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The challenges of rural connectivity: Eight case studies of Thusong Service Centres in Mopani District

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A research report submitted to the Faculty of Commerce, Law and Management, University of the Witwatersrand, in 50% fulfilment of the requirements for the degree of Master of Management in the field of ICT Policy and Regulation (MMICTPR)

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Abstract

The research aimed to investigate the supply and demand side factors that enables or hinders the effectiveness of rural connectivity provided through public access points such as the Thusong Service Centres (TSCs). The lack of broadband and terrestrial infrastructure is often cited as the main reason why rural people are not able to participate in the information society. The status of the Mopani District rural connectivity indicates that the digital divide is not always due to the lack of infrastructure, but due to the etic approach towards the deployment of connectivity and the failure to locate rural connectivity within the broader community development goals. The failure to understand the user requirements contributes to the misconception that Very Small Apparatus Terminals (VSAT) satellite technology is an inadequate solution which must be replaced by fixed broadband. On the other hand, the failure of the Department of Public Service and Administration (DPSA) blueprint indicates the poor level of e-government readiness within the public service sector. The status of the Mopani TSCs also shows that there is a lack of accountability, cooperation and collaboration across the three spheres of government and that there is a misuse of public funds in cases where connectivity resources are duplicated and not optimally used.

The separation of the public service connectivity from the public connectivity creates the digital inequality in the targeted communities. The separation has resulted in connectivity being available to some and not to all, because accessibility is based on personal relationships. In other cases there is constructed denied access due to local politics. 16 years later since the establishment of the Universal Service and Access Agency of South Africa (USAASA), the South African Community Informatics (CI) sector is struggling to achieve outputs that produce the desired impact in the targeted communities.

Keywords: readiness, appropriate technology, capability, functioning, purposeful consumption, digital literacy, digital divide, digital inequality, VSAT community informatics, ICT for development (ICT4D).

Declaration

I declare that this report; **the challenges of rural connectivity: Eight case studies of Thusong Service Centres in Mopani District,** is my own, unaided work. It is submitted to the Faculty of Commerce, Law and Management, University of the Witwatersrand in partial fulfilment of the requirements for the degree of Master of Management in the field of ICT Policy and Regulation (MMICTR) in the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in any other university. Where the efforts of others have been used, all the sources that have been quoted have been acknowledged.

……. …….

SIGNATURE DATE

KGOPOTSO DITSHEGO MAGORO

Dedication

To my children, Matete, Bophelo and Moeletsi, you compromised your weekends and holidays, just to give me the space to focus on my studies. You are the best! To my husband Gift, thanks for the support and believing in me. My mother, my rock, Modjadji Magoro, I thank you for the compromise and support. To my sisters, Mapula, Neo and Basetsana, your support, love, words of encouragement and babysitting gave me the strength to want to achieve and lead by example.

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Abbreviations

ADSL	Asymmetric digital subscriber line
APC	Association of Progressive Communication
CA	Capability Approach
CBOs	Community Based Organisations
CDP	Community Development Practitioners
CDW	Community Development Worker
CI	Community Informatics
Cogta	Co-operative Governance and Traditional Affairs
CPSI	Centre for Public Service Innovation
DAC	Department of Arts and Culture
DoC	Department of Communications
DPSA	Department of Public Service and Administration
DRDLR	Department of Rural Development and Land Reform
DVB-S	Digital Video Broadcasting-Satellite
ECA	Electronic Communications Act
ECD	Early Childhood Development
ECTA	Electronic Communications Transaction Act
e-RAP	e-Rural Access Programme
FAO	Food and Agriculture Organization
FGD	Focus Group Discussion
GCIO	Government Chief Information Officer
GCIS	Government Communication and Information System
GITOC	Government Information Technology Officer Council
GTM	Greater Tzaneen Municipality
GWICTS	Government Wide Information and Communication Technology
ICASA	Independent Communications Authority of South Africa
ICT4D	ICT for development

ICTs	Information and communications technologies
IDT	Independent Development Trust
IEC	Independent Electoral Commission
IGR	Intergovernmental Relations
IGRF	Intergovernmental Relations Forum
IS	Information Systems
ISAD	Information Society and Development
ITU	International Telecommunication Union
LED	Local Economic Development
LIEDA	Limpopo Economic Development Agency
M&E	Monitoring and evaluation
MDGs	Millennium Development Goals
MICT SETA	Media, Information and Communication Technologies Sector Education and Training Authority
MIOS	Minimum Interoperability Standards
MPCC	Multi-Purpose Centres
MTEF	Medium Term Expenditure Framework
NDP	Neighbourhood Development Programme
NEMISA	National Electronic Media Institute of South Africa.
NPO	Non-Profit Organisation
NT	National Treasury
ODL	Open Distance Learning
OGCIO	Office of Government Chief Information Officer
PFMA	Public Finance Management Act
PISC	Provincial Intersectoral Steering Committee
PITs	Public Internet terminals
PNC	Presidential National Commission
PPP	Public Private Partnership
PRC	Presidential Review Commission
PSA	Public Service Act
PSC	Public Service Commission
SALGA	South African Local Government Association
SAMRC	South African Medical Research Council

SANGONeT	Southern African NGO Network
SAPS	South African Police Service
SARI	Sustainable Access in Rural India
SASSA	South African Social Security Agency
SITA	State Information Technology Agency
SMMEs	Small, Medium and Micro-sized Enterprises
SMS	Short Message Service
Stats SA	Statistics South Africa
TAU	Technical Assistance Unit
TSCs	Thusong Service Centres
Unisa	University of South Africa
USAASA	Universal Service and Access Agency of South Africa
USAF	Universal Service and Access Fund
USAID	United States Agency for International Development
USF	Universal Access Fund
VoIP	Voice over Internet Protocol
VPN	Virtual Private Network
VSAT	Very Small Apparature Terminal
WiFi	Wireless Fidelity
WiMAX	Worldwide Interoperability for Microwave Access
WLL	Wireless Local – Loop
WSIS	World Summit on the Information society

CHAPTER 1: BACKGROUND TO THUSONG SERVICE CENTRES

Rural communities often lack access to basic services such as health, transport, telecommunications, water, energy, sanitation and access to personal documentation. Even in cases where services are available, community members have to travel long distances in order to apply or access services. The amount of time spend traveling could result in rural people losing their productive time. The young and active members of the communities also often relocate to cities such as Gauteng in pursuit of their social and economic empowerment. The challenges faced by the rural communities is observed by Belding, Johson, Pejovic , Parks and Zheleva (2012, p. 2268) who concluded that “rural areas of the developing world have few resources such as libraries, and skilled workers tend to migrate to more affluent, industrialized areas”.

Globally, Information and communications technologies (ICTs) are seen as tools that could enable rural communities to have access to information and the services offered by government. ICT for development (ICT4D) refers “to the ways that information and communication technologies can be mobilised in support of development goals, particularly those relating to social, political and economic development” (Association for Progressive Communications, 2013). Organisations such as the Food and Agriculture Organization (FAO) have been using ICTs since the 1980s to support farmers in developing countries. FAO strategy included the use of radio, video and computers. Their current strategy includes the use of mobile phones to connect farmers to the markets and alert them on disasters (Food Agriculture Organisation, 2012). In other areas, ICTs have been used to solve medical challenges. The provision of telemedicine in provinces such as Limpopo and the Eastern Cape has enabled rural people to access specialist medical assessments without having to leave their provinces or villages (South African Medical Research Council, 2012). In Africa, the emergence of the mobile phone is a ground-breaking innovation for the banking sector. The “mobile banking is

creating opportunities for the poor to have access to the wider financial services sector in developing countries in Africa and elsewhere" (Afful, 2014).The sector uses ICTs to bridge the gap between the banked and the previously unbanked in the disconnected communities. Before the mobile phone invention, people had to travel to cities in order to check their balances and they relied on post offices to receive money from their relatives who have migrated to the economic hubs. The mobile phone has changed the way of doing banking and has empowered users to save money and time. However, "developing countries face challenges when harnessing ICTs potential for economic development" (Fong, 2014). Fong posits that investment in ICTs and their enabling infrastructures constitute an expensive affair for developing countries. The high cost associated with the deployment and of telecommunications infrastructure continues to widen the digital gap between the developed, developing countries and within the various socio-economic stratum. This requires governments to provide universal access to telecommunications and specifically internet connectivity in the rural areas.

THE DIGITAL DIVIDE REALITY: A TALE OF RURAL PROVINCES AND MUNICIPALITIES

The inequality and gap in terms of access to telecommunication services is known as the digital divide (Hargittai, 2003). Lack of access to the telecommunications infrastructure and network is known as the first order digital divide and the capability divide is the second order digital divide, which deals with the competency of an individual to perform a specific digital task (Esperanza & Rodrigo, 2007). The digital divide is also a new form of social inequality which impacts the possibility for citizens to access life-improving services (R o b l e s & Torres-Albero, 2012).

The challenge faced by South Africa is that the majority of its rural communities' still lack access to ICTs and are not connected to the telecommunications infrastructure. The 2011 census indicate that 35.2% of the households have access to the Internet and 64.8% lack access, 3 092 541 households

have access to a computer (StatsSA, 2012). Table 1, below, gives an indication of the digital gap in South Africa, illustrating that the provinces that are known to be poor have low levels of internet penetration compared to provinces such as Gauteng and the Western Cape. Another challenge is that there is also a digital divide between government institutions.

TABLE 1: DISTRIBUTION OF HOUSEHOLDS WITH INTERNET BY PROVINCE

Internet access	Province									SA
	WC	EC	NC	FS	KZN	NW	GP	MP	LP	
From home	269 494	83 721	16 620	48 770	190 284	47 124	483 024	55 373	44 777	1 239 187
From cell phone	251 790	215 842	44 054	136 771	449 991	157 408	697 088	194 199	209 797	2 356 921
From work	96 546	47 730	10 471	27 538	87 080	34 472	307 511	35 771	31 124	678 242
From elsewhere	96 030	59 450	7 047	43 553	125 164	40 268	327 675	52 644	59 462	811 295
No access to internet	920 141	1 280 642	223 213	566 684	1 686 911	782 741	2 093 743	737 502	1 072 941	9 364 518
Total	**1 634 00**	**1 687 385**	**301 405**	**823 316**	**2 539 429**	**1 062 015**	**3 909 022**	**1 075 488**	**1 418 102**	**14 450 161**

Source, Statistics South Africa, 2012

Cohen (2011) indicates that a number of municipalities in South Africa lack access to broadband (of the 283 municipalities) with three in five of the 283 municipalities using leased lines. A new trend is towards Wireless Broadband and Asymmetric digital subscriber (ADSL) with only approximately a third of municipalities on ADSL, Wireless Broadband or Virtual Private Networks (Cohen, 2011). Cohen points out that the reason many municipalities remain on dial-up or basic Digital Network service for their Internet connection is due to the limited access and availability of affordable broadband.

The picture painted by Cohen has implications for South Africa in achieving its vision for building an information society. Local government is responsible for service delivery and serves as a link between national government and citizens. Therefore, “local government must promote more effective information flows within government and between the government and communities” (Stavrou, 2001, p.4).

INTERNATIONAL COMMITMENTS ON THE ROLE OF ICT TOWARDS DEVELOPMENT

The missing link

Telecommunications challenges facing rural communities occupied the international fora for the first time during the Maitland Commission that was held in 1983 (ITU, 1984).The commission recognised that telecommunication can play a role in economic and social development and in enhancing the quality of life. It was recognised that government, farmers, villagers and managers need access to information for different purposes in order to achieve their goals. It was then realised that without rapid and effective communication, they will have to wait for days or travel in order to make decisions or access information. The commission pointed out that developing countries lagged behind their industrialised counterparts. It was agreed that the situation in developing countries is dire and needed attention. This digital disparity was also pointed out between urban and rural areas (ITU, 1984, p. 8).

Paving a way for digital inclusion

The World Summit on the Information society (WSIS) held in 2003 in Geneva and Tunis in 2005, became a platform for world leaders to pave a way forward on the role of ICTs in development. Principle two of the Geneva declaration states that, information and communication infrastructure is an essential foundation for an inclusive information society (ITU, 1984, p. 3).Therefore, it is crucial for countries that are aspiring to build inclusive information society to develop policies and enabling environments to encourage investments in telecommunications infrastructure (ITU, 1984, p. 4). The provision of connectivity at public access points such as Thusong Service Centres (TSCs) is aligned to principle 14 of the WSIS declaration, which states that, poor people especially those who are living in remote areas will be empowered to access information and to use ICTs as a tool to support their efforts to lift them-

selves out of poverty. The WSIS summit also recognised that the sustainability of connectivity is critical if ICTs are to serve as an enabler for facilitating development.

TOWARDS AN INFORMATION SOCIETY: THE SOUTH AFRICAN ICT4D LEGAL FRAMEWORK

The South African government has taken an optimistic approach towards closing the digital divide. The government has established institutional machinery that is intended to drive the realisation of the Geneva declaration and the Tunis commitment. The government has put in place legislation to address and promote universal access to telecommunications, access to information and services. Chapter 14 of the Electronic Communications Act 2005 (ECA, 2005) is the legal framework that drives the mandate to provide all persons with universal access and service to electronic communications networks, including any elements or attributes thereof (RSA 2005). The Electronic Communications Transaction Act, 25 of 2002 (ECTA, 2002) recognises the importance of the information society and knowledge economy (RSA 2002).

The Batho-Pele White Paper on Transforming the Public Service Delivery is another legislative instrument which states that citizens have the right to receive accurate and up to date information about the services provided by national and provincial governments. Section 4. 5.3 of the White Paper, states that citizens who are far from the point of service delivery, other arrangements must be explored and this could include the use of public access points such as schools, clinics and shops as alternative means of providing services and information to the disconnected communities (RSA, 1997).

Given the legal framework that is in place, it is argued that the South African government as a signatory to the WSIS declaration has taken steps to ensure that the digital divide is closed between the connected and disconnected. The establishment of the institutions and the development of ICT strate-

gies are some of the indicators of South Africa's desire towards building an inclusive and development oriented information society.

Institutional arrangements and ICT initiatives

The number of institutions responsible for coordinating and implementing ICTs shows the progress made by the South African government towards the implementation of the WSIS declaration and commitment. The Department of Communications (DoC) is responsible for overseeing the implementation of the WSIS recommendations through the Presidential National Commission on Information society and Development (PNC on ISAD). The PNC has developed an ISAD plan which states the vision for South Africa's information society as "to establish South Africa as advanced information society in which information and ICTs tools are key drivers of economic and societal development" (PNC on ISAD, 2006, p.2).

The number of ICTs initiatives implemented by the various stakeholders is another indicator that illustrates the desire to enable the South African citizens to participate in the information society. The DoC has rolled out Public Internet Terminals (PITs) in 1998 which aimed to facilitate access to government information and services as well as empowering the public to have access to electronic mail. The Universal Service Agency of South Africa (USAASA) has been established to ensure that isolated and disconnected communities have access to the telecommunications infrastructure. USAASA spearheaded the roll out of telecentres in 1998, by 2007,154 centres and 245 cyber labs were in place (DoC, 2006).

The Department of Rural Development and Land Reform (DRDLR) has identified the deployment of ICT infrastructure as one of the key interventions for developing rural communities (Department of Land and Rural Reform, 2010). The department has implemented e-Rural Access Programme (e-RAP). The programme aims to accelerate socio-economic development in the rural communities of South Africa through the innovative use of ICTs to make

online resources, information and services a reality and to promote a knowledge-based economy (Department of Land and Rural Reform, 2010). TSCs serve as public access points for government services and public access connectivity in the rural areas.

THUSONG SERVICE CENTRES AS PUBLIC ACCESS POINTS FOR RURAL CONNECTIVITY

Public access point is an umbrella term used to refer to telecentres, libraries, multi-purpose centres and cybercafés (MPCC). Public access points "offer public access to information with services available to all and not directed to one group in the community to the exclusion of others" (Gould & Gomez, 2010, p.248). Public access points are used by the South African government as a model for providing "marginalised and underserved population opportunities to use computers and the Internet to meet their information needs" (Dosono, Pather & Gomez, 2012, p.1).

The TSCs formerly known as the first generation MPCC were established by the Government Communication and Information System (GCIS) in 1999. The purpose of the TSCs is to provide communities with information and access to government services (GCIS, 2006, p.7). The new TSCs are known as the second generation, re-established and re-designed to address the failure of the first generation MPCC. Some of the failures included the following:

- The lack of financial resources to sustain the centres;
- The inconsistency by departments with service delivery and/or rendering services once the MPCC has been established and launched and
- The critical shortage of resources for the centres to operate effectively (GCIS, 2012).

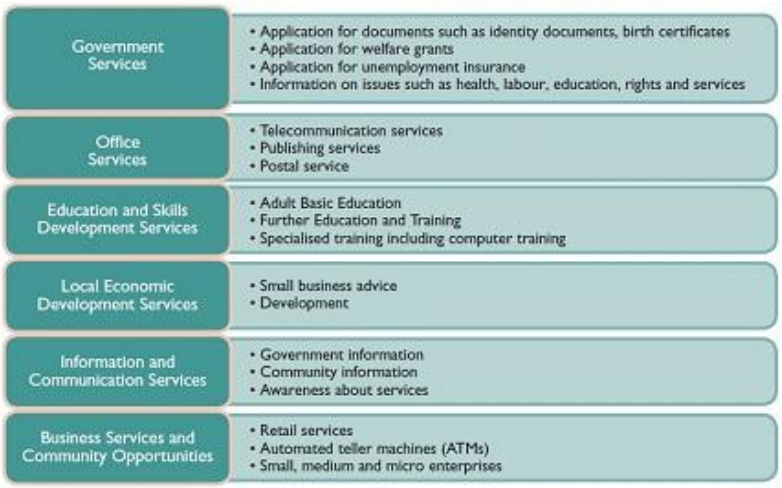
The TSC 2006-2014 business plan describes the centres as one-stop centres providing integrated services and information from government to communities, closer to where they live as part of a comprehensive strategy to

better their lives. Government's vision is to provide every citizen with access to information and services within a reasonable distance of their place of residence in each municipality by 2014 (GCIS, 2006, p.20). According to the GCIS "a high premium is placed on the introduction of ICTs to the targeted communities" (2006, p.7). ICT tools such as the Internet, e-mail and computers will be introduced with the aim of promoting literacy and access to technologies.

Services offered at the TSCs

TSCs offer a variety of services, which differs from one centre to another, depending on the prioritised needs and the availability of infrastructure. Figure 1 is the GCIS integrated service delivery model that is organised according to the six pillars. The pillars enable access to information and services that are crucial to communities towards improving their socio-economic status. Pillar one aims to offer government services such as application for identity documents, birth certificates, application for social grants and unemployment insurance. Pillar two facilitates access to office services such as postal services and printing. Education, skills development, local economic development, information and communication as well as business services are offered in pillars three, four, five and six respectively.

FIGURE 1: SIX PILLAR MODEL OF GOVERNMENT SERVICE CENTRES (GCIS, 2006)



Source: GCIS, 2006

Establishment model

The needs of communities in the targeted areas determine the type of the TSC to be established, guided by the availability of infrastructure and other resources such as water, energy, buildings, funding and personnel to manage the centre. GCIS does not dictate on the type and size of the TSCs. The establishment model differs from one province to another and within the different municipalities. GCIS recommends three models of establishing the TSCs, namely hub, satellite and mobile, this could either be a cluster or under one roof approach and established within shopping centres or malls (GCIS, 2006).The hub centres are expected to offer a full range of service according to the integrated six pillar model. Satellite centres are expected to provide intermediate order of service and provision is less frequent and does not always require permanent infrastructure. Connectivity is seen as a key component of all the models. The GCIS business plan points out that the different models should enable permanent connectivity. Therefore, access to ICT infrastructure cannot be limited by the model that is chosen by a particular municipality, although the various TSCs will have varying services and connectivity levels depending on the chosen model.

TSC connectivity infrastructure and stakeholder roles and responsibilities

The TSC business plan states that connectivity at the TSCs has two aspects targeted at the public and connectivity for the public servants Universal Service and Access Agency of South Africa (USAASA) is responsible for ensuring the deployment of public access connectivity while the Department of Public Service and Administration (DPSA) is responsible for providing ICT infrastructure enabling the public servants based at the TSCs to fast track service delivery. The DPSA is also responsible for the E-Gateway/Batho Pele gate way and funding of the ICT blue print. Batho pele gateway provides pub-

lic access to information on government services. The information is available in 11 official languages and it is categorised according to services for residents, organisations and foreign nationals. GCIS is responsible for the overall management and coordination of the TSCs, provision of support and marketing as well as ensuring access to e-Gateway. USAASA's role include the maintenance of internet connectivity and seed funding for the Internet connectivity in the first year of operation. The State Information and Technology Agency (SITA) is responsible for the development of the connectivity model and deployment of the infrastructure to connect to the Government Common Core Network (GCCN).

SOCIO-ECONOMIC CONTEXT OF THUSONG SERVICE CENTRES IN LIMPOPO PROVINCE

Administration and socio-economic challenges

Limpopo province is categorised as one of the poorest and under-resourced provinces of South Africa (CoGTA, 2009). During the 2011/12 financial year, some of its provincial government departments were put under the national administration due to financial mismanagement, leading to a breakdown of the health and education sectors (Parliamentary Monitoring Group, 2012). The province has an estimated population of 5 404 868 million people (StatsSA, 2012). In 2008, 34% of the population lived below R250 per month (Presidency, 2008) (the 2010 development indicators indicate that the amount has increased to R283). About 77% of the Limpopo economically active citizens fall in the categories of the unskilled and semi-skilled and 71.4% of the population depend on child social grant (Limpopo Provincial Government, 2009).

Socio-economic challenges at District level

Mopani District, the subject of this study has a population of 1068 568 (StatsSA, 2007). Mopani District has five local municipalities, namely; Great-

er Giyani Municipality, Greater Letaba Municipality, Greater Tzaneen Municipality, Maruleng Municipality and Ba-Phalaborwa Municipality. 81% of the population within the Mopani District stay in rural areas, 14, 2% in urban areas and 4, 6% on farms. 50% of the adult population is illiterate, only 12.7% of the adult population has completed their matric and 6.5% completed variety of higher education (Mopani District, 2009). 1.6 % of the households have access to internet, 52.0% to television, 68.8% to radio, and 67.8% to cell phone and 5.8% access to computer (StatsSA, 2007).

The above mentioned statistics indicate that Mopani District is faced with enormous socio-economic challenges. Poor levels of internet penetration could be attributed to the lack of terrestrial infrastructure. The government of Limpopo acknowledges that the “lack of access to communication facilities and of information by rural communities constitute information deprivation and the violation of human right” (Limpopo Provincial Government, 2009). The 2009 Integrated Development Plan (IDP) of the Mopani District states that the “telecommunication sector is an indispensable backbone for the development of other socio-economic sectors” (Mopani District, 2009). Both the provincial and local government recognise ICTs as a means to facilitate development. This has led to the development of the provincial ICT strategy. The strategy aims to deploy Open Access Broadband WAN network and provide connectivity to TSCs, schools, healthcare, and agriculture et cetra. The Greater Tzaneen Municipality (GTM) has embarked on the roll out of rural broadband connectivity, funded by National Treasury (NT).

FRAMING OF THE RESEARCH PROBLEM

Broadband is one of the tools used by the ITU to measure the digital divide “in terms of speed and quality that the users are experiencing” (ITU, 2011, p. 85). The development of ICT strategies by the provincial and local government does not guarantee that the digital divide will be closed. A new way of looking at the digital divide is vital because having access to connectivity infrastructure does not translate into the closure of the digital gap or lead to the

realisation of ICT4D goals. The lack of reliable connection could result in rural people lagging behind their urban counterparts if they are unable to access/download information or connect to information databases as a result of connectivity failures. The digital divide could also arise as a result of inappropriate technologies if implementers fail to locate connectivity within the community, household or at an individual level.

> To ensure that the information society will be truly inclusive, it means policy actions needs to address issues that are related not only to access but also to price, bandwidth, speed and quality of service, skills, content and language and applications targeted to low-end users (ITU, 2011,p. iv).

STRUCTURE OF THE REPORT

The report is organised into six chapters. Chapter one presented the background and context on the role of ICT for development, the South African policy framework, institutions and ICT4D projects. Chapter two unpacks the theoretical concepts of ICT4D and uses Heeks ICT4D value chain as a conceptual framework and attempts to locate ICT4D within the discipline of Community Informatics (CI). Chapter three covers the research methodology, Chapter four provide insight to the status of TSC connectivity based on perspectives from the user, community leaders, centre managers, local, provincial and national government, the chapter ends with a summary or policy analysis, Chapter five and six provide an analysis of the research findings and recommendations for policy makers, project implementers and the regulator, respectively.

CHAPTER 2: CONCEPTUAL FRAMEWORK FOR RURAL CONNECTIVITY

ICT4D scholars must move beyond counting the numbers of people connected to the network and focus on dealing with issues of impact and outcomes (Heeks, 2010; Gomez & Pather, 2002).This chapter deals with the conceptual framework that attempt to move ICT4D scholars from the tangible to the intangible of beyond access and also to locate ICT4D within a recognised discipline of Community Informatics (CI). CI as the application of ICTs to enable and empower community processes. CI goes “beyond the discussions around the digital divide” (Gurstein, 2007, p. 11).

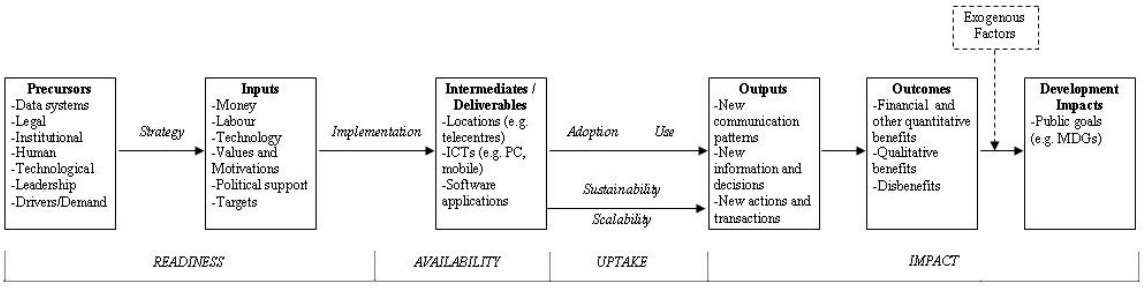
The conceptual framework for rural connectivity is informed by Heeks’s ICT value chain and Gurstein’s definition of CI as supported by scholars such as (O'Neil, 2002; Williams & Durrance, 2009).The framework incorporates the readiness, capability and functioning factors promoted by Alampay (2006), Hanisch, Swatman & Ashraf (2007), James (2006). The chapter also introduces the concept of CI as an umbrella discipline for exploring rural connectivity within the Mopani District.

The sections below provide an overview of the supporters of Heeks’s ICT4D value chain and the scepticism of CI. Stillman and Linger (2009) suggest that CI appear as emerging discipline in which CI researchers lack the technology know how to strengthen their work. However, CI also emerges as a strong discipline when compared to Information Systems (IS) because of its community orientation and its concern for socio-political impact which is missing in the IS discipline. Stillman and Linger (2009) introduces the “dual way” of conducting research by combining the strong points of IS instead of taking a black box view, which focuses on the relationship between people and technology. The conceptual framework applied in this research attempts to bring together the building blocks identified by the above mentioned researchers.

The value of conceptual framework in exploring rural connectivity

Conceptual frameworks help researchers to make sense of how things are and how things really work in reality (Jabareen, 2009, p.51). Conceptual frameworks are composed of key concepts that support one another, articulate their respective phenomena and establish a framework-specific philosophy (Jabareen, 2009, p.51). He posits that researchers use conceptual frameworks to provide a comprehensive understanding of a phenomenon or phenomena. The "ICT4D field has suffered from a lack of a conceptual framework, ICT4D practitioners and researchers have been criticised for being too focused too heavily on action and too little on knowledge and for being too descriptive and insufficiently analytical" argues (Heeks 2010, p.627). The field has also suffered from a lack of theory, conceptual definition; interdisciplinary approach, qualitative research and longitudinal research, posit Gomez and Pather (2012, p.2).This lack of a solid conceptual framework has led to the emergent of two schools of thoughts, the ICT4D optimistic and pessimistic Hanisch et al (2007).

*FIGURE 2: **HEEKS'S ICT4D VALUE CHAIN***



Source; Heeks, 2010: 27

Figure 2 introduces Heeks's ICT4D value chain. Heeks uses the model to address the identified gaps in the ICT4D research. The ICT4D value chain model looks beyond the diffusion of ICT infrastructure. Heeks views infrastructure and access as inputs. Therefore, when one looks at connectivity

uptake and use, the focus should be on the outputs, outcomes and development impact.

The model further highlights the need to understand factors that contribute to the successes or failures of connectivity. In the case of introducing connectivity at the TSCs, this could be achieved by analysing the readiness of communities, availability and sustainability of the infrastructure as well as the ability of the community to use the services. Readiness could refer to factors such as institutional arrangements for initiating connectivity and deciding on the operations and maintenance. It is vital to conduct feasibility studies and community needs analysis in order to determine the status of each level of the value chain and to ensure that the services provided meet the needs of the target group (Hulbert & Snyman 2007, p.7). Hanisch et al (2007) are of the view that Heeks attempts to resolve the two divergent thoughts by focusing on information rather than technology. The authors state that Heeks argues that technology must be understood in its surrounding context of socio-economic, data and action resources to assist human beings to transform data into information. They are of the view that Heeks achieves this with his ICT value chain model.

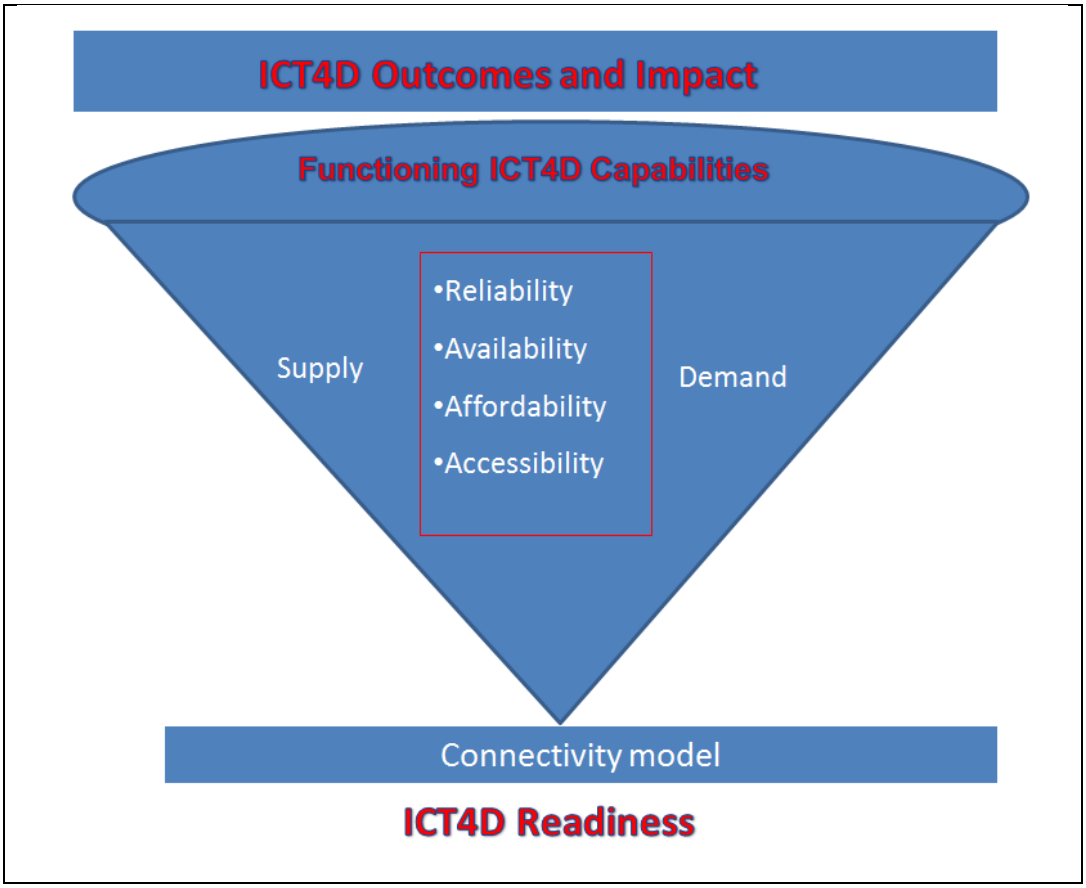
The ICT value chain is a “useful foundation of ICT related activities, although the model fails to consider differing context in which ICT initiatives take place” Hanisch et al (2007). Based on the reviewed literature, Heeks value chain model emerges as a conceptual framework used and cited by ICT4D scholars and researchers. Heeks’s model provides a “foundation for researchers to apply Sens Capability model” (Alampy 2006, p.9). Scholars such as Alampy (2006) and Hanisch et al (2007) have used the model as a foundation for their conceptual models.

Hanisch et al (2007) see the value of Heeks model by using it as a foundation to develop their conceptual framework which argues that ICT4D projects should be approached with a holistic understanding of the impact of ICT on communities. “A robust framework have to recognise the complex nature of such projects”, by analysing the impact at three levels (meso, macro and mi-

cro) Hanisch et al (2007). The reviewed literature indicates that ICT4D researchers rely on Heeks's model as a baseline for developing new models or conducting ICT4D research.

Figure 3 is used as a conceptual framework for understanding the effectiveness of rural connectivity at the TSCs. The framework uses Heeks's ICT4D value chain as a foundation for understanding the phenomenon of ICT4D towards broader the developmental goals and incorporates other factors that enables or hinders the effectiveness of connectivity. It further illustrates the desired outcome and the foundation required in order to provide sustainable and effective connectivity.

FIGURE 3: CONCEPTUAL FRAMEWORK FOR UNDERSTANDING EFFECTIVENESS OF RURAL CONNECTIVITY AT THE TSCS.



For the purpose of this research report, the following variables are used to analyse the effectiveness of connectivity at the TSCs:

- **ICT4D readiness:** in terms of environmental factors such as role of national, provincial and local level to ensure integrated planning and holistic approach towards the contribution of ICTs in attaining development goals as well as the connectivity model.

- **Connectivity model:** ICT4D planners need to focus on the connectivity model used and what are the required supply and demand factors that will sustain the available connectivity.

- **ICT4D Functioning and Capabilities**: in relation to the ability of the target audience to use the provided ICTs depending on factors such as accessibility, availability, affordability and reliability of connectivity. Once accessibility, availability, affordability and reliability of connectivity expectations are met, users are either able to perform functions such as sending emails, making Voice over Internet Protocol (VoIP) calls or downloading content.

- **ICT4D outcomes and impact**: This is achieved as a result of capability and functioning. For example participating in a telephonic interview through Skype and leading to securing employment without migrating from the village. The functioning aspect will directly address the social and economic challenges faced by the rural and disconnected communities.

LOCATING ICT4D WITHIN THE DISCIPLINE OF COMMUNINTY INFORMATICS

CI is the application of ICTs to enable and empower community processes, CI goes "beyond the discussions around the digital divide" (Gurstein, 2007, p. 11). Gurstein posits that CI examines how and under what conditions ICT access can be made usable and useful to the range of excluded populations and communities and particularly to support local economic development, social justice and political empowerment using the Internet. Gurstein's definition of CI provides a foundation for the researcher to locate the challenges of rural connectivity within a recognised discipline. The foundation set by Gurstein enables the researcher to locate the phenomena of ICT4D within a complex social system supported by Heeks ICT value chain which calls for a holistic approach. Gurstein makes a clear distinction between the linear diffusion of ICTs and the value that should be derived from ICT4D interventions. He argues that ICT4D is the generic application of ICT in support of development process. Gurstein points out that the weakness of ICT4D is that Non –Governmental Organisations (NGOs) and agencies in the ICT4D sector focus on knowledge and skills with ICTs and how these should be transferred to communities. Whereas, CI begins with the local community by identifying a need or a possible application and then beginning with the process of working with people who have the skills to respond or satisfy the need within a community context (Gurstein, 2003, p. 63). Gurstein's approach provides the researcher with a foundation that locates rural connectivity within the broader community context. The incorporation of Heeks's ICT value chain and Gurstein's CI approach locate rural connectivity within an inter-disciplinary context, which addresses community development, information studies, local economic development, democracy and governance as well as political factors.

Community Informatics: an interdisciplinary field

McIver (2003, p.33) points out that CI is an interdisciplinary field concerned with the development , deployment and management of information systems designed with and by communities to solve their own problems. His definition promotes a participatory approach by ensuring that members of the communities equally participate in the process as opposed to top-down approach by national and provincial governments. However, “participation is not a guarantee for success” (McIver, 2003). McIver is of the view that implementers of CI projects should be careful of the unintended consequences as a result of community dynamics and individual capabilities to take advantage of the benefits presented by this projects. The interdisciplinary of CI is supported by Williams and Durrance (2010) are of the view that CI researchers come from the disciplines such as library and information science, communications, community development, computer science, informatics, sociology, urban and regional planning.

CI goes beyond meeting the goals of universal access to the benefits of ICTs and their integration in the day to day community processes. It seeks accountability by forcing the CI sector to engage in a critical analysis of ICT interventions from a holistic perspective. The accountability and critical analysis of CI interventions enables researchers and policy makers “to gain an understanding on the external factors that affect CI development and use” (O’Neil, 2002, p.76). O’Neil posits that researchers can build on social informatics research that considers the social factors influencing ICT utilisation and assist in understanding and eventually overcoming barriers to appropriate technological diffusion within communities (O’Neil, 2002, p.7).Mueller (1996) cited in (O’Neil, 2002, p.77) asserts that current definitions of telecommunications access are antiquated and overly simplistic because they overlook technological alternatives, overlaps and interdependencies as well as patterns of usage and integration of usage into daily lives.

Weaknesses of the CI discipline

Stillman and Linger (2009) claim that CI researchers lack the technological background and that; CI is an emerging field of study and practice. As a result it lacks the "conceptual and theoretical base in order to give the field disciplinary cohesion and direction" (Stillman and Linger, 2009, p.1). The claims by Stillman and Linger challenge CI researchers to move beyond focusing on the relationship between people and technology by incorporating the principles of CI and that of Information Systems (IS). The convergence of the two disciplines will strengthen research on rural connectivity or ICTs in general. The authors posits that IS a pure technological discipline that is concerned or too focused on strong organisational and in particular, business and commercial focus. IS involves the purposeful construction of a technological artefact.

The attempt by CI scholars in seeking to understand how rural communities are benefiting from the diffused technologies, without a sound understanding of the technology and the architectural of systems design, processes and functionalities reduces CI research to meaningless exercise due to the inability to focus on the technology artefact as the object of enquiry Stillman and Linger, (2009, p. 6). The strength of CI is the discipline's focus on the relationship between the design of ICTs and local communities and the implementation of ICT projects in local communities, whereas IS neglects community issues (Stillman and Linger, 2009, p. 2). Therefore, the inability of IS to incorporate the social, political or cultural impact makes IS an ineffective discipline of studying the impact of technology within a community setup. As a result, CI becomes a better discipline if the researchers are able to close the weaknesses identified in the section below. Stillman and Linger (2009) propose a new way for the CI researchers to close the highlighted gap through what they call a "dual way" of looking at the role of ICTs in development by connecting the two disciplines of CI and IS. This will be achieved by having researchers who are able to speak the basic language of technology and are able to speak to the engineering practitioners throughout the design and im-

plementation phases. CI researchers are viewed as the agents of change with the ability to bring together the IS and CI practitioners. The study of rural connectivity in Mopani incorporates the dual way approach proposed by Stillman and Linger (2009), through the introduction of connectivity as one of the critical factors to be examined.

READINESS FACTORS

CI and national socio –economic development goals

The link between ICTs and development is clearly documented in the WSIS declarations, which state ICTs should be enhanced to support the attainment of the Millennium Development Goals (MDGs). Section 41 of the WSIS declaration positions ICTs as an important enabler of growth through efficiency gains and productivity, in particular by small and medium sized enterprises (SMEs). Fors and Morenzo (2002, p.199) state that the link between ICTs and development is based on the assumptions that a new kind of economy is emerging (information economy) and that the main constraint to development is knowledge and information gaps. Fors and Morenzo (2002) also point out that this link has resulted in two arguments between the scepticisms and optimists of CI. The scepticisms believe that CI investments divert resources from the real and needy causes such as building of the water infrastructure in areas that lack access to quality water.

On the other hand the optimists believe that there are real tangible benefits on the implementation of CI. The pessimistic question the contribution of CI in Africa's development goals because the continent has many competing demands Welsham and Thompson (2010, p.112). “The relative priority of ICT enabled connectivity as a developmental goal in places where many lack clean drinking water and access to basic services remains a question for the pessimistic of CI” (Welsham & Thompson, 2010, p.120). Alampay (2006, p. 6) refers to a third group of people known as the middle ground. The middle

ground argues that ICTs can play a role in a country's development if applied appropriately.

The South African government is optimistic about the role of ICT connectivity in rural development. South Africa has taken steps towards creating an enabling environment for rural connectivity. The desire to use CI as an enabler for rural development is supported by ECA of 2005 and ECTA of 2002, institutions such as USAASA, GCIS and budget allocations through the Universal Access Fund. The coordination role played by GCIS aims to integrate services and ensure the optimal use of the resources to avoid duplication of rural connectivity. Integration is one of the critical factors and principles outlined in the WSIS integration. Integration will ensure that CI interventions are integrated in national, provincial and local levels.

Ensuring the bottom- up approach

Hulbert et al (2007, p.17) report that the top-down modernistic approaches to development have failed in South Africa. They further warn against the tendency of throwing technologies at a problem that is a symptom of a more profound problem such as poverty, unemployment and lack of infrastructure. Taking "a technological approach on its own to public access centres does not enable development", asserts Dosono et al (2001, p.1). It is vital to have a holistic view when planning and implementing ICT projects. Hanna (2009, p.1) argues that a holistic approach can only be achieved when planners "frame ICT issues in broader context and by understanding ICT issues as a process". Fors & Morenzo (2002) and Duncombe (2006) suggest that applying the bottomup approach and sustainable livelihood framework will contribute to the integration of ICTs in broader development goals. Fors & Morenzo (2002, p.200) argues that ICTs are mainly of western origin and suggest that in order to ensure their relevancy in a developing context, their use should be linked to three areas, which they refer to as the bottom up, namely basic needs, empowerment and rural based development. They point out that ICTs

have the potential to facilitate the delivery of the most basic needs such as health, education and income.

Integrated planning and livelihood framework for ensuring sustainable rural connectivity

The livelihoods framework advocates for the implementation of connectivity for poverty alleviation through micro enterprises. Duncombe (2006) is of a view that “greater benefits for the poor maybe derived from connectivity if they are applied to strengthen a broader range of social and political assets and if they are able to assist in building more effective structures and processes that favour the poor” (2006,p.81). Planners should identify information and ICTs as only one part of a much broader development picture, argues Duncombe (2006), Hanna (2009), Fors, Morenzo (2006), advocates for governments to apply systems thinking to CI. The authors’ points out that CI intervention are located within complex environments. The complexity requires policy makers to understand the environment within which the individual is located, the social, economic, cultural and psychological barriers that confronts the individual. The failure to take a holistic approach will lead to the continuous failure of CI interventions as it has been the case in South Africa.

Hanna (2009) also encourages planners and implementers of CI initiatives to be flexible and to manage the process as a learning process, not a detailed blue print plan. The failure by government to discover the root causes of why the connectivity component of the TSCs is not effective will undermine the broader government vision of building an information society. It could also be argued that if readiness factors such as the alignment of ICTs to broader development goals, institutional arrangements and effective leadership are not addressed, it is impossible to offer effective and sustainable rural connectivity. This assertion is supported by Akinsola, Herselman, and Jacobs (2005, p.19), who argue that:

Bridging the digital divide in disadvantaged communities requires adequate knowledge of the underlying causes of the divide and point the need for a committed management that is prepared to get round the various barriers or risks found in disadvantaged communities amongst other things.

Public access point as a model for rural connectivity

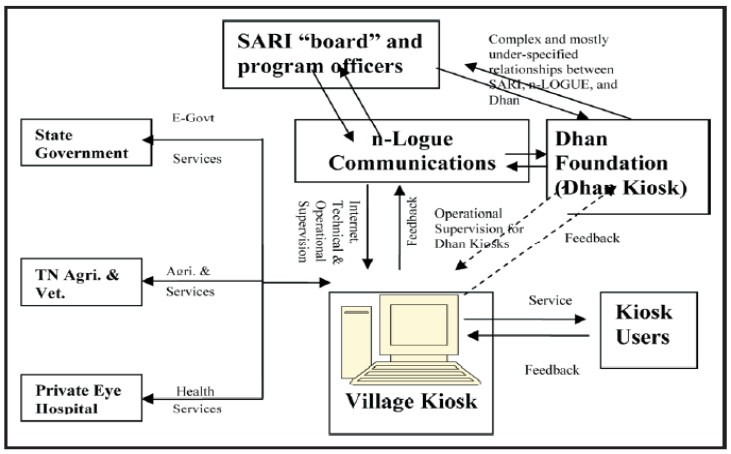
Developing countries mainly use public access centres such as community post offices, MPCC and telecentres. The underlying principle of public access centres is that “public access venues incorporating ICTs, bridge the digital divide by providing access to information for the under-served communities. Such centres are said to bring communities together to help their ability to fight poverty and create a knowledge society” (Dosono et al, 2012). Public access centres could be operated by a government institutions or NGOs. Cybercafés are the privately owned centres and do not receive public funding. (Akinsola et al 2005, p.30). The public access point strategy was recommended during the Maitland Commission and during the 2003 WSIS summit. Its relevancy for ICTs is questioned by Fellows and Sey (2011, p.189). Fellows et al (2011) argue that the relevancy or the impact of public access points in bridging the digital gap depends on the context and the perspective of people implementing the project. They point out public access provide an opportunity to people who are digitally excluded although there is evidence of failure by public access point connectivity due to a number of factors ranging from network problems to end- user problems.

Public Access Models: Case of India and Cambodia

Countries such as India have explored different models of bridging the digital gap between urban and rural communities. India introduced a franchised based business model implemented through the n-Logue project. The n-Logue project linked the formal and informal sectors by establishing kiosks and node using low-cost wireless infrastructure linked to the Internet and the

phone system. Figure 4 below provides a public access model piloted in India indicating the services, roles and responsibilities.

FIGURE 4: SARI PROJECT PARTNERSHIP (INDICATING ROLES AND RESPONSIBILITIES)



Source, (Best & Kumar, 2008)

The Sustainable Access in Rural India (SARI) was seen as one of the successful model in India. The project aimed at rural social, economic and political development by providing information and communication services through computer and internet kiosks in rural communities. The SARI project used Wireless Local – Loop (WLL) technology to provide internet connectivity provided by n-Logue Communications. The government offered e-government services through the kiosks for the issuance of birth and death certificates amongst other things. The partnership also allowed the kiosk to send applications electronically to the sub-district government for various e-government services. This element of the project failed after one year of operations because of poor institutionalisation in project support, change of leadership and insufficient training provided to government officials (Best & Kumar, 2008, p.42).The Indian case studies introduced a model of public private partnerships. The same approach was used in Cambodia for the i-REACH project in which suppliers were invited to deploy the ICT infrastructure (Dara, Dimanche & Ó Siochrú, 2008). South Africa uses the kiosk or telecentre model with the exception that government institutions are responsible for the deployment of the ICT infrastructure.

In cases where there has been a change of approach from the conventional public access and introduction of new models like i-REACH and n-Logue, these have been implemented on pilot bases, therefore the applicability of the models on a large scale is still lacking Ankisola et al (2005) .The evident failure of the South African telecentre in providing sustainable internet connectivity has led to Ankisola et al (2005) recommending the establishment of private ICT centres operators as an ideal model for ensuring effectiveness in the case of Nigeria. This argument is supported by Dosono et al (2012, p.1), the authors highlight that lessons learned from the cybercafés can be an effective way to overcome the shortcomings of the telecentre experience of the last decade in South Africa. Dosono et al (2012) posit that this, could be achieved if the entrepreneur model is rooted within a developmental agenda in order to ensure that ICT facilitate meaningful outcomes amongst needy communities and that a local context for the social appropriation and effective use of ICTs prevails.

CONNECTIVITY MODEL

Public access connectivity is usually deployed through satellite internet gateways and long distance Worldwide Interoperability for Microwave Access (WiMAX) and Wireless Fidelity (WiFi) networks that connect a gateway with institutions such as community centres (Belding, Johnson, & van Stam 2011).VSAT networks provide reliable transmission of data, video or voice over satellite as well as an efficient, cost -effective method of reliable distribution of data regardless of location posits (Sarrocco, 2002, p. 24). Hammond and Paul (2006) are of a view that although VSAT networks could bring Internet connectivity to communities, but like WiMAX networks it will not serve end users directly, other than commercial customers. They suggest that the potential of networks targeted at rural communities could be leveraged by ensuring that connectivity supports the day to day need/activities of members of the community. Hammond et al (2006) are of the view that this could be achieved by spreading the available connectivity within the community or sur-

rounding villages by setting up a fixed wireless network (WiFi hotspot or WiFi mesh network).

Literature indicates that the connectivity model for the public access points aims to provide access to the outside world. This implies that connectivity is not always aligned or customised to integrate the social structure of the community. This is further illustrated by the services that are offered at these places (see section under ICT services). The services are outward looking instead of being community focused or both. The current connectivity models further fail to take advantage of the technology convergence. It is more focused on connecting computers to computers. This approach is challenged by Hammond et al (2006) who advocates for a new model of rural connectivity that is driven by the real demands of users. The authors are of the view that person to person communication is a clear demand that exists. Hammond et al (2006) posits that VoIP is a catalyst for stimulating demand.

The Mbashe Siyakhula Living Lab project in the Eastern Cape provides new technology and skills to support development in rural areas. The project uses VSAT Internet connection that serves the entire community network. The network infrastructure connects various schools within the municipal area and also enables them to communicate with each other using VoIP (Forthare Pade-Khene & Sewry 2012, p. 14).

The Hammond approach of the person to person offers an alternative model of connectivity. However, it is limiting when one looks at the variety of services that could be required by users. However, the Hammond et al (2006) model could be integrated with the conventional model of linking computers. Heeks (2009, p. 6) refers to a new approach of providing ICT to rural communities through what he calls ICT4D 2.0. He points out that the telecentre model (what he calls ICT4D 1.0) was concerned with connecting internet to computers and argues the model was too costly to be sustainable or scalable. The discussion above indicates that there are various models of providing connectivity for CI. However, it is clear that the choice of connectivity model depends largely on the social and environmental factors. It also indi-

cates that the technology convergence and innovation provide an opportunity to explore alternative models such as community networks.

Connectivity supply side and demand side factors

The sustainability of connectivity depends on the effective management of the supply and demand factors (Rowe 2003, p.87). “Rural communities suffer from supply and demand side disadvantages when dealing with Internet access” (Whitacre, 2010, p.1283), There is a mismatch between perceived demand and the supply of services (Stover, 2001, p.344). Therefore public access points such as TSCs requires a balancing act of the two factors in order to achieve their developmental goal of bridging the digital divide.

The supply side refers to the infrastructure that is required to provide connectivity Whitacre (2010, p.19). Government institutions are mainly responsible for providing the necessary equipment to enable connectivity. Computers, modems, type of connectivity, software, connectivity speed are some of the infrastructure required. Government institutions are also responsible for developing usage policies as well as providing training and support. This could also include issues such as the service level agreements between the community centre and internet service providers. The service level agreement could address turnaround time frames on issues such as network maintenance. Failure by management to address supply factors has a direct impact on the demand side.

In India, kiosks providing internet connectivity failed to remain sustainable because of a lack of consistent technical support, inadequate maintenance of a relay base station which delivered wireless connectivity. This led to some kiosks lacking connectivity for more than six months (Best & Kumar, 2008, p.42)

Ladder of connectivity

Rowe (2003, p.87) uses the network layer (adopted from the Internet model) to illustrate the supply and demand factors that contribute to sustainable internet connectivity. Rowe (2003) states that, the demand and supply issues should be looked at from the physical network layers to training, support and equipment access. Rowe posits that as physical layers are improved, it is important to pay attention to issues at the higher layers. For example, users might require conference access or VoIP as they move from website browsing to content downloading, this will lead to an increased demand for bandwidth .He posits that at the supply side of the network layer demand for high capacity, transport facilities, connections to the Internet backbone or high speed local loops constitute sustainability factors that must be managed by government institutions.

On the other hand Rowe points out that the demand side deal with issues such as lack of the physical infrastructure by users to access connectivity or lack of internet connection or lack of sufficient internet connectivity, training or content by rural residents. He also point out that as the nature and type of demand changes, the physical layers must be revisited. Users of connectivity might be satisfied with low bandwidth at the initial stages because their connectivity needs and awareness might be low (from sending emails to wanting video).

Stimulated needs and unmet expectations

User gets frustrated when they are not able to use the provided connectivity. “Network connectivity problems create severe issues to end-users, ranging from malfunction of applications to complete loss of connectivity” (Kim & Lee ,2012, p.1710). In cases where users have to travel to get access to connectivity it could lead to loss of time and financial resources, eventually users will feel demotivated to travel to the centre. The better the quality of internet ac-

cess, in terms of availability, reliability and performance, the more residents stand to gain from their online activities (Belding et al, 2011).

Perceived Usefulness and Perceived Ease of Use

Researchers such as D'Silva, Shaffril and Samah (2011, p.257) analyse the effectiveness of ICTs for development through what they call perceived usefulness and perceived ease of use. The perceived usefulness towards ICT usage can occur when a person believes that utilising a certain technology will assist him/her to increase or double his/her job performance. For instance, the South African public servants based at the TSCs could feel motivated to use the SITA connectivity to connect to their VPN because they know that it will contribute to their performance by saving them time or carrying out their tasks manually. On the other hand when these officials do not see the usefulness of connectivity they will not use it. When they perceive ease of use and greater reliability they gain confidence and it results into better use and sustainability (D'Silva et al, 2011).

CAPABILITIES FACTORS

Alampay (2006,p.16) make reference to Sen's Capability Approach (CA) and uses the model to argue that policy makers must move beyond the diffusion of ICTs as access to ICTs does not guarantee development. The CA makes the issue of the divide in access and use of ICTs for development more complex than just the absence of the needed infrastructure (Alampay, 2006). CI interventions must go beyond supply and focus on people and how they use ICTs, posits Alampay (2006, p.10). Alampay is supported by Pin, Hak and Grunfeld (2011) who also point out that from a CA perspective, physical access to ICT would not be sufficient, as it is not an end in itself, but rather a commodity, or the means through which someone can achieve valued capabilities and functioning. For instance in the case of the TSC, it does not matter how many centres are connected to the Internet or how many people are

using the Internet, “what matters is what people use the Internet for” argues (Alampay 2006). Pin et al (2011) refer to the difference between capabilities and functioning. Pin et al (2011) argue having access to and knowing how to use ICT represent capabilities, and converting these capabilities, to send an e-mail would be a functioning.

The capability model provides a framework for the researcher to illustrate that the diffusion of connectivity to TSC does not lead to change if the supply and demand factors are not addressed. For the purpose of this research, capabilities refer to the ability of the users to process the available connectivity and information into meaningful outcomes. Capability is the outcome of effective management of factors such as access to connectivity, ability to use the connectivity (connect, browse and download), affordability of connectivity, availability and reliability. The section below unpacks the demand and supply side of CI projects and how failure to address these factors could lead to the failure of government in bridging the digital divide.

Public access ICT services

Public access points offer a wide range of ICT related services. Akinsola et al (2005, p.36) indicate that the typical services include internet, e-mail, use of computer, telephone and fax. Akinsola et al (2005) further point out that the services are used for different purposes. They categorise the different services according to communication, information, business and training. They indicate that under communications a user requires ICT services to make calls, facsimile and internet so that they can e-mail, chat, browse, download and transfer documents and files. From the information services perspective, they need information on employment opportunities, government information, local and international news, weather, market prices, web sites directories, trade opportunities as well as productive/service information. On the business side they require services such as transport bookings, e-commerce, secretarial services, desktop publishing, graphic designs, photocopying, and

printing. On the training side they services that are offered include distance education, e-leaning, basic education for adults and Basic computer literacy.

Rural communities are confronted with challenges around services such as access to medical centres, universities, government regional and provincial offices and have to travel long distances. Edmiston (2003, p.21) points out that the Internet and other digital technologies have the potential to address these challenges by facilitating accessibility. The opportunity to access services and information within a reasonable distance will reduce the amount of time and travel costs for the rural poor. The time gained from this savings could be used to engage in more productive and strategic activities. This could also reduce the urban migration by young people if they are in a position to access distance education or look for job opportunities using the Internet.

The use of the Internet to enable access to and improve the efficiency with which government services are provided to citizens is known as e-government (Carter & Bélanger, 2005, p.5). The DoC defines e-services as the application of ICT to transform the delivery of public services from 'standing in line' to online: anytime, anywhere, by any means, and in interactive mode (DoC, 2012). Kaaya (2001, p. 40) points out that there are many e-services and different governments offer these services based on the e-government stage and needs of the people. For instance in the UK e-services include National Health Service hospitals (non-emergencies), social services, doctor's surgeries, local councils and the Passport Agency public services, whereas in Africa people might be interested in information related to health, agriculture, small businesses, job opportunities, sources of credit and education destinations, among others.

FUNCTIONING FACTORS

Functioning is what drives the intended outcomes of connectivity that is linked to the attainment of socio-economic goals. One can argue that CI is

only achieved when functioning is achieved. In the example given by Pin et al on the capability to use an email, one's ability to achieve functioning could be affected by a number of supply side and demand side factors. For example the email policy (supply) of the public access point could limit the size of documents that individual can send and receive (demand). James (2006, p. 337) posits that there are many reasons why the impact of the Internet on poverty in developing countries is poorly understood. James uses Sen's notion of functioning to present a case that warn against the diffusion of ICTs that do not consider the local context of the targeted users.

James is of the view that the traditional welfare economics approach makes a number of assumptions on the expected outcomes of providing access to rural communities. The difference between the two approaches is that the traditional consumption theory assumes that utilities are derived at the point where goods are actually purchased. Whilst the functioning approach assumes that, what matters occurs after the point of purchase, when the good is actually used (James, 2006, p.339). Therefore when unpacking the effectiveness of rural connectivity provided at the TSC it is important to understand how accessing the Internet is translated into actual use. It is assumed that when the supply and demand factors are met and sustainable, the next level is functioning and this is the level at which the users start to derive the benefits of connectivity.

The welfare economics is concerned with utility; in this case the welfare of the individual is represented by utility, usually understood as desire fulfilment or preference satisfaction. Whereas the purpose consumption in the context of functioning deals with the ability of the individual to be free from disease, hunger, social isolation et cetra. What matters for well-being is not just the characteristics of commodities consumed, but what use the consumer can and does make of commodities (James, 2006).

Branching, reproduction and information ability: Case of the Mexican telecentre users

Another way of looking at the functioning aspect of the users is through what Esperanza and Rodrigo (2007, p. 217) refers to digital literacy framework The digital framework deals with three aspects, namely branching ability (ability to navigate through a nonlinear environment to find the desired information); reproduction ability (ability to analyse and synthesise the information retrieved); and information ability (ability to assess the quality of information). Esperanza and Rodrigo (2007) found that Mexican telecentre users did not benefit from the available connectivity due to the inabilities highlighted above. They also indicate that technical barriers, such as Internet access speed demotivated users to use the available connectivity because access speed influences user's behaviours when searching for information.

Case of the Kothmale Community Radio Station

James (2006) offers a new way of assessing the impact of CI using the functionality approach. He achieves this through a case study of the Kothmale Community Radio Station. The radio station succeeded in making the Internet relevant to the community by driving their radio content based on information accessed from the Internet (James, 2006, p.346). The availability of the Internet enabled the radio programmers and presenters to browse the various websites on specific topics that were of interest to community members. The approach enabled members of the community to benefit from the information and participated in the discussion without personally using the Internet. This later translated into "gains in products affecting a relatively high proportion of the community, in contrast to the almost complete lack of gains recorded in the African telecentres" (James, 2006, p.346).

COMMUNITY INFORMATICS DUAL WAY AS A FRAMEWORK FOR EXPLORING RURAL CONNECTIVITY AIMED AT CAPABILITY AND PURPOSEFUL FUNCTIONING

The selected conceptual model and the CI discipline enables the researcher to bridge the simplistic approach towards the implementation of rural connectivity towards a complex interdisciplinary stud. This is achieved by addressing the gap and risks identified by Mueller (1996), O'Neil (2002), McIver (2003), with regard to the simplistic and fragmented approaches to CI, the review of the effectiveness of TSC connectivity is based on an integrated and holistic conceptual framework that aims to move beyond simplicity to the complexity of ICTs and the socio-economic nexus. On the other hand, Stillman and Linger (2009) present an opportunity to the CI researchers to integrate technology as a key variable in the research process. The dual approach proposed by Stillman and Linger (2009) challenges the CI researchers to understand the specific technologies that are meant to facilitate the socio-economic change at an individual, household and community levels. The failure to incorporate technology as a specific research variable creates a gap in understanding the performance of the technology and how it impacts on the non-technological factors. Stillman and Linger (2009, p. 6). argue that by ignoring technological artefact, issues such as users, interfaces, contexts, uses, techniques, technology are meaningless without an artefact as the object of enquiry" (Stillman and Linger, 2009,p.6). It is therefore meaningless for CI researchers to conduct research that does not include the technological artefact as one of their research variables.

The identified concepts are critical in understanding the role of ICTs towards development and how the targeted communities are using the tools. The digital divide could still be experienced by communities who have connectivity projects; therefore it is important to move beyond counting computers and the number of users accessing TSCs. The failure to move beyond the number of computers connected to the network or internet will perpetuate the second effect of the digital divide (Amazan & Huerta, 2007, p. 218). The second effect refers to the digital divide that is caused by the lack of skills needed to

take advantage of ICTs. Therefore, it is important to understand that providing physical access to ICTs only reduces the digital divide in terms of technological access. It is also important to understand that even though people have access and the skills to use computers, there could also be other reasons that contribute to the inability to use the provided technological infrastructure. This is known as the third effect of the digital divide, meaning that rural people could be experiencing challenges in terms of connectivity capabilities i.e. poor connection and bandwidth limitations to name a few.

CHAPTER 3: HOLISTIC CASE STUDY RESEARCH METHODOLOGY

This chapter outlines the research methodology that was adopted by the researcher in exploring the role of rural connectivity as a driver for facilitating development. South Africa has taken steps towards the implementation of the Geneva declaration and the Tunis commitment to build a people centred inclusive and development oriented information society. This is demonstrated by the existence of policies such as the Universal Access and Service and institutions such as the USAASA and the PNC on ISAD amongst others. The implementation of rural connectivity is one of the indicators that the South African government views connectivity as a strategic enabler towards addressing the socio-economic challenges faced by rural communities in provinces such as Limpopo. The research methodology adopted by the research aimed to explore the demand and supply factors that provide a foundation for the sustainable deployment of rural connectivity and how these factors contribute to connectivity uptake and usage by the rural communities.

CONTEXT AND SIGNIFICANCE OF THE RESEARCH

Since the implementation of public access points such as the TSCs and telecentres, researchers such as Benjamin, (2001) and Coleman, Herselman & Jacobs (2008) have conducted research on the effectiveness of public access points. Benjamin's research focused on the various management and functionality issues that contribute to the sustainability of telecentres. The research also focused on the value of ICTs and access to information. The study by Coleman et al (2005) focused on the effective way to access and utilise the PITs services and the information that is provided on the government website and the Public Internet terminals (PITs). In 2010, the Public Service Commission (PSC) conducted a study on the effectiveness of the TSCs. The Commission focused on the general management of the TSCs

and cited that the TSCs are faced with ICT challenges due to cable theft and the inability of public servants to connect to share databases. The research did not report on the connectivity barriers experienced by the public servants, other than stating that the failure to connect to databases is due to security concerns by some of the government departments.

Belding et al (2011, p. 2486) concluded that “sporadic attempts to bring broadband connectivity to isolated areas have been made, but a comprehensive evaluation of the quality and the impact of such connectivity is often lacking”. Their study focused on the network traffic analysis and social surveys in South Africa, Dwesa village and Peebles Valley as well as the Macha village in Zambia. The findings from the three case studies illustrated that “the location of access, connectivity speeds, and the cost of the connection together with the overall context in which the usage happens severely impact online behaviour” (Belding, Johnson, & van Stam, 2012). It is important to note that the DWESA initiative was a collaboration between the University of Fort Hare and Rhodes University while the Peebles Valley provided by the HIV/AIDS clinic sponsor. Therefore, there is inadequate research that is aimed at understanding how rural connectivity that is provided by the South African government is contributing to improved service delivery and towards rural development.

PROBLEM STATEMENT

The problem investigated in this research was that, despite the existence of universal access and service policy, institutional machinery and the financial resources allocated to rural connectivity, the interventions deployed through the public access model are faced with sustainability challenges. Lessons learned indicate that CI initiatives implemented through public access points are not effective in enabling South Africa to achieve its vision of building an Information society (Dosono et al, 2012, p.7). This view is supported by Hulbert and Snyman (2007, p.3). Yet, government continues to invest resources in CI projects despite the reported failures. Hulbert and Snyman question the

continuity of government's approach in rolling out ICTs in rural communities based on the same failed approach. The reported failure indicates that there is a missing link in the government's approach of connectivity deployment targeted at rural communities. Another problem is that, in cases where connectivity is available, it is not known how users translate accessibility and usage into tangible socio-economic.

PURPOSE STATEMENT

The purpose of this research was to explore the readiness, connectivity, capability and functioning factors that enable or hinders the effectiveness of public access connectivity as a strategy for closing the digital divide. Readiness factors refer to the building blocks that are essential for laying the foundation for the effective implementation of CI projects. Connectivity is a technology solution which is central towards enabling the attainment of the socio-economic goals, however, a technological approach towards solving social and economic problems does not guarantee success if the technology is inappropriate. Therefore, the capability and functioning factors are the key steps that drive the desired socio economic change. The research explored the planning and implementation of connectivity and how it is aligned to the broader development goals and socio-economic challenges faced by community members. It also aimed to understand the connectivity challenges faced by users and how the identified challenges impacts on the ability to realise the socio-economic value.

The purpose of this research was to explore the demand and supply factors that enable the sustainability of rural connectivity provided through the public access points such as the TSCs. By understanding the challenges and the factors that hinders the effectiveness of rural connectivity, policy makers and CI implementers will ensure that productive and sustainable projects are better implemented (O' Neil 2007, p. 76). It will also ensure that there is accountability for the continuous roll out of ICT projects in rural communities if

public access points such as the TSCs continue to be the preferred model of bridging the digital divide.

RESEARCH QUESTION

The main research question is:

To what extent do public access points promote sustainable rural connectivity as an enabler for socio-economic change?

The following sub-questions were posed:

1. What are the supply and demand side factors that contribute to the effective accessing of information and services at the TSCs?
2. To what extent do connectivity projects integrate broader community development goals and what is the impact on the socio-economic value?
3. To what extent does the deployment of communal connectivity take into consideration the needs and requirements of the targeted communities and what is the deployment criteria and process.
4. How does policy and legislation guide the implementation of rural connectivity at the TSCs?

RESEARCH METHODOLOGY

The research adopted a qualitative methodology because CI is a complex area that requires of researchers to move beyond measuring the quantitative and tangible aspects. Gomez and Pather (2012, p.5) challenges CI researchers to go beyond the tangible to the intangible and this can only be achieved through qualitative methodologies. Qualitative research is a generic approach in social research according to which, the researcher takes as its

departure point, the insider perspective on social action. The goal is to describe and understand rather than explain the human behaviour.

Qualitative method allows researchers to have detailed engagements with the different role players and also to acquire multiple sources of data Leedy and Ormrod (2005, p. 279). Leedy and Ormrod (2005, p.134) point out that a qualitative study could be descriptive, interpretative, verification or evaluation in nature. The approach in this case was interpretative which enabled the researcher to interpret the effectiveness of rural connectivity as an enabler for social change, the benefits to the individual and community, as well as implications for policy.

RESEARCH DESIGN

The research used a holistic - multiple case study. Leedy and Ormrod (2005, p.135) indicate that a case study may be suitable for learning about a little known or poorly understood situation. Little is known about the outcomes of rural connectivity provided at the TSCs. The findings are used to provide preliminary support or rejection for the popular notion that connectivity accessed by rural people will serve as an enabler for change. Case study is an ideal methodology when a holistic, in-depth investigation is undertaken (Winston, 1997). It provides researchers with an opportunity to conduct multi-perspective analysis and it makes the researcher to consider voices or perspectives of the actors, but also of the relevant groups of actors and the interaction between them.

The provision and management of rural connectivity is a multi-dimension intervention involving different stakeholders with different roles and responsibilities. The stakeholders namely, municipalities, GCIS, USAASA, SALGA, DPSA and DoC had to share their perspectives with regard to policy, planning, operations and maintenance of the TSC connectivity. Selwyn (2003, p.110) refers to a multi-layered model of understanding non-use of ICTs by the targeted users. He posits that people’s non-use of technologies is a com-

plex, fluid and ambiguous issue. Therefore, when one seeks to understand the impact or effectiveness of rural connectivity, it is crucial to understand it from the user's point of view. The holistic case study approach enabled the researcher to analyse policies, legislation and the role of institutions responsible for providing and managing connectivity as well as the individual and community capabilities and benefits. The complexity that the researcher aimed to understand was the policy environment, implementation, connectivity performance, operations and maintenance, use of rural connectivity interventions as well as how these interface with environmental factors at the meso or community level as well as how this lead to the achievement of CI expected outcomes.

POPULATION AND SAMPLING

Population refers to the group or class of subjects, variables, concepts or phenomena (Dominick & Wimmer, 1994,p.64).The primary purpose of sampling is to collect specific cases, events, or actions that can clarify and deepen understanding (Neuman, 2011, p.219). All the ten TSCs in the Mopani District were the population of the research. Limpopo as a province represents the research "large pool" in which the targeted sample was selected (Neuman, 2011, p224). The targeted population refers to the population to which the researcher ideally would like to generalise his or her results Kruger (2003, p.119). The targeted population of the research were the ten TSCs within the Mopani District Municipality.

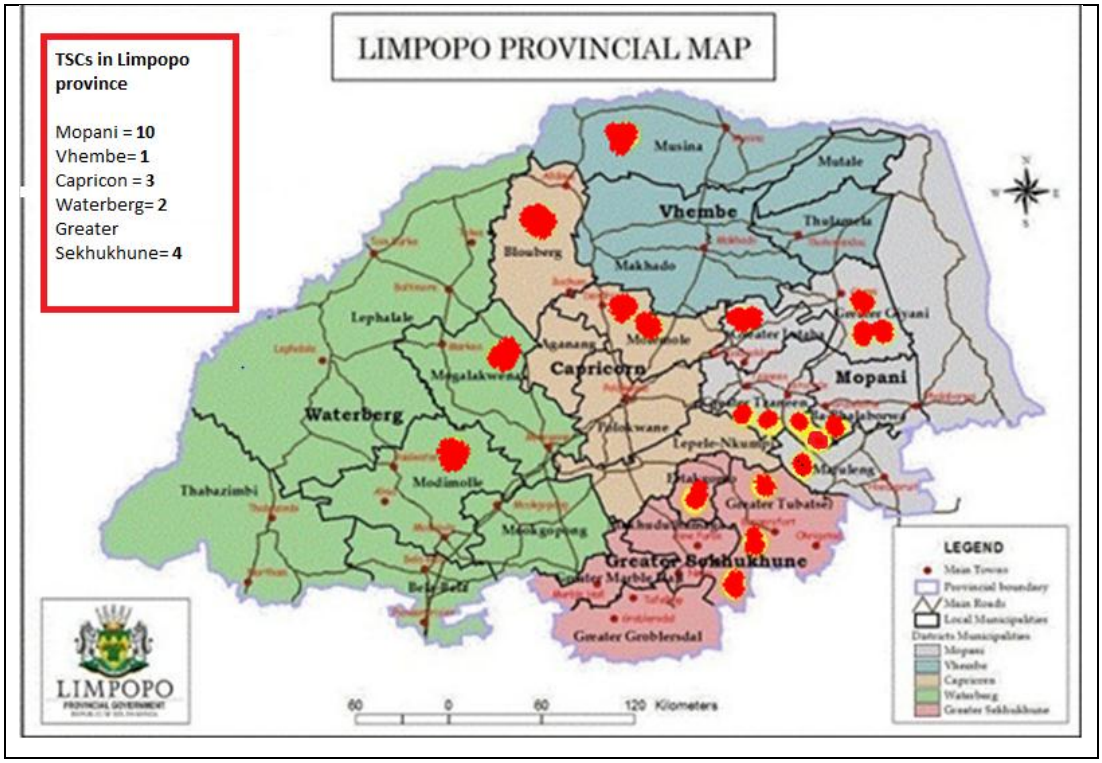
Accessible population

Du Plooy (2001, p.191) defines accessible population as units of analysis in the targeted population to which the researcher has access to. The ten TSCs were accessible to the researcher. Eight TSCs out of ten were visited by the researcher in order to determine the population parameters. Population parameter refers to the unique characteristics of the population, for example, size and nature (Du Plooy, 2001). The eight TSCs shared the same

characteristics. They all have connectivity infrastructure which was either targeted at public servants or members of the community. However, the previsit by the researcher revealed that the TSCs differed in size and type of services provided. Therefore, a convenience sample was used based on the knowledge the researcher had on the status of the eight TSCs. Convenience sample is the type of non-probability sample which is based on the selection of research participants who are deliberately chosen by the researcher or known to the researcher (Dominick & Wimmer, 1994,p.66).

The socio-economic challenges faced by the Mopani District presented an opportunity to explore the role of connectivity in development and how government officials are using the available connectivity to fast track service delivery. The research also provided the opportunity to explore how local government in the district is using ICTs as an enabler for socio-economic development and to how 81% of its rural can benefit from ICTs. Figure 7 shows that Limpopo province has twenty TSCs and Mopani District has ten TSCs. Out of the ten TSC, four are located within the Greater Tzaneen municipality namely; Lesedi, Bulamahlo, Relela and Runnymede. Greater Letaba municipality has one TSC in Mokwakwaila village, and Muyexe, Zava and Makhuba are within Greater Giyani municipality, Maruleng within the Maruleng Municipality and Selwane in the Ba-Phalaborwa Municipality. Mopani District has the highest number of TSCs; this provided the researcher with an opportunity to compare the TSCs within the same district.

FIGURE 5: LIMPOPO PROVINCIAL MAP SHOWING DISTRICT MUNICIPALITIES WITH TSCS



Source: PL Properties, 2012

UNITS OF ANALYSIS

Leedy and Ormrod (2005, p. 84) assert that unit of analysis refers to "WHAT of your study" what object, phenomenon, entity, process or event is the researcher interested in investigating. Leedy and Ormrod (2005, p.88) argue that researchers need to be clear about their units of analysis, for example one must decide whether they are studying marriages or married partners, crimes or criminals. They assert that failure to be clear makes the researcher to run the risk of making assertions about one unit of analysis based on the examination of another. For the purpose of this research, the following units of analysis were studied:

- Readiness of TSCs as public access points for rural connectivity
- The performance of connectivity as experienced by the users
- The capability of users in converting connectivity into functioning

- Functioning derived by the users from the capability to use connectivity
- Legislative and policy factors that guide the deployment of rural connectivity

The research did not look at the effectiveness of TSCs with regard to the establishment model, funding, general management and service issues that are not linked to connectivity.

DATA COLLECTION

Case studies and phenomenological designs uses various methods of data gathering Leedy and Ormrod (2005, p.146), for example structured interviews enabled the researcher to ask questions about people's believes, perceptions, motives, feeling et cetera Leedy and Ormrod (2005, p.146). A combination of structured face to face interviews, focus group-discussions, self-administered questionnaire and analyses of documents were used to collect data.

Focus group-discussion

Focus group discussion “is a special qualitative research technique in which people are informally interviewed in a group-discussion with a minimum of six and maximum of 12 people Neuman (2011, p. 12).Two focus group discussions (FGDs) were conducted in Maruleng and Bulamahlo TSCs. The first focus group discussion, conducted in Maruleng Municipality, consisted of ten participants. The discussion took place on 9 May 2013 and was conducted from 10h49 to 12h12. The participants represented connectivity users who are using internet to provide services to community members in Maruleng municipality.

Initially the researcher planned to conduct one focus group in Maruleng and interviews targeted at the centre manager, ward councillor and Local Eco-

nomic Development (LED) officer. The LED officer and centre manager requested to be included in the FGD because they viewed themselves as users of connectivity. The centre manager also regarded the discussion as an opportunity to understand connectivity challenges faced by the service providers. The Community Development Worker (CDW) participated in the discussion although he is not currently using connectivity provided at the centre. The reason for his inclusion was that he is the link between the municipality and the community and is currently using internet to support his role. CDWs are special public servants who are trained to enter communities and households to engage with citizens and determine what services are needed, to ensure that these services are made available (DPSA, 2013).

The researcher visited Bulamahlo centre on 9 May 2013 from 13h00 to 15:25. The Bulamahlo focus group discussion had a total of 11 participants which was made up of the centre founders/owners, CDW, ward councillor, LED Officer, five students who are enrolled for a computer certificate at the centre. Based on the different voices present in the FGD, the researcher requested to split the group in to two in order to avoid dominance by the founders and community representatives and also to allow the students to express their views without fear of intimidation by the centre founders.

Structured face to face interviews

Neuman state that the advantage of face to face interviews is that well trained interviewers can ask all types of questions. They can also ask complex questions and use extensive probes. Interviewers can also observe the surroundings and can use nonverbal communication and visual aids (Neumann, 2001, p.300). The type, size and services offered at TSCs vary from one centre to another. Therefore, some centres have full time service providers, while others have dedicated service days. Due to this, it was not always possible for the researcher to use FGD in all the targeted TSCs. Based on this, the researcher used structured face to face interviews with users, centre managers, CDWs and ward councillors, local government LED and

connectivity expert, GCIS Limpopo, DPSA, CSIR (Meraka Institute), DoC (ISAD branch) and the National Treasury. In total 46 people participated in the interviews.

The first interview was conducted in Mokwakwaila on May 6 2013 between 12h00 and 16h00 because it was not possible to have a focus group discussion since some of the targeted officials were not in a position to stop serving their clients. The researcher returned to Mokwakwaila village on May 13 to interview representatives from different community projects to explore how the projects are currently using internet and how they think it can support their projects. In total, 16 people were interviewed within the Mokwakwaila cluster. The following people were interviewed:

- Centre manager
- Three Community Development Practitioners (CDPs)
- Social Worker
- South African Social Security Agency (Sassa) official
- Two members of the Mokwakwaila youth cooperative
- Two officials from Senopela Home Based Care
- One learners and lecturer from New Horizon Computer school
- One member of Mokwakwaila Early Childhood Development,
- Two members of Itsoseng bakery and a telephone interview was conducted with the owner of Marelwa poultry farm.

The researcher visited Lesedi TSC on May 7 2013. A face to face interview was conducted with 2 CDWs; ward councillor and acting centre manager who is employed as a Community Development Facilitator employed by the municipality. The researcher visited Runnymede on March 25 2013 as part of the pre-visit that was aimed at determining the status of the various TSCs. The researcher contacted the relevant official to verify the status of the TSC since it

was closed on the day of the visit and also interviewed the cleaner who provided access to the centre. In Makhuvha TSC the researcher conducted structured face to face interviews with the librarian and one user on May 8 2013. The researcher arrived at the TSC around 14h00. None of the service providers were present at the TSCs because they only visit the centre on specific dedicated days.

The first visit to Selwane was conducted on March 25 2013 as part of the pre-visit. The second visit to Selwane was conducted on May 8 2013 to verify the status since the researcher's last visit. The researcher visited Muyexe TSC on the May 8 2013 from 11h00 to 13h00. A face to face interview was conducted with the Deputy Chairperson, responsible for the day to day management of the centre. The researcher also conducted a face to face interview with a panel of four learners from Atlane Muyexe Secondary school. It was not possible to conduct a focus group discussion with users based at the centre because it was closed on the day of the visit due network problems. Separate face to face interviews were held with the LED Manager and IT official from the Greater Tzaneen Municipality. The interview was conducted on May 14 2013. A face to face interview was conducted with a former SALGA local government Local Economic Development (LED)/ICT champion. The interview took place on the 10 June 2013, 9 July DPSA interview, 15 July DoC, GCIS and Meraka interview was conducted on the 20th of November 2013.

Self-administered questionnaires

Self-administered questionnaires are a data collection tool that is distributed to the respondents to complete on their own (Du Plooy, 2001, p.170). The self – administered questionnaire enables the respondent to complete the questionnaire when it is convenient and enable them to check personal records if necessary (Neuman, 2001, p299). Self-administered questionnaires were targeted at USAASA Limpopo office, SALGA and Sentech personnel because the respondents were not available for face to face interviews.

Documents analysis

Document analysis is a research technique that is known as nonreactive, because “those being studied are not aware that they are part of a research project” (Neuman, 2001, p.320). Neuman states that existing statistics and secondary analysis refer to the collection of existing information from government documents or previous surveys. He posits that researchers examine the data in new ways to address new questions. The new question that was posed to the selected documents was, to what extent does the legislative, policy and implementation environment for rural connectivity address the readiness, connectivity, capability and functioning factors? A document analysis of government policies, legislation, strategic plans, Integrated Development Plans (IDPs), and business plans were conducted in order to determine the legislative, policy and, implementation environment for rural connectivity deployed through the TSCs. This was important for the researcher as it contributed to the accuracy of the research by looking at the effectiveness of rural connectivity from multiple perspectives. Neumann, (2011, p.149) defines triangulation as “looking at something from multiple points of view improves accuracy”.

The table below provides a list of government policy and legislative (refer to appendix) for a detailed list of the analysed documents. The research also analysed the National Treasury Estimates of the National Expenditure from 2006 to 2013 as well as the guidelines on strategic planning. An analysis of the IDPs of the local municipalities within the Mopani District was also conducted. The research included an analysis of the 2011 draft rural ICT strategy and the 2013 draft Government Wide Information and Communication Technology (GWICTS) Strategy. The reason for analysing the draft strategies was to assess if government’s new approach takes into consideration the lessons learned from the telecentre model as reported by Dosono et al (2012). The recently published ICT green paper was not analysed because it was released

when the research was being finalised.

TABLE 2: LIST OF DOCUMENTS ANALYSED

Document name	**Year**	**Policy owner/custodian**
Presidential Review Commission	March, 1996	Presidency
Communications 2000 known as Comstask	October, 1996	Presidency
The White Paper on Transforming the Public Service Delivery (Notice 1459 of 1997)	October ,1997	DPSA
Electronic government, the digital future, a public service framework	February ,2001	DPSA
Electronic Transaction Act (Act No. 1046 of 2002)	August, 2002	DoC
Electronic Communications Act (act no. 36 of 2005)	2005	DoC
Towards an information society in South Africa, ISAD Plan	2007	DoC
USAASA definition of universal service and universal access	February, 2010	USAASA
USAASA definition under-serviced and needy people and regulations	September, 2012	ICASA
Broadband draft policy	2010	DoC
Municipal Systems Act (Act No.21776 of 2000)	2000	CoGTA
Thusong service cenres business plan	2006-2014. Approved by cabinet in 2005	GCIS
Towards an ICT rural development strategic framework (Discussion document)	2011	DoC
Estimates of National Expenditure (DPSA, GCIS and DoC)	2006 to 2013	National Treasury

NT regulations on strategic planning and the framework on the development of strategic and annual performance plans	2005 2010	

Data analysis

The qualitative research methodology generates “a large body of information” that requires the researchers to go through a process of data cleaning in order to reduce it to specific themes (Leedey & Ormrod, 2005, p.160). Neuman, (2011, p.460) states that, a qualitative researcher analyses data by organising it into categories on the basis of themes, concepts or similar features. The case studies of rural connectivity in the Mopani District were analysed using conceptualisation as a way of organising and making sense of the data. This was achieved through the identification of the following themes;

- Readiness
- Connectivity
- Capability
- Functioning and
- Outcomes.

The selected themes are based on the research conceptual framework presented in chapter two. The research also grouped the respondents according to their roles and responsibilities. The groups represented connectivity users (community members and public servants), centre managers and community leaders, local government as well as national and provincial respondents. The grouping of the respondents enabled the researcher to compare the views of the respondents according to the role they play in the connectivity value chain.

Once qualitative data is categorised and analysed according to the themes, it requires researchers to engage in a process of data interpretation because “qualitative inquiry is fundamentally interpretive” Leedy and Ormrod (2005, p.150). The authors posit that qualitative fieldworkers cannot view their task simply as “a matter of gathering or generating facts about what happened”. Leedy and Ormrod (2005, p.150) challenge the qualitative field workers to

engage in an active process on interpretation. The research used the identified concepts of readiness, connectivity, capability, functioning and outcomes in order to assign meaning and draw conclusions from the data.

RESEARCH LIMITATIONS

The size and management structure of the TSCs determines the type of connectivity access; therefore connectivity users differ from one TSC to another. Not all TSCs have direct public access connectivity; therefore the focus group discussion was not applied uniformly across all TSCs. Some of the TSCs do not have users that are permanently based at the TSC. In other TSCs, there are high volumes of clients and it was not possible to conduct the focus group discussion.

CHAPTER 4: THE STATUS OF RURAL CONNECTIVITY IN EIGHT MOPANI THUSONG SERVICE CENTRES

The case studies presented demonstrate the status of each TSC based on the level of readiness, connectivity performance, capability, functioning and outcomes. The presentation follows the conceptual framework presented in chapter two. The framework applies a holistic approach in determining the effectiveness of each TSC as an enabler for accessing connectivity and government e-services by rural communities within the Mopani District.

The first step in determining the effectiveness of rural connectivity is to understand the level of readiness. Readiness addresses issues such as institutional arrangements, planning, alignment to broader community goals, availability of buildings to host connectivity, personnel, budget allocation, policies and procedures as well as the clarification of roles and responsibilities. The second step is the determination of the connectivity model informed by environmental factors identified during the feasibility studies. These are the supply side factors such as the required power, connectivity infrastructure, skills, bandwidth, connection speed, equipment reliability and maintenance. The third step is the capability by the users to access connectivity and to use it as expected. Once this step is fulfilled, the users will be able to convert their capability into functioning. Functioning is the fourth step which is achieved when users succeed in what they set to achieve, for example, send email, apply for a job, download and print documents. Functioning leads to outcomes. At this level users' capability and functioning to browse for vacancies, download application forms, print, and email job applications to prospective employers is converted into the fifth step known as outcomes.

This chapter is divided into four sections. The first section presents the status of each TSC from the users' perspective. Government and municipal officials, NGOs, public entities and community members are the current users of connectivity in the various TSCs. The second part present the status of each

TSC based on the perspective of the TSC managers and community leaders. The third and fourth sections highlight findings from local government, provincial and national perspective as well as document analysis respectively.

USER PERSPECTIVE

Maruleng Municipality: the case of Maruleng TSC

Readiness of TSCs as institutions for accessing connectivity and government e-services

Maruleng TSC was established in 2008 and has eight permanent government service providers. The TSC was established through a public participation process, which determined the location of the centre. The table below gives a list of the service providers and their service offerings.

TABLE 3: SERVICES PROVIDED AT MARULENG TSC

Service Providers	Service Offering
Home Affairs	Applications for identity documents, issuing of birth and death certificates
Limpopo Economic Development Agency (LIEDA)	Company registration services, training , business development advice and support to entrepreneurs
Khutšo Kurhula (is a (United States Agency for International Development (USAID) funded project under the Anova Health Institute programme)	Provide technical support to Sekororo hospital, CBOs and NGOs dealing with HIV and AIDS within Mopani District.
The Independent Electoral Commission (IEC)	Responsible for election management and voter education.
Department of Social Development	Offers counselling, victim empowerment and foster parents services
SAPS	Satellite services such as affidavit and document certification
Agriculture	Offers advisory and support services to farmers

Maruleng municipality	Emergency, disaster and LED services such as supplier database registration.

Connectivity performance and reliability as experienced by users

Maruleng connectivity was deployed in 2010 as part of the DPSA blueprint initiative. The TSC does not provide connectivity access to community members. Connectivity at Maruleng is used by six service providers out of eight. The connectivity is regarded by the users to be unreliable and does not meet their expectations. The users were not consulted and did not provide inputs during the planning and deployment process.

The unreliability of connectivity has led to users seeking alternative connectivity such as 3G. The ability to have alternative connectivity is important for the service providers because they consider their services to be highly depended on connectivity. The poor performance of connectivity hinders users from downloading the antivirus software and this has led to the slow performance of computers. Despite the reported level of unreliability, users still regard the current performance as an improvement compared to the initial connection because at the moment they are able to go online without having to wait for too long. The quotes below obtained from the focus group discussion (FGD) summarises why users are not satisfied with the available connectivity and the financial implications of using 3G to supplement their connectivity needs.

> “Initially, it was correct, the speed was fine, but now the challenge is that it is slow and sometimes it breaks while we are working. It is not helping us because it is very slow and if the network is not available we cannot reach Head Office” (Maruleng FGD official user, 9 may 2013). “Since it was reported to SITA it has now improved, but basically it has moved from snail to tortoise” (Maruleng FGD official user, 9 may 2013). “I have to use my own modem, which is more expensive. Because just to

> update the antivirus alone, it takes almost 1G of my data and I buy 1G of data bundles, this means I will be left with a bit of kilobytes, what can I do with those kilobytes? ” (Maruleng FGD official user, 9 may 2013).

The sustainability of connectivity in Maruleng is threatened by the DPSA’s funding model which gives TSCs free access for a period of five years from commencement. The poor performance and the inability to upgrade the connectivity infrastructure as well as the poor response in resolving the technical issues are seen by users as a consequence of the funding model. This is also viewed as a waste of tax payer’s money due to lack of accountability by the officials responsible for the initiative. The quotes below obtained from the focus group discussion highlight why users think it is important to resolve the challenges.

> “If we were paying they will take the queries more seriously, so now because of the grace period, I think that is the problem because then they will check and say they are on a grace period it is for free so why bother” (Maruleng FGD official user, 9 may 2013). “I do not think the grace period should be a barrier, if this thing is slow it means we do not meet the demands of the people. So whether we are paying or not paying, somebody is paying for it. Even if we are talking about the grace period it is our tax. The very same people on the ground are paying for it. So it should be upgraded irrespective of whether the individual departments operating from the TSC are paying or not” (Maruleng FGD official user, 9 may 2013). “It is just a matter of follow up and accountability “(Maruleng FGD official user, 9 May 2013).

Capabilities of users in using the available connectivity

Connectivity is not integrated in the majority of the service offered, out of the six users; only Home Affairs and Limpopo Economic Development Agency (LIEDA) are currently using connectivity to fast track service delivery at the local level. Home Affairs is using connectivity to capture applications and issue personal documentation such as birth and death certificates. LIEDA is using connectivity to access the Companies and Intellectual Property Commission (CIPC) system to assist local entrepreneurs with company registrations.

The perceived usefulness of connectivity and ease of use is challenged by active users such as Home Affairs, LIEDA and Anova as they are often not able to perform and complete their business processes due to the unreliability of connectivity. The users' ladder of connectivity is limited to information search and email, as it does not provide access to social networking sites and software such as Skype. The current user's future accessibility and capability will be affected if all service providers could be connected to the network. The quotes below, summarises the limited capability with regard to the performance of tasks as follows;

> "Sometimes when you download a document, you must leave your computer on so that when you come in the following day, you can get the document" (Maruleng FGD official user, 9 may 2013). "We are not meeting the needs of the community because our office cannot print documentation if the internet is not working (Maruleng FGD official user, 9 May 2013).

Functioning derived by users from the capability to use the available connectivity

Despite the poor quality of connectivity, the Home Affairs and LIEDA officials have successfully converted their capability into functioning by issuing personal and company documentation.

Outcomes of connectivity towards the socio-economic value of the beneficiaries

Access to personal documentation is contributing positively to people's lives within Maruleng as it enables access to government services such as housing, child grants and pensions. The administration and issuing of personal documentation at a local level is contributing to citizens and officials' productivity by reducing the time and the financial costs for travelling to municipal and district offices in order to process and issue documents.

Greater Tzaneen municipality: the case of Bulamahlo TSC

Readiness of TSCs as institutions for accessing connectivity and government e-services

Bulamahlo learning project is a registered NGO that was established in 1984. It offers Early Childhood Development, End User Computing, Adult Basic Education and Training. Bulamahlo plays a vital role in education and facilitate access to tertiary education through its partnership with the University of South Africa (Unisa) as part of Unisa's open distance learning (ODL) principles. The ODL enables the registered students in South Africa's rural areas and townships to access the Internet for academic purpose. Although Bulamahlo was converted into a TSC in 2008, it does not have any government

service providers that are permanently based at the TSCs. The table below highlight government services that are provided on a dedicated service day.

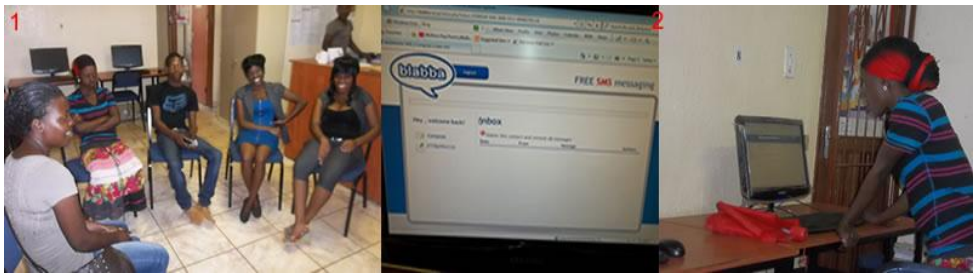
TABLE 4: SERVICES PROVIDED AT BULAMAHLO TSC

Service providers	Service offering: services offered on a dedicated service day
Home Affairs	Applications for identity documents, issuing of birth and death certificates
Social Development	Foster grants administration
SAPS	Satellite services, certifying and affidavits
Sassa	Applications for social grants
Greater Tzaneen municipality	General municipal services and enquiries

Connectivity performance and reliability as experienced by users

Bulamahlo was initially connected in 2005 by USAASA as part of the Southern African NGO Network (SANGONeT) initiative. In 2008, the TSC benefited from the DPSA five year free connectivity when it was converted into a TSC; this has since expired in March 2013. The TSC is now connected through Sentech and the Greater Tzaneen Municipality. The affordability and cost of connectivity is not a barrier for the learners because Bulamahlo provides free access to Unisa and Bulamahlo End User Computing learners, members of the community pay a R10 access fee which allows them 30 minutes of connectivity. However, there is an indirect transport cost for users that travel from the neighbouring villages. The quality and reliability of connectivity and services are viewed by the users as meeting their expectations because it is always available whenever they want to go online, however, the ladder of connectivity limits the users to access social networking sites and SKYPE.

FIGURE 6: CONNECTIVITY USERS AT BULAMAHLO (1: FOCUS GROUP DISCUSSIONS AND 2: USER DEMONSTRATING THE CAPABILITY OF SENDING FREE SMS)



Capabilities of users in using the available connectivity

The current connectivity at Bulamahlo does not contribute to the delivery of government services. The connectivity is mainly used by the students to search for information, entertainment (music downloads) and job searching. The Unisa students use connectivity for performing online registration, access to online library and submission of assignments.

Functioning derived by users from the capability to use the available connectivity

Connectivity at Bulamahlo enables users to address their daily challenges, such as education. They use connectivity to search for information for their siblings to support them with school research. The users value their ability to access online dictionaries, because it is contributing to improved grammar and vocabulary. Despite the ability to use the Internet, users at Bulamahlo are faced with the digital illiteracy and this has led to the retrieval of wrong information as the result of misspelling key words when using search engines. However, their teacher is always available to assist them to assess the retrieved information. Computer literacy is also a challenge that is experienced by users at the TSC because most of the schools within the area do not offer computer lessons; therefore, users lack the basic skills of typing and

using the keyboard. The quotes below, obtained from the FGD demonstrate how users feel about the ability to convert their access into functioning.

> "In my case it helps me, I retrieved special messages that I will use to write a card for my mother. The other thing is that when I started with the course, I did not know how to align my fingers to the keyboard, but now I am happy because I can type like other people. I am also using the Internet to send free Short Message Services (SMSs) FGD, Bulamahlo user, 9 May 2013). "Today's generation is different from the older one. You can no longer say you are going to look for a job in towns, because you can no longer knock door to door. You can do it if you feel like it, but with the Internet it is a short cut, you are able to do everything" (FGD, Bulamahlo user, 9 May 2013).

Outcomes of connectivity towards the socio-economic value of the beneficiaries

Connectivity at Bulamahlo is reducing the level of migration because job seekers are able to access and search for jobs at village level. The Unisa partnership is another example of how connectivity is transforming lives in Bulamahlo and the surrounding villages. The centre operates like a mini university and enables students to access tertiary education without migrating to towns and cities.

Greater Letaba Municipality: the case of Mokwakwaila TSC

Readiness of TSCs as institutions for accessing connectivity and government e-services

The TSC was established in 1998 as a poverty alleviation programme. It was later converted into a municipal Sub-Unit Office and TSC. The table below gives a list of the service providers and their service offerings.

TABLE 5: SERVICES PROVIDED AT MOKWAKWAILA TSC

Service provider	Service offerings
Greater Letaba Municipality	Provide general municipal services such as application for houses and indigent database registrations
SAPS	Satellite office provides affidavit and certifying of documents
Justice	Legal counselling
Social Development	Conduct community outreach programmes, compile household profiles, and conduct capacity building and capturing of NPO registration, Early Childhood and social worker services such as counselling and foster grant application and management.
South African Social Security Agency (Sassa)	Applications for grants
ESKOM	Sale of electricity vouchers
Photocopying centre	Privately owned

The services offered at the TSC do not meet the concept of an integrated service delivery model which promotes a holistic approach to service delivery. The absence of Home Affairs breaks the integrated service delivery model advocated by GCIS, which ensures that community members get all the services under one roof. At the moment applicants must travel to Kgapane and Modjadjiskloof to get birth certificates and then come back to the TSC to certify their documents and apply for the Sassa services. The ability to apply a holistic approach to service offering requires on-going monitoring and evaluation on the level of service consumption and the rise in increased demand for services which move users to the next ladder of development. The decline in the number of people requiring the Home Affairs services has led to the department moving out of the TSC. On the other hand the number of people applying for Sassa grants has not declined. The GCIS integrated

model is further broken by the departments that do not provide office equipment to officials based at the TSC. This has led to officials buying personal laptops in order to take advantage of the available infrastructure at the TSC.

Connectivity performance and reliability as experienced by users

Mokwakwaila connectivity was deployed in 2010 as part of the DPSA initiative. The TSC does not provide direct connectivity access to community members. Connectivity is currently used by the municipality, Community Development Practitioners (CDPs), social worker and Sassa. The lack of consultation during the deployment of connectivity is reflected by the limited uptake and integration to service offerings as well as lack of participation or buy-in by provincial and national departments. The Department of Social Development and Sassa did not provide the officials with connectivity infrastructure like data lines to enable the link between the TSC offices and provincial as well as national offices. The quality of connectivity is poor and not reliable because it is affected by weather conditions. In 2012, the TSC did not have connectivity for a month due to lightning. Users who are generally satisfied with the available connectivity are not based at the TSC on a daily basis and have access to personal 3Gs and private internet cafes. The reality of the digital divide within Mopani has resulted in users accepting the poor quality of connectivity as they regard themselves to be lucky compared to most of their peers within the District, who have no access at all.

Capabilities of users in using the available connectivity

The services offered in Mokwakwaila do not contribute to e-services because they are still based on a manual system. The officials are not linked to their provincial and national departments to enable access to systems that capture applications for the registration of NPOs and social grants. Connectivity is mainly used for information searching and communication. The officials use personal emails such as yahoo and Gmail to communicate and transfer information to their supervisors.

The connectivity does not contribute to the capability to serve clients effectively. Clients must wait for three to six months before they get feedback on the status of their applications. The inability to process applications at the TSC has resulted in the loss of information by the Kgapane office and in some instances Community Based Organisations (CBOs) have missed out the opportunity to apply for funding due to the lack of NPO certificates. Despite the limited usage and the poor quality of connectivity, users value their capability to access the Internet and communicate with colleagues because officials within the municipality struggle with basic communication infrastructure such as telephone and still rely on government transport to deliver messages and interact with their clients.

FIGURE 7: SASSA CLIENTS WAITING FOR THEIR GRANT APPLICATIONS TO BE CAPTURED MANUALLY



Access to the Socpen, Sassa application that enables direct capturing by the officials will improve efficiency, productivity and contribute to the Batho Pele principle of customer service.

The quotes below obtained from the different interviews give an insight on the consequences of sending applications to Kgapane for processing, and waiting period for issuing of documentation and why the officials value the poor connectivity as well as motivation for buying personal computers and alternative connectivity;

> “This is a problem because files get lost on the way to Kgapane. You find clients coming back to complain that they could

> not get their grants when they went to the pay point and were told that their details does not appear on the system" (Interview, Mokwakwaila, official user, 6 May, 2013). "Sometimes when we see funding opportunities, we cannot tell our clients to apply because they do not have the NPO certificate. This means that they lose out on potential funding" (Interview, Mokwakwaila, official user 6 May, 2013). "The availability of connectivity at the TSC is a blessing to me because I am able to communicate with my colleagues without relying on my cell phone, since the department does not provide me with a phone and they do not subsidise my airtime" (Interview, Mokwakwaila, official user 6 May ,2013). "We use our personal resources because we are passionate about our work, we are CDPs. We deal with youth and communities and they need information" (Interview, Mokwakwaila, official user 6 May, 2013). "Even if you report to Polokwane, you have to drive to Giyani or Polokwane to submit reports and leave forms" (Interview Mokwakwaila, official user 6 May, 2013).

The quotes above further demonstrate the level of inefficiency, poor consideration for upholding the principles of sustainable financial resources which ensures value for money and government's poor level of e-government readiness. The case of Mokwakwaila shows the widening gap of the digital divide at a district level within the public service sector. The digital divide is cascaded to the local level and within communities due to the capability of officials to search and retrieve information for community members who are aware of the availability of connectivity.

Functioning derived by users from the capability to use the available connectivity

Mokwakwaila connectivity has enabled the officials to access job opportunities on behalf of two members of the community.

Outcomes of connectivity towards the socio-economic value of the beneficiaries

The impact of connectivity at Mokwakwaila is demonstrated by the case study of two young people who secured permanent positions with the Department of Water Affairs and Sassa.

FIGURE 8: COMMUNITY MEMBERS THAT ARE EXCLUDED FROM THE TSC CONNECTIVITY.



These users understand the value of connectivity; they are all learners at the local computer centre. They believe access to computers and connectivity is a basic need that opens opportunities.

Greater Tzaneen Municipality: the case of Lesedi TSC

Readiness of TSCs as institutions for accessing connectivity and government e-services

Lesedi, TSC was established as an NGO, the municipality took over the project as part of its strategy to establish municipal presence in the community.

Connectivity performance and reliability as experienced by users

Lesedi has connectivity infrastructure that was connected in 2005, it is currently not in use. The TSC will benefit from the second phase of the GTM Rural Broadband project.

Capabilities, functioning and outcomes

Given the status of the TSC, it was not possible to explore issues of capabilities, functioning and outcomes.

Greater Tzaneen Municipality: the case of Runnymede TSC

Readiness of TSCs as institutions for accessing connectivity and government e-services

The Runnymede TSC is not in operation because the service providers were moved to Nwamitwa tribal office under the instructions of Chief Nwamitwa. Runneymede TSC presents a case of stimulated user demands and denied access due to community politics, poor leadership and consultation. The table below gives a list of the service providers and their service offerings.

TABLE 6: SERVICES PROVIDED AT RUNNYMEDE TSC

Service provider	Service offering
Home Affairs	Capturing of identity documents (visit once per week)
ESKOM	Electricity vouchers

Connectivity performance and reliability as experienced by users

The TSC initially benefited from the DPSA blueprint, in November 2012 a community internet café was established as part of the Greater Tzaneen Broadband project. However, the Internet café is currently not in use since the TSC services were moved to the tribal office. The advertising board in figure 14 (photo1) is visible from the main road and enticing to the potential user. The user's expectations to use the Internet are not met regardless of the available connectivity.

Figure 9**:** Unaccounted and wasted resources



. 1)This advertising board gives potential users false expectation (2) official working hours that are not relevant to community members (3) Access denied (4 &5) connectivity infrastructure that is redundent (6) She has the potential to be part of the information society, but she does not know how to operate a computer

The case of Runnymede perpetuates the 3rd level of the digital divide in which people are excluded from the information society not because they lack skills or because there is no physical access. There is also lack of accountability for the financial resources due to the poor integrated planning and duplication of ICT interventions.

Capabilities, functioning and outcomes

Given the status of the TSC, it was not possible to explore issues of capabilities, functioning and outcomes.

Greater Giyani Municipality: case study of Makhuvha TSC

Readiness of TSCs as institutions for accessing connectivity and government e-services

The TSC was opened in 2002 by the then Premier of Limpopo, Ngoako Ramathlodi. The table below gives a list of the service providers and their service offerings.

TABLE 7: SERVICES PROVIDED AT MAKHUVHA TSC

Service providers	**Service offerings**
Greater Giyani Municipality	Library (Funded by the Department of Arts and Culture)
Social Development, Home Affairs, Sassa, SAPS, Post Office, Agriculture and Health	Due to the status of the TSC, it was not possible to determine services offered because the service providers visit the TSC on specific service days.

Connectivity performance and reliability as experienced by users

Makhuvha connectivity was deployed in 2011 by the Department of Arts and Culture (DAC) to enable the librarians to assist community members with access to information that might not be available under the library collection. The DPSA's database also indicates that the TSC benefitted from the blue print. Direct and free accessibility for community members is provided through two computers that are connected to the network. The unavailability of connection points, quality and performance of connectivity hinders the user access. This is also contributing to long waiting periods of 45 minutes before they can have access. The unreliability of connectivity has resulted in users with high connectivity requirements to endure the high cost of travelling to Giyani and paying for accessibility from the private internet cafés in town. The computers are also affected by viruses due to the poor maintenance of the computers. The importance of reliable connectivity is highlighted in the quote below by a user who visits the library daily, because he is currently looking for employment.

> "The Internet is very important to me because connectivity enables me to search for job opportunities, therefore it is important to check emails on a daily basis and see if the potential employers have responded to my applications and also if I have job alerts from the various websites that I subscribe to, that is why I have to go to Giyani if there is no connectivity. The performance of the Internet is frustrating because one cannot push people to finish. Sometimes you can wait for 45 minutes, and not because the person is taking too long but because the Internet is very slow" (Interview, Makhuvha - community user, 8 May, 2013).

Capabilities of users in using the available connectivity

The Makhuvha connectivity does not contribute to the accessibility of government e-services; it is mainly used for communication, information and job searching. Users lack access to social networks due to bandwidth limitations, these restrictions have been imposed from the provincial office. Users who have direct access to connectivity play a vital role in the community, by assuming an unofficial role of information brokering. This is a role that one active user of the library has identified to be a basic need because people in the village do not have access to newspapers. The quote below describe the importance of one person having access to information and sharing it with people who are not interested in using the library or who are not aware of the value they can derive from the Internet or due to lack of computer and internet skills.

> "I do this when I hear someone talking about some Daily Sun or Citizen articles. I just go to the Internet, get the full story and then I print it and share with other people to read. I distribute the information at the bar lounge to make sure that the information spread quickly in the village without any kind of rumours" (Interview, Makhuvha - community user, 8 May, 2013).

FIGURE 10: ONE OF THE FREQUENT USERS OF CONNECTIVITY AND THE POOR ELECTRICAL CABLING



Functioning derived by users from the capability to use the available connectivity

Despite the poor quality of connectivity, one member of the community has achieved functioning by securing a learnership opportunity through the information accessed from the Internet. This has also contributed to the empowerment and enhancement of self-confidence when it comes to job hunting. The retrieved information has led to capacity building in areas such as subsistence farming. This was achieved by accessing agricultural information from an agricultural information website which provides information on different types of diseases according to the seasons and treatment. The quote below demonstrates the level of empowerment experienced by the user.

> "It helps me a lot, sometimes when I Google a post, I assess my own qualification and this is helping me to understand what my potential employers are looking for" (Interview, Makhuvha - community user, 8 May, 2013).

Outcomes of connectivity towards the socio-economic value of the beneficiaries

The outcome of connectivity in Makhuvha is limited; however it has resulted in the interviewed user getting a learnership opportunity at the Department of Agriculture.

Greater Giyani Municipality: the case study of Muyexe TSC

Readiness of TSCs as institutions for accessing connectivity and government e-services

Muyexe TSC is located in the presidential village that is known as a model for rural development under president Zuma. The community telecentre was established in 2009, funded by the Department of Land and Rural Development (DRDLR) and Independent Development Trust (IDT).

Connectivity performance and reliability as experienced by users

Muyexe telecentre is known as the e-Rural Access Programme (e-RAP) which is championed by the DRDLR. The centre is not part of the DPSA initiative or USAASA. Connectivity was deployed in 2010 by a private service provider contracted by the DRDLR. Universal access to connectivity is provided for free to community members. The status of connectivity in Muyexe perpetuates the 3rd level of the digital divide despite the availability of infrastructure. This is due to poor operations and maintenance of the connectivity infrastructure, the continuous and prolonged unavailability of connectivity as well as the poor quality and performance. The sustainability is also threatened by the ^{4th} level of digital divide which is driven by the attitude of the officials at the centre. The quotes below obtained from a group interview with learners from Atlane Muyexe demonstrate the potential for a 4^{th} level digital divide.

> "I have never used the connectivity at the centre because those people are full of stories" (Group Interview Muyexe learner, 8 May 2013). "Sometimes they tell us that, the Internet is not available even if we can see that they are using it" (Group Interview Muyexe learner, 8 May 2013). "They restrict us with the amount of time we can spend online; they allow us to be there for two hours" (Group Interview Muyexe learner, 8 May 2013).

Capabilities of users in using the available connectivity

The purpose of connectivity in Muyexe is to enable easy access to information such as bursaries, learnerships and job opportunities. The e-RAP centre is playing a vital role in education, facilitation of communication and entertainment. The attendance register indicate that the users use connectivity to conduct research, access Facebook and Unisa. The usage statistics indicate a high number of Facebook users. The e-RAP computers are loaded with educational programmes such as geography and mathematics.

Functioning derived by users from the capability to use the available connectivity

Despite the unreliability of connectivity, users value the existence of the e-RAP centre because access to internet is contributing to their performance at school and improvement of their general knowledge. The statements below highlight what users see as value for them.

> "We use Google to search for information when we do our homework" (Group Interview Muyexe learner, 8 May 2013). "The Internet is helping me to know when they say Tupac is not alive, I can go to the Internet and confirm if he is alive or not" (Group Interview Muyexe learner, 8 May 2013).

In general, users feel that the e-RAP centre has the potential to help them with their day to day challenges, but currently it is not helping them. This is because users suffer from the digital illiteracy and information branching ca-

pability. They lack the skills to asses, analyse and synthesis the retrieved information. The e-RAP personnel are also faced with digital illiteracy challenges which lead to the inability to support the learners in accessing relevant information. This has resulted in unmet expectations by the users and has led to users challenging the perceived usefulness of the connectivity. One learner described the failure by personnel to assist them in the quotes below.

> "To be honest, the centre is not helping us. Those people are actually not helping us to do our homework and research. This is a problem because when we go there we want to get more information about what we are researching. I was looking for information in January to help me chose subjects. I was looking for careers in the accounting field. I was not able to get more information, I asked them to help me, and then they told me that they do not know how to help me. I stopped searching, I took accounting and physics. I do not know what I am going to do after matric, because I do not know careers that involve accounting and physical science" (Muyexe learner 3, Grade 10 learner).

FIGURE 11: MUYEXE CONNECTIVITY MAINLY USED FOR EDUCATIONAL PURPOSE



(1)Some of the active users of the e-Rap centre, (2) Educational content projected on the television screen, could be used to facilitate group learning, (3) the centre has enough computers to accommodate learners, but there is limitation on accessibility and availability because of poor bandwidth.

Outcomes of connectivity towards the socio-economic value of the beneficiaries

Due to the status of connectivity it was not possible to determine how user's accessibility and capability has been converted into socio-economic outcomes.

Greater Ba-Phalaborwa Municipality: the case study of Selwane TSC

Readiness of TSCs as institutions for accessing connectivity and government e-services

Selwane TSC is funded by the Ba-Phalaborwa Foundation. It was opened in October 2012 by the former Premier of Limpopo Mr Castle Mathale. Selwane is one of the well-resourced TSCs with regard to space and office availability. However, none of the government departments are based at the TSC; as a result it was not possible to determine the number of government services offered at the centre other than for the Post office and Municipal library.

Connectivity performance and reliability as experienced by users

Selwane has connectivity infrastructure that is earmarked for a community telecentre which is not in operation due to the lack of computers and Telkom data line. Poor coordination and duplication of efforts is reflected by the availability of connectivity from the library, which will be provided to the community for a fee. The quality and reliability of the library connectivity is affected by environmental factors such as electricity shut downs and the turnaround period in resolving technical problems by the municipal officials.

Capabilities, Functioning, outcomes and recommendations

Due to the status of the TSC, it was not possible to explore the capabilities, functioning and the outcomes of Selwane connectivity.

Figure 12: Selwane centre was opened by the former premier of Limpopo, despite of the un-readiness of the TSC.



TSC officially opened in 2012, (2) furnishing of the TSC, (3) space allocated for public access connectivity, but still waiting for the delivery of computers: photos taken 25 March 2013

Figure 13: Post Office and library



The post office is connected via satellite. The library provides photocopying services and in future community members will have connectivity access.

TSC MANAGERS AND COMMUNITY LEADERS PERSPECTIVE

Readiness of TSCs as institutions for accessing connectivity and government e-services

The TSCs institutional arrangements and setup represent poor coordination and ineffective Intergovernmental Relations (IGR) at national, provincial and local levels. There is a lack of standardisation and formalisation of the roles and responsibilities of the different stakeholders. The TSCs are mainly managed by full time municipal employees who report directly to Office of the Premier on TSC operations. The dual role and acting capacity of the centre managers has led to conflicting roles, lack of authority and accountability on the status of the TSCs. In Makhuvha, the acting centre manager, who is also

a ward councillor was dismissed from the TSC by the community due to political factors.

FIGURE 14: MAKHUVHA CENTRE MANAGER OFFICE



Centre Manager chased away by the community members due to politics.

The government's vision to provide universal access to citizens in Mopani is hindered by lack of space to accommodate community telecentres and to procure connectivity equipment in cases where there is space. The lack of operational budgets contributes to inefficiencies and threatens the sustainability of the various TSCs. The e-RAP initiative is an example of a community project that is faced with a number of sustainability issues because it provides free services to community members without a strategy to recover the operational costs. The quotes below obtained from the different interviews summarises the scale of operational challenges experienced at the e-RAP project and various TCSs. It also shows the poor planning and coordination by various stakeholders.

> "Our project does not have a budget, when we run out stationary, electricity, they buy for us. When we run out of electricity, we inform the department, sometimes it takes them two weeks, a month, or a day for them to buy. Sometimes they tell us they do not have a budget" (Interview, centre manager 8 May, 2013). "The mandate of the municipality is to provide services such as water and infrastructure. The planning and initiation of the TSC projects is not aligned to the municipal IDP and lacks

the required political will. In cases where leaders bought into the project, this has been affected by leadership changes. GCIS must make sure that they educate municipalities to understand the value of TSCs, because if I have a meeting with Home Affairs in Giyani, I must first drive to the office (more than 50Km) to seek approval and it is not always guaranteed that I will be allowed to go. This leads to ineffectiveness in resolving problems at the TSCs "(Interview, centre manager 6 May 2013).

FIGURE 15: MUYEXE FACED WITH SUSTAINABILITY CHALLENGES



(1)The status of Muyexe E-rap centre is not a reflection of the IDT and DRDLR slogan, the connectivity initiative is not integrated into community projects, (2) Available connectivity equipment that cannot be maintained due to lack of operational budget, (3) Poor operations and maintenance.

Various government departments in the Mopani District provide services that are not integrated to ensure a holistic approach towards addressing community development. The failure to integrate service offerings and community interventions result in the duplication of efforts and failure to use the available resources optimally. Mopani District has a number of community projects that aim to address socio-economic challenges, but currently connectivity is not explored as an enabler to support the existing projects. This has led to the loss of profits in one area where farmers relied on intermediaries to send their fresh produced to Johannesburg Fresh Market due to lack of direct access to market information. Another example of poor planning is reflected by the role played by CDWs within Mopani District. CDWs are not based at the TSCs and lack access to computers. In 2007, the DPSA, provided the CDWs

with laptops, but the CDWs are not using the computers due to viruses and lack of modems. The quote by the ward councillor demonstrate the challenge and vulnerability faced by small farmers in Mopani, the quote further highlight the level of frustration experienced by the CDWs.

> “In the case of these farmers they used to get market information from some white people and what they did not realise was that they were given wrong information hence they were not able to make profit. So this white company will have a link in Johannesburg, they will work with the Johannesburg people to produce fake invoices and the black farmers accepted this until they realised that there was something wrong. So I think if they can have access to the Internet it will help them a lot” (Bulamahlo FGD, 9 May 2013). “We have been promised modems since 2007; the laptop is too old and has a lot of viruses. This forces me to go to Polokwane in order to clean the virus and it is a stretch and it is very costly. Another problem is that, the officials in Polokwane do not accept handwritten reports. They want a report in black and white and they do not care how you type it (Bulamahlo FGD, 9 May 2013). “ It is important to have access to the Internet and computer, at the moment I am using my cell phone, but it has limitations because I need to type and email reports to the provincial office instead of travelling to Polokwane because it is not always practical” (Maruleng FGD, 9 May 2013).

FIGURE 16: COMMUNITY PROJECTS DRIVEN BY MUNICIPALITIES, GOVERNMENT DEPARTMENTS AND INDIVIDUALS WITHIN THE GREATER LETABA MUNICIPALITY: MOKWAKWAILA CLUSTER.



(1) Municipal funded youth coorporative, (2) Itsoseng Bakery funded by the Department of Social Development. This project was initiated in the 1980s and has been closed several times due to funding and sustainability challenges. The project continues to be under threat due to funding and sustainability challenges, (3) privately owned poultry farm, the owner has not explored connectivity as an enabler for growing his business, (4) privately owned internet cafe, bridging the digital divide.

Connectivity performance and reliability as experienced by users

In general, the centre managers view the TSCs connectivity in Mopani as poor, unreliable and not contributing to government's objective of fast tracking service delivery in remote areas. Muyexe e-RAP demonstrates the worst case of connectivity that does not meet the expectations of the users because of bandwidth limitations and frequent power failures. These often result in the closure of the centre, which could last up to a month. The manag-

ers do not have documented process for reporting connectivity and it is unclear who is responsible for improving or fixing connectivity challenges.

The sustainability of connectivity beyond the DPSA grace period is also not known. Centre Managers are not aware if their municipalities will provide the financial resources to sustain connectivity when the DPSA grace period lapse. Currently the municipalities do not have sustainability plans and the willingness to pay by users has not been confirmed by the DPSA. The quote below obtained from an interview with a centre managers give a glimpse of the challenges and extent of the connectivity problem and the reporting challenges in the various TSCs.

> "We do not know what the problem is, sometimes it can shut down for a month and this is a challenge because we have pupils who do their homework here, it is disturbing because there is nothing we can do. I tried to talk to the lady from IDT; she advised that I speak to the service provider. I have been sending messages since morning but they are not responding. On the other hand we have 15 computers connected to the network. If everyone is using the Internet at once, the connectivity becomes slow and users complain about the slow internet. The issue was reported to the funders and service provider who has since given us a new dish, but this did not improve the performance" (Interview, centre manager 8 May 2013).

Capabilities of users in using the available connectivity

The lack of integration is also reflected by government departments that are not aligning their service offerings with the available connectivity. The use of manual systems by government officials based at the various TSCs is the result of lack of access to applications that support their day to day service offerings. The available connectivity does not increase the efficiency of delivering services and it does not contribute to the productivity of the users as it is

mainly used for information searching and communications. In the case of Makhuvha, the librarians do not have a dedicated library software to support them in managing and tracking library resources. The quotes below highlight the reasons why the various managers view connectivity as an important tool to the users' day to day challenges.

> "As a librarian it is important for me to have the library software to manage books, at the moment if I want to look for a certain book, I have to go shelve by shelve, but if the system is available I can easily check" (Interview, Makhuvha official, 8 May 2013). "The Municipality sees value in service providers having access to their core systems. This links to the idea of having fully fledged TSCs. The current approach is problematic as it means beneficiaries are not able to get feedback on the status of their applications and this is even problematic because if the driver can be involved in an accident all the information of the clients will be lost. And also if we have a telecentre it will help us during the community participation process such as IDP consultations. It will contribute to costs cutting if we publish the IDP on the Internet. At the moment we publish the IDP on the municipal website, but it does not help our people" (Interview, centre manager, 6 May 2013).

Functioning derived by users from the capability to use the available connectivity

Connectivity is not yielding the desired outcomes because it is mainly accessible to officials. Functioning is also affected by lack of resources such as printers, cartridge and photocopying machines. This has led to the inability to print application forms to apply for government vacancies. This further highlights poor level and readiness of government's ability to embrace e-services and e-government. The quote below obtained from an interview with a centre manager gives a clear picture on how poor management and lack of operations budget impact on the functioning ability of the users.

“In our case we have run out of cartridge since November 2012 and this is a challenge because even if users can see job opportunities advertised online, we are not able to download and print forms for community members, as a result people cannot apply for the advertised positions“(Interview, centre manager 8 May 2013).

Outcomes of connectivity towards the socio-economic value of the beneficiaries

The outcome of connectivity in Mopani is limited, although there are few cases in which connectivity has contributed to access employment, personal and company documentation. Bulamahlo and Maruleng are the only TSCs that contribute to education and access to personal documentation. Despite the outcomes noted in the two centres, there is no monitoring and evaluation of the TSC connectivity to determine impact beyond access. The current monitoring and evaluations (M&E) conducted by the Premier’s Office is focusing on client satisfaction and service experience. The monitoring and evaluation gap is summarised by a centre manager who pointed out that there is a need to move beyond counting numbers and look at how people’s lives are changing due to the accessed services . The quote below, obtained from the Maruleng FGD challenges the perceived outcomes of the available connectivity due to the lack of an M&E strategy.

> “How does one know that a person looking for a municipal database form is going to be helped by the form? Our experience at the TSC is that a service provider has issued 102 birth certificates, but how are we monitoring part of the end product? (FGD, centre manager 9 May 2013).

LOCAL GOVERNMENT PERSPECTIVE

Readiness of TSCs as institutions for accessing connectivity and government e-services

The current institutional arrangement hinders the effectiveness of the TSC initiative because it is not recognised as part of the local government mandate. This has led to the lack of ownership and buy- in towards the initiative. Regardless of the complexity of the institutional arrangements, local government view TSC connectivity as one of the key contributors towards socio-economic development. TSCs are also viewed as strategic institutions that could advance SA's vision of developmental local government and contribute towards effective governance. However the inability to integrate connectivity in the municipal processes is due to the lack of skills and the top down approach of ICT initiatives which are not informed by community needs. Municipalities that are ICT illiterate cannot play a role in facilitating citizen participation in the information society and this is widening the digital divide between the metros and small municipalities. The quotes below obtained from an interview with a local government expect highlight the readiness challenges and community competing needs.

> "Even if ICTs are viewed as an enabler for development, the challenge is that most projects are pilots diffused from Head Office, not sustainable in a long term. ICT interventions targeted at communities do not consider and cater for community expectations and fail to address the priority of communities from the day to day competing needs such as water" (interview, local government expert, 10 June, 2013).

Connectivity performance and reliability as experienced by users

Greater Tzaneen is the only municipality in Mopani which has a dedicated connectivity (broadband) initiative which is funded by the National Treasury's Neighbourhood Development Programme (NDP). The project aims to connect the municipal and community buildings like TSCs, schools and health centres.

Capability of local government in using the available connectivity

In general, the capability of municipalities in using connectivity is limited to municipal administration (communication and information searching). Despite the vision by the Greater Tzaneen municipality to link key community institutions, the project is already faced with a number of sustainability challenges which are a consequence of poor planning, stakeholder consultation, coordination and alignment to existing municipal programmes and strategies. This has a direct impact on the capability of the municipality and its citizens to use the available connectivity. This challenge is articulated by an expert in local government and ICT who pointed out that it is important to understand the role and value of connectivity as an enabler for social change, but a critical question to ask whenever ICT projects are deployed is to ask connectivity or ICT for what? The lack of integration and strategy is reflected in the statements below, which reflect the status of the Runnymede TSC that has municipal broadband, but not in use due to political factors. In the second case the municipality has duplicated connectivity at a TSC that has Sentech connection and argues that connectivity can only be used if it is free to the public.

> "If the TSC is not currently in use, we cannot do anything because we are not responsible for ensuring that communities and stakeholders are using the provided connectivity, as our role is on a technical level. Therefore, certain people within the municipality must ensure that the provided connectivity is used.The broadband connectivity in Bulamahlo is ready to be used, it is only a matter of plugging the cable, the only thing is

> that we cannot connect them if they charge community members, because they cannot use it to generate income" (Interview, local government municipal official, 14 May 2013).

The GTM is one of the local municipalities in Mopani which has connectivity infrastructure, but usage is limited to broadband as an enabler for municipal administration and citizen engagement. The municipality uses social media and SMS platform to support citizen engagements and consultation. The research did not determine if citizens are granted access to free connectivity for this purpose. The municipality has a dedicated community radio station that is seen as a vehicle to disseminate LED information to communities. However, the radio station has failed to deliver on this mandate and the municipality does not have a strategy to integrate radio and connectivity to enhance the programming and delivery of relevant and local content.

Functioning and outcomes of connectivity towards the socio-economic value of the beneficiaries

Given the status of connectivity in Mopani and the selected municipalities, it was not possible to explore functioning and outcomes of connectivity from the perspective of local government. In the case of the GTM, it was also not possible to explore the outcomes of the broadband project because the project is still at infancy level.

PROVINCIAL AND NATIONAL GOVERNMENT PERSPECTIVE

Readiness of TSCs as institutions for accessing connectivity and government e-services

DoC is of the view that connectivity is a basic need and in terms of economic development it is the 3rd most important level of socio-economic development. South Africa is lagging behind in realising the value of broadband as an enabler for development, due to a lack of the required ICT infrastructure in many parts of the country. The high cost associated with access, digital skills

and e-awareness by the citizens is a major contributor towards the digital exclusion in areas such as Mopani. On the other hand poor cooperation and coordination by stakeholders contribute to poor ICT interventions. The lack of integration and coordination in planning and implementation of ICT projects has resulted in duplication of projects that that do not contribute to the desired impact of enabling the socio-economic capability of citizens and as well as improving the efficiency by government in delivering services. This is largely because there is a gap between national, provincial and local government with regards to the implementation of the ICT interventions.

The DoC has established institutional mechanisms such as the Intergovernmental Relations Forum (IGRF) targeted at addressing ICT challenges, policy and other regulatory issues at the three spheres of government. The IGRF is also attended by the representatives from house of traditional leaders and SALGA to ensure inclusive approach on the rolling out of ICT interventions at the local level. The traditional leaders are in a better position to know the community challenges and needs and also the best interventions in improving the socio-economic. The TSC initiative is another case study of poor coordination and integration of government planning. The initiative is a presidential intervention managed at a provincial level by the Office of the Premiers, supported by GCIS with coordination and marketing. The TSC Managers' Forum is one of the institutional mechanisms established by the GCIS and Office of the Premier as a platform to address the challenges experienced by the TSC managers. However, the platform has not yielded the desired outcomes due to the non-participation and contribution of the TSC managers.

The DoC is currently working with the department of DRDLR to ensure that the draft ICT rural development strategy is aligned to the National Comprehensive Rural Development Programme. This is to ensure that ICT interventions are aligned and responsive to community needs and to address the current practice of top-down modernistic or blanket approaches towards the diffusion of ICTs. The new approach requires project planners to conduct feasibility studies to ensure that projects are tailor made towards the specific

needs of the targeted communities. However, this is threatened by the requirement of the Public Finance Management Act (PFMA) which requires that the allocated funds to line function departments must be spent within a particular financial year cycle. The officials often fail to conduct community consultation as this takes long and result in the return of the allocated funds to the Treasury. The quote below obtained from an interview with the DoC official indicates that the current policy and regulations challenges hinder rural connectivity.

> **"**There are a number of policies that addresses rural development however the DoC is in the process of developing a national ICT policy which will include the issues of rural connectivity. There is also no policy on free connectivity but several interventions are in place to make connectivity affordable. On the other hand the focus on computers is mainly because wireless is expensive and there is spectrum scarcity. Therefore fixed line connection is cheaper and practical at the moment. The department is also exploring alternative technologies such as wireless connectivity and other interventions such as wireless mesh and cloud computing" (Interview, DoC official, 15, 2013).

FIGURE 17: CONNECTIVITY INFRASTRUCTURE AT BULAMAHLO



This picture shows a high level of duplication and waste of financial resources. DPSA, Sentech and municipal broadband infrastructure deployed in one TSC.

Connectivity performance and reliability as experienced by users

The DPSA TSC connectivity was deployed with the aim of supporting government departments that are based at the TSCs as part of their strategy to take government services to the people. DPSA contributed to this objective by connecting the departments based at the TSC to their departmental mainframes. This was to enable the officials to process and provide clients with services at the point of application. The SITA network was established to provide VPN for the departments, therefore the DPSA connectivity is solely for the purpose of government departments, local government and NGOs are not the targeted beneficiaries. Connectivity is provided through VSAT in areas that do not have Telkom. The use of VSAT is the only option for making connectivity available due to the lack of broadband infrastructure. This has led to poor connectivity and quality because VSAT is affected by weather conditions and that if more people are connected to the network; the quality of the connection is affected. The quotes below obtained from the DPSA interview in response to the poor connectivity performance experienced by the users gives a glimpse of the implications of the lack of ubiquitous broadband.

> “At the moment there is nothing that DPSA can do to resolve the issue; users must do what they can do with what they have. The solution is in getting broadband infrastructure in order to improve the quality of the Internet” (Interview, DPSA official, 2013).

Government entities such as USAASA are bridging the digital divide by subsidising TSCs such as Bulamahlo. USAASA provides 100% subsidy to the service providers responsible for deploying connectivity. According to USAASA the idea is to provide free connectivity, but due to sustainability factors, the telecentres charge for their services to cover operational costs. The free access model promoted by DPSA, USAASA, DRDLR and DAC is contributing to the unsustainability of the TSC connectivity. This approach exacerbates the inability of public access points in sustaining connectivity and pro-

moting it to the community to ensure business and user continuity post the subsidy phase. The challenge faced by government towards building a sustainable information society is the determination of access fee structure that is equitable. The quotes below obtained from DPSA and USAASA provide an insight on the need for a funding model.

> “DPSA must look at a funding model to ensure sustainability because at the moment, users are not paying for the connectivity and it is not clear how DPSA can breakdown the cost to determine the payment criteria for the different users” (Interview, DPSA official, 2013).

Appropriate technology design and integrated community development

In general, VSAT is an appropriate technology and solution for the underserviced areas and it has many benefits if used appropriately. According to Sentech, some of the VSAT benefits include ubiquitous availability, network reliability, timely deployment and installation: However, the successful implementation of VSAT depends on the initial design which should be informed by the user requirements. Therefore, VSAT cannot be deployed as a one size fits all solution. Various communities have different needs and the environmental characteristics such as weather patterns and power availability differs from one community to another.

The reason why VSAT is failing in South Africa is due to the poor understanding of the user requirements and the inabilities to tailor make the technology to fit the specific contexts. The user requirements should be determined from the inbound and outbound activities. Connectivity could be used for web browsing, email, VoIP, content downloading and uploading. These are some of the requirements that should determine the type of required frequency, bandwidth and typology. The quote below shows the complexity and diverse nature of user requirements.

> “It is important to spend more time understanding the user requirements, solution designing and implementation approach in order to deploy sustainable interventions. Even if you implement school connectivity you cannot provide the same solution to the different schools, because schools have different requirements. Some schools might want to browse the internet, others might want to download content and participate in interactive sessions (Interview, Meraka official, 20 November 2013).

Cost of VSAT

Recently, the cost of VSAT is declining, in the past the highest monthly payment used to be $3000 per megahertz; recently it is estimated at $1800 per megahertz. The major cost of VSAT is satellite capacity, which normally contributes to more than 80% of the cost. The once of cost include equipment and installation and there is a rental option for equipment which is spread over the period of the contract.

VSAT performance and reliability

VSAT is the most reliable form of connectivity due to the guaranteed position of the satellite. The unreliability and poor performance of the technology is often due to the poor design and selection of inappropriate frequency bands. VSAT technology uses three types of frequencies, namely C-band, Ku-band and Ka-band. C-band is the most expensive, reliable bandwidth and not easily affected by weather conditions. In cases where Ka and Ku-bands are deployed, there are available techniques to enhance and improve performance, for example, local caching and software packages. Internet services such as VoIP, VPN, online transactions such as banking are real time services and this requires high bandwidth, therefore caching strategy does not apply. In order to mitigate the poor performance, those responsible, must ensure that the service level agreements are clear and realistic. The failure to enter into

clear service level agreements leads to high maintenance costs. The quotes below obtained from Sentech, Meraka and the National Treasury illustrate the importance of operations and maintenance and capacity building in the public sector.

> "The industry has the skills and capacity for effective VSAT deployment and management; however, there is a gap in government. This requires the strengthening of the DoC and ICASA" (interview, Meraka official, 2013). "The private sector is not keen to invest in the underserviced areas and on the other hand, government entities such as Broadband Infraco lack the capacity to deliver on their mandate to roll out fixed broadband" (Personal communication, National Treasury, 2013). "There are enhancement software packages that are used in the satellite industry. Initially, VSAT was using Digital Video Broadcasting — Satellite (DVB-S) and now has upgraded to Digital Video Broadcasting-Satellite-Second Generation (DVB-S2) which has more benefits than the former like more capacity for the same satellite bandwidth (Sentech, 2013).

Capabilities of users in using the available connectivity

There is a gap in terms of the actual purpose of connectivity versus the real use on the ground. In the case of the DPSA connectivity, the usage gap is created by government's assumption that departments will use connectivity for accessing the VPN. Out of the eight TSCs, only Home Affairs is using connectivity for issuing personal documentation such as birth and death certificates. Therefore the DPSA TSC connectivity initiative does not contribute to government's service delivery of Batho Pele, which promotes access to information, delivery of services with efficiency and effectiveness as well as ensuring value for money.

The capability of users is limited to Internet access which is used mainly for, email and information searching. The usage gap is the result of lack of consultation during the planning and also because the location of the TSC is the key determinant for deploying connectivity. This implies that the targeted departments might already have alternatives or options for bridging the service access gap; therefore they do not see the value of being at the TSC. The lack of resources such as staffing and budget constraints are some of the factors that contribute to the connectivity usage gap.

Connectivity that is targeted at members of the community should enable the users to address their day to day challenges which will eventually lead to socio-economic change in their personal lives. This is vital for communities such as Mopani, due to the high level of unemployment, poor level of education, limited access to health facilities and lack of income. In Mopani, connectivity purpose consumption remains a farfetched dream because of the skills challenges. Skills in this context is beyond the ability to browse websites, it refers to the ability to access information and convert it into outcomes. The DoC has established an E-skills institute, known as the National Electronic Media Institute of South Africa (NEMISA) and other training institutes to address the skills gaps. However, the training and skills development provided through entities such as NEMISA does not reach the majority of communities such as Mopani. In cases where local initiatives are taken to close the skills gap there is often no direct support by government. Bulamahlo TSC has trained over 200 students in end-user computing. However, the TSC has failed to provide accredited certificates to the learners due to the failure to complete the Media, Information and Communication Technologies Sector Education and Training Authority (MICT SETA) process. As a result, this threatens the continuity of the TSC is providing End-User training and attracting new learners. Government entities that are aware of the centre's accreditation challenges claim it is not their role to assist Bulamahlo towards solving the challenge.

Functioning derived by users from the capability to use the available connectivity

In South Africa, functioning could be measured by the user's ability to use ICT applications that support e-health, e-education and SMMEs. In Mopani, the contribution of connectivity functioning is visible in linking users to the outside world, e-education and access to government services.

Outcomes of connectivity towards the socio-economic value of the beneficiaries

The outcomes of an information society are measured according to the WSIS seven dimensions which constitute ICT in the context of the individual, household, business, government, health, and local content development and education domains. In South Africa, there is a gap within the TSC initiative towards monitoring connectivity targeted at the seven dimensions advocated by the WSIS. The, DoC, GCIS and DPSA do not have strategies to monitor the impact of connectivity. The DoC monitoring and evaluation strategy addresses penetration, policy review as well as project management.

POLICY ENVIRONMENT FOR THE TSCS- FOCUS ON READINESS AND CONNECTIVITY

The TSC connectivity initiative is supported by a number of government directives and indirectly supported by various policies. Therefore, there is no dedicated policy that governs or regulates the establishment of the centres or the deployment of connectivity for public access. The section below provide an analysis of the various legislation, policies and implementation plans for the TSC connectivity

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Public Service connectivity

The public service connectivity that aims to enable the provision of e-government services is supported by the DPSA policy on Electronic government, the digital future, a public service framework of 2001. This policy is a response to the recommendations of the Presidential Review Commission (PRC) of 1998. The PRC and Electronic government policy position connectivity as an enabler for efficient and effective public service by providing government services at the local level using platforms such as kiosks and the TSCs. The e-government framework does not provide details on issues of connectivity standards and technology type, but emphasise the interoperability of platforms which is based on the Minimum Interoperability Standards (MIOS) under the custodian of SITA. It also emphasises on the value of IT in government and argues that value is achieved when IT enables the user to increase productivity, derive cost effectiveness and improved service delivery.

The framework recognises that the success of e-government depend on the e-awareness of citizens and recommends that all government departments must take a lead in ensuring that citizens have access to the required ICT interventions and infrastructure. The policy spells out the key IT role players (Department of Trade and Industry, DPSA, and DoC) and their key mandates. It further position GCIS and Government Chief Information Officers (GCIO) as champions for developing a strategy that will ensure that IT is used to improve government service delivery to citizens and to ensure that negative aspects of criminal consequences are closely managed. The policy state that IT should be provided in previously disadvantaged areas targeting community members who have not been able to use IT as a result of a lack of education or due to lack of access or language barrier. The policy state that all state organs should take a lead, this contribute to the duplication of ICT interventions for community access and it is also not clear if the SITA connectivity available in the identified communities should be made available to communities members as per the policy directive.

Public access connectivity

Presidential Comtask Report

The public access connectivity of the TSCs is addressed in the 1996 Comtask Report known as Communications 2000. Chapter five focus on the development challenges, particularly the flow of information which is hindered by factors such as the lack of communication infrastructure and the digital divide in the previously disadvantaged communities. Section 5.7.4 advocates for the utilisation of electronic devices where possible to enable people to make enquiries and retrieve information. Section 5.8 warn against the use of inappropriate and misleading technology solutions and emphasise on stakeholder collaboration. Comtask Report does not give the GCIS a mandate to play a role towards the facilitation and development of the technology infrastructure to ensure the effective integration of connectivity as an enabler for a two-way communication at the local level. It limits GCIS's role to a consumer of connectivity that will enable it to push information through the use of the Internet, by developing an electronic system/portal in which government departments will be mandated to contribute content. This implies that the use of technology to deepen democracy and support the development communication strategy of government is not aligned to the broader development goals and turns to be reactionary and dependent on DPSA and DoC.

Electronic Communications Transaction Act of 2002

Electronic Communications Transaction Act of 2002 does not make any direct reference to the TSCs, however section five and six give a clear mandate to the DoC to develop a national three year e-strategy within a period of two years from August 2002. The DoC should develop a national e-strategy that will outline strategies and programmes to Internet connectivity to disadvantaged communities, foster the adoption and use of new technologies for attaining universal access and stimulate public awareness, understanding

and acceptance of the benefits of Internet connectivity and electronic transacting. The Act gives a mandate to the DoC to lead the country towards the information society by ensuring collaboration with government and private institute. It further prescribes that citizens should be trained to use and see the value and benefits of connectivity. This implies that South Africa should have a clear e-strategy that integrate Internet connectivity in the broader development arena and develop country-wide training and awareness raising initiatives on connectivity. It also implies that DoC has the power to issue regulations/directives to departments that are not contributing towards the attainment or implementation of the e-strategy, therefore, the DoC cannot blame departments for implementing ICT interventions that continue to be of adhoc in nature and not aligned to the e-strategy. The non-existent of the strategy implies that the DoC has failed to deliver on the critical aspects that contribute toward readiness for building an information society (coordination, planning, roles and responsibilities, budget allocation).

The Electronic Communications Act of 2005

The Electronic Communications Act of 2005 does not make specific reference to the TSC, but state that universal access should be provided in all areas and communities. It also state that ,citizens must be able to obtain quality, affordable and usable access to a publicly available minimum set of quality in terms of voice, data, messaging and broadband connection. Quality, affordable and usable access within the context of universal access has not been define as well as the minimum set of what constitute quality voice, data, messaging and broadband connection and whether this standards refer to a public access provided through private internet cafes or government and donor funded projects. In cases where broadband connection is not available, minimum standards must also be defined so that there is an on-going monitoring and evaluation on the performance of the provided technology to ensure that facilities are constantly upgraded to meet the standards.

PLANNING AND IMPLEMENTATION OF CONNECTIVITY INTERVENTIONS

ISAD Plan

ISAD- 2007 does not provide a realistic implementation path. The suggested targets and interventions are not prioritised to ensure that focus is given to areas that will ensure governance and regulation of connectivity as one of the pillars for building an information society. Although ISAD was developed after the ECTA, it is not a direct response to the prescript of the Act on the development of the e-strategy for the country. The inability of the DoC to position ISAD as a response to the ECTA shows lack of consistency and follow up by the DoC. The document repeat issues highlighted in the PRC and Comtask Report and lack clarity on what will be achieved and measured as indicators for SA's progress towards building an information society.

Thusong Service Centres Business Plan 2006-2014

The Thusong Service Centres Business Plan 2006-2014 recognises that connectivity at the TSCs is critical and requires high level of coordination and dedicated resources (financial and human) in order to achieve effective functioning of the ICT system. The document lacks clarity on how implementation will be carried out, other than emphasising the role of SITA and interaction between the various entities and the potential process for engaging SITA services. It does not outline the role of the municipality, despite locating the day to day operations of the TSC at the municipal level and that the TSCs will be aligned to the municipal IDPs as well as the provincial plans.

The failure to outline the role of local government created a gap in ensuring ownership and buy-in by local government. The lack of a clearly defined strategy for ensuring the deployment of connectivity for public access has led to the fragmentation and duplication of interventions. The lack of technology standards, guidelines and regulation on cost recovery contribute to the sustainability challenges and digital exclusion in areas where ordinary members cannot afford the access fee charged at the centres. This perpetuates the

digital divide at the various levels. GCIS has failed to implement the ICT aspect of the business plan to contribute to the prescripts of the ECTA as well as integrating ICTs to deepen democracy, service delivery and facilitate a two- way communication system as outlined in the Comtask Report.

Draft ICT rural development framework

The DoC draft ICT rural development framework for rural development aims to provide ICT interventions that will contribute to the comprehensive rural development strategy. This will be achieved by rolling out fixed and wireless broadband, focus on the creation of local content, capacity building, SMME support, education, health as well as e-government. Priority will be given to the underserviced areas as per the 2008 ICASA regulation. The document does not provide anything new other than making reference to the use of fixed and wireless broadband and putting focus on rural development and connectivity. It does not mention DPSA and GCIS as key stakeholders, despite mentioning the e-gateway portal, TSCs and the provision of e-government services. It positions the Department of Land and Rural Development as a champion for rural development. It lacks clarity on process, roles and responsibilities, monitoring and evaluation. It perpetuates duplication and disintegration of ICTs as an enabler for development in the rural development chain.

Draft Government Wide Information and Communication Technology (GWICTS) Strategy

The purpose of the draft strategy is to close the gaps that were identified during the 1998 Presidential Review Commission (PRC) review and new challenges such as the failure by government to implement e-government services, unnecessary duplication of functions and systems between line departments and across spheres of government to name a few. The strategy aims to provide effective and efficient service deliver through:

- Up to date, reliable and secured infrastructure;

- Optimised utilisation of ICT resources;
- Innovative, integrated and interoperable systems;
- Skilled and sustained ICT organisations throughout government and
- Increasing digital inclusion through increased affordability and accessibility

The draft strategy has nine strategic goals which are linked or aligned to the 12 government goals/priorities and outcomes. Goal number one is the enhancement of citizen convenience with better access to government information and services. This will be achieved by developing government to citizen policy, consolidation of all transactional services into unified portal, educate and create awareness on e-services, ensure digital inclusion in rural communities through wireless connectivity programme that will enable local economic growth. The weakness of the strategy is that it makes no reference to the digital inclusion interventions that are implemented by the various departments. The strategy also suggests unrealistic time-frames as it proposes to achieve the set target within a period of five years. It also risks falling in duplicating efforts and repeating the mistakes of the other weakness is that the strategy is driven by Office of the Government Chief Information Officer (OGCIO), Government Information Technology Officer Council (GITOC) and the State Information Technology Agency (SITA), this is a greater weakness as the participants could approach digital inclusion from the perspective of enabling and supporting e-government services without understanding the environmental factors that contribute to the sustainability of rural digital inclusion as the result of the top-down approach.

Local government integrated development plans

In general, the municipalities do not have objectives that relate to the use of TSCs to support their municipal service delivery objectives. Their focus is on the provision of infrastructure and maintenance to ensure that government departments are able to provide service delivery to community members. The

municipalities acknowledge that more TSCs must be established, but they do not indicate the broader objective of the establishment within the context of local government's mandate, other than viewing them as appropriate locations for providing library services and they do not make any mention of connectivity. Greater Tzaneen emerges as the only municipality that has embraced the value of connectivity at the TSCs, however, the municipal local economic development and communications plan does not show any integration of the rural broadband project.

Departmental strategic plans 2006 to 2012

The planning and implementation of connectivity in the TSCs is the responsibility of the DPSA and USAASA. The DPSA MTEF information submitted to the National Treasury for the period 2007 to 2012 indicate a lack of planning, alignment of interventions to the GCIS business plans, lack of continuity and clear targets. GCIS has failed to secure the required political will to relocate the management and ownership of the TSCs to CoGTA. As recommended by the National Treasury's Technical Assistance Unit (TAU). In 2010 the former TAU recommended the movement of the TSCs from the GCIS to the CoGTA (NT, 2009). However, this recommendation has not been endorsed by cabinet. The table below provide a summary of the departmental targets submitted to the National Treasury.

TABLE 8: SUMMARY OF DEPARTMENTAL TARGETS 2006 TO 2013

DPSA	DPSA:MTEF submissions to NT	GCIS	DoC (UNIVERSAL ACCESS FUND/USAASA)
2006	No mention of the TSC in ENE	88 TSCs were in operation	86 community-based telecentres will be setup and this will be connected to the government internet portal gateway and 200 sites will get virtual private network connectivity
2007	focus was on rolling out 65 general service counters which will enable access to the Natho Pele eGateway portal, of which 23 TSCs where connected	launched business plan	7 centres deployed
2008	Pilot of e-government for electronic registration of birth, death, personal ID, pension, foster child grants and maintenance of grants. No mention of the TSC	Clean up and rentals of TSCs	Focus is on finalising the definition of universal service and access for submission to the minister
2009	Targeted to connect the TSCs, with the objective to improve access to services by remote and rural communities by connecting all TSCs by 2009 (48 were connected by end of 2009)	NT reviews the TSC initiative and recommends a shift to CoGTA	No mention of USAASA in the ENE
2010	Increased the TSC connectivity target to 49 TSCs connected	51 TSCs are connected to the ICT infrastructure, but the departments are not making their services available at the centres in a meaningful way	100 centres deployed
2011	97 TSCs connected and target to connect 120 by 2012	TSCs did not move to CoGTA because Cabinet did not endorse the move	50 centres deployed
2012	validating of the ICT infrastructure at 100 connected TSCs (38 are functional)	170 TSCs in operation	84% of the budget was used for set top boxes
2013	Focus on operations and maintenance	Focus is on marketing the TSCs	No allocation due to the forensic investigation

An analysis of the 2007 National Medium Term Expenditure Estimates submitted by the DPSA to the NT illustrate that the initial focus of the DPSA in fulfilling the requirements of the Public Service Act (PSA) of 1994 and White Paper on Transforming the Public Service, was to provide access to government information through the Batho Pele Portal/Gateway. In 2008, the focus shifted to the piloting of electronic government services followed by connecting 44 TSCs in 2009. In 2010, the focus was to include centralised infrastructure and local area network requirement in the various TSCs. On the other hand an analysis of the DoC's public entity, USAASA illustrate that the initial focus was on establishing new centres in the underserviced areas in 2007,

and then in 2008 the agency's focus shifted to the definition of universal service and access for submission to the minister. GCIS's focus from 2007 was to facilitate the establishment of concrete structures with the objective of establishing 186 centres by 2012 and to establish centres in all the municipalities by 2014. However, this focus shifted in 2011, when GCIS realised that it is more effective to establish mobile and satellite centres instead of concrete structures, as the new approach will result in greater access to the services and that the shift from the number of physical centres built will ensure universal access to information and services by the poor people in the marginalised communities.

Allocated financial resources

South Africa does not have a centralised budget and strategy for implementing connectivity in the underserviced areas. Government departments and public entities are allocated the connectivity funds based on their three year strategic plans. The departmental strategic plans must include measurable objectives, expected outcomes, programme outputs, indicators and targets. The National Treasury is responsible for the allocation of funds and monitoring of performance by the government departments based on their strategic plans. Connectivity funding for the public service is funded under vote 12 as part of the Public Sector Information and Communication Technology Management.

Thusong Service Centre connectivity falls under the subprogramme: Information and Communication Technology Infrastructure and Operations, which aims to support all national and provincial departments on significant transversal projects and ICT infrastructure related projects. Public access connectivity for the underserviced areas such as Mopani is funded under vote 27, within the Broadcasting and Communication Regulation and Support, under the Universal Service and Access Fund (USAF). The Universal Service and Access Fund was established to fund projects and programmes that are aimed at providing universal access to the underserviced areas. The local

municipalities in Mopani are classified as underserviced areas as per the ICASA regulation 88(2), of 2012 despite this, only one TSC has benefited from the Universal Access Fund. In 2012, USAASA rejected the request for funding by the Greater Tzaneen Municipality based on the fact that the project is a pilot that is based on an unknown technology. The failure to utilise the funds is contributing to the misuse of the public funds and forces beneficiaries to approach other government entities to fund their projects. It further raises questions about USAASA's criteria for connecting the TSCs and whether this failure is linked to the financial mismanagement and the corruption allegations which are currently under investigation. Other sources of funding include the National Treasury, Neighbourhood Development Programme (NDP) and the Independent Development Trust (IDT).

TABLE 9: ESTIMATED COST FOR PUBLIC SERVICE AND COMMUNITY CONNECTIVITY

Funder	Programme	Financial year				
DPSA	Programme 4: Public Sector Information and Communication Technology Management. Thusong Service Centre connectivity falls under subprogramme: Information and Communication Technology Infrastructure and Operations- support all national and provincial departments on significant transversal projects and ICT infrastructure related projects.	2009/10	2010/11	2011/12	2012/13	2013/14
		19.6 million	22	24.8	15.3	22.2
Universal Service Access Fund	Subsidisation of ICT infrastructure to promote universal access and services	10	20	25	0	0

Source: Estimates of National Expenditure, 2013

The table above provides information about the financial allocation for the public service blueprint and Universal Access Fund for the period 2009 to 2013. The figures do not give a true reflection on the cost of connectivity because both the blueprint and underserviced infrastructure are subprogrammes. However, SITA, has reported to Parliament that the DPSA has paid an amount of R 34 937 418.96 for the financial years 2009 to 2011 for the TSC project. It is estimated that from 2009 to 2011 the DPSA has spent an estimate of R 11,645.96 annually and R 121,310.4825 per TSC. The figures gives an indication of the financial allocation and estimated costs for each TSC, however it should be noted that TSCs differs in the type of con-

nectivity, location, number of users and services offered. Therefore, the actual costs will differ from one TSC to another. In 2013/14 the running costs for ICT connectivity at Thusong service centres are expected to be R6.3 million.

The table above also shows that in 2012 the allocated funds for programme 4 declined from 22 million in 2011/12 to 15.3 million in 2012/13. The USAF is allocated a budget of R285 million for 2013/14, however nothing has been allocated for the subsidisation of infrastructure to promote universal access and service. In the 2009, 10 and 11 an amount of 10, 20 and 25 million have been spent respectively for infrastructure development. The estimated figures raises questions about the determination of the TSC connectivity cost and whether the provided figures are sufficient to operate high performing connectivity.

A senior official within the National Treasury has indicated that the responsibility to monitor whether the projects are yielding the desired outcomes and impact lies with the departments where the funding is. The quote below summarises the responsibility of the NT with regard to ensuring accountability for allocated funds, in cases where TSCs are not operating despite of being connected or when the provided services do not meet user requirements/expectations.

> "We are responsible for the monitoring of performance and reporting on it" (Personal communication, National Treasury official, 5 September, 2013)

TABLE 10: CONNECTIVITY FUNDERS AND STATUS OF CONNECTIVITY

TSC connectivity	Funder	Connectivity status
Maruleng	DPSA	Active and partially used
Bulamahlo	USAASA- 2005	Inactive
	DPASA- 2008 TO 2013	Inactive
	Sentech - 2013	Active and used optimal-

		ly
	Municipal broadband-2013	Inactive
Runnymede	DPSA	Inactive
	Municipal broadband	Inactive
Mokwakwaila	DPSA	Active and partially used
Muyexe	IDT and the department of Land and Rural Development	Active and partially used
Makhuvha	DPSA	Inactive
	Department of Arts and Culture	Active and partially used
Selwane	Municipal (public library connectivity)	Active and partially used
Lesedi	Unknown	Inactive

SUMMARY OF CASE STUDIES

In the various TSCs users are faced with a number of challenges and barriers with regard to the accessibility, availability, reliability, quality, affordability, lack of content and the users's branching abilities or digital illiteracy. In general connectivity challenges are similar across the different TSCs, despite of who is the service provider. Therefore, users in Mopani do not enjoy the standards determined by the DoC, in terms of section 82(3) of ECA, 2005, which state that, universal access is provided where persons in all areas and communities are able to obtain quality, affordable and usable access that meet the minimum set quality in terms of voice, data, messaging, broadband connection and emergency services, should be provided as part of the universal access. It further state that public access points should be open to the public from 8-18:00 and users must be supported to use the services if they struggle.

Accessibility

Accessibility in the Mopani District TSCs is limited to government, municipal officials, UNISA students (more than 200 students), and learners from the Atlane Muyexe. In general, members of the community do not have access to the government funded connectivity. Community members and government officials do not also have access to social networking sites and voice over the internet, which is a mismatch in terms of government supplied connectivity and the real connectivity needs by the users, as a result users rely on their mobile phones to gratify their actual connectivity needs.

Availability

In general, connectivity is not always available due to power failures, environmental factors such as, weather conditions, inadequate connection points, usage policies that allow six hours of online activity per month for the UNISA students and two hours per day in the case of Muyexe. In the cases of Muyexe and Mokwakwaila there is evidence of the non-availability of connectivity for a prolonged period of time, which could go for more than a month without the diagnoses of the technical challenges by the centre managers. The centre managers lack the technical capacity to diagnose problems. The service providers are not always accessible and available to diagnose and resolve the problem.

Reliability and quality

The TSC connectivity within the district is not reliable and it is of a poor quality due to the failure by the officials to design appropriate infrastructure and the selection of inadequate VSAT frequencies that are easily affected by weather conditions such as rain and lightning. This has led to poor bandwidth and fails to meet the online expectations of the users. The poor quality of the available connectivity is illustrated by the case of Maruleng in which, it sometimes takes more than more than 14 hours to download a publication. The

reliability and performance of connectivity is also affected by the poor maintenance of the connectivity infrastructure and computers as the users lack the financial resources to purchase and upgrade their anti-virus software.

Affordability

The cost of connectivity varies across the district due to lack of regulations that determine the minimum connectivity charges. In general, connectivity is free for some and not for all, even though the government is the source of funding.

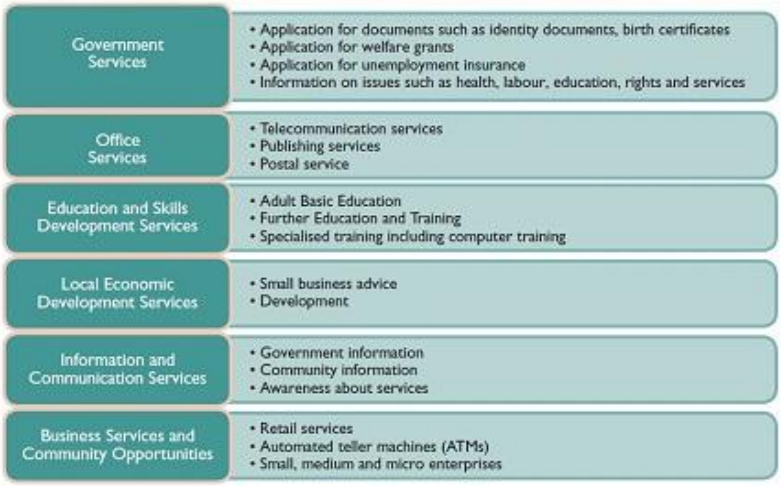
Connectivity enabled services at the Thusong Service Centres

The focus of the TSCs in the Mopani District is still on the provision of the anchor services such as manual applications for personal documentation and social grants. The Home Affairs office, based at the Maruleng TSC, is the only department that offers connectivity enabled services. This renders the TSC connectivity in the Mopani District to be redundant and not contributing to the government's goal of making information and services easily accessible and available. The services offered are also not based on the GCIS integrated model, making the model to remain theoretical and irrelevant for the Mopani TSCs.

The case studies indicate that the services rendered at the TSCs are not based on the integrated six pillar model advocated by the GCIS business plan. The analyses of the model and services indicate that pillar one will be effective if various governments departments are able to provide online services. This will position TSCs as true public access points for closing the digital divide and gap in accessing service delivery. Services rendered under pillar five are crucial for ensuring that rural people are aware of government information and services. This could be used to support services rendered under pillar one. Citizens will use services rendered under pillar one if they are aware of what government offers. Rural people rely on radio and word of

mouth to be informed about development issues and sometimes the government core messages get lost during the dissemination process, due to the use of the mainstream media which is not always accessible to everyone (Magoro, 2005). Municipalities could use community portals designed in local languages in order to communicate key community issues as required by the Municipal Systems Act.

Figure 1: SIX pillar model of government service centres



Source: GCIS, 2006

ICTs are a cross-cutting pillar and could be used to support all the services that are offered at the TSCs. Connectivity should be the heartbeat of all the TSCs as it has the ability to connect rural communities to the information society. The separation of the office services and ICT shows a lack of forward looking approach with the technological convergence. If properly planned, the office services as faxing, payment of services such TV licences and direct marketing services offered by companies such as Home Choice could be digitalised instead of taking a conventional and manual based postal service approach.

Contribution to WSIS and ISAD pillars

The ISAD plan and draft ICT rural framework advocate for ICT interventions that focus on e-health, e-education, local economic development and the creation of local content. On the other hand the DPSA connectivity aims to enable the public servants officials deployed at the TSCs to connect to their VPN in order to capture and issue application for personal documentation and social grants. Maruleng TSCs is the only centre that uses connectivity to issue personal documentation. The table below provide an overview of the contribution of Mopani TSCs towards the identified focus areas.

FIGURE 18: THE CONTRIBUTION OF CONNECTIVITY TOWARDS ISAD FOCUS AREAS

Focus area	TSC contribution
e- education	Bulamahlo contributes to e-ducation through its partnership with Unisa. The TSC operates like a mini Unisa campus, learners are given free internet access which is covered by the university. Bulamahlo end user computer learners use internet as a source of information for the programme
	In Mokwakwaila the Social Worker depend on Google for continous learning that helps with tips and solutions to potential cases.
Local economic development	Maruleng offers business support to local entrepreneurs by providing registration of new companies and assisting community members with SARS related transaction. The service is provided by LIEDA as part of their MoU with CIPC. The municipality also uses connectivity to download municipal supplier database to be considered by the municipal supply chain

In general the connectivity intervention in the Mopani District lacks the required readiness foundation, lacks clear institutional arrangements, stakeholder buy in at the three levels of government. The document analyses indicate that the current policy and legislative environment does not support the

implementation of rural connectivity. The etic and top-down approach of rural connectivity does not contribute to the integration of connectivity into the broader development goal. The inability to integrate and coordinate the implementation of connectivity has led into the unaccountable use of the financial resources due to duplications and poor usage of the provided infrastructure.

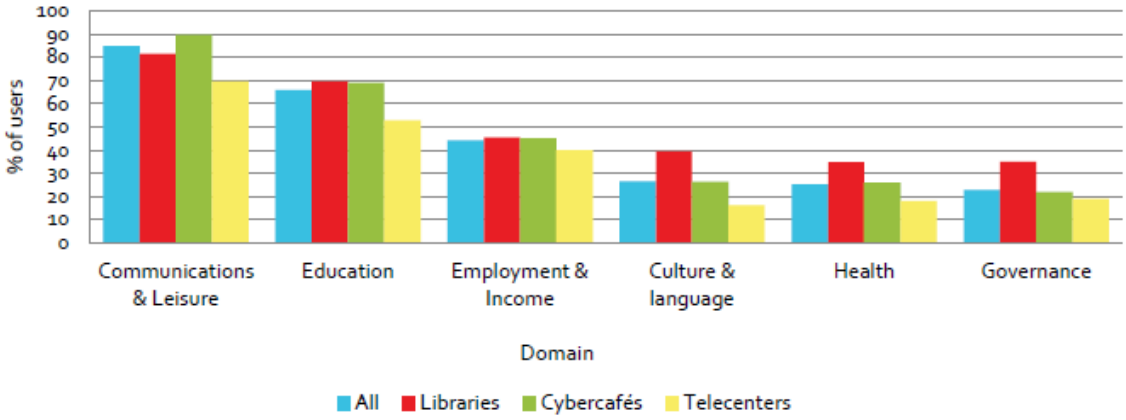
CHAPTER 5: TOWARDS AN INFORMATION SOCIETY; THE COMPLEXITIES AND OPPORTUNITIES OF RURAL CONNECTIVITY

The status of rural connectivity in the Mopani District confirms the challenges and complexities of implementing effective CI programmes. The case studies show that CI is a complex field of study which requires a multi-perspective approach in order to be effective. The status of Mopani District rural connectivity further illustrates that public access points that are supplied by the government are not promoting easy access to information and government services. This indicator is applicable to the state funded public access points in general, as supported by (Akinsola et al, 2005; Dosono, et al, 2012;Hulbert & Snyman, 2007). The public service blueprint connectivity provided at the Mopani District TSCs does not contribute to the provision of e-government services. The connectivity challenges faced by the public servants serves as a barrier to the users and do not increase their productivity or fast track service delivery at the local level. The ineffectiveness of the blueprint connectivity in the Mopani District indicates that in general, the TSC connectivity is dysfunctional as supported by the Deputy Minister of the DPSA Ms Mildred Oliphant, who reported to parliament that 100 TSCs were connected, however only 38 are fully functional and 50 have been validated (SA IT news, 2012).

The ineffectiveness of public access connectivity is a general phenomenon experienced by users in developing countries. Araba, Coward, George Chris, Francois and Lucas (2013, p.168) identified that 45% of the users in Bangladesh, Brazil, Chile, Ghana and Philippines experienced problems with internet connectivity compared to 16% of problems using computer hardware and 19% of problems using software. In Ghana 65% of the users experienced internet connectivity problems. On the other hand, the case of Maruleng TSC and Bulamahlo NGO (converted into a TSC) indicate that public access connectivity has the potential to contribute towards the socio -economic change, if properly

implemented. Bulamahlo TSC emerges as a “sustainable” community centre that operates on the principles of profit making. Bulamahlo has been in operation since 1984 and was first connected in 2005. The value and impact of public access connectivity is supported (Araba,et al, 2013, p.211). However, Araba, et al (2013) differentiates the impact according to the type of public access venues and their findings confirms that the telecentre model has the lowest impact in the socio-economic domains as illustrated in figure 21.

FIGURE 19: USE OF DOMAINS, BY VENUE TYPE



Source: Araba, et al (2013, p.113)

The effective implementation of CI requires an enabling legislative environment, sufficient resource allocation, planning, coordination and an analysis of the readiness factors at the three spheres of government as well as readiness within the communities before ICTs are diffused. The lack of a holistic planning, consultation and integration of ICTs in the broader development goals, contribute to a waste of the scarce financial resources.

The section below analyses the effectiveness of the TSC connectivity in the Mopani District by unpacking issues relating to the legislative environment in creating an enabling environment for the development of a coherent and integrated approach towards the deployment of connectivity in the underserviced areas. The analysis paint a picture of competing and conflicting mandates amongst the different government departments and entities, poor strategic and

operational planning, which leads to the formulation of poor objectives and targets that are not aligned to the plans of the mandated stakeholders.

The failure to align planning at the three spheres of government is due to poor stakeholder management and ineffective intergovernmental relations. The silo approach, poor planning and inconsistence targets lead to the failure by the officials to identify the user requirements, which are a pre-requisite for designing the appropriate technology models and solutions. This creates misconceptions about the lack of broadband being the main reason why rural people are excluded from the digital divide. On the other hand the lack of a clear monitoring strategy and the inability by parliament to take corrective measures leads to the continuous waste of the financial resources by investing on the TSC connectivity initiative, despite the evidence that the intervention is not producing the desired tangible outputs and the socio-economic change envisaged. The analysis also illuminates a policy and regulation environment that lacks the capacity to create an enabling environment for the deployment of connectivity in the underserviced areas. This is demonstrated by the lack of connectivity policies and regulations targeted at the underserviced areas, for the determination of appropriate models, access fees as well as the quality and standards that are line with section 82 (3) of the Electronic Communications Act of 2005.

READINESS FACTORS: LEGISLATION, POLICY, REGULATION, PLANNING AND IMPLEMENTATION

Incoherent legislative environment contributes to ineffective institutional arrangements and unclear mandates

The status of connectivity in the Mopani District indicates that the TSC initiative is an unfunded mandate that lacks ownership. The data analysis of the eight case studies illustrates poor planning and the understanding of readiness factors by the officials responsible for the initiative. The failure by Cabinet to endorse the National Treasury's recommendation to move the TSCs to

CoGTA contributes to the ineffective institutional arrangements due to the lack of a clear mandate for the participating stakeholders. The failure to establish a clear mandate that is supported by legislation in order to ensure accountability and the effective performance of the second generation of the TSCs illustrate the inability to apply the lessons learned from the first generation of the TSCs, known as the MPCC.

The planning and implementation of the TSC connectivity is based on the assumption that government departments and local government will integrate the programme into their strategic plans. This assumption is in contrast with the NT's framework for the development of strategic plans and annual performance plans, which state that, each department's activities must be founded in the legislative mandates, that the department is directly responsible for implementing, managing or overseeing. This implies that departments will not get budget allocations from NT for activities that are outside their mandates. The DPSA and GCIS have some mandate to implement activities at the TSCs, but they are not directly responsible for the overall TSC initiative. This creates a gap in the management and implementation of the initiative because their mandate is based on the assumption that the TSCs are well established and operational. Hence, their focus is on the provision of connecting infrastructure, coordination and marketing of the TSCs.

On the other hand the municipal legal framework does not mandate municipalities to take responsibility and ownership of the TSC initiative as a result, municipalities do not have allocated budgets to proactively embrace the establishment, maintenance and the deployment of connectivity. The assumption that the municipalities will align the establishment of the TSCs in their IDPs is a questionable one, when the budget and planning process clearly state the requirement that activities should be supported by the legislative mandate. Despite this, municipalities in Mopani have embraced the call to establish the TSCs. This has been achieved by converting municipal civic buildings, NGOs/community buildings into the TSCs and entering into public private partnership (PPPs). However, the current ownership model has cre-

ated challenges for the GCIS in resolving TSCs problems in cases where the TSCs are not operational due to local politics.

Lack of connectivity policy targeted at the underserviced areas leads to the creation of new forms of social inequalities

South Africa does not have a dedicated policy on the deployment and use of rural connectivity, specifically public access connectivity. This has resulted in the lack of uniformity, norms and standards to guide the deployment of connectivity at the TSCs. The absence of policy has also resulted in an ability to motivate for budget allocations from NT. As a result there are varying connectivity access and usage models. The separation of the public access and public service connectivity has led to unintentional digital exclusion between government officials and the citizens as well as within communities. Community members that have personal relationships with the officials have indirect access to connectivity. This creates the digital divide within the communities and contributes to the disempowerment of community members who lack alternative means to access the Internet.

The digital divide in the rural municipalities is exacerbated by the lack of government's position in declaring connectivity as a basic need that is crucial towards the human development index. The lack of a policy statement on connectivity as a basic need which is supported by the user subsidy contributes to the digital divide and building of an information society that is based on the principles of connectivity for some and not for all. This has positioned connectivity as a new form of social inequality between the haves and have nots, urban and poor communities. Failure to develop the policy will perpetuate the 2nd order digital divide and this would mean that even if there is ubiquitous broadband, rural people will not benefit from the value of broadband as a catalyst for social and economic change.

The non-existence of regulatory interventions by ICASA for the underserviced is a barrier towards bridging the digital divide

The case studies indicate that there is a lack of regulations targeted at VSAT technology, rural connectivity standards and pricing. The lack of regulations in these areas is a barrier towards bridging the digital divide as it does not encourage the PPP. The failure to invest in the fixed broadband implies that wireless connectivity is a viable option for the underserviced areas. However, the potential investors are faced with challenges due to the long process imposed by the regulator in allocating licenses. The regulator issues frequency licenses for each VSAT site and this requires the service provider to pay for each license, making the cost of connectivity unaffordable. This has resulted in the failure to maximum the available resources and it has implications for projects that aim to connect more than one building at the municipal and community level. The failure to expand the use of one license for multi connection contributes to inefficiencies because one frequency is often sufficient to cover a large area. The current approach perpetuates the duplication of resources and complicates the process for designing effective community networks. There is also a lack of skills and capacity by ICASA in dealing with technologies such as VSAT. The lack of capacity and understanding of the VSAT technology has implications for the regulator as this could lead to regulations and processes that are not enabling VSAT investors and operators.

The lack of price regulation by ICASA and the varying connectivity fees charged to community members, creates a digital divide amongst those who have the resources and the have nots. This contributes to digital exclusion with regard to the cost for connectivity in communities where TSCs charge user connectivity fees. The centre managers use their own discretion in terms of their operational cost and projected profits. Therefore, users are vulnerable and have no mechanisms to determine if payment is in line with government regulation. The lack of minimum standards for quality contributes to the digital divide depending on where a person is accessing connectivity, because those who are able to afford accessibility at privately owned access

points have better access and this will increase their capability and functioning experience which will ultimately lead to outcomes, while their counterparts are not able to browse a basic government website.

Non-compliance to the PFMA and the National Treasury Regulations

The research findings present evidence that there is non-compliance by the DPSA, GCIS, DRDLR, USAASA and DoC to Section five of the Public Finance Management Act (PFMA), Regulations of 2005 dealing with planning and budgeting. The Regulations are supported by the Framework for the development of Strategic Plans and Annual Performance Plans (NT, 2010). The Framework for development of Strategic Plans and Annual Performance Plans outlines the process that must be followed by government departments in producing their five year strategic plans. The framework promotes the concept of outcomes oriented as this approach contribute to effective management, including planning, budgeting, implementation, reporting, monitoring and evaluation performance of funded mandates. The sections below illustrate that the implementation of rural connectivity is not a clearly defined mandate. The lack of a clear mandate has impacted on the ability to engage in strategic integrated planning that outlines a clear roadmap for South Africa. It also shows that in cases where the above mentioned departments and state entities are allocated budgets, they have failed to take accountability of the allocated funds by ensuring that the implemented projects produce the desired output. Accountable officials have also failed to take corrective measures in cases where inefficiencies were identified.

SA lacks a national strategy and implementation plan for public service and public access connectivity

The research analysis indicates that South Africa lacks the political will to develop a coherent national e-strategy as per the prescript of the Electronic Communications Transaction Act of 2002. The lack of a coordinated strategy to deploy connectivity has led to the use of different approaches by the

DPSA, GCIS and USAASA. This is done with poor planning, setting of unclear goals, poor stakeholder management, the lack of an effective monitoring system and inadequate research and determination of user requirements to inform the design of appropriate technology solutions. The non-existence of the national strategy has led to the failure by the three institutions to deliver on the objectives outlined in the GCIS business plan.

The lack of a political will to develop the strategy is a direct contravention of the PFMA regulations which requires departments to have a legislated mandate that will enable the National Treasury to allocate the implementation budget. This shows the failure by the DoC to take ownership of its mandate to develop and implement the national e-strategy.

Poor strategic and lack of programme integration leads to wasted financial resources

The failure by the DoC to develop a coherent national e-strategy has led to the desperation by the municipalities and departments such as Land and Rural Development and the DPSA in implementing rural connectivity projects that are not directly linked to the broader community development. Poor strategic planning and programme integration across the three spheres of government has resulted into the duplication of connectivity implementation across the district and this applies to the whole country. The planning fails to take into consideration the inputs that are required in order to produce the expected outputs. The effective implementation of connectivity depends on the establishment of institutions, clarification of roles, development of policies, strategies, processes and procedures. Therefore, the first phase in implementing sustainable connectivity is to build a foundation that creates an enabling environment for the project managers and implementers.

The planning of connectivity by the DPSA, GCIS and USAASA, focused on the number of centres that must be connected without looking at the institutional requirements and the impact beyond access. The planning also failed

to take a phase approach to ensure that planning and implementation follows a logical approach. If GCIS conducted research and applied the lessons learnt from the first generation of the TSCs, it could have developed a more coherent and practical strategy that will be cost effective and ensure universal access instead of pushing for one centre per municipality. The geographic landscape of the South African communities is that of a dispersed and isolated communities, who still need to travel from their communities to the TSCs. The GCIS failed to conduct a cost benefit analysis on the proposed model of the 2nd generation of the TSCs and to do an environmental assessment to determine the readiness and sustainability factors of the new generation.

The DPSA and USAASA, failed to identify the required inputs that will contribute towards achieving their strategic objectives. In the case of the DPSA, the effectiveness and relevancy of e-services at the local level depends on a solid e-government strategy. Therefore, taking a bottom approach by deploying connectivity and assuming government departments will enable their services without a clear government wide strategy contributed to the poor uptake by the targeted departments. In the case of USAASA, defining universal service and access is the first requirement that should have been fulfilled before establishing community telecentres in the underserviced areas. By defining what universal service and access is for the underserviced areas, it would have ensured that the deserving communities are connected and also that they have access to equitable connectivity infrastructure. This failure has led to the inadequate allocation of the required funds to implement a solid and clear connectivity strategy that is not based on assumptions about the level of readiness within the communities and also amongst the various spheres of government.

The inability to align planning at national, provincial and local government contributes to fruitless and wasteful expenditure by duplicating the connectivity infrastructure and not ensuring that the resources are optimally used. Poor strategic planning further compromises section 38 (b) of the PFMA which state that the accounting officer are responsible for effective, efficient, economical and transparent use of the resources of the department, trading enti-

ty or constitutional institution. South Africa is a developmental state faced with a number of competing community needs in areas such as health, education, housing, water, sanitation et cetra. Therefore, the continuous unaccountable investment in rural connectivity initiatives that are not producing the desired outcomes and impact shows the level of insensitivity towards the strained fiscal resources and towards communities that are struggling with access to the identified basic needs such as water and sanitation.

Poor coordination and cooperation amongst the different stakeholders has resulted in the mismanagement of the allocated connectivity resources and the duplication of interventions by the three spheres of government. The failure to use the existing infrastructure due to community politics and the continuous duplication of interventions illustrate high levels of poor coordination amongst the three spheres of government when designing community interventions. It further shows the failure by the officials to uphold the principles of the PFMA which advocates for value for money and cost effective measures that will contribute to the sustainable use of the financial resources within the public sector. This raises questions about the level of accountability by the officials towards the sustainable use of the allocated resources and it contravenes section 45 (b) of the PFMA which state that officials are responsible for effective efficient, economical and transparent use of financial and other resources within that official's area of responsibility . It further shows the level of insensitivity on the objective of building a better life for all, in a country where the majority of the people still lack access to basic services such as housing, water, sanitation, access to tertiary education et cetra. The financial resources allocated to connectivity initiatives that are not producing the desired outcomes could be used to improve communities by providing the pressing and competing community needs identified in the municipal IDPs.

Top down approach and ineffective stakeholder management leads to the non- alignment of connectivity in the broader development goals and the design of inappropriate technological solutions

Section 3, 3;3 of the National Treasury Framework for Strategic Plans and Annual Performance Plans state that when institutions are planning the roll-out of new infrastructure and the location of new services, they must ensure that their plans are aligned to or informed by local government integrated development plans (IDPs).

The research data indicates that the implementation of connectivity in the Mopani District is driven by national departments without conducting feasibility studies that confirms the need and the availability of the resources required to implement the programme. This top down approach has led to the failure by the officials to determine community readiness factors such as the availability of electricity, community structures and the decision making processes that are essential towards the sustainability of connectivity. The etic and top down approach in which connectivity initiatives are deployed has resulted in the non-alignment of connectivity within the broader socio-economic goals. The research also shows that at the national level, departments are not ready to offer e-services that will fast track service delivery at the local level. The non-availability of connectivity enabled services at the TSCs is a clear indication of lack of readiness at the national level to embrace e-government. The level of readiness within the public sector is also demonstrated by the failure to provide connectivity infrastructure to the officials based at the TSC. This is mainly because the decision to connect the TSCs is not based on the request by the government departments. It is a reactive or reactionary strategy by the DPSA towards the principles of Batho Pele which are outlined in the White Paper for Transforming the Public Service. This response by the DPSA has failed take into consideration the readiness and viability of the departments in providing e-services and to locate the con-

nectivity initiative within the broader government goal of e-government. The lack of a holistic planning and alignment of connectivity within the broader development goals is illustrated by DPSA's inability to integrate its community development worker (CDW) programme within the connectivity initiative.

The lack of a clearly stated mandate for the local government contributes to the misalignment of connectivity in the broader community development goals. The IDP process is the only participatory process that captures the socio-economic challenges of the communities and prioritise on areas of interventions over a period of five years. This means that, the implementation of connectivity interventions that are not aligned to the IDP priority areas will not respond or target the real community challenges, as the TSCs are only viewed as structures that provide the conventional government services. The lack of buy-in by the local government also shows that the municipalities fail to see the value of connectivity in enhancing and contributing to local economic development, promoting e-democracy and facilitating community participation at the local level in order to fulfil the prescripts of section 18 of the Municipal Structures Act.

The Mopani District, 2009/12 IDP indicate that 81% of the population stay in rural areas, 50% of the adult population is illiterate, 12.7% has completed their matric and 6.5% completed a variety of higher education (Mopani, 2009). Despite the socio-economic challenges faced by the district, the services offered at the various TSCs does not support the day to day community challenges in areas such as health, agriculture, local content, and access to market information and funding resources to support the existing community initiatives. Given the population dynamics and the poor literacy levels within Mopani, the research analysis poses a question about the focus and the required building blocks for ensuring that communities in the Mopani District realise the value of connectivity.

Poor monitoring and evaluation

The implementation of connectivity in the Mopani District is not supported by a monitoring and implementation strategy that aims to improve effectiveness and efficiency. Section 5.3 of Treasury Regulations, 2005 state that the accounting officer of an institution must establish procedures for quarterly reporting to the executive authority to facilitate effective performance monitoring, evaluation and corrective measures. The focus of the GCIS and DPSA has been on monitoring the efficiency of the TSCs from the general establishment and service provision perspective. The focus is on counting the number of TSCs established, connected and the number of people served. The monitoring system does not track how connectivity enabled services are facilitating the socio-economic transformation by the recipients. As a result the real value and impact of connectivity within Mopani cannot be ascertained.

The failure to monitor the connectivity usage and performance has led to the monthly payment of the connectivity pipe by the DPSA in centres that are not using the infrastructure. There is also evidence of the unauthorised usage of the public service connectivity, by NGOs, municipal officials and members of the community. In the case of Bulamahlo, the DPSA was used by the UNISA learners and general members of the community and this enabled the centre to generate income from the blueprint connectivity. The non-existence of the monitoring and evaluation is further illustrated by the TSC database maintained by the DPSA, which could not be validated with the actual numbers of the TSCs that are in operation within the Mopani District. This is specifically in the case of Runneymede and Makhuvha, where the DPSA connectivity remains unused without DPSA's knowledge. On the other hand the GCIS is under the impression that the TSCs are operating as expected, while in cases such as Ba-Phalaborwa, government departments are not based at the TSCs despite the fact that the centre is less than a year old and was officially opened by the Premier of Limpopo. The tendency by the department to abandon the TCs is one of the challenges that were experienced by the

GCIS during the 1st generation of the MPCCs after they have been launched. This shows the failure to learn from past experience and take corrective measures based on lessons learned. In Mopani, no real corrective measures have been taken to improve the efficiency and effectiveness of the TSC connectivity. This raises questions about the continuous investment of the resources towards the TSC initiative.

The failure to monitor the performance of rural connectivity initiatives contravenes section 45 of the PFMA and leads to fruitless and wasteful expenditure. The absence of monitoring and the inability to take corrective measures, contributes to the incoherent legislative environment.

INEFFECTIVE INTERGOVERNMENTAL RELATIONS

The failure of the TSC connectivity is also attributed to poor stakeholder management and ineffective intergovernmental relations (IGR). The IGR mechanisms established by the GCIS and DoC to ensure buy-in and alignment of the TSCs programme to the strategic outcomes of the government departments are not producing the desired outcomes. The IGR forums such as Provincial Intersectoral Steering Committee (PISC) and the TSC centre managers' forum established by the GCIS in Limpopo are failing to resolve the connectivity and service delivery challenges faced by the various TSCs within the Mopani district. This is mainly because there is a lack of clarity with regard to the processes and procedures for reporting the connectivity challenges. The centre managers are also not clear who is accountable for the connectivity. As a result the challenges do not get resolved due to the complexity of the current institutional arrangements which makes GCIS ineffective as a coordinator and champion for the centres.

The ineffective governmental relations has led to key government departments failing to provide officials based at the TSCs with access to the virtual private networks, data lines, required applications and software for enabling the provision of e-services. This has led to the use of personal equipment

when connecting to the government network as well as the use of connectivity for activities that are not aligned to their departmental strategic objectives and business processes. The use of private equipment and personal email addresses that are cloud based raises questions about the effectiveness of the government policies and the security controls on the transmission of information outside the government network.

The case studies indicate that the officials operate at process level without putting much effort on the inputs required in order to produce the desired outcomes and impact.

CONNECTIVITY MODEL: BARRIERS TO APPROPRIATE TECHNOLOGY AND ACCESS MODEL

VSAT technology is recognised as an appropriate solution for providing connectivity in the underserviced areas such as Mopani District. However, the inappropriate design and poor management of the supply and demand factors has led to a number of barriers which impact on the ability of the users to derive value from the available infrastructure. This is the result of the failure by the officials to understand the user requirements, which are a pre-requisite to the design of any developmental intervention, more vital to the design of technology solutions. The uniqueness of the communities requires tailor-made interventions which must be conceptualised within the local context, to ensure relevancy and usability.

Technology is viewed as a western tool and its diffusion within the African context should be relevant and demonstrate its value towards the ladder of human development. The mobile phone uptake is a good example that when the technology is well positioned and responding directly to the daily needs of people, the uptake and investment in it becomes natural , without much effort from the government. Therefore, the failure to locate technology solutions within the individual, household and community context, leads to the deployment of inappropriate solutions that fail to add value to communities. This

failure leads to the creation of misconceptions about the performance of technologies deployed in the underserviced areas. It further promotes the popular notion that the underserviced areas are not benefitting from the information society due to the unavailability of broadband. This misconception is not true for the case of the Mopani District because the district has wireless connectivity penetration across the district, despite the lack of fixed line broadband.

Evidence from the research shows that, the connectivity solutions deployed within the Mopani District is ineffective and unsustainable, due to the failure by the officials to base the design of the connectivity models on user requirements and environmental factors within the different areas. The poor design of the connectivity model and failure to understand the availability of the resources within the community has resulted in inadequate connectivity infrastructure such as network points, electricity grid and the calculation of the required bandwidth to connect more computers. This implies that the deployment of connectivity in the underserviced areas cannot be based on a once size fits all approach, as communities are not a homogeneous group of people. The poor designs are exacerbated by the failure to conduct research and pilot innovative models which will enable government to keep in touch with the users' evolving consumption and usage patterns. A user, who initially used connectivity for browsing the Internet, might have a new requirement for voice over the Internet or video downloads, therefore TSC connectivity must meet the growing user demands and not treat connectivity as a static once of event.

The ineffective and poor performance of the Mopani connectivity is also due to the lack of training targeted at the users and centre managers, poor operations and maintenance, lack of access and usage policies , clear service level agreements, procedures and processes to be followed by connectivity managers and administrators when they experience connectivity challenges. In the various TSCs users are faced with a number of challenges and barriers with regard to the accessibility, availability, reliability, quality, and affordability, lack of content and the users' branching abilities or digital illiteracy. In

general connectivity challenges are similar across the different TSCs, despite of who is the service provider. Therefore, users in Mopani do not enjoy the standards determined by the DoC, in terms of section 82(3) of ECA, 2005. The cost of connectivity varies across the district due to lack of regulations that determine the minimum connectivity charges. In general, connectivity is free for some and not for all, even though the government is the source of funding.

CAPABILITY FACTORS: DIGITAL ILLITERACY AND LACK OF E-ENABLED PROCESS

The focus of the TSCs in the Mopani District is still on the provision of the anchor services such as manual applications for personal documentation and social grants. This renders the TSC connectivity in the Mopani District to be redundant and not contributing to the government goal of making information and services easily accessible and available. In the case of Bulamahlo and Muyexe, users are faced with digital illiteracy which often leads to users failing to attain their online objectives such as access to career information. This is due to the lack of branching skills and the capabilities to synthesise the retrieved content into a meaningful information that could inform their decision making process.

FUNCTIONING FACTORS: MAKING TECHNOLOGY WORK FOR SOCIAL AND ECONOMIC CHANGE

Alampay (2006, p.16) argues that the diffusion of connectivity does not guarantee development, if the focus in only on counting the number of people having access to the technology. Therefore, the focus should be given to beyond access, by analysing how and what people use connectivity for. A better approach in understanding the value of connectivity is to understand what happens beyond access or what occurs after the point of purchase, when the good is actually used. Therefore, communities and public servants officials will derive value from connectivity if it addresses their day to day challenges

by freeing them from unemployment, hunger, diseases and contributing to their productivity.

The blueprint connectivity deployed in the Mopani District does not lead to improved effectiveness, efficiency and improved productivity as well as service delivery by the public servants based at the TSCs. As a result, connectivity does not add value to communities and officials because it is mainly used to access information by the privileged government officials and associates. This is in contrast with the DPSA policy on Electronic Government, which state that the value of information technology (IT) in government is achieved when it enables the user to increase productivity, derive cost effectiveness and improved service delivery.

THE MISSING LINK

The data analyses shows that officials are engaged in activities that aim to resolve the socio-economic challenges from their own perspectives, without engaging in critical discussions and planning that will pull everyone in the same direction and put the communities at the centre of their plans. There is also failure by the officials to move away from the development models or approaches that have been used and failed in the 1960s. These models focused on diffusing or throwing technology at the socio-economic challenges faced by the rural people, making assumptions that rural people lack appreciation for technology when the projects failed due to the poor uptake and usage.

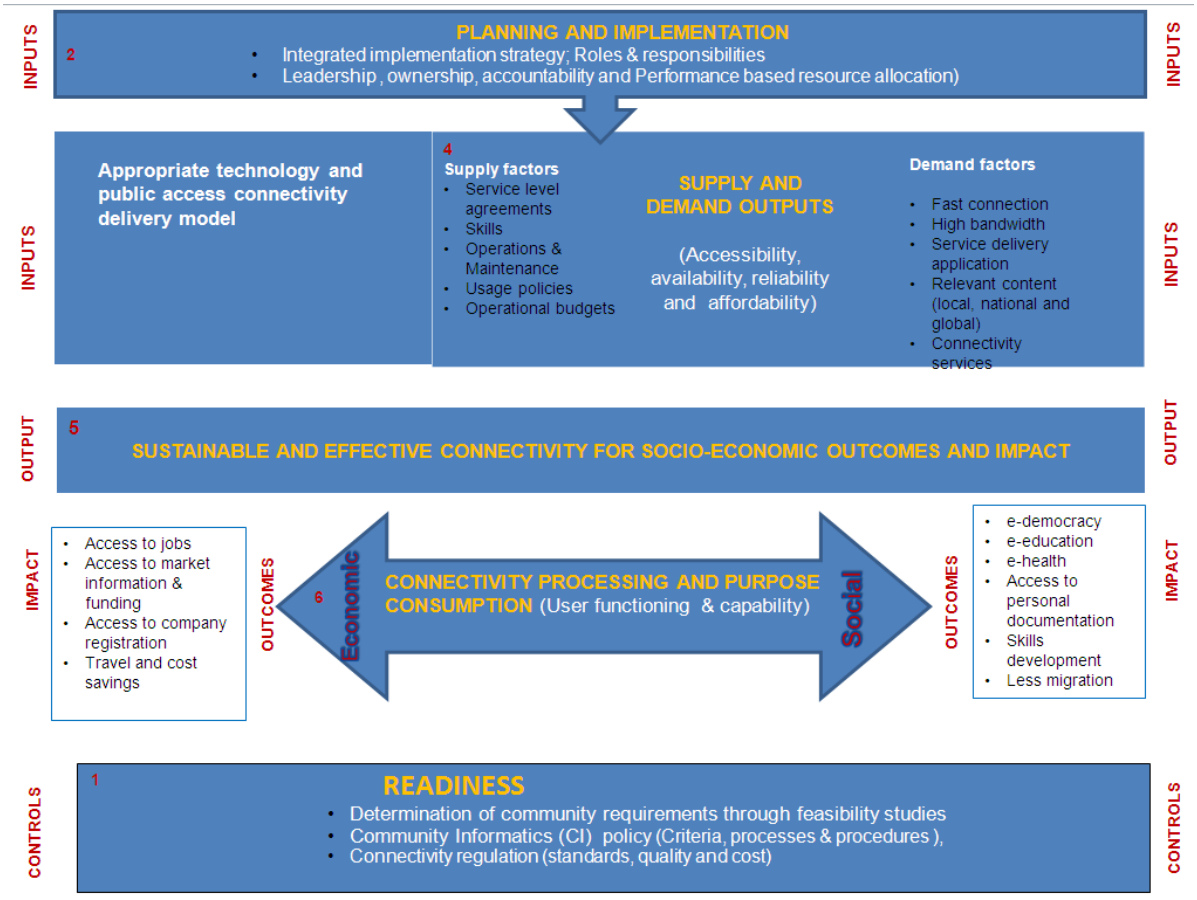
South Africa does not have a policy and national strategy that outlines and informs the deployment of connectivity at public access points such as the TSCs .The lack of a national strategy and policy on ICT projects has led to the fragmentation and duplication of connectivity interventions that are not producing tangible outcomes. The ICT sector does not have agreed and documented standards on what constitute quality connectivity for different areas based on the different technologies .Since 1996 government has rec-

ognised the value and benefits of connectivity as an empowerment tool that will enable individuals to overcome their social and economic challenges. Despite this realisation, connectivity is not classified as one of the basic services such as water, sanitation and there is no policy on connectivity subsidy or free basic connectivity for households or individuals. The research analysis further indicates that sustainable connectivity requires a high level of readiness at macro, micro and meso levels to build the required foundation that enables the establishment of relevant and capacitated institutional mechanisms, the assignment of clear roles and responsibilities. At the macro and micro levels there is inadequate allocation of resources, lack of controls to govern and regulate connectivity as well as lack of an integrated planning and budgeting system that is sensitive to the sustainable use of the financial resources. The deployment of connectivity in Mopani is based on outward looking strategies that fail to understand the meso environmental factors such as community needs, institutional arrangements, politics, and availability of resources and the capacity of local institutions to manage and maintain connectivity.

PROPOSED MODEL FOR CI

The diagram below represents an ideal model for the sustainable implementation of community informatics interventions.

FIGURE 20: REVISED CONCEPTUAL MODEL FOR ANALYSING THE EFFECTIVENESS OF TS CONNECTIVITY



The model is a variation from the ICT4D value chain proposed by Heeks as well as the conceptual framework that is presented in chapter two. The variation is informed by the research findings on the status of the Mopani District TSCs. The model in figure 20 above, paints a different picture in terms of the requirements for connectivity diffusion in order to produce the desired outcomes. It further confirms the complexity, opportunities and the multidisciplinary of CI. This model and its application will be explained in chapter six.

CHAPTER 6: CONNECTIVITY FOR ALL, NOT FOR SOME

The conclusion drawn from the research analysis is that, although South Africa made commitments to the WSIS declarations on information society, by establishing the institutional mechanisms and allocating the financial resources to implement the universal access, there is a missing link between policy, implementation and regulation. The connectivity deployed in the Mopani District is not sustainable and it does not contribute to the socio-economic outcomes. However, the case studies of Maruleng and Bulamahlo TSCs, demonstrate that there is value and potential for connectivity as an enabler for socio-economic change. This value can only be experienced if there is a proper and solid foundation to ensure the sustainability and impact of connectivity.

The deployment of connectivity in the Mopani District did not take into consideration the readiness, supply and demand factors as well as the capability of the users in processing the available information into meaningful knowledge assets that will inform their decision making process. The ineffectiveness is also due to poor planning, ineffective intergovernmental relations and the inability to determine the user requirements. The failure to determine the user requirements has led to the deployment of technologies that do not meet the user demands. The lack of capacity and technical knowledge of VSAT as an alternative technology for the rural areas has contributed into ineffective and costly regulatory processes which do not promote the deployment of community networks. The lack of capacity and knowledge has also resulted in poor operations and maintenance of VSAT. The poor maintenance and operations by the officials and service providers has created a misconception that VSAT does not provide reliable and quality connection. The poor operations and maintenance has also created a myth that the solution for sustainable rural connectivity lies in fixed ubiquitous broadband.

The proposed model below, aims to re-engineer the government's approach towards CI. It represents a new approach for the sustainable implementation of rural connectivity interventions. The model attempts to bridge the gap between CI planning and implementation by locating technology within the socio-economic goals of the individual, household and community levels, through targeted purposeful consumption. The model also advocates for a legislative, policy and regulatory environment that will enable effective planning and implementation as well as accountability. The model is not entirely new as it is based on the existing building blocks within the South African public service sector.

THE DUAL APPROACH OF COMMUNITY INFORMATICS

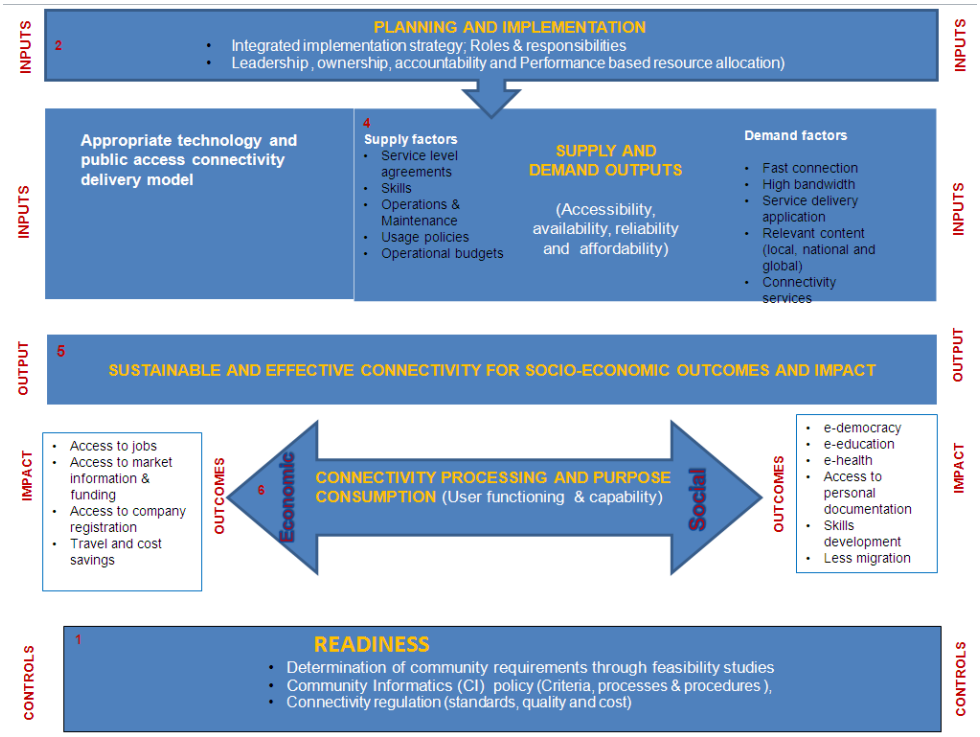
The model in figure 21 pulls together the building blocks/arguments presented by Heeks (2009); Gomez, Pather (2002), Hanisch et al (2007), Alampay (2006) James (2006); Gurstein (2003), O'Neil (2002), Mclver (2003). The model is informed by Heeks's concepts of readiness, inputs, outputs, outcomes and impact. Based on the identified concepts from Heeks, the model introduces a new concept known as controls. Controls serve as a foundation for the deployment of any CI interventions. The introduction of CI policy and regulations as well as conducting feasibility studies at the local level brings together the required readiness at the macro, micro and meso levels. The resource based funding allocation enforces accountability and ensuring value for money for CI projects as advocated by O'Neil (2006). Alampay (2006) and James's (2006) concepts of capability and functioning are presented in the impact area of the model to illustrate the desired outcomes, once sustainable connectivity is deployed. The capability and functioning aspects of the model attempts to close the gap between inputs, output and outcomes by challenging CI implementers to move beyond counting the numbers into measuring impact.

The model further attempts to address the gaps identified by Stillman and Linger, who argue that CI researchers focus on the relationship between

technology and people as they lack the capacity to understand technology, as a result they take the" black box approach" in which "ICTs are seen as tools for social justice for communities rather than as tools for the community itself", Stoecker cited in (Stillman and Linger, 2009; p. 4). Therefore, the proposed model advocates for a balanced understanding of the technological artefacts to ensure the design and deployment of appropriate technologies based on the user requirements with the objective of achieving purposeful consumption.

An understanding of the social, information systems, politics, economics, and community history will contribute to the successful implementation of CI projects. The practical implementation of the dual focus requires the appointment of intermediaries with the capacity to interrogate the design and development of the selected technology and also have a sound understanding of the social-economic issues. The role of the intermediary is to connect the dots and help the various stakeholders to realise that their inputs form part of a bigger information society chain, therefore if one component of the chain is broken they will be no outcomes and outputs.

FIGURE 21: REVISED CONCEPTUAL MODEL FOR ANALYSING THE EFFECTIVENESS OF TSC CONNECTIVITY



The dual model is based on the principle that the effectiveness of connectivity deployment in the rural areas requires the development of controls systems such as connectivity policies, financial and connectivity regulations to be put in place to ensure efficiency and accountability. The model positions planning, implementation, appropriate technology and the effective management of the supply and demand factors as inputs towards reliable and sustainable connectivity. The proposed approach recognises that there is a gap in integrated planning and that poor government relations will be a barrier for the effective implementation of the model. Therefore, the application of the model requires a public service sector that is able to look at development from a holistic view in order to produce the desired outputs. It also requires the willingness to learn from the past experience and see the different inputs by the various departments as contributors towards government's vision of building a better life for all. Therefore, there is no need for public officials to compete or duplicate their interventions. The approach suggested by the model aims to provide a logical approach towards sustainable connectivity and it empowers the officials to recognise that they are currently operating at

inputs level , as a result; their efforts are futile as they do not lead to the desired socio-economic impact.

APPLICATION OF THE MODEL

The model advocates for a holistic approach that is based on the principle that having sustainable connectivity does not guarantee development or drive the desired socio-economic change. Therefore, moving beyond access should be a focus of connectivity interventions in the underserviced areas.

Development of a community informatics policy and national ICT4D strategy

The model advocates that government officials must focus on readiness factors such as the development of community informatics policy. The policy must be supported by an implementation strategy that is supported by a performance based resource allocation. This requires the DoC to take a leading role in the re-engineering of connectivity as a catalyst for socio-economic change. The DoC must conduct a country wide CI impact assessment and draw lessons learned to inform the policy development process.

The model recognises that the existence of a policy on community informatics will not produce the expected outcomes if the implementation path is not clear. This requires the development of an implementation strategy that is informed by the user needs and requirements. The development must be driven from a bottom up approach and ensure that the outputs are directly linked to community and individual challenges. This requires the development of local strategies through the municipal IDP process which will be consolidated into district, provincial and national plans. The implementation plan will give implementers a holistic view of the socio-economic challenges and inform the deployment of ICTs which will ensure that the outcomes are specific and targeted. The national community informatics strategy must be integrated with the government e-services strategy to ensure that the DPSA blue

print is aligned to the broader community needs and support the community development initiative.

Allocated performance based funding

The model recommends that the National Treasury must introduce regulations that will ensure that the departments receive funding based on the performance of their programmes. Performance in this regard refers to the production of outcomes and the desired impact. Performance moves beyond the financial reporting that is based on the allocated funds as per the departmental strategic plans. The model further advocates for the centralisation of the rural connectivity budget to ensure that the implementation of CI projects are based on one legislated mandate which will be driven by one institution through consultation and collaborative processes with departments that are impacted by rural connectivity. The inability to enforce a performance based funding and to centralise rural connectivity will perpetuate the fruitless and wasteful expenditure.

Effective management of the connectivity supply and demand factors

The officials responsible for the planning and management of connectivity could improve the efficiency and effectiveness of connectivity by managing the supply and demand factors. The following supply and demand factors are the pillars of CI, if not managed, government will continue to fail and waste the scarce financial resources by investing in a sector that does not produce the desired outcomes.

SUPPLY SIDE FACTORS

Operations and maintenance (O & M) strategy

The effectiveness of connectivity depends on the ability of government officials in understanding the user requirements, the development and design of an appropriate technology model. Once this is understood, the officials must develop an operations and maintenance strategy that outlines service level agreements. The service level agreements must outline the processes to be followed when reporting technology challenges with the service providers, the turnaround time as well as roles and responsibilities of the involved stakeholders.

Cost recovery strategy and income generation

The operations and maintenance (O&M) strategy must be supported by a cost recovery strategy that will enable the centre managers to provide income generating services such computer training, printing, photocopying, computer repair workshops, Unisa partnerships and the creation of local content by the local producers.

Capacity building, training and awareness campaigns

The O & M strategy must include the creation of awareness campaigns and training sessions targeted at centre managers, officials and community members. The centre managers must be trained with basic technical skills that will enable them to diagnose technical challenges before escalating the problem to the service providers. In cases where centre managers are not trained with the basic technical skills, it must be a prerequisite to employ information brokers or intermediaries who are trained on information management and technical skills. Knowledge sharing is another factor that will contribute to the effectiveness of connectivity in the rural areas. This could be

achieved by establishing the connectivity user forums in order to identify challenges and case studies on the value derived by the users from using the connectivity. The documentation of case studies will be used to share the experiences and success of the various TSCs at the local and district level. The case studies will be used to demonstrate the value and benefits derived by the users who were able to convert their access into purpose consumption.

Connectivity access and usage policies

The development of clear and practical connectivity usage and access policies is critical in order to prevent centre managers from applying their own rules which are in conflict with the prescribed regulations or guidelines by the DPSA and the DoC.

DEMAND SIDE FACTORS

Users are the main drivers that contribute to the effectiveness of connectivity through their uptake and usage. However, their uptake and usage depend on the availability of bandwidth, fast connection, service delivery software, applications, and relevant content.

Bandwidth availability and fast connection

The demand side of connectivity requires the ability to see accessibility as a moving goal that is influenced by technological changes, real-time online transactions, inbound and outbound activities such as content downloading and uploading. These activities require fast connection, quality and adequate bandwidth. The inability to respond to the users' bandwidth requirements as they move up the connectivity ladder contribute to the poor usage of government funded community informatics initiatives. When the users move up the connectivity ladder and as their connectivity experience matures from the basic need of website browsing to new requirements such as social network-

ing, VoIP and the processing of online transactions, their bandwidth and connection requirements increases. Therefore, officials and connectivity service providers must monitor connectivity usage on an on-going basis in order to analyse usage patterns and upgrade the connectivity infrastructure when and as required.

Service delivery applications and software

The unavailability of service delivery software and applications leads to poor productivity and performance by the officials who require connectivity in order to render services. DPSA must align the TSC connectivity to the broader e-government strategy and ensure that government departments buy into the e-government policy by introducing punitive measures to the non-complying departments.

Connectivity enabled services, relevant and current content

Relevant and current content that informs the users about the current affairs, local news, cultural, heritage, economic, sport, entertainment and international news as well as government information contribute to the user content consumption. Content is another factor that could stimulate the users' interest and demand in using the available connectivity. This could be achieved by packaging content that respond to the local socio-economic challenges and by ensuring that it is translated into the local languages. It also requires the integration of the online content with the existing community radio stations. In the case of Mopani, content could be packaged to address issues such as agriculture, LED, health, education, early childhood development, nutrition, heritage and awareness/advertising of the local business.

Beyond access: connectivity processing and purposeful consumption for socio-economic changes

The value of connectivity is realised when the targeted users are able to process the accessed data, information and content into meaningful knowledge assets that lead to informed decision making and access to resources. Once the users are able to process connectivity, they achieve targeted functioning in the form of access to personal identification documents, company registration, which further gives them access to social grants, the right to vote, indirect benefits such as less migration to big cities. This gives the users the capabilities similar to their urban counterparts and the opportunity to gain more economic freedom.

Connectivity processing is a key outcome that drives the users towards purposeful consumption that will free them from the socio-economic challenges such as diseases, unemployment, and hunger and provide them with new skills. Once purposeful consumption is achieved, it is critical to implement or conduct impact assessment in order to ensure that there is impact beyond access. The failure to assess the outcomes of connectivity beyond purposeful consumption contribute to the criticism posed by the scepticisms of community informatics due to the continued lack of large scale evidence based research that demonstrate the direct value and contribution of CI. It is also vital to conduct impact assessment that will justify the continued financial investment by governments in community informatics initiatives.

SPECIFIC RECOMMENDATIONS

A call for connectivity to be declared a basic human need

Connectivity has become a new form of social inequality and exclusion. The accessibility of connectivity still depends on one's social and economic status. The poorest of the poor are still excluded from the information society, due to the second and third levels factors of the digital divide. This requires a shift in government and the commitment to position connectivity as a basic human need that will advance the principle of the right to communication and information as outlined in the South African Bill of Right. Therefore, it is recommended that CI activist engage government in a coordinated manner in order to lobby and advocate for the declaration of connectivity as a basic human need. This requires the CI activists to lobby government on providing free basic connectivity and ensuring the regulation of connectivity fees. The civil society and community based organisation emerge as the relevant lobby groups to advocate for connectivity as a basic human need and to ensure that there is a bottom up approach that is linked to the broader development goals and to the ladder of human development. The civil society groups and community based organisations provide support to the government in areas such as health, education, LED and general community development which requires ICT support. Therefore, these groups are exposed to the developmental challenges faced by communities and their experience gained over the years will contribute to lessons learnt on why CI interventions in South Africa are failing.

A new model for a localised connectivity provision through the public private and community based partnerships.

The conclusion drawn from the research analysis is that the telecommunications regulatory environment suffers from a weak and under capacitated regulatory regime. The effective management of connectivity requires the regulator to create an enabling and conducive environment that will encourage the private sector in partnership with community based organisations and local entrepreneurs to drive the delivery of CI projects. This requires the development of a business model that will localise the provision of connectivity and allow innovation through the public private and community partnerships subsidised by the Universal Access Fund. The internet café model proves that the connectivity bottom up approach and the demand creation by the aspiring telepreneurs contributes to government objective of universal access. Therefore, more focus should be towards supporting local initiatives that are self – sustainable. The recommended model is in line with the assertion by Dosono et al (2012) who state that the use of cybercafés can be an effective way to overcome the shortcomings of the telecentre experience of the last decade in South Africa by introducing an entrepreneur model which is rooted within a developmental agenda.

A new model for community informatics

Heeks (2009, p.6) refers to the conventional approach of CI as ICT4D 1.0 which is concerned with connecting internet to computers. He argues that this is costly and unsustainable. Consideration should be given to wireless technology as an alternative for bridging the digital divide in the rural areas by connecting people in the village and village structures through network architectures that are suitable. This approach is supported by Hammond et al (2006); the new model could incorporate the person to person communication which is supported by the mobile uptake. This new model is being piloted in the DWESA project in the Eastern Cape. The lessons learned should be

explored further by the CI sector and the government to test the viability of the model. The application of the community networking requires the regulator to promote the use of spectrum efficiently and optimally by allowing the spreading of the available frequency to cover more than one building.

CONCLUSION

Although the focus of the research was Mopani District, the findings indicate that in general, public access points are an ineffective strategy for facilitating access to sustainable rural connectivity. The deployment of connectivity is also based on etic approaches that fail to take into consideration the needs and requirements of the users. This practice is exacerbated by the incoherent legislative environment, lack of policy, regulations and processes to ensure standardisation in deploying rural connectivity. The lack of policy, standardisation and deployment processes has created the digital inequalities in Mopani District and this applies to other rural areas in the nine provinces of South Africa.

The research also concludes that GCIS has failed to implement the TSC 2006 to 2014 business plan which stated that a high premium will be placed on the introduction of ICTs to the targeted communities. The DPSA has also failed to uphold to the principle of its policy on electronic government, the digital future, a public service framework, which states that the value of IT in government is achieved when IT enables the user to increase productivity, derive cost effectiveness and improved service delivery. The deployment of rural connectivity is funded from the strained fiscal resources, in a country with the majority of its citizens still lacking access to the basic services such as water, sanitation and housing. The lack of accountability in the CI sector contributes to fruitless and wasteful expenditure and also compromises the role of ICTs as an enabler for socio-economic change. The lack of accountability and return on the rural connectivity investment will jeopardise the future funding of genuine CI interventions and this will lead to the widening digital divide that exists between the rural and urban areas.

References

Afful, E. F. (2014). *Africa's mobile banking revolution: the poor now have access to financial services.*

Akinsola, O. S., Herselman, M. E., & Jacobs, S. J. (2005). ICT provision to disadvantaged urban communitites: A study in South Africa and Nigeria [Electronic version]. *International Journal of Education and Development using Information and Communication Technology, 1*(3), 19-41.

Alampay, E. A. (2006). Beyond access to ICTs: Measuring capabilities in the information society. *International Journal of Education and Development using Information and Commu-nication Technology, 2*(3), 4-22.

Araba, S., Coward, C., George, S., Chris, R., Francois, B., & Lucas, K. (2013). *Connecting people for development: Why public access ICTs matter.* Technology & Social Change Group at the University of Washington.

Association for Progressive Communications. (2013, February 20). *ICT for development*. Retrieved from ICT for development: https://www.apc.org/en/taxonomy/term/337

Ba-Phalaborwa Municipality. (n.d.). *Integrated development plan:2010-15 (draft) and 2011-2016 (approved).*

Bélanger, F., & Carter, L. (2005). The utilization of e-government services: citizen trust, innovation and acceptance factors†[Electronic version]. *Information system journal*.

Belding, E. M., Johnson, D., & van Stam, G. (2012). *Network traffic locality in a rural African village.* Retrieved August 15, 2012, from UCSB Computer Science: http://www.cs.ucsb.edu/~ebelding/txt/ictd12.pdf

Belding, E., Gertjan, v. S., Veliko, P., & Johnson, D. (2011). Traffic characterization and internet usage in Rural Africa. *WWW '11 Proceedings of the 20th international conference companion on World wide web*, (pp. 493-502). New York.

Benjamin, P. (2001). *Perspective on distance education:Telecentres: case studies and key issues.* (C. Latchem, & D. Walker, Eds.) Canada: The Commonwealth of Learning.

Benjamin, P. (n.d.). The Gaseleka Telecentre, Northern Province, South Africa.

Best, M., & Kumar, R. (2008). Sustainability failures of rural telecenters: challenges from the sustainable access in rural India (SARI) Project. *Information Technologies & International Development, 4*(4).

Cohen, D. (2011). *E-Government practice at the local government level, South African Local Government Association.* Retrieved February 16, 2011, from Paper Presented at the GOVTECH conference on e-government: http://www.govtech.co.za/wwwgovtech10/presentations/Day3 Track 3 1 DouglasCohen.zip

Coleman, A., Herselman, M., & Jacobs, S. (2008). Factors influencing the utilization of the public Internet terminal system in two rural communities[Electronic version]. *SA Journal of Information Management, 10*(1), 1-12.

Corporate Governance and Traditional Affairs. (2009). *National state of local government assessment.* Corporate Governance and Traditional Affairs.

Dara, K., Dimanche, L., & Ó Siochrú, S. (2008). The i-REACH project in Cambodia [Electronic version]. *The Journal of Community Informatics, I 4*(1).

Department of Land and Rural Reform. (2010, July 26). *E-Rural access programme -presentation at E-Skills summit.* Retrieved November 9, 2012, from eSkills Summit 2010: http://www.eskills-summit.org/2010/presentations/eSkillsSummit_eRuralAccessProgramme_RTshabalala.pdf

Department of Public Service and Administration . (2001). *Electronic government, the digital future, a public service framework.*

Department of Public Service and Administration . (2013). *Draft government wide information and communication technology (GWICTS) strategy.*

Department of Public Service And Administration. (2012, February 16). Retrieved from Parliamentary Monitoring Group: www.pmg.org.za/files/docs/091104dpsa.ppt

DoC. (2006). *Information Society and Development Plan.* Pretoria.

Dominick, J. R., & Wimmer, R. D. (1994). *Mass Media Research- An Introduction* (4th ed.). Belmont: Calif: Wadsworth.

Dosono, B., Gomez, R., & Pather, S. (2012). Public access computing in South Africa: Old lessons and new challenges. *Electronic Journal on Information Systems in Developing Countries, 1*(42), 1-16.

D'Silva, J. L., Shaffril, H. M., Samah, B. A., & Hassan, M. A. (2011). Perceived usefulness of ICT usage among JKKK Members in Members in Members in Peninsular Malaysia . *Asian Social Science*, 255 -266.

Du Plooy, G. (2001). *Communication Research.* Lansdowne: Juta.

Duncombe, R. (2006). Using the livelihoods framework to analyze ICT applications for poverty reduction through microenterprise. *Information Technologies and International Development, 3*(3), 81-100.

Edmiston, K. D. (2003). State And Local E-Government : Prospects and challenges. *The American Review of Public Administration, 33*(20).

Esperanza, H., & Rodrigo, S.-A. (2007). Digital literacy: problems faced by telecenter users in Mexico[Electronic version]. *Journal of information technology for development, 13*(3), 217-232.

Fellows, M., & Sey, A. (2011). Loose Strands: Searching for evidence of public access ICT impact on development. *Paper presented at the IConference 2011* (pp. 189-194). Seattle: ACM.

Fong, M. (2014, October 30). Digital Divide: The Case of Developing Countries. *Issues in Informing Science and Information Technology (IISIT), 6,2009*. Retrieved October 30, 2014, from http://iisit.org/Vol6/IISITv6p471-478Fong597.pdf: http://iisit.org/Vol6/IISITv6p471-478Fong597.pdf

Food Agriculture Organisation. (2012, September). *Information and communications technologies for small-scale fishers and fishing administrations.* Retrieved October 22, 2012, from http://www.rflp.org/sites/default/files/ICT_for_Fishers.pdf

Fors, M., & Morenzo, A. (n.d.). The benefits and obstacles of implementing ICTs strategies for development from a bottom-up approach[Electronic version]. *Aslib Proceedings, 54*(3), 198-206.

Girard, B., & Ó, S. S. (2003, Bruce Girard and Seán Ó Siochrú). *Communicating in the information society.* Retrieved October 22, 2011, from Communica: http://comunica.org/com_rights/mciver.pdf

Gomez, R., & Gould, E. (2010). The "cool factor" of public access to ICT: Users' perceptions of trust in libraries, telecentres and cybercafe's in developing countries[Electronic version]. *Information Technology & People, 23*(3), 247-264.

Gomez, R., & Pather, S. (2012). ICT evaluation: are we asking the right questions[Electronic version]. *The Electroninc Journal on Information Systems in Developing Countries, 50*(5), 1-14.

Government Communication and Information System. (n.d.). Retrieved January 10, 2011, from Establishment and roll-out: http://www.thusong.gov.za/documents/establish_rollout/business_plan/reports/thusongbusplan.pdf

Government Communication and Information System. (2012). *SA Year Book 2011/12.* Retrieved October 22, 2012, from Government Communication and Information System: http://www.gcis.gov.za/sites/default/files/docs/resourcecentre/yearbook/2011/10_Communications.pdf

Government Information and Communication System. (2010, May 25). *Communications 2000: A vision for government communications in South Africa (Comtask Report Report)*. Retrieved February 16, 2012, from Government Information and Communication System: http://www.gcis.gov.za/resource_centre/reports/Comtask Report/rec_info.htm

Government Information and Communication System. (2012, June 13). *A workshop in support of the Service Delivery Innovation (SDI) Learning Network hosted by the Department of Public Service and Administration (DPSA), the Government Communication and Information System (GCIS) and Simeka at the Farm Inn in Pretoria, 2001*. Retrieved from Multi-purpose Community Centres /One-stop shops as Vehicles of a Shared Service Delivery Approach: http://www.thusong.gov.za/documents/research/multipurpose.htm

Greater Giyani Municipality. (n.d.). *Integrated Development Plan:2011-12.*

Greater Letaba Municipality. (n.d.). *Integrated Development Plan:2012-2017.*

Greater Tzaneen Manucipality. (n.d.). *Integrated development plan:2007-2011.*

Greater Tzaneen Municipality. (n.d.). *Draft review communication strategy: 2010/ 2011.*

Greater Tzaneen Municipality. (n.d.). *Local economic and social development strategy:2011-12.*

Gurstein, M. (2007). *What is Community Informatics (and wgy does it matter)* (2 ed.). Italy: Polimetrica.

Hammond, A., & Paul, J. (2006). *A new model for rural connectivity.* Retrieved October 22, 2012, from http://cohesion.rice.edu/Conferences/Hewlett/emplibrary/A_New_Model_for_Rural_Connectivity.pdf

Hanisch, H., Swartman, P., & Ashraf, M. (2007). Some perspectives on understanding the adoption and implementation of ICT interventions in developing countries[Electronic version]. *The Journal of Community Informatics, 3*(4).

Hanna, N. (2008). Why a holistic e-development[Electronic version]. *Information Technologies and International Development, 4*(4), 1-7.

Hargittai, E. (2003). *The digital divide and what to do about it.* Retrieved November 5, 2012, from http://www.eszter.com/research/pubs/hargittai-digitaldivide.pdf

Heeks, R. (2009). *The ICT4D 2.0 Manifesto: Where Next for ICTs and international development?* University of Menchester.

Heeks, R. (2010). Do information and communication technologies contribute to development?[Electronic version]. *Journal of International Development, 22*, 625-640.

Hulbert, D., & Snyman, M. (2007). Determining the reasons why ICT centres fail: six South African[Electronic version]. *Mousaion, 25*(2), 1-20.

International Telecommunications Union. (1984, December). *Maitland report-The missing link.* Retrieved November 22, 2012, from http://www.itu.int/osg/spu/sfo/missinglink/The_Missing_Ling_A4-E.pdf

International Telecommunications Union. (2003, December). *Geneva declaration principles.* Retrieved November 22, 2012, from World Summit on the Information Society (WSIS): http://www.itu.int/dms_pub/itu-s/md/03/wsis/doc/S03-WSIS-DOC-0004!!PDF-E.pdf

International Telecommunications Union. (2011). *Measuring the information society.* Geneva, Switzerland: International Telecommunications Union.

Jabareen, Y. (2009). Building a conceptual framework. *International Journal of Qualitative Methods, 8*(4), 49-62.

James, J. (2006). The Internet and poverty in developing countries: Welfare economics versus a functioning-based approach. *Futures*, 337-349.

Kaaya, J. (2001). Implementing e-Government services in East Africa: assessing status through content analysis of government websites [Electronic version]. *Electronic Journal of e-Government, 1*(2), 39-54.

Kim, H. S., & Lee, S. (2012). End-user perspectives of Internet connectivity problems [Electronic version]. *Computer Networks, 56*, 1710-1722.

Kruger, S., & Welman, J. (2003). *Research Methodology* (2nd ed.). Oxford University Press.

Lawrence, N. W. (2011). *Social Research Methods* (6th ed.). USA.

Leedy, P., & Ormrod, J. (2005). *Qualitative research.*

Limpopo Government. (2012, March 16). *Limpopo employment, growth and development plan 2009- 2014.*

Magoro, D. (2005). *The contribution of communication strategies towards sustainable service delivery by local municipalities; unpublished mini dissertation.* Pretoria: University of South Africa.

Maruleng Municipality. (n.d.). *Integrated development plan:2011-2016.*

McIver, Jr., W. (2003). *A community informatics for the information society.* Retrieved April 18, 2013, from http://comunica.org/com_rights/mciver.pdf

Mopani District Municipality. (n.d.). *Integrated development plan: 2009-12.* Retrieved February 16, 2012, from Mopani District Municipality: http://www.mopani.gov.za/index.php?page=IDP

National Planning Commission. (2012, 03 14). *Publications: Development Indicators.* Retrieved from The Presidency: http://www.thepresidency.gov.za/MediaLib/Downloads/Home/Publications/NationalPlanningCommission4/Development%20Indicators2010.pdf

National Treasury. (1999). Public Finance Management Act (Act No1 of 1999). Republic of South Africa.

National Treasury. (2006 to 2013). *National budget: national medium term expenditure estimates.*

National Treasury. (2006-2012). *Estimates of national expenditure.*

National Treasury. (2014). *Estimates of National Expenditure.* Pretoria: National Treasury.

National Treasury. (22010). Framework for strategic plans and annual performance plans (National Treasury).

National Treasury. (n.d.). *National Treasury Budget Review 2014.* Retrieved October 17 , 2014, from http://www.treasury.gov.za/documents/national%20budget/2014/review/FullReview.pdf

Neuman W, L. (1997). *Social Research Methods* (3rd ed.). USA.

O'Neil, D. (2002). Assessing community informatics: a review of methodological approaches for evaluating community networks and community technology centers [Electronic version]. *Internet Research*, 76-102.

P. N. (n.d.). *e-Government initiave*. Retrieved March 14, 2012, from Presidential National Commission: http://www.pnc.gov.za/index.php/e-government/e-government-initiative

Pade-Khene, C., & Sewry, D. (2012). The rural ICT comprehensive evaluation framework; implementing the first domain, the baseline study process [Electronic version]. *The Electronic Journal on Information Systems in Developing Countries, 51*(8), 1-34.

Parliamentary Monitoring Group. (2012 a). *The oversight visit by the portfolio committee on communications to Limpopo 5 - 8 February 2012.* Retrieved October 22, 2012, from http://www.pmg.org.za/files/doc/2012/comreports/120629pccomreport2.htm

Parliamentary Monitoring Group. (2012). *Section 100(1)(b) Limpopo provincial Interventions, Public entity boards: National Treasury briefings.*

Pejovic, V., Johson, D., Zheleva, M., Belding, E., & Parks, L. (2012). The bandwidth divide: obstacles to efficient broadband adoption in rural Sub-Saharan Africa. *International Journal of Communication, 6*, 2467–2491.

Pin, T., Hak, S., & Grunfeld, H. (2011). Understanding benefits realisation of iREACH from a capability [Electronic version]. *Ethics Info Technol, 13*, 151-172.

PL Properties. (n.d.). *PL Properties*. Retrieved 2012, from PL Properties: http://www.marula.co.za/Limpopoinfo.htm

Presedintial National Commission. (2012 , April). *Multistakeholder forum*. Retrieved March 14, 2010, from Presedintial National Commission: http://www.pnc.gov.za/pnc_isad_msf/index.php?option=com_docman&task=doc_download&gid=27&Itemid=15

R o b l e s, J. o., & Torres-Albero, C. r. (2012). Digital divide and the information and communication society in Spain. *Izvorni znanstveni rad, 50* (443(460)), 291-307.

Rasool, F. (2011). *USAASA, Siyafunda unite for rural telecentres.*

Republic of South Africa. (1996). *South Africa - Bill of Rights .* Pretoria: Government Printers.

Republic of South Africa. (1997). *Batho-pele white paper on transforming the public service delivery.* Pretoria.

Republic of South Africa. (1999, March). Public Finanance Management Act.

Republic of South Africa. (2000). *Electronic Communications Transaction Act 25.* Pretoria: Government Printers.

Republic of South Africa. (2000). *Local Government Municipal Systems Act 2000.* Pretoria: Government Printers.

Republic of South Africa. (2000). *Municipal Systems Act (Act No.21776 of 2000).*

Republic of South Africa. (2005). *Electronic Communications Act, No 36 of 2005.* Pretoria: Government Printers.

Rowe, B. (2003). Rural technology deployment and access: successes upon [Electronic version]. *Government Quaterly, 20*, 85-93.

SA IT News. (2012, May). *Only 38 fully functional Thusong centres – DPSA* . Retrieved June 17, 2012, from SA IT News: http://saitnews.co.za/featured-news/fully-functional-thusong-centres/

Sarrocco, C. (2002). Improving IP connectivity in the least developed countries: breaking the vicious cyvle [Electronic version]. *Info, 4*(3), 14-28.

Selwyn, N. (2003). Apart from technology: understanding people's non-use of information and communication technologies in everyday life [Electronic version]. *Technology in Society, 25*, 99-116.

Simanis, E., & Simms, J. H. (n.d.). Retrieved August 12, 2012, from UNESCO: http://10.121.144.134:15871/cgi-bin/blockpage.cgi?ws-session=1846747233

South African Local Government Association. (2012). *Municipal approaches to e-Participation.* Retrieved October 22, 2012, from The Local Government ICT Network.

South African Medical Research Council. (2012). *MRC News*. Retrieved November 6, 2012, from South African Medical Research Council: http://www.mrc.ac.za/pressreleases/2010/telemed_depty_minister2010.htm

Statistics South Africa. (2007). *Community survey.* Pretoria: StatsSA.

Statistics South Africa. (2012). *2011 Census.* Retrieved November 2, 2012, from Statistics South Africa: http://www.statssa.gov.za/Census2011/Products/Census_2011_Census_in_brief.pdf

Stavrou, A. (n.d.). The role of communication in key national , regional , provincial and local government development initiatves. *The Southern African Journal of Information and Communication*.

Stillman, L., & Linger, H. (2009). Community informatics and information systems: can they be better connected? Social Informatics . Retrieved February 4, 2014, from http://webstylus.net/files/Community%20Informatics%20revised_0.pdf

System, G. I. (2006). *Establishment and roll-out, second generation Business Plan.* Retrieved February 16, 2012, from Government Information and Communication System: http://www.thusong.gov.za/documents/establish_rollout/index.html

The National Treasury. (2013). *Estimates of the national expenditure, Vote 9: Government Communications and Information Systems.*

The Presidency. (1998). *Report of the Presidential review commission on the reform and transformation of the public service in South Africa*. Retrieved September 10, 2013, from Developing a culture of good governance: http://www.polity.org.za/polity/govdocs/reports/presreview/

The Presidency. (2010). *Development indicators 2010.* Retrieved March 14, 2012, from The Presidency: http://www.thepresidency.gov.za/MediaLib/Downloads/Home/Publications/NationalPlanningCommission4/Development%20Indicators2010.pdf

(n.d.). *The Public Service Act (PSA) of 1994, as amended by Act 30 of 1997.* Pretoria: Republic of South Africa.

Thompson, M., & Walsham, G. (2010). ICT Research in Africa: Need for a strategic development focus. *Information Technology Development, 16*(2), 112-127.

Universal Service and Access Agency of South Africa. (2008, August 15). *Notice in terms of section 82(3) and sections 88(2), (3) and (4) of the electronic Communications act, 2005 (act no. 36 of 2005) inviting written representations in respect of the definitions of universal service, universal access, andUnderserviced areas.* Retrieved October 22, 2012, from Lisa Thornton Inc: http://thornton.co.za/resources/gg31333_nn987_pg2-31.pdf

Whitacre, B. E. (2010). The diffussion of internet technologies to rural communities: A portrait of broadband supply and demand. *American Behavioral Scientist, 53*(9), 1224-1302.

Williams, K., & Durrance, J. C. (2010). *Community Informatics.* Retrieved February 4, 2014, from http://people.lis.illinois.edu/~katewill/williams-durrance-encyclo-community-informatics.pdf

Winston, T. (1997). Introduction to case study[Electronic version]. *The Qualitative Report, 3*(1).

APPENDIX

Moderator Guide: User perspective

INTRODUCTION

1. My name is Ditshego Magoro and I'm the facilitator for this discussion. I am a student at the University of the Witwatersrand. Thank you very much for making yourselves available and for your willingness to participate in this discussion.
2.
3. The purpose of this discussion is to talk about internet connectivity that is available here at the Thusong Service Centre. I am doing this as part of my degree. The research discussions will be recorded and interpreted so that I can write a report to the university. I'll be asking you questions that will help me to get answers on how internet is helping you and the community. This means that I will ask questions about your experiences and what you think of the internet and the services that you get from the TSC.

4. Before we start with the discussion I am going to ask you to complete the attendance register. One of the rules for this discussion is that I must not mention your names when I write the report. Therefore, I am going to allocate numbers to represent your names. This means we are going to call each other by the allocated numbers, but you can call me by my name.

GROUND RULES (ask participants to add)

1. This session will last about 1½ hours.
2. This session is being audio taped and I will also take notes during the discussions
3. Only one person must speak at a time
4. There are no wrong answers
5. Please turn off all cell phones

ICE BREAKER (5 minutes)

1. Please take the first few minutes to get to know the person seated next to you.

5. **Activity:** I'm going to ask you to introduce him/her to the group. I'd like you to tell us something about that person such as their interests and hobbies and when and where did they first use the internet and what was their impression?

QUESTIONS

READINESS

To what extent does the deployment of communal connectivity take into consideration the specific needs and requirements of the targeted communities and what is the deployment criteria and process.

1. What role did you play during the deployment of connectivity (or did you participate during the implementation of the connectivity project?
2. What was your specific role and contribution towards the deployment process
3. If you had specific needs, name them?
4. How did you inform the project managers about your needs?
5. To what extend do you think your inputs and community needs have been addressed or met?
6. How did the community chose this Centre as a communal place for accessing the internet
7. How else do you access connectivity if not at the TSC? If no alternative how does this impact on you

CONNECTIVITY/AVAILABILITY AND ACCESSIBILITY

What are the supply and demand factors that contribute to the effectiveness of connectivity as an enabler for accessing information and services at Thusong Service Centres?

1. How often do you use the internet
2. How much money do you spend on internet connectivity per visit/session?
3. What are the problems that you experience when using the internet? (speed, errors, loss of connection, broken links or unavailable sites and irrelevant content)
4. Are there any restrictions in terms of what you can do with the internet? If any what are the restrictions and how does that affect you?
5. When you experience problems do you ask for help from the Centre Manager and other users?
6. How often do you ask for help? If you do not seek help what are the reasons for not seeking help?

CAPABILITY

To what extend does connectivity projects integrate broader community development goals

1. Are the people in the community of having projects that are helping the community? What kind of projects and who is funding them?
2. To your knowledge, are these projects benefiting from internet? If so how and if not how do you think they can benefit?
3. What kind of internet activities do you perform when visiting the Centre?
4. How does this help you to address your day to day needs/challenges and future goals?

5. What other activities would you like to perform other than the current?
6. Why is it important to access or perform these activities? In other words how will it help you?
7. What kind of information do you access and how do you use it/for what purpose?

FUNCTIONING

If you are able to access internet and are able to perform the desired activities. To what extent did accessibility help you to solve a problem relating to your social or economic challenges? ASK them to give examples. (Employment, education, health, income: and how did this help you or your family members)

Moderator guide: officials perspective

READINESS

To what extent does the deployment of communal connectivity take into consideration the specific needs and requirements of the targeted communities and what is the deployment criteria and process.

1. What role did you play during the deployment of connectivity (or did you participate during the implementation of the connectivity project?
2. What was your specific role and contribution towards the deployment process
3. If you had specific needs, name them?
4. How did you inform the project managers about your needs?
5. To what extend do you think your inputs and community needs have been addressed or met?
6. How did the community chose this Centre as a communal place for accessing the internet
7. How else do you access connectivity if not at the TSC? If no alternative how does this impact on you

CONNECTIVITY/AVAILABILITY AND ACCESSIBILITY

What are the supply and demand factors that contribute to the effectiveness of connectivity as an enabler for accessing information and services at Thusong Service Centres?

1. How often do you use the internet
2. How much money do you spend on internet (monthly bill)
3. What are the problems that you experience when using the
4. Internet? (connection to virtual private networks, speed, errors, loss of connection, broken links or unavailable sites and irrelevant content)

5. Are there any restrictions in terms of what you can do with the internet? If any what are the restrictions and how does that affect you?
6. When you experience problems do you ask for help from the Centre Manager and other users?
7. How often do you ask for help? If you do not seek help what are the reasons for not seeking help?

CAPABILITY

To what extend does connectivity projects integrate broader community development goals

8. Are you aware of any community projects that are helping the community to uplift their lives? What kind of projects and who is funding them?
9. To your knowledge, are these projects benefiting from internet? If so how and if not how do you think they can benefit?
10. What kind of internet activities do you perform? Specific to your work and the services that you provide to the community.
11. How does this help you to manage your day to day tasks?
12. What other activities would you like to perform other than the current? In relation to your work and personal
13. Why is it important to access or perform these activities or tasks using the internet? In other words how will it help you and the community?
14. Other than using internet for your daily tasks, what kind of information do you access and how do you use it/for what purpose?

FUNCTIONING

If you are able to access internet and are able to perform the desired activities. To what extent is accessibility helping you to perform render

services efficiently and effectively? What is the socio-economic value? In your view is your ability to access connectivity having an impact in the community and the people that you service? If so what kind of impact and please feel free to share examples of the individual or households that have been able to turn their lives around due to services that you provide

Interview Guide: DPSA, July 09 2013 at the DPSA

Personal perspective on DPSA connectivity programme targeted at the TSCs

1. What is the purpose of connectivity at the TSCs?
2. How was this conceptualized? Was it based on research? What informed the need and the technology to be used? How is this linked to SA vision of building an information society and e-government?
3. Quality of connectivity- stakeholders in Limpopo pointed out that the TSC connectivity is not meeting their expectations, it is slow, affected by weather conditions, operations and maintenance not effectively done
4. What is the role of National Departments – alignment to their service delivery systems like Home Affairs is doing. Many of them are not even based at the TSC. Optimal use of resources---in cases where service providers are not using the available connectivity for the intended purpose because they are not linked to the required or enabling systems or because they feel they cannot stay at the centre to serve few clients.

5. The cost of connectivity & grace period and sustainability- Current TSCs are not paying for connectivity and indicated that they do not know what will happen after the grace period has lapsed- this raises concerns on sustainability issues.
6. Users also pointed that it appears that the grace period is the contributing factor to the poor quality of connectivity

7. CDWs and connectivity access
8. In your view what do you perceive to be the biggest contribution of TSC connectivity towards the socio-economic value?
9. To what extent is DPSA monitoring the perceived impact?
10. What is the future of TSC connectivity and target? GCIS Limpopo is of the view that the blue print is no longer relevant because it was conceptualized to bridge the gap in access to services. What is your comment and what is the plan going forward?

Interview Guide: GCIS

QUESTIONS

1. What is the role of GCIS in ensuring that connectivity at the Thusong Centres within Mopani/Greater Tzaneen is available and reliable?
2. Mopani has 10 TSCs; Tzaneen municipality has 3 centres with connectivity infrastructure.
    a. Runnymede TSC is currently not in use. What is the status of connectivity in Runnymede and what is the role of GCIS and its partners to ensure the Centre is used
    b. What is government's plan to make sure that the connected centres are effectively used and maintained
    c. Bulamahlo is faced with sustainability challenges since the 5yr DPSA connectivity grace ended in March. There is a possibility that they might have to procure connectivity from Sentech (meaning they will pay Sentech for connectivity). In your view, how is this going to impact on users and the sustainability of connectivity at the Centre?

3. How can government (DoC, DPSA, USAASA, Local Government and GCIS) ensure that Thusong Service Centre connectivity is sustainable
4. Who is responsible for ensuring budget allocation for public access internet connectivity?
5. GCIS's target is to have fully fledged TSCs in all municipalities by 2014. The status of the various TSCs within Mopani paints a different picture towards the reality of achieving this target. What is your view
6. The TSC business plan position technology, specifically internet as an enabler for development ("A high premium is placed on the introduction of ICTs to the targeted communities. This will be achieved by using tools such as the internet, e-mail and computers with the aim of promoting literacy and access to technologies" GCIS, 2006; 7). However, the visited TSCs within Mopani are faced with a number of challenges i.e. connectivity is mostly available to officials. Some of the centres do not have public access connectivity. What is your comment on this gap and what is your recommendation for closing this gap
7. The GCIS business plan outlines clear roles and responsibilities for connectivity provision and management. However, Centre managers within Mopani are of the view that the arrangement is not effective. What is your comment on this?
8. To what extent is connectivity used by GCIS and municipalities to support development communication?
9. How is GCIS promoting lessons learned and sharing from "best practice models" from other provinces?
10. To what extent is connectivity promoted to communities?
11. What kind of educational programmes are in place to support and promote the use of connectivity by members of the community?
12. TSCs are mainly associated with access to government services such as application for IDs, grants etc. Findings from the visited Mopani TSCs indicate that a different community internet access strategy is required. What is your view?

13. What, in your opinion, is the biggest contribution of the Thusong Centre in the lives of the people within Mopani?- What is the socio-economic value

Interview Guide: DoC, ISAD branch, 15 July at the DoC

QUESTIONS

1. Does SA have policy on rural internet connectivity and how is this linked to government rural development strategy
2. Why is government continuing to promote or supply connectivity that is based on computer to computer, yet research and latest census indicating that South Africans rely on mobile devices for internet access?
3. There are views that future connectivity should be based on connecting households, institutions and communities using latest technologies such as Wi-Fi. What is your view and comment? How practical is this and what are the institutional arrangements and policy environment required in order to achieve this?
4. The following gaps were identified. How is DOC planning to close them?
5. Access, Skills and awareness- there is lack of computer skills and awareness on the value of ICTs. In some TSCs access is only for government officials.

6. Duplication of services by government institutions – this is leading to fruitless expenditure because the resources end up being white elephants yet they could have been used in other areas. What is your comment and what is your strategy to eliminate duplication.
7. It practical to have one approach and a centralised budget for rural connectivity?
8. What is your comment on the digital gap that is created by having internet that is free for some and not for all
9. The visited centres seem to be suffering from a dependency syndrome. As a result their projects are faced with a number of sustainability challenges. What is DOC and USAASA strategy to ensure that connectivity is sustainable and to build a culture of self-dependency?
10. Monitoring and evaluation/ impact assessment- How is DOC monitoring the contribution of connectivity towards the socio-economic value and SA's vision of building an information society?
11. USAASA provincial indicated that they decided not to fund the Greater Tzaneen municipal broadband project because the technology to be used is still a pilot by CSIR. Therefore they decided not to use tax payer's money to fund the project. What is your comment or view on research and new innovation?
12. What was DOC's role in the Greater Tzaneen broadband project?
13. Greater Tzaneen raised a concern that their project was impacted by ICASA's delay in granting the required frequency. They are of the view that ICASA should improve their internal processes and that it is important to distinguish applications by government institutions from private. Simplified processes should be considered for projects such as municipal broadband. What is your comment on this?
14. Is connectivity a basic need? Where does it fell in the ladder of human development? And who must coordinate the planning, implementation as well as monitoring and evaluation?
15. Local government is of the view that connectivity is not part of their mandate therefore they have not given much thought on the value and benefits at community level. On the other hand SALGA pointed out that some municipalities are ICT illiterate therefore it means that they

cannot integrate ICT in their business process and community processes.

16. What is your comment and implications for the information society? How can government support the private internet providers? What programmes are in place to support them
17. What is your view on the geographical digital divide at local level (district access, local municipality and the fact that not all villages have easy access to the access points within their municipal boundaries)

Contrary to the believe that rural people lack access due to connectivity infrastructure—some of the visited TSCs point a different picture

18. Young people are the forefront of service delivery- they have computer skills and value the role of connectivity in their development, but are frustrated by connectivity that is not meeting their expectations or that was not designed to cater for public access.
19. In some cases connectivity is available but government departments are not integrating connectivity as part of their service delivery strategy

Overall it appears that SA has all the pieces of a puzzle (institutions, people, infrastructure, finance) however, the puzzle is not coming together. What is the missing link?

Self-administered: questionnaire sentech

1. Does South Africa have documented minimum standards for ensuring quality and reliable connectivity in areas where VSAT is the only alternative?
2. In cases where VSAT connectivity is not meeting user expectations, what is the alternative technology that could boost VSAT?
3. What is the cost associated with VSAT deployment?
4. What are the benefits and disadvantages of VSAT in areas that lack fixed telecommunication line?
5. The latest census statistics indicate that South Africans access the Internet via the mobile phone; this has implications for the current government strategy of connecting computers to computers at public access points. Is VSAT an appropriate technology for linking communities at a District level and linking key buildings within a community? The research is carried out as part of my academic requirement for a degree in Master of Management in Information Communication and Technology: Policy and Regulation at the Faculty of Commerce, Law & Management- University of the Witwatersrand.

Meraka institute: interview, 20 Nov 2013 at Meraka

Dear,

My name is Ditshego Magoro, a final year student at Wits University; Master of Arts in the field of ICT Policy & Regulation. I am currently researching on internet connectivity provided by the State Information Technology Agency (SITA) at the Thusong Service Centres. Due to lack of broadband and the availability of Telkom lines in many rural areas, connectivity is provided through the VSAT technology. My field observation is that the quality of connectivity is poor and users generally complain that it does not meet their expectations.

My research is about the second order digital divide vs. the first order digital divide. In the first order we look at lack of access to connectivity or ICT infrastructure. In the second order, in my specific area of research we look at capability and functioning derived or not derived by the users due to a number of factors that hinders effectiveness. This could be government policy, regulatory approach, human resources, poor planning and lack of research and innovation.

What I would specifically like to know is the strengths and weaknesses of VSAT technology and if it is possible to upgrade or use various technologies in combination with VSAT to make it more effective or to increase performance and the quality of connectivity. The department of Public Service and Administration (DPSA) is of the view that users with VSAT technology must just do what they are able to do as there is nothing DPSA/SITA can do until such time we have the broadband infrastructure. In my view I think this perpetuates the 2nd order digital divide and I think government could improve the current performance.

It is within this context that I request to speak to technical people as per my supervisor's recommendation in order to gain a deeper understanding of the VSAT technology and appropriate connectivity for rural communities. I would be able to meet with you whenever it is possible to assist me.

The participation in the research is voluntary and you may refuse to participate without consequence. You are welcome to contact me for more information or my supervisor Ms Luci Abrahams (luciennesa@gmail.com) Faculty of Commerce, Law & Management at the University of the Witwatersrand.

Self-administered questionnaire: USAASA

1. Is USAASA responsible for connectivity in all TSCs within Mopani? If no which centres are you responsible for?
2. What is the criterion used by USAASA to install/support telecentres in Mopani and what is the requirement to qualify for connectivity funding?
3. Who is responsible for funding connectivity and how are funds allocated to the various centres in Limpopo, specifically Mopani?
4 What is USAASA's role in ensuring effective and reliable connectivity in the various telecentres/Thusong Service Centres within Mopani?
5. Mopani has a number of TSCs with connectivity; however most of the centres do not offer internet access to members of the community. What is your role in facilitating community access?
6. Maruleng is one of the TSCs that have a plan to offer internet access to community members with a vision to support their local economic development strategy. Their challenge is that they do not have connectivity equipment. How can USAASA support them with funding?
7. Bulamahlo's connectivity could face sustainability challenges because their five grace period which was part of DPSA/SITA ended in March. Now they are getting connectivity from Sentech. During my meeting with the management it was not yet clear if they are expected to pay Sentech for the connectivity. If they have to pay this implies that they might have to increase their

prices which will have a negative impact on members of the community and the centre as a whole. What is your comment and how can USAASA support Bulamahlo with this?

8. Greater Tzaneen Municipality has deployed broadband within their municipal area. Bulamahlo is one of the centres that has benefitted from this broadband project. However, during my interview with the GTM IT section it was indicated to me that Bulamahlo can have access to free connectivity as part of this municipal broadband provided they do not charge members of the community. What is your comment on this and what is USAASA's role in the GTM broadband project?

9. If Bulamahlo is interested in using the free connectivity from GTM, they have to change their business model. In your view, what is Bulamahlo's option in this case?

10. What is USAASA's policy of free internet connectivity?

11What is USAASA's role in ensuring operation and maintenance of connectivity infrastructure and equipment's?

12To what extent does USAASA engage in monitoring & evaluation on the impact of rural connectivity?

13. In your view what is the biggest contribution of internet connectivity towards the socio-economic value within the Mopani District?

14. Research indicates that the South African model of Public Access Internet Connectivity has failed to deliver or contribute towards bridging the digital divide? What is your comment and what is the contributing factor according to USAASA?

15. What policies are in place to support or enable Universal Access?

16. Who is responsible or who is the custodian of these policies?

17. In your opinion are the current policies on connectivity contributing to the objectives of Universal Access? If yes, to what extend is this being achieved? If no, what are the barriers and what is your recommendation?

Greater Tzaneen Municipality: interview guide, 14 may 2013

QUESTIONS

1. To what extent does GTM LED strategy integrated internet connectivity as an enabler for LED projects?
2. How is the municipality using internet connectivity available at the TSCs to support community projects? Give examples of projects that are currently benefiting
3. What is the role of GTM community radio station in supporting the LED strategy and how is the community radio station integrating internet connectivity in their programmes?
4. Does the municipality have a dedicated internet connectivity plan aimed at supporting the broader municipal goals?
5. Are you aware of the GTM broadband project? If yes what is your role in the project?
6. What are the objectives of the project? And how is the project funded?
7. In your view what is the biggest contribution of connectivity in the current LED projects within the municipality?
8. How can GTM use connectivity to support community development communication?
9. Your strategy is specific on the types of electronic communication platform to be used in support of your interventions. What is the rationale behind this?
10. To what extent are the suggested platforms informed by community needs / requirements?
11. Does your electronic communication strategy take into consideration the use of local content? If yes, do you have any LED dedicated websites? If no, what is your view of the value of local content?
12. The visited TSCs are faced with a number of connectivity challenges. What is the role of the municipality in ensuring effective connectivity?
13. To what extend does your LED strategy incorporate the monitoring and evaluation of internet as an enabler for LED?

14. Some respondents shared a story of black farmers who are allegedly losing money due to lack of access to market information. What is your role in supporting these farmers to have access to reliable market information? Give an example of electronic tools currently used to support farmers.

Self-administered: questions: local government

1. To what extent are municipalities integrating internet connectivity as an enabler for socio-economic change in their planning?
2. How can LED projects maximize or explore internet as an enabler for supporting their business goals?
3. There is a perception from municipal officials within Mopani that Thusong Service Centres (TSCs) are not adding value to the core business of the municipality. What is your view? And how do you think municipalities can benefit from connectivity available at TSCs.
4. What, in your opinion is the biggest contribution of the Thusong Centres in the various municipalities?- What is the socio-economic value
5. How can government ensure that connectivity is used to support the day to day issues of communities?
6. In your view what are the policy gaps that hinders the effectiveness of connectivity for Local Economic Development and how government close this gaps and what is SALGA's role towards the deployment of internet connectivity for socio-economic value.

Questions: local government expert, 10 June 2013

1. What is the role of local government towards the information society and how can ICTs be used as an enabler for local economic development?
2. How can municipalities align ICTs to their LED strategies and IDPs?
3. What is your comment on the view that local government does not have a mandate to deal with TSCs?
4. How can government improve the current coordination and institutional arrangements?

5. How does the TCS concept link to the concept of developmental local government?
6. What kind of control measures are required to ensure the sustainability of projects and duplication of projects that are funded from the same

Sample of research protocol

P O BOX 165
Tzaneen
0850
19 April 2013

INVITATION TO PARTICIPATE IN AN INTERVIEW: THE ROLE OF CONNECTIVITY IN RURAL DEVELOPMENT

Dear Sir/Madam

You are cordially invited to participate in a meeting scheduled as follows:

Date: 10 May 2013
Venue: Maruleng TSC
Time: As per your availability

The purpose of the interview is to discuss the role of connectivity/internet in rural development. The interview is part of a research project that aims to understand how connectivity accessed by service providers at the Maruleng TSC is helping community members to gain access to government services, economic opportunities as well as solutions to their social problems.

The research is carried out as part of my academic requirement for a degree in Masters of Management in Information Communication and Technology: Policy and Regulation at the Faculty of Commerce, Law & Management at the University of the Witwatersrand.

The research findings will be used to compile a report to the University. The findings will be used to inform GCIS, DoC and DPSA to improve or promote the current connectivity strategy. Therefore, it is my hope that your participation will contribute to the provision of sustainable connectivity to facilitate rural socio-economic development.

There are no identified risks from participating in this research. Your identity will be protected. Please note that participation in the research is voluntary and you may refuse to participate without consequence.

You are welcome to contact me for more information or my supervisor Ms Luci Abrahams (luciennesa@gmail.com) Faculty of Commerce, Law & Management at the University of the Witwatersrand.

Ditshego Magoro; Masters student @Wits University: ICT Policy and Regulation;
Ditshego.magoro@treasury.gov.za;0714924137

Documents analysed