alcohol abuse, linked to unemployment, the general emotional state was unstable and the crime rate was high. Consequently, most people – whether they are employable or non-employable – migrate from the rural to urban areas in search of job opportunities and greener pastures. The migration to urban areas exacerbated the situation as, most often, the people who moved were those that were literate and educated; all of this happened against the backdrop of a rural society which was

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predominately characterized by its low levels of literacy and education. This did not promote the creation of job opportunities, but it aggravated the situation of low production activities and worsened the situation of exclusion from import and export opportunities. Basically, poverty became entrenched and basic necessities like food became unaffordable. Therefore, any strategies and projects that were not aligned to addressing these community's challenges and the community's priorities were not acceptable to the rural communities.

The author argues that there was indeed an attempt by the local municipality to create an internal capacity to support core operations. The ICT policies did try to address the needs of internal and external stakeholders and to ensure that there was value added by all services and especially by ICT services. However, the majority of the needs of the community were not met due to international policies that were out of touch with the local challenges.

7.2.5 Economics

The study showed that the poor state of the economy in all regions where this study was conducted was seen to limit job creation and was viewed by the community as the cause of reduced employment. The current policies were internally focused and did not support the environmental growth. The ICT services were not clearly focused so that they would directly benefit the community and the municipality. Implementation of ICT policies and related projects became impossible because of insufficient financial resources and the lack of appropriate skills to perform certain key operations.

The availability of ICT services and their usage had the promising potential to increase the community's appreciation of the power and value of ICT and thereby foster job creation. For example, increased usage of ICT services could lead to the development of Internet Cafes. There were, however, major obstacles to face: insufficient financial resources and the shortage of competent resources to implement existing ICT policies and projects. This state of affairs led to threats that could marginalize or impact negatively on job creation and value-add to the community. In certain instances the available funds were re-directed to initiatives other than ICT projects.

The author argues that low economic activity contributed to slow economic growth in as much as it increased the unwillingness by potential investors to invest in that area.

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Low levels of productivity also aggravated this state of affairs; hence, the importing and exporting of different types of goods or services were minimal.

For the economy to be viable in the rural areas one of the fundamental requirements was the availability of funds to support the different initiatives. Fund-raising skills were under-developed; the productivity levels were low due to the unaffordability of scarce and expensive means of production, which had a direct bearing on the economies of scale. Within rural areas the distances to be travelled are long, the conditions of the road network poor, and the travelling costs high. The associated costs had directly contributed to the current low level of economic development; hence, most of the service costs in rural areas were unaffordably high.

7.2.6 Technology

The study showed that ICT service providers like Telkom constituted monopolies especially as perceived by inhabitants of Dr J.S Moroka; hence the availability of the ICT infrastructure was also limited, especially in the non-profitable rural areas. Distribution of services was not uniform within the rural areas themselves, resulting in a skewed and misaligned situation in terms of meeting the communities' needs. The relevance of the deployed ICT systems was questioned; especially since it was not possible to recognize the value added being derived from these systems in the light of the burning issues of the rural communities.

This state of affairs was confirmed by the Municipality. Due to low skills level within the municipalities, maintenance and support of ICT systems became inadequate. The range of ICT services/ types that were supposed to address various communities' needs became more limited due to infrastructural constraints and inappropriate ICT systems. The electrical infrastructure was one of the fundamental elements that played a pivotal role in making available the different service types. However, the available electrical infrastructure and its instability limited ICT too. This situation reflected badly on the process of provisioning and the quality of services offered in the rural areas.

Landline telephone services were not accessible in the greatest portion of the rural areas; only mobile phones were available. The predominance of mobile phones in the area could be attributed to their flexibility and their affordability compared to landline telephones. Research and development, which would serve as the driver of developmental

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initiatives, was absent within the Municipality because of the low level of skills that hampered the performance of such operations.

The author argues that the existing ICT policies were not specific enough in addressing core infrastructural activities and ensure technological compliance, in areas such as network, internet, security and computer peripherals. Hence, there were some obvious exposures related to business continuity – a key strategic dependency which should been addressed in ICT standards. Other technological requirements that should have been covered are: dumping of technology, standardization of the different platforms, technology refreshing, the systems development life cycle approach and so on. The ability to introduce e-services to be an enabler of providing better services to the broader society was lacking.

There was no clearly defined official methodology and/or process for the deployment of applications such as rapid application development model, waterfall model, spiral model V-model and so on. The methodology would guide the process of a System Development Life Cycle (SDLC) and its stages to ensure that all applications were developed in response to business requirements and that they were therefore relevant to meet the community needs.

Proper data management was not in place for positioning the Municipality in terms of business continuity. The business continuity strategies should have indicated what steps needed to have been taken to ensure that the municipality would still be able to operate in an event of a disaster or a calamity. The service support processes did not specify it as such and the infrastructure was not properly deployed to ensure the business continuity and the implementation of the different back-up services.

7.3 Rural Communities as a study area

Rural communities often lived in areas spread over huge expanses of land, part of which was used for agriculture. This land could also be used to extract raw materials e.g. soil, borehole water, grass for thatched roofing and paving stones. The land was relatively affordable in terms of its acquisition, rates and property taxes. It would be possible to exploit the availability of this affordable land by building structures for light industrial projects or for the promotion of agricultural skills and agricultural activities.

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The land was mainly under control of traditional leaders who did not change as often as politically elected leaders. Changes in political leadership usually had negative impacts on the continuity, stability and sustainability of projects. For projects to succeed in the rural communities, the traditional leaders must be appointed as the champions of the intended projects since: (a) they acquired their leadership powers by birthright, (b) they commanded a lot of respect from their subjects and they were well versed in the priorities of their constituencies. Traditional leaders would usually convene “imbizo” meetings, which served as an effective way of communicating with their subjects, as well as mobilizing and educating them. The traditional “imbizo” meetings, the traditional music and the traditional art promoted the sense of identity and purpose as well as enhanced cohesion amongst rural community members. They could also serve to focus on matters of service delivery and projects. Technology, in the form of cellular phones, radio and television, which were already owned by most community members and which they were able to use well, could be used to augment the traditional "imbizos", music and arts in extending effective communication, the mobilization and the education of the rural community members at large.

7.4 Priorities

The author’s position in respect of developmental initiatives/projects is that; when these are carried out within rural communities, for them to be successful and sustainable, they must take into account the main concerns and priorities of the affected communities.

Dr J.S. Moroka had the typical challenges that existed in any rural community. These were the main priorities that all rural communities would like addressed as a matter of urgency. Some of the main concerns/issues and guidelines on how to use them are listed in table 7.1 below:

Table 7.1: Main priorities

Main issues	Guideline on how to use them
The diverse and incompatible mandates espoused by the traditional, the political and the administrative leadership;	A legislation framework to be established to cater for the leadership that exists within rural areas with less disruption of services.
The lack of common purpose and vision	A bottom-up approach will help to ensure a

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	common understanding from the different stakeholders and will ensure common purpose and vision
The non-alignment of action to strategies	Actions to be guided by vision and common purpose, goals to support the vision.
The governance issues from the perspective of roles, responsibilities and accountability;	Establishment of the appropriate governance structures that have a clear role, responsibility and accountability
The inadequacy of project management skills and capabilities	Proper customised training in terms of specialised skills and taking into account capability of the community and enhancement of the skills
The lack of infrastructure in terms of roads, electricity and ICT	Government to prioritise on key infrastructural initiatives to improve economic condition and ensure stability of the municipality.
The issue of the dispersed and extensive rural land	The extensive land to be developed for agricultural purposes that will allow people to feed themselves and to establish projects that will improve social condition of the rural community,

The political and the administrative leadership were constituted through the Municipal Finance Management Act No. 56 of 2003 (MFMA (South Africa, 2003) whereas traditional leadership was governed by the Traditional Leadership and Governance Framework Act (Act No 41 of 2003) (South Africa, 2003).. Each Act had its own unique mandate and point of view which focused on the rural community as the targeted domain. Consequently, there was a lack of common vision and common purpose emanating from the leadership and that further led to non-aligned strategies.

From a governance perspective the situation was chaotic as there was no clarity in terms of roles, responsibilities and accountabilities. There were high levels of dependency on external consultants who were engaged to address the exposures due to inadequate project management capabilities and the lack of skills that were rife within the rural communities. Then there was also the lack of road-, electricity- and ICT infrastructure seen against the backdrop of a widely diffused rural land.

As a consequence long distance travel was the order of the day and the ICT services, for which electricity and ICT are prerequisites, were not readily available to the rural communities.

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The rural community's priorities would have to be addressed as well, before any launched initiative or project was going to be successful and sustainable. Typical priorities included: poverty; level of education and skills; high rate of unemployment; lack of housing; and alcohol and drug abuse.

The author concluded that any initiative that was introduced in the rural community, which did not address the main concerns and priorities of that rural community, would be misaligned to the needs and requirements of the community. It was imperative that any initiative or project which was to be launched should have demonstrated its relevance and the benefits which would accrue from it when it addressed the main concerns and priorities of the people for whom the initiative was meant. The mapping process required, therefore, would rank the community priorities in such a manner that the execution of the projects would each have a fundamental and widespread positive impact and outcome by alleviating the communities' concerns and burning issues when employing the limited project resources.

7.5 Government initiatives

The initiatives came through government legislation, outcomes of government strategic planning sessions or through recommendations by agents or companies. It did not necessarily mean that these initiatives were driven by the needs of the rural communities but rather by agreements to comply with international standards, by bilateral agreements signed by different countries or by corporate social innovation programmes.

Three crucial and pertinent questions had to be answered:

- Who created the ICT initiative?
- For whose benefit was the ICT initiative created?
- Did the ICT initiative address the priorities of the rural community given the unique characteristics of the rural community? (Was it at least compatible or reconcilable with the priorities?)

Hence, the LSGSET framework suggests that when any initiative is proposed by the government or by whoever introduces the initiative, it is imperative to discover whether the proposed initiative is aligned to, or compatible with the priorities of the rural communities which are expected to benefit from it.

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Due to the lack of local ICT skills within the rural communities, the rural communities would usually use external service providers to introduce the initiative. Government initiatives, such as multipurpose community centres, PIT and telecentres were not successful in the rural areas such as Dr. J.S. Moroka, because the implementation team did not appreciate the importance of factoring in the implications of the social context on their projects.

The failures of these ICT initiatives resulted in these rural areas foregoing the benefits of forming part of the global information community.

7.6 Summary

The framework could be appropriately used for the assessment of the state of preparedness of a rural community for the implementation of any proposed initiative. It produced a basis for comparison of the factors which should be taken into consideration from a rural community's point of view, to ensure successful delivery of any initiative. It also produced some concrete guidelines with respect to the implementation of initiatives and was found to be able to identify focus areas for the project.

Leadership plays a pivotal role in the alignment of ICT policies, by identifying stakeholders and by direct participation in the definition and implementation projects. It was observed that ICT policies and their implementation were focused inward on local ICT rather than on promoting the realisation of a community's needs.

Furthermore, the lack of funds and the scarcity of ICT skills in municipalities posed a major challenge in terms of the proliferation of ICT services. Lastly external factors, mainly related to the multinational companies, affect the policies as well as the ICT services directly. An example of such external factors is the licence conditions stipulated for software use.

Dr J.S Moroka was less advanced in the technology space due to the extreme infrastructural challenges and the effect of telecommunications monopolies. ICT infrastructure service providers were not motivated to invest in this area (which had little industrial activity), purely for social responsibility reasons. Innovation initiatives were also absent.

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Social Welfare in this Municipality suffered because the inhabitants were mostly illiterate or had only very little education. Emigration of the literate and educated members of the community was pronounced.

Among stakeholders the Municipalities demonstrated a low level of maturity. This was particularly obvious when it came to policy making, which was predominately performed by national departments, and very little input was contributed by the Municipality in this regard. It posed problems for the municipalities: firstly, they may not have been able to relate to the policies; and secondly, they were the ones expected to implement them.

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CHAPTER 8
CONCLUSIONS AND RECOMMENDATIONS

8.1 Introduction

This chapter provides the main points of the findings which relate to Dr J.S Moroka, the research area. It presents the emergent framework that was used, major findings that were discovered and the research process that was followed. Furthermore, it outlines a high level overview of the study and the knowledge contributed by this research. Figure 1.1 in chapter 1 indicated the social context as the focal point of this study, and the purpose of the study was to establish a framework through Grounded Theory and other considerations. Consequently, Figure 7.1 depicts an enhanced version of Figure 1.1. which shows, highlighted in yellow, a detailed framework that emerged from the research study as well as other considerations.

The GT Methodology discovered major categories that translated to a framework that can be used as a tool for representing the community's views in terms of its developmental needs. Through the data analysis process, six major categories and the relationships between the categories emerged and constituted a framework, namely: Leadership, Stakeholders, Governance, Social Welfare, Economics and Technology (LSGSET). LSGSET is a framework that can be used by various stakeholders: the community members to empower themselves; by policy makers to help in developing policies; and by project managers in implementing projects initiatives. Thus the framework can assist with enabling a collaborative policy development environment for ICT and related policies in rural areas.

The diagram shows the social context of the rural community: the components and their relationships. It emphasizes the need to focus on rural communities and their capabilities; their main concerns and related priorities; the landscape and prevalent enabling standards; government or agencies that introduce ICT/ICT4D initiatives; the mapping process based on the framework produced from this research study; gaps identified from the mapping process as well as the programme of action required to close the identified gaps; and then the project execution process. But, if there are no gaps then the project execution process will take place.

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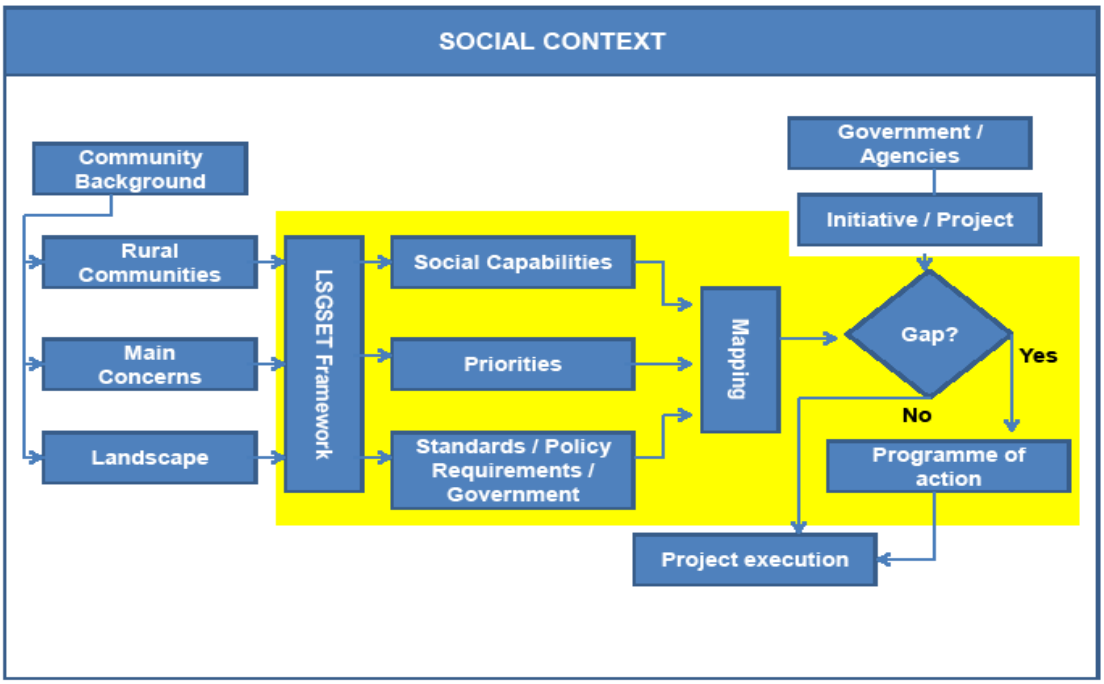

Figure 8.1: The Social Context of a Rural Local Government

8.2 Summary of the position at the rural community of Dr J.S. Moroka

8.2.1 The main developmental concerns of these communities and the developmental landscape

Dr J.S. Moroka is a rural area characterized by challenges including the lack of ICT services as a result of the inadequate ICT infrastructure; poverty; lack of skills and lack of jobs. These challenges are not only confined to this Municipality, but probably exist in many rural communities in South Africa. Some of the challenges that relate to the major categories identified during the data analysis process based on the Grounded Theory Methodology are outlined below.

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Table 8.1: Main categories and Challenges

Main categories	Challenges
Governance	Governance structures were non-existent which invariably led to outsourcing of critical services such as policy development, auditing, financial management and ICT management. In such situations the outsource engagement terms needed to clearly and explicitly enforce the fact that what was being outsourced were responsibilities rather than accountabilities. Also, since policy development was done by consultants to the exclusion of the participation of the local community, the probability of non-compliance was high because of the non-involvement of the beneficiaries from the outset or the inception of the exercise.
Leadership	There was heavy reliance on and support of traditional leadership from the local rural communities. This state of affairs was the result of the fact that traditional leadership historically had played an oversight role and the community members still depended on them for critical decisions as well as the performance of traditional and cultural duties such as traditional marriages, customs, and the allocation of land. The primary challenge for this leadership was that it did not have much exposure to modern trends and practices in terms of economic activities, technological services and financial investments.
Technology	There was inadequate road, electrical and ICT infrastructure and the related ICT systems. The situation was aggravated by the fact that there was a serious shortage of the specialized skills that needed to be deployed to support and maintain the systems that were in existence. The technology that was prominent and used included radios, cellular phones and televisions and the usage of these technologies was limited to communication.
Economics	Economic activity within the municipality, as was corroborated by Statistics South Africa (2003), was so low that unemployment was estimated at thirty percent (30%). The sector status for different industries in terms of communication, agriculture, mining, and transport was less than five percent (5%), which was very low by any standards (Statistics South Africa, 2003). Furthermore, investors only put their money in areas where there was a high return on investment. This also applied to foreign direct investment, which was minimal at best. The challenge with respect to road, electrical and ICT infrastructure exacerbated the situation by making it difficult for the people to move from one place to another as well as by making transportation of the goods an awkward and exacting task. Therefore, rendering of services, as and when required, was impacted upon negatively. Lack of proper funding and the usage of meagre allocated funds needed to be matched with specialized skills to manage such funds; the requisite specialized skills were however minimal or non-existent.
Stakeholders	The internal stakeholders within municipalities were dominated and swayed by the internal political adversaries that made it difficult to implement any initiative. The consultation process became almost impossible, as stakeholders did not necessarily have a common understanding of issues or a single vision. To aggravate the situation, the external stakeholders often carried different mandates from their respective institutions; some of these mandates did not benefit the rural communities at all. For example, some companies had the tendency to “dump technology” in rural areas. On analysis, one would consistently find that the technology that was dumped did not add any value in addressing the needs of the community. Furthermore, the lack of involvement of the major stakeholders, from the planning to the execution phases of the initiatives, resulted in a complete failure of such initiatives.
Social welfare	Population growth was high in most rural communities, which posed challenges as many people would have to contest for limited resources. Jobs were extremely scarce, a situation which fuelled poverty, drug and alcohol abuse, and migration of skilled persons from the rural communities to urban communities. Inadequate health care facilities were constantly put under pressure and doctors and other medical practitioners were reluctant to serve in the rural communities.

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8.2.2 Social capabilities

The issue was to determine which aspects of the rural community's background and social capabilities within Dr J.S. Moroka Local Municipality could be harnessed to ensure successful delivery of any ICT4D project that was launched within the rural community. The author concluded that the rural community's background and the social capabilities highlighted above could be leveraged to introduce and ensure delivery of successful initiatives. Furthermore, the author believes that, since the rural community's background and social capabilities are known, the requirements of any proposed initiative should be mapped against the LSGSET framework to check for gaps. These gaps would then have to be addressed through an identified programme of action, before the commencement of the project or as part of its initiation.

8.3 Conclusion

The LSGSET framework emerged as a tool that can be used by rural communities for self-empowerment. The framework can also be used by project managers, politicians, strategists, and planners when implementing any initiatives. It would provide them with some social context that relates to the environment to help them in performing any planning activities. The usage of the LSGSET will also help in choosing which elements must be evaluated, and must be measured accordingly. The framework has clear guidelines that must be followed in determining gaps and the interventions necessary to close the gaps. Furthermore, it shows external elements, outside of the rural community but with direct impact on the community, that must be considered when implementing any initiatives. The use of the framework encourages the implementers of projects/initiatives to have a clear understanding of the environment and the stakeholders that have to be involved.

More specifically, therefore, the framework can also be used by rural communities to serve as a point of departure when planning as well as implementing ICT initiatives. Furthermore, the framework suggests other considerations to be taken into account to overcome challenges within rural areas. Prevalent conditions, such as the priorities, standards and social capabilities of the community, must be checked first within the community in order to introduce corrective interventions where necessary prior to or during the execution of an initiative/project.

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8.4 Recommendations

Any person or entity that wishes to embark upon any initiative / project must take into account, in a structured way, the developmental context of the community where the initiative is to be undertaken; their main concerns and the landscape that affects them.

The LSGSET framework that emerged here through the application of the Grounded Theory Methodology should be employed to refine the understanding of the proposed beneficiaries of the initiatives, in terms of their capabilities, priorities and prevailing standards/enablers for the rural community of Dr J.S. Moroka in Mpumalanga, South Africa.

Prerequisite as well as requisite interventions must be identified; urgent action must not only be planned but also undertaken to ensure the success of the projects and the sustainability of the initiatives.

As the study is interpretive in nature, the author makes no claim about the extent to which the findings may be generalized. However, given the "typical" nature of Dr. J.S. Moroka as a rural municipality in South Africa, many of the contextual developmental patterns that emerged from this study should also be of interest to other rural communities in South Africa.

8.5 Contribution made by this study

The contributions made by the research study are twofold:

At a practical level a contextual framework was established through the use of the Grounded Theory Methodology and related considerations for the Dr. J.S. Moroka Municipality. These include the LSGSET framework, social capabilities, community priorities and prevailing standards. A thorough understanding of these will ensure the identification of the corrective steps to be taken to guarantee a successful and sustainable project.

At a conceptual level the contribution of the thesis is a furthering of the discourse around context in Information Systems as a discipline, and ICT4D as a specific area within this discipline. The main contribution lies in the argument for a more structured conceptualisation of context, with the consequent possibilities of a more structured and more comprehensive interaction with other communities on this basis. Central to this is the

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argument that the context should reflect the views and lived experiences of those within the community and that the developmental discourses in a community frame the ICT4D discourses.

Therefore one of the contributions the thesis makes is to create a framework for a bridge across the divide between developmental and technological discourses in communities by explicitly framing the developmental discourses of the community as a framework for ICT4D engagement by policymakers and communities at local level.

8.6 Limitations of the study

This study is limited to South Africa within the province of Mpumalanga, in the rural community called Dr J.S Moroka. Some of the elements that were considered are: The population size which differs from area to area; the bigger the population size the bigger the sampling; economic condition of the area has great impact on the study, for example if the area is characterised by low economic conditions, it will show results that relates to that particular condition; infrastructural development such as the roads, electrical and ICT related infrastructure could also have an impact to the research environment; social capabilities of the local community and so on.

The established framework is only recommend for the rural community in terms of its implementation and usage; Social behaviour of the community in terms of accepting the established framework to be used as tool for the implementation of ICT related initiatives; the level of skills that is required within the community or the ability to select appropriate champions that could lead the process; the implementation methodology that relates to the framework, whether it will be an incremental or big bang approach based on the availability of resources.

Stakeholders within the rural environment include structures such as traditional leadership (Kings, chiefs, induna’s and traditional councils); political leadership at the local level (Mayors, municipal managers, local councils) and other community structures and forums. The different structures operate at the local level, that will trigger questions about if the same structures were to operate at the national or international level, will it produce the same results? If it is one structure instead of two what will be the limitations?

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The established framework in only limited to six categories namely; LSGSET. There could be other categories that can be impacted such as social capital that will be required to make it work; social impact: to what an extant does it affect other social aspect of the community; techno-economic aspects as the driver to ensure sustainable economic condition.

8.7 Further Research

The author suggests that further research is required to test whether the developed framework does help in ensuring that the proposed initiatives are indeed implemented well and that they do meet the needs of various stakeholders.

Testing in various municipalities and against any other tools or existing framework should yield regular feedback to implementers for refinement of the framework.

Testing should be done initially in rural municipalities, in deep rural areas and then it should be extended to semi-rural areas.

1 Adoption and acceptance of the framework by relevant stakeholders
2 The process of implementing, testing the framework in different municipalities and refinement
3 Possibility of expanding the framework to be used for rural community, urban communities and international markets.

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APPENDIX A

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ANT Levels	Respondent	Age	Gender
User			
Group			
Organization			
Community			

The questions outlined below would be put to the various "Actors" in the context of their representation relative to the total network.

1. What are the five major problems that affect you (i.e.: the individual, the group, specific organization and the community) in your rural area? i.e. low level of community literacy, ICT Programs currently implemented do not give adequate results, inadequate ICT infrastructure, lack of ICT awareness, information not effectively interpreted and understood, inadequate process to determine satisfaction levels.

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3. In your opinion, how can these major problems be resolved?

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4. Is there any specific goal that needs to be set and achieved by the community on a collective basis? i.e. “cyber community”

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5. As a respondent (an individual, a group, organisation or community) what type of leadership do you respect and respond best to?

- Leadership based on tradition and custom
- Political leadership based on party politics
- Leadership based on religious beliefs
- Leadership based on social and / or class structures
- None of the above – Other: …….

In your opinion what type of leadership will best suite the rural area people.

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7. As a respondent, you may be aware that you are affected by internal and external elements that impact on you as well as the entire community such as internal policies, governance, political, social, economical, technological etc. To what degree do you believe these factors impact on you and the community at large and to what extent do you regard these elements as being beyond your control?

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8. When policies are being developed for rural areas, who do you believe decides on what policies need to be formulated? For example structures such as community members, organizations, Kings, chiefs, legal authorities etcetera.

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11. Do you believe the use of ICT related solutions within your area (community) would be of material value or benefit like change of people's lives.

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APPENDIX B

SUMMARY OF THE KEY FINDINGS

Interview no 1. Age: 20-30 Yrs; Gender: Female; Representation: User

- **Question.** In your view are the any challenges facing people who are staying in rural areas?
  - **Answer**. Yes, there are major challenges that drastically affect people in rural areas such as the lack of employment. As a result of this, even though technology can be deployed in rural areas, it is not easily maintained and supported. The daily usage of the related technology also needs money to make it work. Therefore, food and other basic needs are the key challenge.

Memo.

- Lack of employment
- ICT support and maintenance needs money
- Basic needs such as food essential.

- **Question**. How can some of these challenges be overcome?
  - **Answer**. It might be a great idea for the government to put more focus on youth activities since youth have the energy and strength to face up to newer challenges. People older than 60 years of age receive grants from the Government which helps them to survive while younger people and the youth receive nothing. Because younger people do not receive any grants from the government and are unemployed and therefore have no money to buy food this could be one of the reasons why there is such a high crime rate, particularly crime associated with theft and robbery. Robbery and the theft are used by the youth as a desperate means to get money so that they can live. So, the youth can play a meaningful role in adding more value towards economic development of the particular region.

Memo.

- Youth key focus
- Grant main link
- Outcome of unemployment robbery and theft

- **Question**. Any specific goal for the entire region that can satisfy each community member?
  - **Answer**. Seeing that all communities have different needs and wants such as food, employment, roads, housing, and electricity etcetera it seems impossible to decide what common goal can be set and achieved. The priorities should be set by key role players who are in a leadership position

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and are able to decide for the entire community according to their judgement.

Memo.

- Who are key role players perceived to be?
- Who are in leadership position and why?

- **Question**. What is the impact of internal and external elements on the community?
  - **Answer**. The impact of internal and external elements is incredibly high. For example, the weather charts that are broadcast on national television are fairly simple and informative as they allow people to plan how to dress according to weather conditions. However, when the subject matter becomes more complex, such as with economic issues, the community is unable to interpret and analyse the subject. This means that communities are forced to develop and take their own initiatives in order to keep with developments.

Memo

- Internal and external elements not so well understood
- What does own the initiatives entail in this regard?

- **Question.** When policies are being developed to what an extent does the government consult community members?
  - Answer. No consultations are made with communities that will be impacted by the policy when implemented. We are not aware of any policy formulation process to be followed. At the end community members only see things happening and are unaware of where it is coming from.

Memo.

- What things are seen to be happening?

- **Question**. What is your view about ICT services in rural communities?
  - **Answer**: There is a need for ICT related services in rural communities, especially for students who need to access certain information that cannot be found within their own resource centres. Furthermore, by sharing information with all relevant stakeholders, people will save money by not having to travel long distances in order to access facilities such as telephones etcetera.

Memo.

- Travelling is a main factor
- Save need to be saved
- What does the resource centre entail?

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- Who are the different stakeholders talking about here?

- **Question.** Any general comments about this research?
  - **Answer**. Policy making as a process needs to ensure involvement of all relevant stakeholders so that proper implementation of appropriate policies and procedures are carried out. In general people need access to technology that plays a meaningful role in their lives. Such technology includes gaining access to health services, transportation and so on.

Memo

- Who are the stakeholder in this regard
- What will be the meaningful role be?

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Interview no 02; Gender: male; Age: 40 yrs

1. **Question:** What are the major problems in rural areas?
    - **Answer**. Major problems experienced by people who are staying in rural areas are lack of economic activities. As a result of this, rural areas cannot attract investors due to poor infrastructure. Therefore, people who are educated move to urban areas for the better quality of life, education, job opportunities etcetera. Hence, the gap between the people who live in the rural areas and those in the cities gets wider in terms of issues such as the provision of better services and ICT related services.

    Memo.

    i. Educated people move to urban areas
    ii. Major reasons for the move, quality of life, education, job opportunities and so on
    iii. There is a gap between urban and rural and the gap widens every day

2. Question. Any possible solutions to resolve some of the problems?
    - **Answer.** A possible solution could be for people in the rural areas to be helped to explore agricultural activities. This will enable them to feed themselves and also generate income from an ability to sell their excess produce. The current challenge that there is no growth in the agricultural sector within the rural areas, despite efforts by the government to provide free land and render necessary assistance to farmers.

    Memo

1. What kind of assistance does the government render?
2. Do all people who are staying in rural areas receive free land?
3. Agricultural services key for feeding and income

3. Q**uestion**. Any specific goal that can be set for the rural areas?
    - **Answer**. No specific goal can be set or realized since there are so many problems that are being experienced such as poverty, lack of essential infrastructure namely roads and water services and so on. Therefore, the demand comes from various communities.

    Memo.

    - Which various communities been referred?

4. **Question.** What type of leadership might be essential for the rural community?
    - **Answer**. The clash between traditional leaders and political leaders causes a lot of conflict among community members. Traditional leaders are seen by the community as the natural leaders that need to be respected by the community at all times. The history of kings and chiefs is well established.

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For example, the leadership through theocracy, people who believe in theology, there is no interference from the government. It might be a good way to treat traditional believes - the same way that theology is treated. This will ensure traditional activities are well regulated and managed. It might be essential to put all the key structures under the leadership of the king.

Memo.

- Comparison of traditional leadership with theology
- Role played by the government when handling the two
- Clash and conflict with traditional and local government leadership

5. **Question**. Viewing some of the external elements that impact heavily on community, to what an extent can it impact?
   - **Answer.** An economic activity means nothing to the people who are staying in the rural areas. They are not in a position to understand any of the activities such as economic and financial that impact on them daily. Their main area of focus will be the good health and basic needs such as food and so on. However, the major determining factor in this regard will be a low level of literacy. To an extent that some of the community members do practice agricultural services. Therefore, they cannot take care of their own stock such as sheep and cattle or any agricultural services; hence, the key factor is the availability of the information and the ability to interpret it.

Memo

- Interpretation and availability of the information by rural people
- Economic and social factors affect them drastically

6. **Question.** To what an extent are people involved when policies are developed?
   - **Answer.** The involvement of people when developing policies does not appear to involve any consultation at all. No concepts are brought to community for debate, because it has been taken for granted that people living in rural areas are not educated. So, it has been deemed that they cannot make any contribution. This is one of the government's shortfalls. They expect comment from people based on a published document as the process for consultation – yet these people are usually not literate. Furthermore, the Government Gazette is not a free service. An ideal approach would be to invite local people in a rural community to elect leaders through a normal election process, in order to be represented in various structures. However, the national executive of the ruling party will decide on the representation of various committees at the different levels, hence it remains extremely difficult to have proper representation.

Memo

- What concepts are being discussed in this text
- Assumption made that people who are staying in rural areas are not educated

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- Literacy not a free service
- No proper representation by the community
- Confusion about leadership and the ruling party

7. **Question**. Any assumption of ICT related policies with specific reference to benefits.
    - **Answer.** There are some policies that have managed to produce good results, for example ICASA as the telecommunications regulator. It has managed to ensure that people are able to use different mobile operators such as Vodacom, Cell C and MTN. As a result of this, more than 50% of the population use cell phones for communications purposes. Success appears to be based on technology that has been well designed and implemented to suite the basic need of the people. Other projects have failed dramatically due to the lack of support and maintenance. Furthermore, other basic services are not being put into place and remain as a great challenge, such as water services etcetera.

Memo.

- Cell phones successful in communication purposes
- Success of technology due to well design and implemented solution
- Failure due to lack of support and maintenance

8. **Questions**. What are your views about ICT services in rural areas?
    - **Answer**. I strongly believe that ICT related services will play a key role at schools as the use of such technology can help students to perform better and gain more knowledge. This process could also help to shape children's future at an early stage and be able to change their lives. Acquiring skills at an early stage will be the best way of ensuring full utilization of technology. Therefore, the technology can help community members to keep their own records and perform related transactions through the internet.

Memo.

- In what way can the student perform better?
- What will full utilization of technology being referred to?

Interview no 3 Age: 40-50; Gender: male; User

1. **Question**. Are you aware of any major problems that impact on people in rural areas?
    a. Answer. The major problem that affects the people in rural areas is poverty. Lots of people are still unemployed which means that they have no food. Any other programs and projects that do not address poverty will not be accepted by the community. The high rate of unemployment will have a greater impact on community as a result; high crime rate will be experienced because of people desperate to eat. Whenever people are depressed, it seems inevitable that they become rapists and alcoholics and so on.

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Memo.

- One of the key requirements for the project will be those projects to address poverty.
- Shortage of food is very key
- Outcome of unemployment could be rapist

2. **Question**. How can the problems be resolved?
    a. **Answer.** Self sustainability through self-help projects that have a direct link and benefit to the community is the only solution. The establishment of the self-help projects can enable the community to feed themselves. The active involvement of women in economic development is also essential.

Memo

- What will be self-help project mean?
- The direct link as required to be what?

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Interview no 4; Gender: male; Age: 40-50 years

1. **Question**. Are you aware of any challenges within rural areas?
    a. **Answer.** Yes, key challenges affecting people who are staying in rural areas will be a lack of ICT-related infrastructure. In terms of the current situation Telkom is supposed to provide the communication infrastructure for the entire country both in urban and rural areas. However, their main focus is on urban areas where they make more money. Services in the rural areas are not fully utilized and economic activities are slow. This situation continues as Telkom has a monopoly. However, the introduction of the Second Network Operator (SNO) was mainly formed to focus on the rural areas and under serviced areas which may help to redress the situation.

Memo.

- SNO focus on under serviced areas
- Telkom currently monopoly in telecommunication
- Focus by Telkom on centralized areas

2. **Question**. In terms of specific goal to be achieved by the community, can there be a common one?
    1. **Answer**. The needs of the people are so diverse with different support services required that it seems difficult to set and agree a common goal. An integrated strategy will be a key factor to ensure that the objectives of the broader network are achieved.

3. **Question**. Any type of leadership that will be suitable for the rural areas?
    a. **Answer**. Traditional leaders are identified as the champions of local communities; hence it is important that traditional leaders are recognized in rural areas. Traditional leaders used to allocate land for the community to stay and when any other project to be perform they had to be involved, and so on; Hence, the introduction of the local council has caused some conflict among the two leadership structures and this impacts negatively on the community through division and confusion. As a result of this it is inevitable that delays are experienced in terms economic development in rural areas.

Memo

- Tradition leaders seen as champion and true leaders
- Conflict and division among communities due to leadership
- It has great negative impact to economic development

4. **Question**. What are your views about policy development for the rural areas?
    a. **Answer**. Policy development normally happens at various levels within the different spheres of the government. The ruling party structures have a different protocol that needs to be observed such as

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leadership at the branch level, operational and national. The process of policy development will therefore be carried out in terms of the current ruling party's operations. Since, all members of the ruling party they are involved in the whole policy formulation process, other community members who do not belong to the same party do not have the same opportunity. This can mean that while there are correct policies currently in place, these policies are lacking in implementation due to the exclusion of some people in the process that means a lack of capacity and skills.

Memo.

- Only members of the ruling party are involved in policy formulation process
- Other challenges are lack of skills and capacity

5. **Question**. What is your assumption about ICT policies impact to the rural areas?
    a. **Answer**. ICT is critical for the improvement of communication, which is best, illustrated by the successful introduction of cellular phones services. The introduction of such policies has managed to increase connectivity and improve communication among the different users. Currently it is estimated that more than twenty million of users in South Africa are active users of cellular phones. This is one project that has shown that when a right technology is deployed to the community it will be accepted and well used. Hence, there might be a great drive to improve wireless connectivity that could be more effective and ensure better communication anywhere relatively to fixed line.

6. **Question**. In your view, if ICT related services are implemented in rural areas, can there be any benefit?
    a. **Answer**. Usefulness of ICT related services for the rural areas should include video conferencing that can be used to facilitate on-line lectures and classes for various educational topics. Access to the sharing of information with other schools will promote knowledge and learning among students as well as their awareness of different services etc.

7. **Question**. About this research any general comments?
    a. **Answer**. The country needs to ensure that the right balance is maintained at all times, especially by ensuring that the involvement all the right parties at the right time when ever initiatives are established and implemented. The recognition of traditional leadership such as kings and chief needs to be put in place as society believes in them. Rural communities will always be at a disadvantage and considered to be backward because most of the qualified and educated people move to urban areas. As a result of this, there will be a lack of role models, no access to information,

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and no program that will ensure that there is an investment for the people who are staying in the rural areas.

Memo

- Educated people move to urban areas, therefore rural people will always be disadvantage
- Recognition of traditional leaders
- Maintain right balance at all times

Interview no 5; Gender: male; Age: 40-50 yrs; level: User

1. **Question**. Any major problems that impact on people who are staying in rural areas?
   a. **Answer.** One of the major problems faced by people in the rural areas is the lack of access to telephone services that form part of the communication infrastructure services. Availability of electricity is another problem, because it causes major challenges even though services could be obtained - without electricity nothing works. Furthermore, no hardware is available such as personal computers. Finally, the lack of financial resources is also a major problem.

2. Question. Any possible solutions to resolve such problems?
   a. Answer. Possible solutions would be the involvement of the community members and other related stakeholders. The different committees involved in policy development will also be abreast with the different needs of the people and the best approach. In order to ensure success, there should be a good business proposal between community members and the local authority to work together.

3. **Question**. Can there be any common goal for the rural area?
   1. **Answer**. There could be one common goal for the community - such as the utilization of schools as the centre of development. In terms of the current situation, each school is central to a community and the distance to be travelled is not a major hindrance. Most schools also have electricity and have security in place. It is therefore possible that the local school within a rural community could be established as a centralised facility to be used to empower all stakeholders.

   Memo

   i. Schools used as the centre for development
   ii. Distance could be eliminated
   iii. Empower, what will be the meaning and interpretation

4. **Questio**n. What are your views about leadership in rural areas?
   a. **Answer**. Leadership within rural communities relies on traditional leaders and this means that practically nothing can be done without the King and chief being involved. For example, Royal Bafokeng, the tribal leadership, bought some computers on behalf of the

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community. The project was extremely successful because it was introduced by the right structure to the community.

Memo

- Introduction of the projects by right people well accepted by the community
- Community rely on traditional leadership

5. **Question**. In terms of the internal and external elements is there any impact?
   a. **Answer**. The major impact can be described as the "generation gap" among the community members. People who are above the age of 50-60 years have little or no interest the introduction of technology. While the youth and younger generations demand access to technology. Therefore, the introduction of ICT related services will be appropriate for the students and people who are probably educated.

Memo

- Age group categorizes people with different needs
- Older people not interested in using technology, not literate and have different interest
- People who are educated use PC

6. **Question**. Are you aware of any process followed when policies are formulated for the rural areas?
   a. **Answer**. When policies are being developed, the policy initiators will call a big gathering called "imbizo" to come and share their views with the different roles players for different needs. Major problems are caused due to political issues, where other members within the same party might have different interests and needs. In most instances, if one member within the council is not happy with the decision taken, he/she might try to influence the community to support an opposing idea. The major driving force will depend on whether or not the person is considered influential. Community members are consulted but not in totality. The ruling party does most of the consultation only to its stakeholders, so it becomes a challenge for the members who are not part of the ruling party. As a result of this, when meetings are called, especially by the ruling party, it becomes very difficult to distinguish whether the meeting is for the own interest as the party or for other community needs.

Memo

- Who are key role players
- Consultations happens only with the ruling party
- Problems can not be distinguish meetings

7. **Question**. What are your views about ICT related policies currently established?

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a. **Answer**. The assumption about ICT related policies has a negative impact to the community; especially some of the projects implemented such a creation of the “cyber community” at Limpopo by HP that did not work at all. Computers were dumped by HP in order to gain recognition that it has some tremendous job with regards to social responsibility. Hence, the machines were deployed without providing the necessary training and the maintenance.

Interview no 06; Group: user; Age: 30-40 yrs Gender: male

1. **Question**. What to you think are major challenges facing people who live in rural areas?
   a. **Answer**. The major challenge is that whenever projects are undertaken project implementers do not do enough market research for the different products and services. This means that various solutions become irrelevant as they do not address the needs of the community. Another issue is the low level of literacy as most people in rural communities are not educated. This frustrates most of the ICT related project such as Public Information Terminal (PIT) that were installed by the government for people who could not use the machines. Furthermore, the availability of different services is often provided at a point that forces citizens to travel vast distances in order to access the service, such as a telephone. The average distance will be in the region of 10km and the money spent on travel will exceed the cost of the actual phone call.

   Memo.

   - Actual travel costs more than the cost of phone usage
   - Environmental scanning for each project before get started

2. **Questio**n. Given the current situation, how can the problems be resolved?
   a. **Answer.** One could possible resolve some of the problems but not all by ensuring that there is a buy-in from the communities with regards to community needs and related projects. It might be a good idea to utilize local people for various projects. Under current circumstances, external companies tender for different jobs and when they are awarded a project they do not involve the local people. This process in ups with technology being dumped in the rural areas. This should be stopped. A clear program designed to address community needs has to be set up and be well supported with regards to ICT related services.

   Memo

   - Utilization of local skills for projects
   - Buy in from the projects

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3. **Question**. Communities have diverse needs and different challenges; can there be any one goal that can be set for the rural community?
    a. **Answer**. There can only be one goal that can be set and supported by the community – the creation of jobs.

4. **Question**. What are your views about leadership in rural areas?
    a. **Answer**. Leadership within the rural areas is still predominantly under the traditional leader, including kings, the chief and indunas. As a result of this kind of leadership, nothing within the community can be done without their blessing or endorsement. For example, during the launch of PIT at Dr. Moroka, the chief and the kings were not consulted and invited to the function. The local authority was responsible for co-ordination. The majority of the people did not attend the function because the king and chief were not invited. Hence, kings and chiefs are still recognized as true leaders of the community

5. **Question**. Information communicated to communities includes subjects such as economic issues, weather, financial and so on. Do you think people the community understand the implication and the meaning?
    a. **Answer**. People are not able to understand the meaning of the different information given to them. For example, during the news broadcast on the SABC when coverage is provided on the weather and financial indicators. The community is not able to respond to the financial indicator by having a different strategic plan with regards to their project. Hence, for them “sizo bona kusasa ilanga malihamba” meaning that we will see as the day moves on and take necessary steps. The promotion of the different government programs do not talk to the people at the lower level. The biggest challenge is that government puts important information on the web site in the hope that people will be able to access it.

Memo

- Government not using the right media for communication purposes
- Government programs do not address the basic needs
- People not able to interpret the information available

6. **Question**. What are you views about the policy development with regards to the rural areas?
    a. **Answer**. Policies developed about 6-7 years ago were based on a centralized, top-down approach. This does not allow people to contribute in a process of policy development and implementation. It is unfair that a community is not consulted during the policy formulation process but at the end they get affected by implementation of the policy. Local government forms part of the

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direct interface with the community with regards to services, they are also not consulted and involved.

Memo

- Policies were enforced on people
- As result no consultation, implementation becomes void
- The local government also not consulted

7. **Question**. Are you aware of any ICT related policies to be implemented or currently used?

   Answer. As a person I am not aware of any of the policies. However, I still believe that it could add more value to the local operations to ensure that policies do contribute towards the development of the rural areas. It might be nice for the local people to be represented in those committees that will be responsible for the policy formulation. The process must ensure that correct forum is formed as being representative of all the stakeholders.

   Memo

   - Representation of the local people in various committees

8. **Question**. There are ICT related policies that were implemented by the government. Are you aware of any of these one and how has it impacted on the community?
   a. **Answer.** Some policies, I think, caused tremendous problems for the community such as the fragmentation of the people through the separation of the infrastructure. This was compounded by the fact that some people were able to use the ICT related services while others could not. There could have been far more progress. The government, for example, has tried to introduce upliftment policies based on social responsibly programs carried out by the private sector. However, some companies do not respect or implement some of the policies that could benefit the community. For example, a company like Telkom is supposed to provide communication related services to all communities. Their key focus is on the urban areas because that is where they make more money. This means that the rural areas could remain isolated for ever.

   Memo

   - Fragmentation of people through technology introduction
   - Policy enforcement for some of the stakeholders
   - Rural community will remain ignored for ever

9. **Question**. Can there be any benefit if ICT related services are implemented in rural areas?

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a. **Answer**. The availability of ICT related services can change the lives of people, such as the provision of telephone services at the point of demand so that users do not have to travel long distances. If the correct technology is chosen and properly implemented and introduced to the people, it has a great positive impact. This best example of this is cell phones. The present situation within the rural area is that a point is being reached where an increasing number of households have a cellular phone and can therefore communicate effectively. Furthermore, different communities can be brought together through different technologies. However, there is still a literacy problem among rural users. Finally the biggest challenge is the establishment of some project for 2010 world cup soccer and opposed to the community needs. So, the development of ICT related solutions to be based on afro centric approach in order to represent the real needs of the people.

Memo

- Project should not be based on 2010, but must address the current needs of the people.
- The Afrocentric, meaning that all projects to be based on the local context

Interview no 07; Gender: male; Age: 40 – 50; target: group

1. **Question**. Any challenges that you aware of in the rural areas?
   a. **Answer.** There are so many challenges that affect the people on daily basis such as lack of electricity. Lack of lighting leads to increased crime. Even when electricity is available, many people in the rural areas cannot afford to pay for it so go without. This has caused so many challenges than even though some ICT related solution can be implemented, without power nothing of significance can be achieved. The road infrastructure is also so poor that people are unable to move about using motor vehicles. As a result, investors are not prepared to invest in an area where they cannot establish job creating opportunities. Lack of job opportunities means yet more poverty. There is continuous growth of the population due to other government policies that encourage larger families by providing grants for children under the age of 10 years. This policy encourages women to have more babies in order qualify for the grant and some means of financial income. This, in turn, promotes the spread of HIV and Aids.

Memo

- High population growth due introduction of some policies
- Contribute towards the increase of the social problem such as HIV & Aids
- Lack of investment due to poor infrastructure

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2. **Question**. How can some of the problems be resolved?
    a. **Answer.** There are no easy or obvious solutions other than the provision of basic services and infrastructure such as roads and the promotion and support of economic activity leading to job creation. But this has to be planned to avoid some situations whereby there are areas that do have electricity but where no people are living and there is no prospect for economic development. Other poor planning that was based on good intentions but has not addressed the real issues include various RDP programs designed to address the housing needs of various communities. In some instances the RDP houses were built but are now occupied illegally while the people who should have benefited remain homeless.

Memo

- RDP houses second biggest problem, illegal occupants occupied the houses.
- Poor planning of the projects from the local government
- No prospect of economic growth

3. **Question**. Could there be any common goal for the community?
    a. **Answer**. Of course there could, but only once the basics have been addressed such as the provision of electrical services that can be used to support other projects such as ICT related services.

4. **Question**. What are views about the leadership in rural areas?
    a. **Answer**. The leadership question is chaotic. There is nothing but conflict between politically-based local authorities and the traditional leadership. As a result, it has caused more division among the community members. There are people who are pro kings and chief and other pro local authorities.

Memo

- Why leadership chaotic?
- More conflict and fight between traditional and political based.

5. **Question**. Any impacts to the community are you aware of that will affect internal and external elements?
    a. **Answer.** The impact will be so low, because the majority of the people are not educated. They will not be able to interpret and understand some of the meaning and implication of the different data.

6. **Question**. Are you aware of any process followed when developing policies in rural areas?

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a. **Answer.** When any policy is being developed, there is no consultation at all with the local community. Community members only get to know about any policy when it has been implemented and has negative impact to them. Mostly it does not talk to them - it is meaningless.

Memo

- Meaningless policies money is being wasted without any value add to beneficiaries

7. **Question**. Do you think implementation of ICT related services in rural areas can it help the community?
   a. **Answer.** The implementation of ICT related services could add value to schools, where they can be used as the common centre. The schools are mostly accessible to all community members and during their spare time over weekends. They can be used to educate the community. It may be more appropriate if the teacher can have more access to PC and enough knowledge, it will help to teach the community and the students. The focus may even be for all citizens of this country to have an e-mail address as opposed to a cell phone.

Memo

- Accessibility of the schools by all communities' members, when projects need to be established schools can be given the consideration.
- Teacher to have access to Personal Computer and able to teach students and public
- E-mail should be a centre of focus for communication cheaper to use, it would demands huge and stable infrastructure

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APPENDIX C

TABLE 5.1. SHOWS ALL THE DIFFERENT CODES/LABELS THAT EMERGED

CATEGORY: INFRASTRUCTURE: RQ1 - 14

Poor Road Infrastructure	Lack of Lighting
Poor Infrastructure	No Power, no ICT Services
Lack of Electricity	Skewness of ICT
Countering Monopoly	Lack of Electricity
ICT Infrastructure Provider - Telkom	Technology Maintenance
Lack of Hardware	Lack of ICT Related
Technology Deployed	Monopoly and Telkom

SUB – CATEGORY: ICT INFRASTRUCTURE – I (ICT1)

Availability of HW/SW	[Y/N]
Service Provider	[Monop/Not Monop]
Service Provisioning	[Urban/Rural]
Service Alignment	Aligned/Not Aligned]

SUB – CATEGORY: ELECTRICAL INFRASTRUCTURE I (E1)

Electricity Available	[Y/N]
Impact on ICT Services	[Negative/Positive]

SUB – CATEGORY: ROAD INFRASTRUCTURE

State of Road Infrastructure	[Good/Bad]
Existence of Road Infrastructure	[Adequate/Inadequate]

SUB – CATEGORY: TECHNOLOGY

Deployed Technology	[Relevant/Irrelevant]
Maintenance of Technology	[Adequate/Inadequate]
Support of Technology	[Adequate/Inadequate]

CATEGORY: COMMUNITY BASIC NEEDS: RQ1- 10

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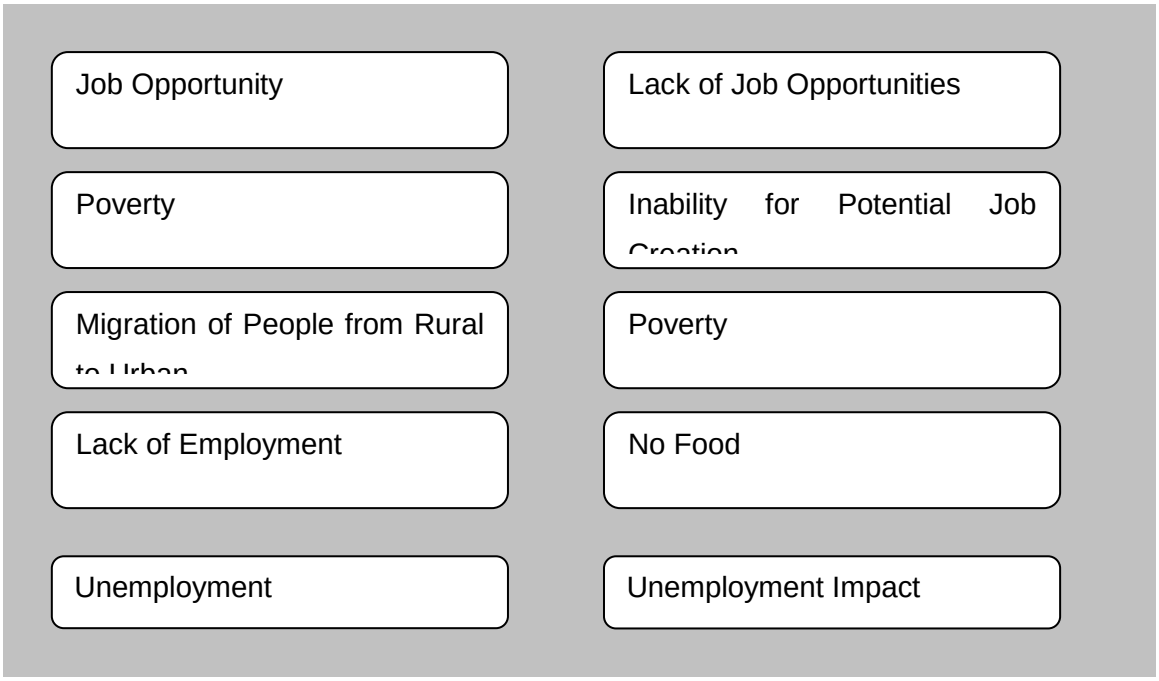

SUB – CATEGORY EMPLOYMENT

Jobs	[Available/Not Available]
Movement	[Stay/Go]
Location of Opportunities	[Rural/Urban]
Potential for Job Creation	[Low/High]

SUB – CATEGORY: POVERTY

Food	[Affordable/Not Affordable]

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CATEGORY: COMMUNITY INTERVENTION: RQ1 - 8

Community Acceptance of Projects	Priority of Spending
Priority of Needs	Project Misalignment
Lack of Marketing Understanding for Projects	Not Address the Needs of the Community
Children Grants don't meet	Basic Needs not met

SUB-CATEGORY: PROJECTS

Community Acceptance	[Accepted /Not Accepted]
Community needs Focused	[Yes /No]
Priorities – Projects vs. Community	[Aligned /Misaligned]
Project Marketing Strategy	[Good /Bad]
Community Understanding	[Yes /No]
Project Spending	[Relevant /Irrelevant]

SUB-CATEGORY: POLICY INTERVENTIONS

Needs Alignment	[Yes /No]
Outcomes	[Attended /Unattended]

CATEGORY: ECONOMICS: RQ1 - 8

Urban and Rural Gap	Attraction of Investor
Level of Economic Activities	Lack of Money
Lack of Economic Activities	Economies of Scale
Willingness to Invest in Rural Areas	Financial Viability (Money) Technology used

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SUB-CATEGORY: INVESTMENT

Willingness to Invest	[Low/High]
Attraction to Invest	[Existing/Not]

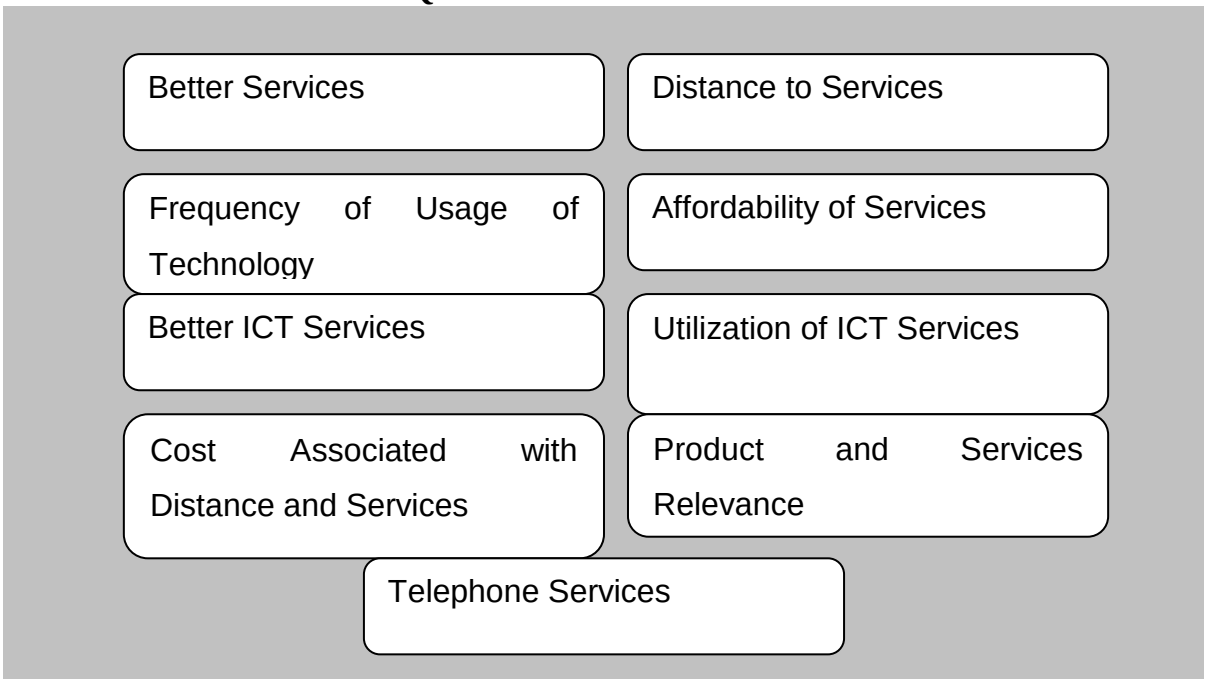
SUB-CATEGORY: FINANCIAL VIABILITY

Availability of Funds	[Yes/No]
Funds for Technology	[Available/Not Available]

SUB-CATEGORY: PRODUCTIVITY

Level of Economic Activities	[Low/High]
Economies of Scale	[Existent /Non Existent]

CATEGORY: SERVICES: RQ1- 9



SUB-CATEGORY: PROXIMITY

Distance to Service Site	[Nearer/Far]
Travel Cost	[Low/High]

SUB-CATEGORY: SERVICE TYPES

Telephone Services	[Accessible/Not Accessible]
ICT Services	[Limited /Not Limited]

SUB-CATEGORY: SERVICE COSTS

Affordable	[Yes /No]

SUB-CATEGORY: QUALITY OF SERVICES

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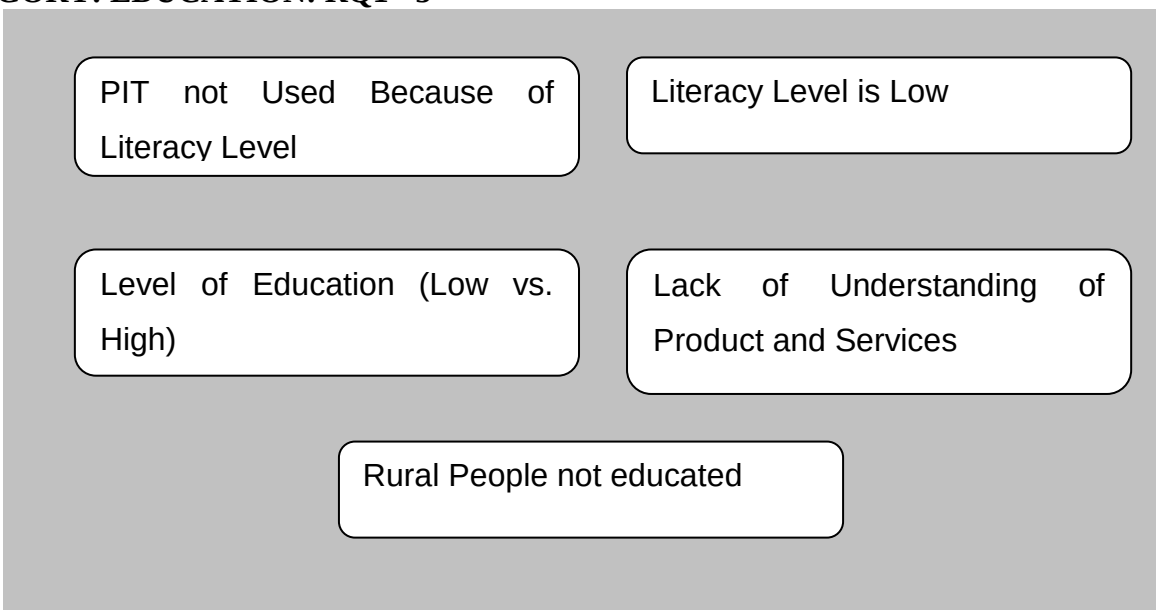
ICT Services	[Good /Bad]
Services in General	[Good /Bad]

SUB-CATEGORY

Alignment of Services	[Relevant /Not Relevant]
Alignment of Products	[Recognized/Not Recognized]

CATEGORY: EDUCATION: RQ1 - 5



SUB-CATEGORY: LITERACY

Literacy Level	[High /Low]
Use of Technology	[High /Low]

SUB-CATEGORY: EDUCATION

Level of Education	[Low /High]
Location	[Rural /Urban]

SUB-CATEGORY: TECHNOLOGY

Alignment of Product (Community Needs)	[Yes /No]
Alignment of Services	[Yes No]

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CATEGORY: GOVERNANCE: RQ1 - 8

Lack of Regulations	Lack of policies
Inappropriate structures	No adhere to ICT policies
Lack of community structures	Involvement in community project
Lack of proper accountability	Well defined roles and responsibility
Compliance to all laws	Information availability

SUB-CATEGORY: STRUCTURES

Relevancy on community structures	[Yes/No]
Involvement in project initiation	[Yes/No]

SUB-CATEGORY: REGULATIONS

Regulations existence	[Available/Not available]
Adherence to policies	[Yes/No]

SUB-CATEGORY: ROLES AND RESPONSIBILITIES

Accountability	[HighLow]
Define Roles and responsibility	[Clear/Not clear]

SUB-CATEGORY: ICT REGULATIONS

Accessibility of information	[Available/Not Available]
Compliance with regulations	[Comply/Not Comply]

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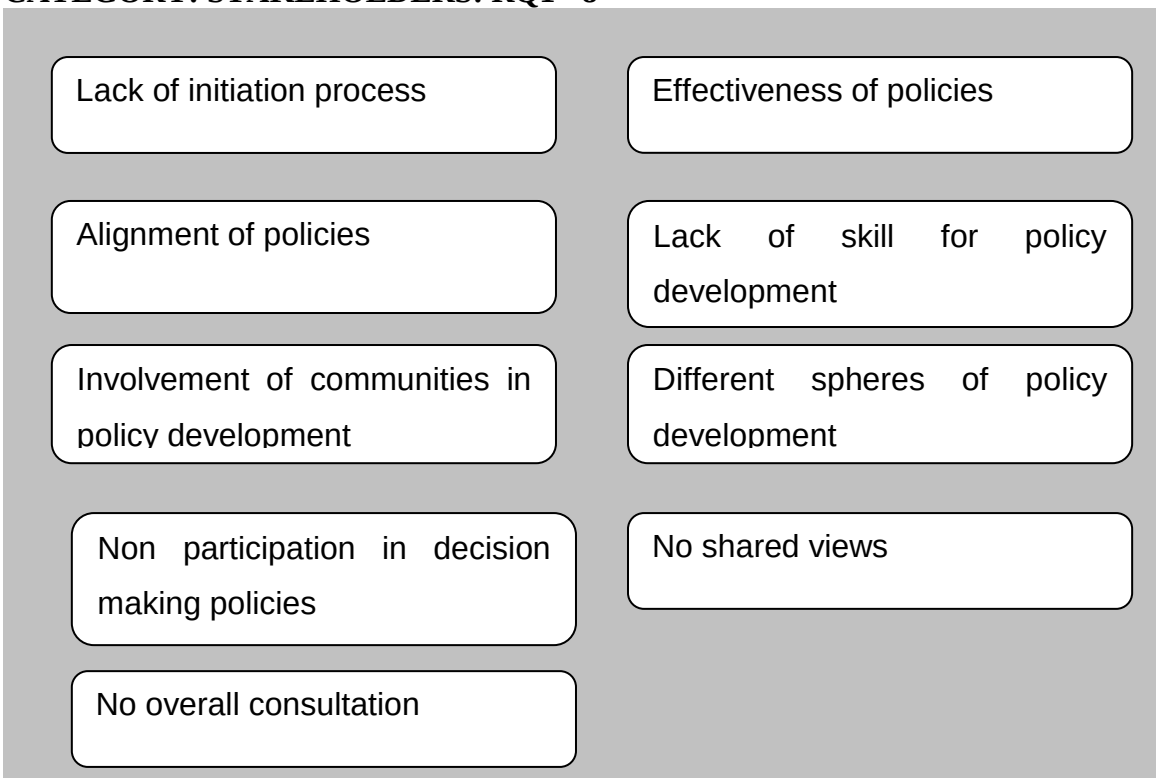
CATEGORY: STAKEHOLDERS: RQ1 - 8



SUB-CATEGORY: POLICY DEVELOPMENT

Policy development	[Effective/Not effective]
Policy initiation process	[Available/Not available]

SUB-CATEGORY: CAPACITY TO DEVELOP POLICIES

Availability of policy development	[Available/ Not Available]
Effectiveness of policies	[Effective /Not effective]

SUB-CATEGORY: APPROACH

Applicable approach	[Worse/Better]
Involvement of stakeholder	[Bottom/Top]

SUB-CATEGORY: CONSULTATION PROCESS

Imbizo meetings	[Effective/Not effective]
Community understanding	[Understand/Don't understand]
Overall consultation	[Yes/No]

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CATEGORY: LEADERSHIP IN RURAL AREAS: RQ1 - 8

Interference of political leaders	Diverse political parties' interest
Lack of participation in decision making	No integrated strategy
Leadership stability chaotic	Traditional leadership dominate
Allocation of resources lacking	Funds not allocated

SUB-CATEGORY: TRADITIONAL LEADERSHIP

Traditional leadership	[Champion /Not a champion]
Leaders are	[Born/groomed]

SUB-CATEGORY: ROLES

Customer affairs	[Managed/Not managed]
Allocation of land	[Yes/No]

SUB-CATEGORY: POLITICAL LEADERS

Recognized by the community	[Yes/No]
Impact to the society	[High/Low]

CATEGORY: ECONOMICS: RQ1 - 8

Urban and Rural Gap	Attraction of Investor
Level of Economic Activities	Lack of Money
Lack of Economic Activities	Economies of Scale
Willingness to Invest in Rural Areas	

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APPENDIX D

Appendix D shows the Details of Higher Order in terms of Categories

Category	Major properties	Dimensions
Governance	**4 Structures**	**Formal structure non existence** **Role players non known**
	4 Regulations	**Promulgation does not exist** **Management non-existent** **Not user friendly**
	4 Roles & responsibility	**Roles not clear at all** **Lack of accountability** **Limited knowledge in skills** **Stakeholders not known**
	4. ICT regulations	**Services not effective** **Competition unmanageable** **Accessibility of information by rural people none** **Certification not functional** **ICT sector driven by profit margin**
ICT infrastructure	**1. Skills level**	**Ranges from 0 – 1 level (low)** **Ability to support system low** **Ability to maintain system low**
	2. Usage ability	**Non existence at all**

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	3. Investments	**Investment on services non-existent** **Investment on users non-existent** **General investment on ICT low** **Financial support non-existent**
	4. Capacity	**Capacity to deliver non-existent**
	4. ICT Industry	**Changes unmanageable** **Continuous changes/amendment of policies** **Local expertise none** **Equipments very limited** **Maintenance very low** **Support none**
Policy development life cycle	**1. Policy development**	**Not adequate to community** **Lack of skills and capacity** **Lack of stakeholders participation** **Does not address the needs** **Participation of all stakeholder non-existent** **Consultation process does not exist** **Development over-saturated** **Amendments are continuous** **Planning non-existent**

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	2. Policy implementation	**Implementation process very poor** **Implementation strategy non-existent** **Policy implementation very low** **Skills to implement limited** **Roles of implementers not clear** **Accountability not clear**
	3. Policy monitoring	**Monitoring measure non-existent.** **Evaluation measure non-existent** **Policy monitoring does not exist**
Consultation with stakeholders	• **Stakeholder involvement**	**Involvement very low** **Input received very low** **Communication none** **Community participation low**
	• **Consultation process**	**Skills to consult very low** **Education level limited** **Value add non-existent** **Process consultation non-existent**
	• **Travelling distance**	**Distance travelled too far** **Road infrastructure non-existent** **Travelling around non-existent**

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Approach	**1. Decision making**	**Only executives decides** **Policies are imposed on people** **Decisions are imposed**
	2. Service delivery	**Delivery capability limited** **Basic needs not satisfied** **Services are imposed on people** **Approach very disjointed** **No co-ordination of services** **No collaboration with stakeholders** **Mandates are duplicated** **More confusion being created**
	3. Consultation	**It's done to legitimise the process** **Only individual consultation** **People participation none**
	4. Communication	**Media used very badly** **Target market not known Affordability by people high** **Wrong perception about people**

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	5. Participation	**Participation non-existent** **No local buying from people** **Project participation non-existent** **Community initiatives non-existent** **Decision making only by executives**
Communication	**Feedback**	**Feedback to community non-existent** **Imbizo meetings not effective** **Sharing of vision non-existent**
	"Imbizo"	**Only political party members invited** **Happens during election times** **No direct benefit to community** **Only party politics are discussed**
	"Lekgothla"	**Only executives attend the meeting** **Decides on country policies** **No feedback to stakeholders** **Not inclusive of all stakeholders**

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	Media	**Government Gazette not accessible** **Skills level too low to read** **Affordability to purchase Gazette** **Interpretation skills very low** **Media complicated for analysis**
ICT Value	**Policies**	**Policy effectiveness non-existent** **Value added non-existent** **No benefit to people** **No linkage to community needs** **Small growth in PIT** **Disapproval of people** **Connectivity** **Consultation non-existent**
Compliance	**Culture**	**Compliance culture non-existent** **Culture of resistance adopted** **Acceptance level very low**
Research and Development process	**R&D**	**ICT innovation non-existent** **Research very limited** **Development very minimal** **Skills level very low** **Capacity very limited** **Sustainable development low**

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Human Resources	**Skills**	**ICT skills very limited** **Skills level very low** **Knowledge very low** **Technology very complicated**
	Capacity	**Capacity to deliver limited**
Rural Society	**Challenges**	**Social challenges dominates the people** **Unemployment very high** **Affordability major problem** **Focus to be on grants** **Acts hamper development**
Funding	**Maintenance**	**Costs very high** **Continuous increases**
	Infrastructure	**Costs increases**
	Economies of scale	**Non-existent**
	Universal Service Obligation	**Affordability by users** **Funding strategy non-existent** **Support & maintenance strategy non-existent**
	Skills and Capacity	**Funding of training to be done** **Bursaries to be issue**
Recommended solutions	**Changes**	**Changes to be structured** **Amendments to be managed** **well**

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	Governance	**Structure to be set up** **Involvement of all people** **Consultation to be done at lower level** **Recognition of local structure to be done**
	Stakeholder	**All stakeholders to be involved** **Clear roles and responsibility to be established** **Accountability to be clear** **Co-ordination done with stakeholders**
	ICT Forum	**ICT forum to be formed** **All stakeholders to be represented** **Proper strategy to be developed** **Proper policies to be in place**
	Implementation strategy	**Implementation plan to be put in place** **Implementation strategy to be established** **Implementation team to be in place**

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	Policy process	**Policies to be aligned to needs** **Testing to be done on policies** **Creation of meaningful policies** **Amendment of policies to be controlled and managed** **Policy implementation to be planned**
	Communication strategy	**Community strategy to align with community needs** **Expansion of cell phone services** **Strategy to be flexible** **Imbizo meetings to be called continuously** **Community needs to be discussed**
	Skills	**Skills development to be done** **Alignment of ICT skills with needs** **Skills development plan to be in place** **Sustainable skills to be place**
	Funding	**ICT infrastructure and services to be funded** **Government to provide subsidy on ICT infrastructure** **Services to be**

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		afforded
	Framework	**Framework to be suitable** **Affordability by people key goal** **Projects to be sustained**
	Education	**Community to be educated** **Community programs to be established** **Education to be a continuous process** **Education to address the key needs**
	Environmental scanning	**Environment to be scanned** **Understanding of the environment is key** **Dominating fixture to be done** **Rural people heavy users** **Identification of target market is key**

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	Approach	**Approach to be integrated** **Build from what you know approach** **Centralized data management is key** **Bottom up approach recommended**

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APPENDIX E.

CATEGORIES, MAJOR PROPERTIES AND DIMENSIONS

Category	Major properties	Dimensions
4 Governance	**4.8 Structures**	• **Relevance (Y/N)** • **Involvement (Y/N)**
	4.8 Regulations	• **Existence of Regulations (Available/Unavailable)** • **Adherence to Policies (Y/N)**
	4.8 Roles & responsibility	• **Accountability (High/Low)** • **Defined Roles (Clear/Unclear)**
	4.8 ICT Regulations	**7. Accessibility of Information (Y/N)** **8. Compliance to Regulations (Comply/Not Comply)**
	4.8 Policy Intervention	**9. Requires Alignment (Y/N)** **10. Outcomes (Attended/Unattended)**
4 Technology	4.8 **ICT Infrastructure**	**3 Availability (Y/N)** **4 Service Provider (Monopoly/non-monopoly)** **5 Service Provisioning (Rural/Urban)** **6 Services (Aligned/Misaligned)**
	4.8 ICT Systems	• **Deployed Technology (Relevant/Irrelevant)** • **Maintenance (Adequate/Inadequate)**
	4.8 Electrical Infrastructure	**12 Availability (Y/N)** **13 Impact on Services (Negative/Positive)** **14 Telephone Services (Accessible/Not Accessible)** **15 ICT Services (Limited/Unlimited)**

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Social Welfare	• **Population**	• **HIV/Aids spreads from low to high** • **Death rate extremely (High/Low)**
	• **Health**	• **Medical support (Exist/Non existence)** • **Awareness campaign (Exist/Non existence)** • **Clinics/hospitals (Sufficient/Not sufficient)** • **Doctors (Available/Not available)**
	• **Literacy**	• **Literacy Level (Low/High)** • **Use of Technology (Low/High)**
	• **Employment**	• **Jobs (Available/Not available)** • **Movement (Stay/Go)** • **Location of Opportunities (Rural/Urban)** • **Job Creation (Low/High)**
	• **Education**	• **Level Of Education (Low/High)** • **Location (Urban/Rural)**
	• **Poverty**	• **Food (Affordable/Unaffordable)**
	• **Projects**	• **Community Acceptance (Y/N)** • **Needs-Focused (Y/N)** • **Priorities (Aligned/Misaligned)** • **Strategy (Good/Bad)** • **Spending (Relevant/Irrelevant)**

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4	**Policy development life cycle**	• **Crime rate**	• **Crime (Controllable/Not controllable)** • **Eradication measures (Available/Not available)** • **Impact on community (High/Low)** • **Crime drivers (Youth /Elders)** • **Community entertainment (Exist/Non existence)** • **Children abuse (High/Low)** • **Depression of individuals (High/Low)** • **Alcohol abuse (High/Low)** • **Continuous growth of alcoholics (Yes/No)**
		a. Policy implementation	• **Implementation process (Poor/Good)** • **Implementation strategy (Exist/Non-existent)** • **Policy implementation (High/Low)** • **Implementations Skills (Limited/Unlimited)** • **Roles of implementers (Clear/Not clear)** • **Accountability (Accountable/Not accountable)**
		b. Policy monitoring	• **Monitoring measure (Available/Not available)** • **Evaluation measure (exist/Non-existent)** • **Policy monitoring (available/Not**

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		available)
4 Stakeholders	**4.8 Policy Development**	• **Development (Effective/Ineffective)** • **Initiation Process (Available/Unavailable)**
	4.2 Capacity to Develop Policies	• **Capacity Availability (Y/N)** • **Effectiveness (Effective/Ineffective)**
	4.8 Consultation process	• **Meetings (Effective/Ineffective)** • **Understanding (Y/N)** • **Consultation (Y/N)**
4	**Approach**	• **Applicability (Worse/Better)** • **Involvement (Bottom/Top)**
	Travelling distance	• **Distance travelled (Near/Far)** • **Road infrastructure (Exist/Non-existent)**
4 Approach	**4.8 Decision making**	• **Only executives decides** • **Policies are imposed on people** • **Decisions are imposed**
	4.8 Service delivery	• **Delivery capability (Limited/Unlimited)** • **Basic needs (Satisfied/Not satisfied)** • **Approach (Jointed/Disjointed)** • **Co-ordination of services (Yes/No)** • **Collaboration with stakeholders (Yes/No)** • **Mandates (Clear/Not clear)**

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	4.8 Consultation	• **Consultation process (Done/Not done)** • **Participation (Individual/Community)**
	4.8 Communication	• **Communication media (Bad/Good)** • **Target market (Known/Unknown)** • **Affordability to people (Affordable/Not affordable)** • **Perception about people (Wrong /Right)**
	4.8 Participation	• **Local buy-in from people (Exist/Non-existent)** • **Participation on projects (Exist/Non-existent** • **Community initiatives (Available/Not available)** • **Decision making (Executives/Community)**
4 Communication	**4.8 Feedback**	• **Feedback to community (Exist/Non-existente)** • **Imbizo meetings (Effective/Not effective)** • **Shared vision**

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		(Available/Not available)
	4.8 "Imbizo"	• **Invitation people (politicians/Non members)** • **Frequency of meetings (Election times/Not election times)** • **Benefits to the community (Direct/Indirect)** • **Discussed items (Political/Non political)**
	4.8 "Lekgothla"	• **Attendees (Executives/Non executives)** • **Decision types (Local policies/Country policies** • **Feedback to stakeholders (Yes/No)** • **Stakeholders involvement (Inclusive/Not inclusive)**
	4.8 Media	• **Government Gazette (Accessible/Not** • **Accessible)** • **Skills level (Low/High)** • **Affordability to purchase gGzette (Yes/No)** • **Interpretation ability (Yes/No)** • **Media analysis (Complicated/Not complicated)**
4 ICT Value	**4.8 Policies**	• **Policy effectiveness (Exist/Non** • **Existence)** • **Value add (Yes/No)** • **Benefit to people (Yes/No)** • **Linkage to community needs (Links/No links)** • **Growth in PIT (Small/Big)** • **Connectivity**

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		(Available/Not available) • **Consultation (Exists/Non-existent)**
4 Compliance	**4.8 Culture**	• **Compliance culture non-existent** • **Culture of resistance adopted** • **Acceptance level very low**
4 Research and Development process	**4.8 R&D**	• **ICT innovation non-existent** • **Research very limited** • **Development very minimal** • **Skills level very low** • **Capacity very limited** • **Sustainable development low**
4 Human Resources	**4.8 Skills**	• **ICT skills very (Limited/Unlimited)** • **Skills level (Low/High)** • **Knowledge base (Low/High)** • **Technology nature (Complicated/Easy)**
	4.8 Capacity	• **Capacity to deliver (Limited/Unlimited)**
4 Rural Society	**4.8 Challenges**	• **Social challenges (Dominates/Not domination)** • **Unemployment rate (High/Low)** • **Affordability (Yes/No)** • **Focus on grants (Yes/No)** • **Acts hamper development (Yes/No)**
12. Economics	6. Economic activity	• **Economic activity (low/high)** • **No growth at all in the economy** • **Investments non-existent** • **Financial resources not available** • **Ability to import and export non-existent.**

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	12.1 Investment	• **Willingness to Invest (Low/High)** • **Attraction to Invetsments (Existent/ Non-existent)**
	o **Financial Viability**	• **Funds Availability (Y/N)** • **Funds for Technology (Available/Unavailable)**
	12.3 Productivity	• **Level of economic activity (Low/High)** • **Economies of Scale (Exist/Non-existent)**
	12.4 Proximity	• **Distance (Near/Far)** • **Travel Cost (High/Low)**
	12.5 Service Costs	• **Affordability (Y/N)**
Leadership in rural areas	**General information on economy available**	• **Accessibility by rural people (Yes/No)** • **Ability to interpret the information (Yes/No)** • **Ability to read the information (Able/Not able)**
	Traditional leadership	• **Champion to community (Yes/No)** • **True leaders of the people (Yes/No)** • **Leaders (Born/Groomed)** • **Elected by the community (Yes/No)** • **Followers (Few/Lot)** • **A link to community (Direct/Indirect)**

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	Roles	• **Ability to advise on traditional policies (Yes/No)** • **Manage customary affairs (Able/Not able)** • **Allocate land for the people (Yes/No)** • **Manage community projects (Able/Not able)**
	Political leaders	• **Creates conflict against traditional (Yes/No)** • **Recognized by community (Yes/No)** • **Confusion of people (Yes/No)** • **Impact on people (Positive/Negative)** • **Division of the society (Yes/No)**

Category	Major properties	Dimensions
Governance	Structures	Formal structure non-existent Role players not known
	Regulations	Promulgation does not exist Management non-existent Not user friendly
	Roles & responsibility	Roles not clear at all Lack of accountability Limited knowledge and skills Stakeholders not known

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	ICT regulations	Services not effective Competition unmanageable No Accessibility of information by rural people Certification not functional ICT sector driven by profit margin
ICT infrastructure	5. Skills level	Ranges from 0 – 1 level (low) Ability to support system low Ability to maintain system low
	6. Usage ability	Non-existent
	7. Investments	Investment in services non-existent Investment in users non-existent General investment in ICT low Financial support non-existent
	4. Capacity	Capacity to deliver non-existent
	8. ICT Industry	Changes unmanageable Continuous changes/amendment of policies Local expertise none Equipments very limited Maintenance very

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		low Support none
Policy development life cycle	1. Policy development	Not adequate to community Lack of skills and capacity Lack of stakeholders participation Does not address the needs Participation of all stakeholder non-existent Consultation process does not exist Development over-saturated Amendments are continuous Planning non-existent
	2. Policy implementation	Implementation process very poor Implementation strategy non-existent Policy implementation very low Skills to implement limited Roles of implementers not clear Accountability not clear

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	3. Policy monitoring	Monitoring measure non-existent. Evaluation measure non-existent Policy monitoring does not exist
Consultation with stakeholders	• Stakeholder involvement	Involvement very low Input received very low Communication none Community participation low
	• Consultation process	Skills to consult very low Education level limited Value add non-existent Process consultation non-existent
	• Travelling distance	Distance travelled too far Road infrastructure non-existent Travelling around non-existent
Approach	7. Decision making	Only executives decide Policies are imposed on people Decisions are imposed

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	8. Service delivery	Delivery capability limited Basic needs not satisfied Services are forced on people Approach very disjointed No co-ordination of services No collaboration with stakeholders Mandates are duplicated More confusion being created
	Consultation	It's done to legitimise the process Only individual consultation No people participation
	Communication	Media used is very bad Target market not known Unaffordable to people Wrong perception about people
	Participation	Participation non-existent No local buying from people Project participation non-existent Community

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		initiatives non-existent Decision making only by executives
Communication	Feedback	Feedback to community non-existent Imbizo meetings not effective Shared vision non-existent
	"Imbizo"	Only political party members invited Happens during election times No direct benefit to community Only party politics are discussed
	"Lekgothla"	Only executives attend the meeting Decides on country policies No feedback to stakeholders Not inclusive of all stakeholders

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	Media	Government Gazette not accessible Reading skill level very low Affordability to purchase Gazette Interpretation skills very low Media complicated for analysis
ICT Value	Policies	Policy effectiveness non-existent Value add non-existent No benefit to people No linkage to community needs Small growth in PIT Disapproval of people Consultation non-existent
Compliance	Culture	Compliance culture non-existent Culture of resistance adopted Acceptance level very low
Research and Development process	R&D	ICT innovation non-existent Research very limited Development very minimal Skills level very low Capacity very limited Sustainable development low

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Human Resources	Skills	ICT skills very limited Skills level very low Knowledge very low Technology very complicated
	Capacity	Capacity to deliver limited
Rural Society	Challenges	Social challenges dominate the people Unemployment very high Affordability major problem Focus to be on grants Acts hamper development
Funding	Maintenance	Costs very high Continuous increases
	Infrastructure	Costs increase
	Economies of scale	Non-existent
	Universal Service Obligation	Affordability by users Funding strategy non-existent Support & maintenance strategy non-existent
	Skills and Capacity	Funding of training to be done Bursaries to be awarded

Public Information Terminal (PIT)	South African Post Office (SAPO)	National, with specific emphasis on rural since SAPO has country wide footprint	e-government services	15. Promotion of One citizen one e-mail address 16. e-mail services

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				17. e-government services (downloading of government forms) 18. internet access

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APPENDIX F.

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