

**IS IT A RIP-OFF OR NOT? CHANGES IN THE SERVICE DELIVERY  
PATTERNS IN THE INTEGRATED SUSTAINABLE RURAL  
DEVELOPMENT PROGRAMME (ISRDP) NODES  
FROM 2001 TO 2011**

By MALIBONGWE CHRISTOPHER MHEMHE



Thesis presented in partial fulfilment of the requirements for the degree Master of  
Philosophy in Urban and Regional Science in the Faculty of Arts and Social Sciences  
at Stellenbosch University



Supervisor: Ms Lodene Willemse

March 2018

## **AUTHOR'S DECLARATION**

By submitting this thesis electronically I declare that the entirety of the work contained therein is my own, original work, that I am the sole author thereof (save to the extent explicitly otherwise stated), that reproduction and publication thereof by Stellenbosch University will not infringe any third party rights and that I have not previously in its entirety or in part submitted it for obtaining any qualification.

Malibongwe Christopher Mhemhe

Date: 20 February 2018

## ABSTRACT

South Africa, like other developing countries, is characterised by numerous rural development defies. These rural development challenges are mainly caused by apartheid policies that were implemented during the apartheid era, and not by rural-urban market relations as is the case for many developing countries. For example, black people were forced to stay in the homelands, except if they were under employment in the urban areas and that had to be proven beyond reasonable doubt. These undesirable laws adversely affected people's quality of life (QOL). QOL refers to some qualities of individuals such as education or health achievements (both mental and physical) or environmental conditions under which people live such as poor housing or water and air pollution. In this study, Census 2001 and 2011 data was used to establish the changes in the service-delivery patterns in the Integrated Sustainable Rural Development Programme (ISRDP) nodes (selected poorest district municipalities (DMs)) from 2001 to 2011 as measured through housing, water, electricity for cooking, heating and lighting, sanitation, refuse removal and Information and Communication Technology (ICT) service indices. The relevance of this is that municipalities are tasked to provide these essential services to South African residents. Subsequently, a three-way mixed-model Analysis of Variances (ANOVAs) was calculated in finding if statistically significant changes took place for the six service delivery indices. The provision of Free Basic Services (FBS) to poor households (indigent) was also looked at. The results indicate that great strides have been made in the 10 years (2001 to 2011) in terms of providing different services to households in the nodes. Central Karoo District Municipality (DM) appears to be the best for all the service delivery indices with the exception of ICT services. John Taolo Gaetsewe DM follows for housing, water, electricity and ICT services. Greater Sekhukhune DM is also doing well with housing, so as Chris Hani DM with water. Joe Gqabi DM is doing better with the provision of sanitation and refuse removal. Ugu DM is appearing better with the ICT services after John Taolo Gaetsewe DM. In contrast, Alfred Nzo DM seems to be the worst performer for most of the delivery indices followed by O.R. Tambo DM. Greater Sekhukhune DM is doing badly in terms of sanitation and refuse provision. Umkhanyakude DM is not performing well when it comes to electricity distribution. The housing service delivery index is doing well in most of the ISRDP nodes except for O.R. Tambo and Alfred Nzo.

Most nodes seem to be struggling in registering the indigent households, let alone providing the necessary services to these indigents. This is revealed by the small percentage of indigent households over the total number of households in the nodes. All of the above-mentioned results thus point towards only significant improvements in service delivery indices for the majority of the nodes. Significant policy implications are proposed for policymakers to consider.

**Keywords and phrases:** Quality of life; QOL; Housing, water, electricity, sanitation, and refuse removal (solid waste management (SWM)); Service-delivery indices; 11 of the poorest rural districts in South Africa (ISRDP areas); Rural areas; Free basic services; FBS; Poor households (indigents).

## OPSOMMING

Net soos ander ontwikkelende lande, word Suid-Afrika gekenmerk deur talle uitdagings met betrekking tot landelike ontwikkeling. Hierdie uitdagings is hoofsaaklik veroorsaak deur apartheidsbeleide wat tydens die apartheidsera geïmplementeer is, en nie deur landelike-stedelike markverhoudings nie – soos wat wel die geval in vele ontwikkelende lande is. Om 'n voorbeeld te noem: Swart mense is gedwing om in die tuislande te bly, behalwe as hulle werkzaam in die stedelike gebiede was, en dié moes dan bo alle twyfel bewys word. Hierdie ongewenste wette het die mense se lewensgehalte nadelig beïnvloed. Lewensgehalte verwys na sommige eienskappe in individue soos onderwys- of gesondheidsprestasies (beide geestelik en fisies) of omgewingstoestande waaronder mense 'n bestaan voer, byvoorbeeld swak behuising of water- en lugbesoedeling. In hierdie studie is data van Sensus 2001 en 2011 gebruik om die veranderinge te bepaal in diensleweringsspatrone in nodes in die Geïntegreerde Volhoubare Landelike Ontwikkelingsprogram (GVLOP) vanaf 2001 tot 2011. Hierdie nodes is geselekteer vanuit die armste distriksmunisipaliteite, en veranderinge word gemeet volgens dienste gelewer ten opsigte van behuising, water, elektrisiteit vir kook-, hitte- en beligtingsdoeleindes, sanitasie, vullisverwydering en inligting- en kommunikasietegnologie. Die relevansie hiervan is dat munisipaliteite getaak is om hierdie noodsaaklike dienste aan Suid-Afrikaanse inwoners te voorsien. Gevolglik is 'n drieledige, gemengde-model variasieanalise bereken om te bepaal of statisties beduidende veranderinge plaasgevind het vir hierdie ses diensleweringssindekse. Daar is ook gekyk na die voorsiening van Gratis Basiese Dienste aan arm (hulpbehoewende) huishoudings. Die resultate dui daarop dat groot vooruitgang gemaak is gedurende die 10 jaar (2001 tot 2011) ten opsigte van die voorsiening van verskillende dienste aan huishoudings in hierdie nodes. Die Sentraal Karoo-distriksmunisipaliteit blyk die beste af te wees ten opsigte van al die diensleweringssindekse, met die uitsondering van inligting- en kommunikasietegnologie. John Taolo Gaetsewe-distriksmunisipaliteit is volgende ten opsigte van dienste gelewer vir behuising, water, elektrisiteit en inligting- en kommunikasietegnologie. Die Groter Sekhukhune-distriksmunisipaliteit vaar ook goed met behuising, en Chris Hani-distriksmunisipaliteit vaar goed ten opsigte van waterdienste. Joe Gqabi-distriksmunisipaliteit vaar beter met die voorsiening van sanitasie- en vullisverwyderingsdienste. Naas John Taolo Gaetsewe-distriksmunisipaliteit, vaar Ugu-distriksmunisipaliteit ook beter met dienste gelewer ten opsigte van inligting- en kommunikasietegnologie. In teenstelling hiermee, blyk dit dat Alfred Nzo-distriksmunisipaliteit die swakste vaar ten opsigte van die meeste van die diensleweringssindekse, en so ook OR Tambo-distriksmunisipaliteit. Die Groter Sekhukhune-distriksmunisipaliteit vaar redelik swak ten opsigte van die lewering van sanitasie- en vullisverwyderingsdienste. Umkhanyakude-distriksmunisipaliteit vaar nie baie goed met die voorsiening van elektrisiteit nie. Die diensleweringssindeks vir behuising

vaar baie goed in die meeste van die GVLOP-nodes, met die uitsondering van OR Tambo- en Alfred Nzo-distriksmunisipaliteite.

Dit blyk dat die meeste nodes sukkel met die registrasie van hulpbehoewende huishoudings – laat staan nog in die voorsiening van die nodige dienste aan hierdie hulpbehoewende huishoudings. Dit is duidelik te spur uit die klein persentasie hulpbehoewende huishoudings van die totale aantal huishoudings in die nodes. Al die voorafgaande resultate dui dus op beduidende verbeterings in die dienslewingsindekse vir die meerderheid van die nodes. Beduidende beleidsimplikasies word voorgestel aan beleidsmakers sodat hulle dit kan oorweeg.

**Sleutelwoorde en -frases:** Lewensgehalte; Behuising, water, elektrisiteit, sanitasie, en vullisverwydering (soliedeafvalbestuur); Dienslewingsindekse; 11 van die armste landelike distrikte in Suid-Afrika (GVLOP-gebiede); Landelike gebiede; Gratis basiese dienste; Arm huishoudings (hulpbehoewend).

## ACKNOWLEDGEMENTS

I would like to express my sincere appreciation and thanks to the following people for their assistance with my thesis:

- First and foremost, I thank **Almighty God** for giving me the strength, ability, wisdom, knowledge and opportunity to undertake this research study and to persevere and complete it satisfactorily. Without **His** blessings, this achievement would not have been possible. This is extended to all church **members** from **Holy Baptist Church of Christ** for prayers and support all the time.
- Statistics South Africa (Stats SA) and Centre for Regional and Urban Innovation and Statistical Exploration (CRUISE) under the leaderships of the Statistician-General of South Africa Dr **PJ Lehohla** and **Professor HS Geyer** respectively, for granting me the opportunity to study an MPhil degree at Stellenbosch University. A special thank you also goes to the CRUISE **lecturers** for supporting me through thick and thin during my studies.
- **Ms L Willemse**, my supervisor for her full support, countless motivation, continuous guidance, meticulous suggestions, astute criticism and outstanding supervision she provided during my research. Her acquaintance with the subject and tolerance were key factors for my delivering this academic product.
- **Professor M Kidd** from the Centre for Statistical Consultation (CSC) for assisting me with calculating the services delivery indices, a three-way mixed-model ANOVAs and interpretations of results thereof.
- My loving immediate family, who supported me throughout the entire study period. To my lovely wife **Zamabongwe**, my son **Mikhulu** and my little daughter **Zethembiso ZeNkosi**, I owe you all a debt of gratitude for your encouragement and understanding during my time of studying.
- My family at large, **dad, mom, brothers and sisters, uncles, aunts, cousins** and my **in-laws**, I thank you for your encouragements and prayers.
- My best friend, my brother in Christ, **Mr Malibongwe Skota** and his caring **wife** and **kids** for all their words of encouragement.
- **Ms Annelize Allner** from Stats SA, who edited this document, and translated abstract and keywords into Afrikaans. Thank you very much.
- To all Government Finance Statistics (GFS) **staff** in Stats SA, under the supervision of **Dr GP Naidoo**, for their support and making sure that everything ran smoothly and for not disturbing me with work-related matters during my absence; **everyone's support** is highly appreciated.

## CONTENTS

<b>AUTHOR’S DECLARATION</b> .....	<b>ii</b>
<b>ABSTRACT</b> .....	<b>iii</b>
<b>OPSOMMING</b> .....	<b>v</b>
<b>ACKNOWLEDGEMENTS</b> .....	<b>vii</b>
<b>LIST OF TABLES</b> .....	<b>x</b>
<b>LIST OF FIGURES</b> .....	<b>xi</b>
<b>ABBREVIATIONS AND ACRONYMS</b> .....	<b>xii</b>
<b>SECTION 1: SETTING THE SCENE</b> .....	<b>1</b>
<b>1. INTRODUCTION</b> .....	<b>1</b>
<b>1.1 Research problem</b> .....	<b>5</b>
<b>1.2 Research questions</b> .....	<b>6</b>
<b>1.3 Aims and objectives of the study</b> .....	<b>6</b>
<b>SECTION 2: LITERATURE REVIEW</b> .....	<b>8</b>
<b>2. THE QOL CONCEPT DEVELOPMENT, DEFINITIONS AND DIFFERENT APPROACHES TO MEASURE IT</b> .....	<b>8</b>
<b>2.1 The influence on QOL of service-delivery scenarios faced by people residing in rural areas</b> .....	<b>10</b>
<b>2.1.1 The influence of housing conditions on QOL for people residing in rural areas</b> .....	<b>11</b>
<b>2.1.2 Access to safe drinking water in rural areas</b> .....	<b>14</b>
<b>2.1.3 Access to electricity in remote communities</b> .....	<b>15</b>
<b>2.1.4 Access to sanitation in rural communities</b> .....	<b>19</b>
<b>2.1.5 Waste collection and disposal in rural areas</b> .....	<b>20</b>
<b>2.1.6 ICT services in rural communities – public service delivery perspective</b> .....	<b>23</b>
<b>2.2 Service delivery infrastructure and its impact on QOL in remote communities</b> .....	<b>25</b>
<b>2.3 Conclusion</b> .....	<b>27</b>
<b>SECTION 3: METHODOLOGY</b> .....	<b>29</b>
<b>3. THE CONNOTATION OF RURALITY/RURALNESS IN SOUTH AFRICA: ISSUES WITH DEFINITION</b> .....	<b>29</b>
<b>3.1 Choice of the study design</b> .....	<b>31</b>
<b>3.2 Data collection and variables</b> .....	<b>36</b>
<b>3.3 Data processing and analysis</b> .....	<b>38</b>
<b>SECTION 4: DISCUSSION AND INTERPRETATION OF RESULTS FOR SERVICE DELIVERY RELATED CENSUS DATA: 2001 TO 2011</b> .....	<b>40</b>
<b>4.1 Determining the changes in the QOL dimensions from 2001 to 2011 for the ISRDP area</b> .....	<b>40</b>
<b>4.1.1 Average housing-delivery index in the ISRDP areas</b> .....	<b>40</b>



<b>4.1.2 Average water-delivery index in the ISRDP areas.....</b>	<b>42</b>
<b>4.1.3 Average energy-delivery index in the ISRDP areas.....</b>	<b>44</b>
<b>4.1.3.1 Use of energy for cooking by households in the ISRDP areas .....</b>	<b>44</b>
<b>4.1.3.2 Use of energy for heating by households in the ISRDP areas.....</b>	<b>45</b>
<b>4.1.3.3 Use of energy for lighting by households in the ISRDP areas .....</b>	<b>46</b>
<b>4.1.4 Average sanitation-delivery index in the ISRDP areas.....</b>	<b>48</b>
<b>4.1.5 Average refuse-removal delivery index in the ISRDP areas .....</b>	<b>50</b>
<b>4.1.6 Average ICT service delivery index in the ISRDP areas .....</b>	<b>52</b>
<b>4.2. FBS provided to indigent households in the ISRDP households.....</b>	<b>54</b>
<b>SECTION 5: CONCLUSIONS, POLICY IMPLICATIONS, LIMITATIONS OF THE STUDY AND RECOMMENDATIONS FOR FUTURE RESEARCH .....</b>	<b>56</b>
<b>5.1 Policy implications .....</b>	<b>58</b>
<b>5.2 Limitations of the study and recommendations for future research .....</b>	<b>59</b>
<b>6. REFERENCES.....</b>	<b>60</b>

**TABLES**

Table 3.1	The study areas (the ISRDP nodes and the local municipalities affected, including the towns within the districts) .....	32
Table 3.2	Selected variables used in the study .....	36
Table 4.1	Indigent households as a % of total households per ISRDP area and beneficiaries as a % of identified indigents.....	55

**FIGURES**

Figure 4.1 Access to housing for citizens in the ISRDP areas.....	41
Figure 4.2 Water delivery to citizens of the ISRDP areas .....	43
Figure 4.3 Use of energy for cooking by households in the ISRDP areas.....	45
Figure 4.4 Use of energy for heating by households in the ISRDP areas.....	46
Figure 4.5 Use of energy for lighting by households in the ISRDP areas .....	48
Figure 4.6 Sanitation provision for households in the ISRDP areas.....	50
Figure 4.7 Refuse removal delivery for households in the ISRDP areas.....	52
Figure 4.8 ICT service-delivery for households in the ISRDP areas.....	53

**ABBREVIATIONS AND ACRONYMS**

AANDC	Aboriginal Affairs and Northern Development Canada
AMP	Asset Management Plan
ANC	African National Congress
ANOVAs	Analysis of Variances
ASGISA	Accelerated and Shared Growth Initiative of South Africa
CRDP	Comprehensive Rural Development Programme
CRUISE	Centre for Regional and Urban Innovation and Statistical Exploration
CSC	Centre for Statistical Consultation
CSIR	Council for Scientific and Industrial Research
DM	District Municipality
DMs	District Municipalities
DPLG	Department of Provincial and Local Government
DRC	Democratic Republic of Congo
DRDLR	Department of Rural Development and Land Reform
DWA	Department of Water Affairs
DWAF	Department of Water Affairs and Forestry
DWS	Department of Water and Sanitation
EDD	Economic Development Department
Eskom	Electricity Supply Commission
FBE	Free Basic Electricity
FBS	Free Basic Services
FBW	Free Basic Water
GAA	Group Areas Act
GDP	Gross Domestic Product
GEAR	Growth, Employment and Retribution
GFS	Government Finance Statistics
GHS	General Households Survey
GNP	Gross National Product
GNU	Government of the National Unity
HAC	Housing Assistance Council
HRC	Human Rights Council
ICT	Information and Communication Technology
IDPs	Integrated Development Plans

IEA	International Energy Agency
IFC	International Finance Corporation
INEP	Integrated National Electrification Programme
ISPs	Internet Service Providers
ISRDP	Integrated Sustainable Rural Development Programme
ISRDS	Integrated Sustainable Rural Development Strategy
KSD	King Sabata Dalindyebo
kl	kilolitres
kWh	kilowatts hours
LGBER	Local Government budget and expenditure review
LM	Local Municipality
LMs	Local Municipalities
MDGs	Millennium Development Goals
MFMA	Municipal Finance Management Act
MIG	Municipal Infrastructure Grant
MIIF	Municipal Infrastructure Investment Framework
MIPF	Municipal Indigent Policy Framework
MSW	Municipal Solid Waste
MSWM	Municipal Solid Waste Management
MTN	Mobile Telephone Network
MYPD2	Multi Year Price Determination 2
NDP	National Development Plan
NERSA	National Energy Regulator of South Africa
NFCM	Non-Financial Census of Municipalities
NGP	New Growth Path
NPC	National Planning Commission
NRECA	National Rural Electric Cooperative Association
NTCA	The Rural Broadband Association
OECD	Organisation for Economic Co-operation and Development
PC	Personal Computer
PPPs	Public Private Partnerships
PSC	Public Service Commission
QOL	Quality of life
RBIG	Regional Bulk Infrastructure Grant
RDF	Rural Development Framework

RDP	Reconstruction and Development Programme
RHIG	Rural Households Infrastructure Grant
RIAT	Rural Innovation Assessment Tool
SAHRC	South African Human Rights Commission
SAS	Statistical Analysis System
SCOPE	Scientific Committee on Problems of the Environment
SERI	Socio-Economic Rights Institute of South Africa
Stats SA	Statistics South Africa
SWM	Solid Waste Management
UN	United Nations
UNDP	United Nations Development Programme
US	United States
USA	United States of America
VIP	Ventilated Improved Pit
WEO	World Energy Outlook
WHO	World Health Organization
WSAs	Water Services Authorities

## SECTION 1: SETTING THE SCENE

### 1. INTRODUCTION

South Africa, similar to other developing countries (mostly African countries), is characterised by numerous rural development challenges. For South Africa per se however, these rural development challenges are caused by apartheid policies that were implemented during the apartheid era, instead of rural-urban market relations – as is the case for many other developing countries. In 1913, the Natives Land Act (Act No. 27 of 1913) was passed to allocate only about 7% of arable land to Africans and leave the more fertile land for whites, who made up less than 20% of the population then. Black people were forced to stay in the homelands, and only if they could provide proof that they were under employment were they allowed to stay in urban areas (Davenport 1991; Kole 2005; Marx & Engels 1976; Muller 1981; Reader's Digest 1988). In April 1950, the Minister of the Interior introduced the Group Areas Bill, which became law on July 12<sup>th</sup> that same year. The Group Areas Act (GAA) (Act No. 41 of 1950) was formed as the foundation of the apartheid policy and aimed at eliminating mixed neighbourhoods in favour of racially segregated ones, which would allow South Africans to develop separately. The GAA systematised segregation in the control of transfers of land and immovable property (property which cannot be moved without being severely altered or destroyed, like a house) as well as occupation rights throughout the Union of South Africa, with the exception of reserves. The consequence was that one could only buy property from people of the same race (Kirkwood 1950). The Reservation of Separate Amenities Act (Act No. 49 of 1953) formed part of the apartheid system of racial segregation in South Africa. The Act enforced segregation of all public facilities, including buildings and transport, in order to limit contact between the different races in South Africa. The Act also stated that the facilities for different races did not need to be equal. In practice then, the best facilities were reserved for whites while those for other races were inferior (Union of South Africa 1953). The Bantu Homeland Citizenship Act (Act No. 26 of 1970 (subsequently renamed the Black States Citizenship Act, 1970 and the National States Citizenship Act, 1970) was a denaturalisation law which was instrumental to separating different ethnic groups into nation-states called homelands, and required that all South African Blacks become citizens of one of the self-governing territories (Davenport 1977). During the late 1980s and early 1990s, certain pieces of apartheid legislation were repealed, which resulted in an influx of black people moving to the cities (formerly known as white areas), and in turn caused urban poverty pockets, thus creating the need to focus on improving rural areas in order to even out the urban-rural gap (Kole 2005). After the full abolishment of most apartheid legislation as a result of the newly elected Government of the National Unity (GNU) led by the African National Congress (ANC) in 1994, numerous rural

development programmes and policies were put in place in an attempt to improve the QOL of many previously disadvantaged South Africans who stayed in the homelands. Below is a brief summary of these various rural development programmes that were planned for the amendment of the rural and urban divide as well as for resolving the service delivery imbalances of the past:

The Reconstruction and Development Programme (RDP) was introduced as a result of the history of apartheid and colonisation which created divisions amongst South African population in such a manner that whites received preferential treatment and were provided with higher standards of living; they obtained sufficient public services while the majority of Africans were ignored. Therefore, the ultimate goal of the RDP was to balance the provision of services to all. The programme ran from 1994 to 1996 (Kole 2005; Luiz 2002).

Kole (2005) states that in 1995, a scheme called the rural development strategy was introduced by government through the Department of Land Affairs. The main purpose of the strategy was to establish better equality in the use of land and other resources in rural areas, focusing mainly on infrastructure.

In 1996, the Government of South Africa approved a Constitution (Act No. 108 of 1996), that focused more on human rights of the country's inhabitants, especially the previously disadvantaged groups. As a result, three government spheres were created and different responsibilities were assigned. The developmental role was given to local government (municipalities) which, amongst other responsibilities, encompasses the provision of services such as electricity, water, sanitation, health care, refuse removal, housing, municipal roads, etc. (Bekink 2006; Constitution 1996; Kole 2005).

In 1996, the then President Dr Nelson Rolihlahla Mandela broadcast the closing of the RDP and an introduction of a macro-economic policy framework called Growth, Employment and Redistribution (GEAR). GEAR aimed at improving economic growth; creating employment opportunities; reducing budget deficits; redistributing wealth and stabilising inflation. The programme ran up to 1998 (South Africa 1996).

The Rural Development Framework (RDF) is a comprehensive strategy devised under the auspices of the Rural Task Team of the RDP office in 1997. It was not a new strategy per se but rather a status quo report which incorporated the rural development programmes of other departments (Kole 2005; The Presidency 2000).



In 1999, South Africa, in line with the international sphere, acknowledged the importance of community engagement by introducing a strategy called the Integrated Sustainable Rural Development Strategy (ISRDP), which was later transferred into an implementable programme called Integrated Sustainable Rural Development Programme (ISRDP). The aim of the ISRDS was to integrate local government struggles through harmonisation of Integrated Development Plans (IDPs). The programme also targeted at improving rural development through improved service delivery and boosting local economic growth. Unlike other programmes, however, the ISRDP does not have a budget of its own. The sustainability part of the strategy intended to foster local community participation and ownership. It was created mainly to address the unsustainable and uncoordinated mechanisms propelled under the RDP. The ISRDP is one of the key government programmes which seek to contribute towards poverty reduction. The ISRDP is also unique in that it tries to achieve the aim of poverty reduction through existing programmes and budgets, by making sure that all the programmes that are implemented in a district, in their combined effect operate in an integrated manner (De Beer & Swanepoel 1998; Department of Rural Development and Land Reform (DRDLR) 2000; Kole 2005; Public Service Commission (PSC) 2009; The Presidency 2000).

In its attempt to alleviate poverty in South Africa, government has devised an overall strategy or policy for delivering free basic levels of municipal services to indigents (those poor households who cannot afford to pay for basic services). These services apply to specified capped services in water, sanitation, energy and refuse removal that are provided at no cost to poor communities. In the year 2000, government declared a policy intended for the provision of FBS to poor households. This policy was adopted in 2001. A Free Basic Water (FBW) policy that directed municipalities to provide poor households with access to sufficient water free of charge was established in 2001 (Department of Water Affairs and Forestry (DWAF) 2002). In July 2003, the Department of Energy launched a Free Basic Electricity (FBE) policy (*Government Gazette* 2003). In 2008, DWAF created a Free Basic Sanitation Implementation Strategy as a guidance to all Water Services Authorities (WSAs) when implementing the National Free Basic Sanitation Policy. In 2009, a National Policy on Free Basic Refuse Removal was developed by the Department of Environmental Affairs. The FBS policy is a national government policy but can only be implemented by local government. The Municipal Indigent Policy Framework (MIPF) is aimed at improving the lives of indigent (poor) households and providing access to FBS. The policy clearly mandates municipalities to address the needs of the poor. The framework was approved in 2005 and implemented in 2006. The MIPF affords a foundation for the delivery of FBS to indigents (Department of Provincial and Local Government (DPLG) 2007).

Accelerated and Shared Growth Initiative of South Africa (ASGISA) was introduced in 2006 by the current government in order to promote small businesses, including creating incentives for investment and reducing unemployment, poverty and inequality. It is premised on the objectives of the RDP and was intended to phase out racial and sexist cultures. The initiative ran up to 2008 (South Africa 2006).

In July 2009, government introduced the Comprehensive Rural Development Programme (CRDP), which aimed at mobilising and empowering rural societies to be involved in initiatives that were directed at controlling their own destiny. The CRDP ensures that communities achieve development and social cohesion through value-added access to enterprise development, basic services and village industrialisation (Economic Development Department (EDD) 2014).

The New Growth Path (NGP) is a strategy framework for government which is mainly intended to promote decent job opportunities through economic transformation and inclusive growth, to increase skills, and to develop the economy of the country across South Africa (EDD 2014). The NGP plan was introduced in 2010 and it forms part of the National Development Plan (NDP), and is contained in Outcome 4. The NGP is also regarded as a medium-term approach for realising the long-term goals of the NDP. The NDP, on the other hand, is a plan aimed at uniting South Africans; unleashing its citizens' energies; growing an inclusive economy; building capabilities; and enhancing the state's ability in order to provide solutions to the complex problems the country faces. These two schemes are still in place even today (National Planning Commission (NPC) 2011; South Africa 2009).

According to Chapter 7 of the South African Constitution, all South African local government institutions are expected to deliver services to their societies in a manner that is sustainable and, more importantly, they need to administratively structure and manage their budgetary and planning processes in order to give priority to the essential needs of the people they are serving (Constitution 1996). This means that municipalities should concentrate on delivering services that are important for the improvement of the QOL of their residents. According to Koma (2010), the South African government has increasingly changed its attention from national and provincial spheres of government to the local government sphere in terms of resource allocation in order to make it effective and efficient. In layman's term, this means that government is focusing more on funding municipalities, as they are closer to the people than any other level of government. Koma (2010) further stipulates that government showed its interest in local government by putting in place certain

projects and initiatives, such as Project Consolidate in 2004, which was created to support low-capacity municipalities; the introduction of Municipal Infrastructure Grant (MIG), which was aimed at improving municipal infrastructure and cost government billions of rands; the formulation of intergovernmental legislation structures, which aimed at ensuring interaction between and among the spheres of government – both vertically and horizontally; and the construction of local government legislation such as the Municipal Finance Management Act (MFMA) (Act No. 56 of 2003), which was aimed at certifying sound financial management by municipalities.

In a South African context, this simply means the provision of basic services such as shelter (housing – formal dwelling, informal dwelling and traditional dwelling), water (piped (tap) water inside dwelling/yard, piped (tap) water on a communal stand, electricity (for cooking, heating and lighting), sewerage and sanitation (flush or chemical toilet and ventilated improved pit (VIP) latrines), refuse removal (by local authority and/or private company) and access to ICT services to all citizens.

Section 1 introduces the study, while section 2 highlights the applicable theoretical foundation of the study and provides case study examples from the developed and developing world, Africa and South Africa. Section 3 typically discusses the methodology that was followed; Section 4 contains the results and discussions, while Section 5 summarises and synthesises the main findings and provides policy recommendations.

### **1.1 Research problem**

South African municipalities have a constitutional mandate to provide basic services such as health, roads, housing, water, electricity, sewerage and sanitation, refuse removal etc. to residents in order to satisfy their basic needs. According to the Local Government Turnaround Strategy (2009), amongst the minimum service standards set by government for 2014 with regard to the provision of water, electricity, sanitation and refuse removal, were the following obligations:

- All households must have access to at least clean piped water 200 m from the household's yard;
- All households must have access to at least a VIP on site;
- All households must be connected to national grid; and
- All households must have access to at least once-a-week refuse removal services.

The main purpose for setting up the above standards was to accelerate service delivery, which addresses essential needs and which promotes growth.

Recently there has been a public outcry regarding service delivery in the country. Every day on the news we read and hear about service delivery protests in different towns and cities across South Africa, with angry rioters horribly vandalising public property in dispute against poor performance by the municipalities governing their towns and cities. The majority of such protests are attributable to service delivery failures, and this trend can be traced back to 2004 (Allan & Heese 2013; Nleya 2011).

## **1.2 Research questions**

There are six research questions which are based on the ISRDP nodes (a rural node is equivalent to an identified district municipality):

- 1.1.1 How have the average housing-delivery patterns in the ISRDP nodes changed from 2001 to 2011?
- 1.1.2 How have the average water-delivery patterns in the ISRDP nodes changed from 2001 to 2011?
- 1.1.3 How have the average electricity for cooking, heating and lighting patterns in the ISRDP nodes changed from 2001 to 2011?
- 1.1.4 How have the average sanitation-delivery patterns in the ISRDP nodes changed from 2001 to 2011?
- 1.1.5 How has the average refuse removal index in the ISRDP nodes changed from 2001 to 2011?
- 1.1.6 How has the average ICT service-delivery index in the ISRDP nodes changed from 2001 to 2011?

## **1.3 Aims and objectives of the study**

The aim of the study was to determine the changes in the service-delivery patterns in the ISRDP nodes from 2001 to 2011 as measured through housing (formal dwelling, informal dwelling and traditional dwelling), water (piped (tap) water inside dwelling/yard, piped (tap) water on a communal stand, and no access to piped (tap) water), electricity (for cooking, heating and lighting), sewerage and sanitation (flush or chemical toilet, pit latrine, bucket latrine), refuse removal (by local authority and/or private company) and ICT service-delivery indices.

The aims were achieved through the following objectives:

- 1.1.7 To perform a literature review of QOL theories and case studies applicable to rural service delivery in the developed and developing world, African countries and South Africa.

- 1.1.8 To define what is meant with rural areas in this study, which assisted in identifying the study areas.
- 1.1.9 To calculate average housing, water, electricity, sanitation and refuse removal indices for each ISRDP node for 2001 and 2011.
- 1.1.10 To determine the statistically significant changes in the average housing-delivery index in the ISRDP nodes from 2001 to 2011.
- 1.1.11 To determine the statistically significant changes in the average water-delivery index in the ISRDP nodes from 2001 to 2011.
- 1.1.12 To determine the statistically significant changes in the average electricity for cooking, heating and lighting index in the ISRDP nodes from 2001 to 2011.
- 1.1.13 To determine the statistically significant changes in the average sanitation-delivery index in the ISRDP nodes from 2001 to 2011.
- 1.1.14 To determine the statistically significant changes in the average refuse removal index in the ISRDP nodes from 2001 to 2011.
- 1.1.15 To determine the statistically significant changes in the overall average access to ICT services index in the ISRDP nodes from 2001 to 2011.

## **SECTION 2: LITERATURE REVIEW**

The literature first deliberates on the development, definitions and different approaches to measure QOL. Subsequently, the influence on QOL by different service delivery aspects including housing, water, sewerage and sanitation, solid waste management and ICT services for people residing in remote communities in the developed, developing and African countries and South Africa is discussed.

### **2. THE QOL CONCEPT DEVELOPMENT, DEFINITIONS AND DIFFERENT APPROACHES TO MEASURE IT**

The concept of QOL started forming part of extensive scholarly (academic) discussions in the 1960s and then later progressively developed into being a key public and government concern. Research on QOL has developed considerably, displaying more depth of analysis of its determining factors as well as the use of various techniques in order to recognise the real issues surrounding the subject of QOL (Chan et al. 2005; Kitchen & Muhajarine 2008).

QOL and well-being are used interchangeably in the literature nowadays. In the olden days, however, scholars suggested that well-being be applied when referring to objective general life circumstances of the entire populace, while QOL on the other hand should be used only when referring to individuals' subjective life valuations. Currently, the difference between these two terms is no longer practical in literature. When assessing their well-being, people often look at their own direct surroundings, family and living circumstance, before they examine the overall representation or broader spectrum of QOL. QOL has various and often competing explanations, which makes it challenging to measure and also to incorporate into a scientific research. It is therefore considered a difficult and complicated concept. The theory of QOL emphasises the self-perceptions of a person's present state of mind (Chikowore & Willemse 2017; Kapuria 2013; Theofilou 2013).

For the formulation conceptualisation of QOL, theoretically speaking, there is no single standard procedure of instituting the analysis of life; different conceptualisations are used by different academics. QOL refers to some qualities of individuals such as education or health achievements (both mental and physical) or environmental conditions under which people live such as poor housing or water and air pollution (Kapuria 2013; Pacione 2003). Chan et al. (2005) make a distinction between QOL and standard of living. The latter denotes the level of achieved satisfaction in basic materialistic needs, while the former refers to the satisfaction in emotional needs, such as being

satisfied with freedom, justice and opportunities for the complete development of individual capabilities, on top of life chances and satisfaction in basic physiological needs. Kironji (2008) shares the same sentiments with Chan et al. (2005) by saying the objective of a development policy is to advance the living conditions of humans and in that one improves people's QOL. Thus, a poor standard of living deteriorates people's well-being. QOL therefore is closely associated with Maslow's Hierarchy of Needs in that it first starts with the satisfaction of physiological needs of a person up to the subjective feelings of fulfilment in a manner that a person first achieves the basic needs before moving on to the higher order needs of self-satisfaction (Chan et al. 2005).

A list of indicators for QOL is given in the study by Kironji (2008). These are education level; dwelling type; water source; distance from water source; energy for cooking; energy for lighting; energy for heating; toilet facility; access to telephone; health care facility available; employment; job status; transport used to get to work; household income; and access to medical aid. These indicators are similar to what has been articulated by Moller (2001) in her article, according to which indicators range from climate, crime, employment, recreation, health care to cost of living and how these impact differently on QOL. QOL extends from material overall well-being of individuals to take into account their emotional comfort as well (Chan et al. 2005; Theofilou 2013).

QOL is measured using two approaches, namely objective and subjective methods. The objective method refers to the exogenous facts and factors of life that determine an individual's satisfaction with life as a whole, while the subjective method is the endogenous perception and valuation of these facts and factors of life by individuals. Thus, objective QOL makes use of quantitative variables and statistical techniques such as frequencies, while subjective QOL focuses only on individually expressed variables which differ from one individual to the other and can only be measured by the individual who gave them; for example, levels of fulfilment and satisfaction. Measuring QOL therefore started with the objective approach, which largely consisted of economic procedures that employed quantitative measures such as unemployment rates to assess the overall well-being. Then later, researchers found these quantitative methods inadequate to measure QOL and turned to other subjective approaches which question an individual's personal experiences (Chikowore & Willemsse 2017; Kapuria 2013; Lamit et al. 2013; Theofilou 2013). The development of other QOL measurement approaches as indicated earlier, was due to the fact that, for several decades, assessment of quality of human life and monitoring of the evolution of the societal environment thereof were only piloted in monetary terms using for example, the Gross Domestic Product (GDP) and Gross National Product (GNP), and that was not enough for researchers to draw decisive conclusions (Chan

et al. 2005). From the subjective analysis therefore, life satisfaction is mainly a cognitive summary assessment of one's life conditions in which individuals make their own ruling about different life aspects (Idris et al. 2016; Kironji 2008).

Both the objective and subjective approaches have advantages and disadvantages. The advantages of objective indicators are as follows: as the name suggests, they are considered objective because they are definable and quantifiable, thus they allow local and global cross-section and time series comparisons. They therefore make policymaking easier. Additionally, the objective indicators time and again reflect on normative ideals of the society. This means that objective indicators evaluate societal aspects that are based on widely shared values; for instance, people value the absence of crime in an area. The disadvantage of the objective approach is its subjectivity when it comes to selecting indicators and assigning values to such selected indicators. The advantages of subjective well-being, on the other hand, are as follows: it captures the important individual life experiences whether positive or negative, and these are comparable across domains (usually across time and regions). The disadvantages of subjective well-being are that it is very difficult, if not impossible, to validate the trueness of one's state of happiness as individuals usually misrepresent in their responses and people adapt to situations; thus, people get used to bad circumstances and they end up being happy under such nasty conditions (Kironji 2008).

What can be reasoned from the literature is that QOL is a wide theme. It therefore can also be concluded that there is no universal definition of QOL that can be used as a yardstick for its measurement. However, the general meaning of the QOL concept transmits to reaching the overall well-being, life-satisfaction, and contentment by different individuals.

### **2.1 The influence on QOL of service-delivery scenarios faced by people residing in rural areas**

All people aim at improving; therefore, in order to get improved QOL, they need to access different amenities and resources. For people's well-being as well as the country's economic expansion, access to basic services plays a key role. From the point of view of the current study, focus will be on the following service delivery indicators only:

- Housing (formal dwelling, informal dwelling and traditional dwelling);
- Water (piped (tap) water inside dwelling/yard, piped (tap) water on a communal stand, and no access to piped (tap) water);
- Electricity (for cooking, heating and lighting);



- Sewerage and sanitation (flush or chemical toilet, pit latrine, bucket latrine);
- Refuse removal (by local authority and/or private company); and
- Access to ICT services (e.g. cellular phone, computer or a landline to all citizens).

It is for this reason that provision of these services to residents, irrespective of the level of income and geographical location, is generally seen as a crucial public policy objective (Chikowore & Willemse 2017; Mahadea 2014).

### **2.1.1 The influence of housing conditions on QOL for people residing in rural areas**

Some of the key indicators of good QOL are the housing satisfaction and satisfaction with the neighbourhood conditions. Dissatisfaction sometimes amounts to high stress levels and relocating among households (Auh & Cook 2009; Salfarina et al. 2011). Generally, the provision of housing cannot be left to governments and the private sector as they are failing to meet the demand. There is therefore an escalating need for housing co-operatives which are capable of delivering shelters to those members where government and the organised private sector are unsuccessful. This is the result of, amongst other things, unfavourable economic conditions within countries (Housing Assistance Council (HAC) 2012; Makgetlaneng 2010; Makinde 2014).

For many countries in the world, including South Africa, the right to adequate housing that is secure, safe, healthy, inexpensive and available is considered a basic need and at the same time, affordable and good quality housing reflects high QOL (Salfarina et al. 2011; Stats SA 2012b; UN Habitat 2001). Housing therefore, being a basic human need, directly and indirectly impacts on the households' lives, including health, welfare and social status. A distinction though needs to be made between formal housing and an informal dwelling. A formal dwelling structure is defined as a genuine construction with foundations and a roof. Such dwellings can be found as single units or in clusters and by definition, this category definitely excludes traditional dwellings (including huts, rondavels, etc. made primarily of clay, mud, reeds, grass or other locally available natural materials). A good example of traditional dwellings is found in La Zaranda, a town in rural Peru where the houses are made of adobe (a mud and straw mixture) and rarely have indoor plumbing (Empower Dex, Economic Empowerment Rating Agency 2009; McAllister 2015; Nevondwe & Odeku 2012). Informal dwellings on the other hand, are defined as unstructured and illegal shantytowns with the absence of basic infrastructure and services, which are often built with materials of temporary nature that are generally below par and do not last long. In addition to the above, Stats SA defines informal dwellings

as makeshift structures not approved by a local authority and not intended as a permanent dwelling. These are typically built with found materials (corrugated iron, cardboard, plastic, etc.). Rural villages are characterised by these kind of settlements (Bosman 2014; Meth 2017; Stats SA 2012a; Tredoux 2009).

Although the housing costs are low in rural areas as compared to urban areas for most of the developed world (countries such as the United States of America or United states (USA or US), Germany and North Korea), rural households have lower income and higher rates of poverty as compared to the city dwellers. Thus, not all can afford housing according to their own aspirations. Only those who are earning a relatively higher income can afford what is so-called affordable housing. In rural America, communities and households are still faced with housing problems because of a lack of diversification and economic vitality. In America, federal support for affordable housing is facing enormous financial pressure and as a result, it is shrinking when people need it the most. In the rural locations of Australia, the supply of affordable housing is tremendously short and as a result, access to adequate housing is a key concern for all citizens. This shows that even in the developed world, the demand for social housing is higher than the supply. Thus, the percentage of households who legally qualify for social housing is by far more than the proportion of social housing in the overall stock (HAC 2012; Lubka 2001; Rapoza & Mickelson 2013; Scanlon et al. 2015; Zuffeerey & Chung 2015).

The developing countries mainly in South America, South Asia and Africa have more than a billion people that are living without suitable shelter or live in unacceptable housing. These people who are said to be living in hostels, traditional dwellings and shacks are usually poorer than those living in formal dwelling structures. Even though Africa has a heterogeneous housing sector, it appears that most poor countries are experiencing malfunctioning housing markets. This is because procuring, developing and transferring residential land is time-consuming and costly. As with the case of the developed world, the developing countries in Africa are also faced with a higher demand than the supply could cater for, which results in over-crowding and overburdening of other infrastructure networks, which in turn give rise to poor housing conditions. Such conditions impact negatively on people's QOL and government intervention is always relied upon (Ngwane et al. 2002; World Bank 2015). Additionally, statistical trends show that the majority of the countries boasting the highest number of people residing in rural areas are found in Asia and Africa. Within Africa, the numbers rise to even higher proportions in the sub-Saharan Africa countries. For example, in Asia, the numbers increase as one enters East and South-East Asian countries, such as Nepal, where 81.76% of Nepalese inhabitants occupy rural zones. Another category of countries found to have a high incidence of their

peoples residing in rural areas are in the Oceania region of the South Pacific to the southeast of Asia. In Samoa and the Solomon Islands, 80.745% and 78.12% of the population, respectively, inhabit rural areas. Likewise, in Burundi and Uganda, 88.24% and 84.23% of the people, respectively, reside in rural districts. Africa is the least urbanised continent in the globe, taking only 11.3% of the world's urban population, and the sub-Saharan region is the continent's least-urbanised area (World Bank 2015).

In 2001, close to 2 million South African households were housed in informal settlements (excluding those in traditional dwellings). It was for that reason that government in 2004, made an announcement that by 2014, it wants to get rid of such housing backlog. The policy stipulated that this upgrade of informal settlements needs to be achieved by delivering fully serviced homes (bigger than the apartheid house, having basic services such as electricity, water, sanitation etc. and with freehold title) (Del Mistro & Hensher 2009; Stats SA 2012b; Tshikotshi 2009). Within South Africa, most informal housing is constructed from relatively basic, temporary, non-weather-proofed materials (namely cardboard, mud, plastic, wooden boards and metal) and usually are single-storey dwellings. This kind of settlement is seen in the ISRDP areas as identified, and are characterised by traditional dwellings (including rondavels) which are made of perishable materials such as mud blocks, daub and wattle. These are temporary in their very nature and easily surrender to bad weather conditions; something which negatively impacts on the occupants' QOL (Le Roux 2011; Ngwane et al. 2002; United Nations (UN) 2003). This situation is still prevalent in South Africa even today despite the fact that since 1996, government through the RDP has been giving decent free houses to low income earners residing in informal settlements (Stats SA 2016b)

Tenure is defined as the legal right to occupy property or land or the continued right to continue renting property. The former homelands in South Africa have land under communal tenure. As the ISRDP areas mostly fall within the homelands, their population lives in traditional dwellings and informal settlements, which lack security of tenure, are overcrowded with no privacy, lack potable water and domestic electricity supply, have inadequate sanitary facilities (including waste disposal), and are situated in life- and health-threatening conditions (Kilian et al. 2005; Le Roux 2011; Ndinda et al. 2011; Tredoux 2009).

### 2.1.2 Access to safe drinking water in rural areas

Approximately forty per cent of the population across the globe has no access to satisfactory provisions of water and sanitation services, which is key to sustain human health. Actually, more than 780 million people do not have access to safe water supplies, and about 2.5 billion people lack access to basic sanitation world-wide (Bouabid & Louis 2015; Jones & Silva 2009). Safe water is one of the most basic services that people cannot do without; in fact, both safe drinking water and wastewater sanitation are globally renowned as key elements of public health. It is also well recognised across the globe that absence of these basic commodities causes millions of yearly avoidable life losses among vulnerable populations. It is anticipated that each year globally about 1.6 million children under five years of age are killed by unsafe water coupled with a lack of basic sanitation. In 2012, approximately 89% of the world population had access to an enhanced source of drinking water, and 64% had access to an improved sanitation facility (Daley et al. 2015; Ngwane et al. 2002; World Health Organization (WHO) 2006; WHO 2014).

It is worth mentioning that even though Canada is a first-world country, some of its residents who are known as Aboriginal (local) peoples still receive a relative substandard state of safe drinking water and wastewater sanitation. Aboriginal communities have got almost 20% of all advisories for drinking water with, more often than not, conditions analogous to those experienced in developing countries. This population group, however, represents less than 5% of the Canadian total population (Daley et al. 2015; Ford et al. 2010).

In the rural areas of the whole developing world, drinking water exposure from an improved source is still inadmissibly minimal. In 2004, less than 50% of the rural population had coverage of enhanced drinking water in 27 developing countries across the world. Only one in two people has access to some kind of improved sanitation facility (WHO 2006). In sub-Saharan Africa, even though characterised with endowments including a rich aquifer and a tropical climate, the residents in this sub-region still suffer from water scarcity. Two out of five people without access to an enhanced drinking water source live in Africa. For example, the majority of the Democratic Republic of Congo (DRC) inhabitants have no access to water; approximately 78% of the population do not have access to water facilities, and 66% of waterworks in the rural areas are malfunctioning. As a result of this extremely limited access safe drinking water, coupled with insanitary environmental circumstances, diseases such as typhoid, cholera and dysentery develop. Most of the 40 countries that are lagging behind in meeting the Millennium Development Goals (MDGs) as far as the target pertaining to safe

drinking water is concerned, are from sub-Saharan Africa. The same applies to sanitation (Makgetlaneng 2010; Sambwa et al. 2008; WHO 2014).

For South Africa, government made an attempt in 2001 to minimise service-delivery arrears and to ensure that the basic needs of households are met in as far as water is concerned by mandating the Department of Water Affairs and Forestry (DWAF), now known as Department of Water and Sanitation (DWS) that households receive up to 6000 litres of free water per month. The subsistence level of this free water, however, still needs to be measured in the context of larger families, those living in backyard shacks on the same property and people involved in subsistence activities (Kilian et al. 2005). Nationally, 73.4% of households have access to piped water in either the dwelling or yard, constituting an increase of 11.1% from the 2001 Census figures. Those in rural villages and certain townships are excluded from that list as they are getting water outside the yard. They form part of the 17.9% that are either getting piped water at a distance of 200 m from the yard or above. Those that are getting it at a distance greater than 200 m from the yard travel longer distances for water, which is outside the RDP standards (Stats SA 2012b).

### **2.1.3 Access to electricity in remote communities**

Energy plays a dominant part in tackling two big problems faced by the world: fighting poverty and addressing climate change. Smart-designed policies for energy are capable of simultaneously fighting poverty and addressing climate change when properly implemented (Clark 2010; United Nations Development Programme (UNDP) 2011). Electricity is regarded as the most flexible, modern source of energy and one of the primary driving forces that motivate the provision of basic services in rural areas as well as the development of every community. Access to energy is still constrained in many remote communities of the world. Simple and inexpensive indigenous sources of energy such as biomass for cooking and kerosene lamps or candles for lighting is the only access in these locations. This shortage in energy is perceived by the World Bank and the International Energy Agency (IEA) as a main hindrance to realising economic development of the communities as well as to finding satisfactory admittance to health services and clean water.

The estimates made by the World Bank in 2014 demonstrate that about 1.2 billion people worldwide were without electricity and that it was not feasible to connect them to the existing electric grid within the next five to ten years from then. Those estimates consisted of the 93% from Africa and Asia (about 587 million and 675 million, respectively), while the remaining 7% lives in Latin America (31 million), the Middle East (21 million), and the developed countries. In Canada alone, roughly 200 000

residents in 280 communities across the country are categorised as off-grid communities by Aboriginal Affairs and Northern Development Canada (AANDC) because they are not connected to the North American electric grid. It is also worth noting that if government does not take concerted action by involving the private sector in the provision of electricity (forming Public Private Partnerships (PPPs)), the IEA estimates that by 2030, nearly 1.4 billion people (which is 18% of the world's population) will still be in the dark in as far as electricity access is concerned (Arriaga et al. 2014; Organisation for Economic Co-operation and Development (OECD) & the World Bank 2006; UNDP 2011; World Bank 2006).

In the past couple of years, many developing countries extended electricity and clean cooking fuels to a number of households, both in absolute and relative terms. Below are a few examples that serve as proof to the statement above. In 2008 electrification rates in the Socialist Republic of Viet Nam and China reached 95% and 99% of households, respectively. In the Federative Republic of Brazil, the percentage of the population using modern cooking fuels increased from 16% to almost 100% between 1960 and 2004, while more than 95% of the population was connected to the national electricity grid. In the Pacific, the Republic of the Fiji Islands increased rural access to electricity from 30.6% in 1986 to 81.4% in 2007 (UNDP 2011). This, however, is not universal across all the developing world. About 1.3 billion people who have no access to electricity live in the developing countries (limited in Asia but wider in Africa). Some 590 million of them live in Africa, where the rate of electrification in rural areas is predominantly low. Moreover, most of them live in rural areas of developing countries which are often isolated with a scattered population and characterised by poor infrastructure and services. This is so despite the fact that access to electric power supply significantly promotes improvements in all the society sectors. Cooking energy, in particular, has received comparatively less attention, with just a few developing countries setting targets for access to modern cooking fuels or improved cookstoves, or targets for reducing the share of the population relying on traditional biomass. Fuelwood is the primary energy source for domestic purposes throughout the developing world, in both urban and rural environments. Work in Zimbabwe, Kenya, Mozambique, Tanzania and South Africa, to name a few, has shown that the vast majority of rural households rely extensively upon fuelwood as their basic energy source and that this has changed little over the last few decades, despite increasing population pressures and changing socio-economic and environmental profiles (Azimoh et al. 2017; Lenz et al. 2017; Madubansi & Shackleton 2007; Mandelli et al. 2016; UNDP 2011).

Electricity is still distant to many people around the world, including two out of every three people in sub-Saharan Africa, and for those that do have access to it in this region, they are challenged by unreliable, insufficient and among the most costly supply in the world. Approximately 80% of people who do not have access to electricity in sub-Saharan Africa live in rural areas. There are close to a billion people in the region who still depend on solid biomass for cooking, which pollutes the air – especially when it is used indoors with inefficient cookstoves – and that in turn results in over half a million premature deaths in Africa each year. This situation is worse in rural Ethiopia where almost all households rely on solid biomass (primarily fuelwood, charcoal and agricultural waste) for cooking (Madubansi & Shackleton 2007; UNDP 2009; World Energy Outlook (WEO) 2014). Countries such as Congo, characterised by low population densities, are seriously struggling to connect their rural parts because it becomes too costly to supply electricity from the grid, as such areas are normally dispersed and therefore, off-grid renewable energy sources, mainly photovoltaic, play a crucial role in the electrification process (Madubansi & Shackleton 2007; UNDP 2011; WEO 2014).

Almost every year, South Africa is beset by protests for service delivery, which makes it crucial to evaluate the existing levels of provision of services received by the population. This is so despite the fact that the South African government is devoted to universal access to basic services, including electricity for all citizens across all provinces in the country. The estimated electrification rate in South Africa was around 75% in 2013. There is still 25% of the country which is not electrified through the grid due to the uneconomical cost of extension lines or the difficult terrain – especially in rural areas. With 80% of urban areas and 45% of rural areas connected to the national grid, the South African government has shifted the focus from the urban to the rural areas of the country. Possible grid electricity is being expanded as far as is possible into the rural areas. However, due to high transmission and distribution system costs to these areas, the current expenditure related to the upgrading and construction of new power stations and the relatively low demand for electricity within these remote communities, many households and communities might remain disconnected to the national electricity grid for the foreseeable future (Bonhuys et al. 2016; Kusakana 2014; Municipal Infrastructure Investment Framework (MIIF) 2011; Van Ruijven et al. 2012). The use of renewable energy sources is still low in South Africa. The reason is the higher cost of energy produced by renewable sources compared to the cost of energy produced from the currently used coal power plants (De Groot et al. 2013; Kilian et al. 2005; Kusakana 2014). A WEO report indicates that even in South Africa, traditional use of solid biomass is still heavily relied upon in rural areas and among those with the lowest incomes. Thus, the choice of fuels for cooking is much more varied in urban areas than in

rural areas. Furthermore, over a decade after the introduction of electricity in rural areas, over 90% of households in certain villages of Bushbuckridge Local Municipality (LM) still use fuelwood for thermal purposes, especially cooking, and the mean household consumption rates over the 11-year period have not changed, even with a policy of 50 kilowatts hours (kWh) of free electricity per month (Madubansi & Shackleton 2007; WEO 2014).

In South Africa, electricity is categorised into three components, namely electricity for lighting, electricity for cooking, and electricity for heating. All these categories indicate an increase in consumption between the censuses of 2001 and 2011, as explained below. Household usage of electricity for lighting increased from 69.7% in 2001 to 84.7% in 2011. Similarly, electricity as a source of energy for cooking shows an increase from 52.2% in 2001 to 73.9% in 2011. In the same way, the proportion of households using electricity for heating has increased from 49.9% in 2001 to 58.8% in 2011. All the South African provinces, both urban and rural, reflected an increase as well for all three kinds of electricity. Despite the increased access to electricity, large numbers of people are reliant on other forms of energy for lighting, heating and cooking. These range from wood, paraffin, and coal, to gas, candles, solar power, and animal dung (Kilian et al. 2005; Stats SA 2012b).

Concerning electricity provision in the ISRDP nodal points, Stats SA (2016a) reflects that the proportion of households that are using electricity for lighting has increased in all the ISRDP nodal areas. The census results depict an improvement between 2001 and 2011 in as far as electrification of rural nodes is concerned, and the proportion of families using other alternative sources of energy has decreased significantly. Of great concern though, is the fact that one in five households in the nodal areas was still using candles for lighting purposes in 2011. Solar energy as a type of energy used for lighting showed the biggest increase (100% increase from 2001 to 2011), while the use of gas remained constant over the same period (Stats SA 2016a). Data shows that by 2011, the majority (56.0%) of households in the rural nodes used electricity for cooking. Only 38.6% of households used firewood and paraffin combined compared to 67.3% of households that used firewood and paraffin combined during 2001. The use of coal for cooking decreased by almost seventy-three per cent (72.7%) over the same period. Even though the use of wood as a source of energy for cooking also decreased over this period, a higher than expected percentage of households still used wood (31.1%) in 2011. As far as energy that is used for heating is concerned, the situation is slightly different. Heating is very much a part of life for South African households – especially in winter. It is a known fact that households cannot do without fuel for heating. In 2001, more than half (53.5%) of households in the nodal areas depended on firewood for heating, and hardly a quarter of the households used



electricity for heating. But by 2011, most of the households were using electricity for heating while dependency on fossil energy was on the decrease. It was also evidenced that the proportion of households using electricity for heating purposes increased from 22.6% in 2001 to 43.2% in 2011, which is an increase of 20.6 percentage points. The proportion of households using paraffin and wood fell from 14.2% and 53.5% in 2001 to 12.3% and 39.6% in 2011, respectively, while the use of coal and animal dung declined by about a half to 1.8% and 0.9%, respectively. Although about a quarter (25.9%) of households that used wood as a source of energy for heating during 2001 switched to other sources of energy – presumably electricity – firewood was still used by about two-fifths (39.6%) of the households as a source of energy for heating in 2011. This is only second to electricity (43.2%), which has become the most common source of energy for heating in the nodal areas (Stats SA 2016a).

#### **2.1.4 Access to sanitation in rural communities**

Until the turn of the century, the sanitation catastrophe was a low priority topic in much of the developed world, but one that affected the quality of life for billions of people globally (Barnes 2014). Presently, the right to sanitation has been acknowledged internationally. In July 2010, the UN General Assembly approved a resolution affirming the right to safe and clean drinking water and sanitation as a human right that is essential for the full enjoyment of life and all human rights. This was reaffirmed by the UN Human Rights Council (HRC) in September 2010, with a resolution confirming that this right is legally binding in international law. Although there has been progress in the delivery of clean water, there are evident lags in the delivery of sanitation facilities (Socio-Economic Rights Institute of South Africa (SERI) 2011).

In the developing countries, only one in two people has access to some kind of improved sanitation facility (WHO 2006). Many households do not have access to adequate sanitation facilities. It is depressing to say that 68% of people in five fringe settlements in Niger state, Nigeria, are susceptible to unimproved sanitation practice. This deficiency suffered as a result of this inferiority means that people's rights to proper sanitation facilities has been disturbed (Sanusi 2010). The apparent lack of progress in sanitation provision is due to the combination of a growing population and the number of households, as well as relatively low levels of delivery. Consequently, inferior forms of sanitation persist in many areas, resulting in high incidences of water-borne diseases, for example cholera and typhoid (Hemson & Owusu-Ampomah 2005; Kilian et al. 2005).

The outbreak of cholera in KwaZulu-Natal (South Africa) in 2001 is an example of the result of poor access to sanitation in the country. For sanitation in South Africa, there are three categories of toilets

used, namely flush, chemical, and dry toilets. Whilst the 2011 Census results for the ISRDP rural nodes indicate a percentage increase in households using flush and chemical toilets between 2001 and 2011, there was a percentage increase in households using pit latrines (with or without ventilation pipes) in these rural nodes in the same period. Conventional pit latrines, which consist of a rudimentary top-structure built over a pit which collects waste, generally have inadequate ventilation and are vulnerable to odours and flies. They are not considered an acceptable form of basic sanitation (SERI 2011; Stats SA 2016b).

A huge service delivery gap between rural and urban municipalities is prevalent throughout South Africa. What is even demoralising, is the poor service delivery levels to communities within the former homelands in the Eastern Cape, North West and Limpopo provinces and the rural areas of KwaZulu-Natal (Empower Dex, Economic Empowerment Rating Agency 2009).

### **2.1.5 Waste collection and disposal in rural areas**

Goal No. 7 of the MDGs report requires that government has to ensure environmental sustainability. This is indirectly advocating for municipal solid waste management (MSWM) by local authorities in order to oppose the negative impact on the environment as well as to ensure that the sustainability of the environment is incorporated into the programmes and policies of all the member countries (MDGs 2005; Troschinetz 2005). Municipal solid waste (MSW) management is the most important service a city provides. In low-income countries as well as many middle-income countries, MSW is the largest single budget item for cities and one of the largest employers. Waste is generated by human activities. Once waste generation starts to increase, it creates additional problems to the environment, which in turn pose a threat to both human and ecosystem health and negatively affect QOL if not properly taken care of. Studies show that most municipalities, especially those in rural areas, are incapable of managing waste due to different challenges, including financial, institutional, knowledge, regulatory, public participation and technical challenges (Glanville & Chang 2015; Henry et al. 2006; International Finance Corporation (IFC) 2014; Ngoc & Schnitzer 2009; Van der Merwe & Steyl 2005; Zurbrügg 2002).

Many developed countries, including Australia, France, Ireland, Italy, Japan, the United Kingdom and the USA, regard the unlawful disposal of waste as a significant management problem, especially in rural areas. This is because illegal waste disposal causes pollution, which relentlessly affects the quality of several natural resources, including land, flora, sea, air, soil and groundwater. These pollutants in turn have a negative impact on human health – particularly in cases where people have

prolonged exposure to illegally dumped waste, whether direct (e.g. contact with decomposing waste) or indirect (e.g. contact with contaminated water or crops) and also hasten climate change, which in turn worsens the effects of natural disasters (Glanville & Chang 2015; IFC 2014; McAllister 2015; Romeo et al. 2003).

In the earlier years, in the USA, rural solid waste items that were burnable were burnt, and those that could not be burnt, parked, composted or sold for scrap, would be thrown in pits in nearby valleys. Nowadays, that is history; rural household waste is collected by professional services and sent to landfills; plastics are taken to town to be recycled. This is the progress made in rural USA even though the pace of change is not progressing as speedily as is the case in urban areas. However, rural areas in general have lower waste generation rates because rural residents are usually poor; they purchase fewer store-bought items (which results in less packaging), and have higher levels of reuse and recycling (IFC 2014).

For Southeast Asian nations such as Indonesia, Malaysia, Singapore, Thailand, the Philippines, etc., policies are formulated by government to protect the environment. These policies, however, are only implemented in national capital cities and not in small towns and rural villages. Rural areas still make use of open dumping as a method of solid waste disposal because municipalities do not cover these areas as part of their collection. Thus, in these areas, waste is universally deserted on the sides of the road or it is dumped straight into rivers and waterways for the following reasons (amongst others): lack of environmental awareness; land acquisition problems; insufficient waste-collection; transfer system; lack of funding for such a service; poor SWM; and lack of enforcement by authorities (Ngoc & Schnitzer 2009).

For the developing world, SWM conditions in the developing countries are time and again fairly awful and indicative of those found in the first-world countries many moons ago. A case study piloted in numerous rural Indian cities found that trash was repeatedly thrown or burnt in unregulated areas. La Zaranda, a small town in rural Peru in South America, is no exception. There were rarely trashcans or recycling programmes and waste management services were inconsistent. Often families resorted to dumping waste in the streets or burning it in pits in the yards of their homes (McAllister 2015; Narayana 2009). In Nigeria, there is not enough waste management service coverage for most urban areas, and in rural areas there is no collection of refuse. Thus, rural inhabitants are deprived of their right of access to proper waste management services, and as a result they simply dump waste at any public space, vacant plot and river or burn it in their backyard, thereby polluting the air (Ogwueleka

2009). Kenya had poor suburban zones wherein indiscriminate disposal of MSW at the river sides, road reserves, and roadsides was common (Henry et al. 2006). In Mexico, the majority of rural towns, which constitute the biggest part of the country, do not have the necessary solid waste collection services (Troschinetz 2005).

In South Africa, local municipalities (LMs) are certified to collect, handle and dispose of domestic waste from all households and to ensure an equitable service to their communities. However, a number of known sites for waste disposal are not licensed and across the country, there are countless illegal communal dumping sites, many of which do not conform to the mandatory environmental health standards. When it comes to rural coverage, South Africa is no exception to the rest of the developing world: local authorities in several remote rural areas provide no service at all. Even though burning of waste is considered harmful to the environment in general and to human health in particular (because it produces particulates and other dreadful gases), rural dwellers are left with no option but to burn refuse (Kilian et al. 2005). Van der Merwe & Steyl (2005) seem to agree with Kilian et al. as they stipulate that in South Africa, the challenge of rural waste management has been extremely neglected and largely ignored, if not left to the manoeuvres of rural landowners or the inhabitants themselves. This means that on-property disposal accounts for the bulk of waste generated in rural areas. This desertion more often than not results in hazardous and diffuse land and water pollution, poses a threat to the health of rural people and causes serious problems for the environment.

With regard to the ISRDP nodes, the proportion of households that had a refuse disposal service where the refuse is removed by a local authority at least once a week increased from 19.9% in 2001 to 23.5% in 2011, while the proportion of those whose refuse is removed less often remained constant at 1.1% over the same period. The percentage of households using a communal refuse dump rose by 0.5 percentage points, representing a 45.5% increase between 2001 and 2011. It was also noted that there was a minor increase (4.2%) in those households that have their own refuse dump, while those with no rubbish disposal dropped by 35.7% from 18.5% in 2001 to 11.9% in 2011. Even though there has been some improvement in refuse removal, it is still concerning that a high percentage (61.8%) of the nodal area households have to have their own refuse dump and 11.9% of that same population had no rubbish disposal at all in 2011 (Stats SA 2016a).

### **2.1.6 ICT services in rural communities – public service delivery perspective**

In recent years, ICT – the Internet in particular – has turned out to be the major transmitter in stimulating growth and sustainable development in the global economy. Fan (2005) believes that there is enough proof that both developed and developing countries can advance their social, political and economic well-being if they participate in the global information network. Similar to most countries, Australia and China consider the Internet as an influential instrument for national economic and social development. However, due to a lack of competition at the backbone layer in both these two countries, the costs of internet service providers (ISPs) to enter the backbone networks are fairly high. Many rural communities in the US were bypassed by the Internet revolution and were put at a substantial economic disadvantage. In retaliation, these rural communities had to adopt projects that are self-developmental in nature to compensate for the market failures caused by the Internet revolution (Fan 2005). In the USA, residents of rural areas in particular, are increasingly concerned that they are not fully plugged into the new digital economy. Consequently, rural (non-metro) counties are more likely to have both fewer switches and switches with lower levels of digital capability (Malecki & Boush 2003). Bandias & Vemuri (2005) bring about a similar case for Australia. They state that telecommunications access in the rural and remote areas of Australia has come under considerable scrutiny in recent years and that they are at risk of certain telecommunication impediments such as insufficient infrastructure, absence of service provision, the high access costs and thin markets.

During the mid-1960s, telecommunication services could not compete with the basic needs, including provision of food, water, health, roads, electricity, education, and other essential infrastructure resources. There was a strong belief that telephones originated after a certain level of development has been accomplished, and then enabled the accomplishment of new advanced developmental levels. The underlying connection between access to telephone services and economic and social development was vague. Over the past two decades, however, the situation has changed intensely. The changing role of telecommunication services in all economies, and the growing research literature detailing the restrictions, barriers, penalties and costs of insufficient telecommunication services for partaking in economic and social life in all countries have taken the subject of telecommunication development to the forefront of investment and policy analysis. Access to basic telecommunication services makes it more efficient and practicable to create and uphold access to essential needs such as food, water, health, education, etc., in the poor countries. There is, however,

a need for regulatory agencies in most OECD countries to improve connectivity in rural areas and to protect consumers from operator abuse (Melody 2000).

The rural areas of the developing world also face some challenges in as far as the ICT infrastructure is concerned. For Tanzania, these problems are similar to those cited for the developed world above, including but not limited to these: high cost of establishing such infrastructures, lack of electrical energy, and low ICT literacy. These ICT (rural-area bound) shortcomings can be overcome by making use of PPPs models in implementing ICT projects that are sustainable in rural areas (Simba et al. 2012).

South Africa also recognises telecommunication as one of the solutions to sustainable economic development. Mobile operators such as Vodacom, Mobile Telephone Network (MTN), CellC, etc., are already reaching people in rural areas without roads, rail or a stable power supply. Telecommunication in South Africa is also a fast-moving, high-technology field where technology transfer occurs frequently (Pieterse & Pretorius 2002). Hemson et al. (2004) mention one of the achievements of the ISRDS as being the extension of cellphone networks as well as TV signals to rural areas. This ensured that a number of rural households are now enjoying the benefits of such services.

Stats SA (2016a) revealed that ownership of assets by households in the nodal areas experienced a significant amount of transformation during the ten-year period between the two censuses. The overwhelming majority of households in these areas had attained modern means of communication by 2011. At least four out of every five households owned a cellular phone, and ownership of various assets across the board had increased, except for a radio and a landline telephone.

Landline use has shifted to cellular phones as indicated by the Census 2011 results. The ownership of landline telephones decreased by 41.6% between 2001 and 2011. The second largest percentage increase was recorded for those households who owned a computer, which increased by 280% – from 2.5% in 2001 to 9.5% in 2011 (Stats SA 2016a).

## 2.2 Service delivery infrastructure and its impact on QOL in remote communities

Infrastructure is considered the backbone of every human settlement (Adaku 2016). Bandias & Vemuri (2005) have noted that in the rural and remote areas of Australia, there is a lack of adequate infrastructure for provision of services such as telecommunication. This means that these residents are hindered the opportunity to benefit from the information age. Rural America is making use of companies such as National Rural Electric Cooperative Association (NRECA) and NTCA – The Rural Broadband Association to develop infrastructure in such areas so as to make rural markets vibrant places in which to live, work, and raise a family, and to help them remain competitive with technological innovation. This enhances their quality of life significantly (NRECA 2015).

There is a positive correlation between infrastructure and economic growth; however, derisory infrastructure is the key vital developmental encounter for the developing world, especially Africa. In developing countries such as India, China, Mexico and specifically in Africa, Nador (Morocco) estimates show that between 30% to 60% of installed water supply and sanitation infrastructures are malfunctioning (Bouabid & Louis 2015). This high rate of failure is attributable to unsuitable technology and fiscal-related challenges, particularly in lower-income communities. This lack of infrastructure in turn results in diseases such as malaria, waterborne diseases (diarrheal diseases) and indoor air pollution (Hemson et al. 2004).

Seemingly, investment in rural infrastructure development can lead to other spinoffs (by-products) for rural communities. For instance, investments in rural electrification bring obvious benefits in terms of access to information, knowledge and even distance learning by radio and television, facilitate evening classes at community schools and permit the use of electrical appliances that not only facilitate women's housework but also contribute toward improving the health of the entire family (through better food storage) (Hemson et al. 2004). In the past centuries, infrastructure development was more of an engineering problem; however, nowadays infrastructure development goes much further to include social capabilities which include amenities that are put to reach a certain purpose. However, there have been major shortfalls in the delivery of infrastructure services, which are attributable to, among others, biased and flawed priorities, poor management and resources scarcity. Additionally, there is a lack of network infrastructure such as telecommunication, power, roads, piped water, sewage and sanitation, drainage and so forth to service residential land, which makes it even more expensive to retroactively build in settlements that do not have such connections (Makhura & Wasike 2003; World Bank 2015).

South Africa is still lagging behind the rest of the world concerning infrastructure development. This is notwithstanding the fact that in 2004 the country introduced the MIG, which aimed at correcting deficiencies and lack of coordination observed with the fragmentation of grants. Additionally, MIG aimed at supporting municipal capital budgets to fund municipal infrastructure, so as to assist municipalities to address infrastructure backlogs related to basic services and to upgrade existing infrastructure, principally for the benefit of poor households. In addition to the MIG, in the 2010/11 financial year, the South African government introduced the Rural Household Infrastructure Grant (RHIG) to fund rural infrastructure specifically. The main reason for the introduction of this grant was to eradicate water and sanitation backlogs in rural municipalities using the on-site approach, such as VIP latrines and rainwater tanks. There is also another infrastructure related grant called the Integrated National Electrification Programme (INEP) that aims at ensuring that all schools and clinics have access to electricity and to extend access to poor households. Part of this grant is implemented directly by Electricity Supply Commission (Eskom), who is the service provider in many rural areas (Central Karoo 2005; Fourie 2007; Local government budget and expenditure review (LGBER) 2011).

It is the goal of the ISRDS published in 2000 to increase investment in physical infrastructure and delivery of social services in rural areas. With regard to MIG allocations, the nodal municipalities associated with the URP and the ISRDP are supposed to get greater allocations by law so as to combat the backlog. Additionally, the programme is aimed at providing infrastructural services to the poor, and therefore funds are targeted to reach them (DPLG 2006; Hemson et al. 2004). Van Schalkwyk (2013) records that for Western and Northern Cape, the key driver of bulk infrastructure is water scarcity, and in Limpopo, Eastern Cape and KwaZulu-Natal, the key driver is to enable the provision of services to households with backlogs in services. Considering all the drivers, the Department of Water Affairs (DWA) estimates that the provinces with the largest water services bulk infrastructure needs are Eastern Cape, KwaZulu-Natal and Limpopo. Consequent to this, an introduction of the Regional Bulk Infrastructure Grant (RBIG) was made to boost provision of infrastructure services in the identified problematic provinces. This is not limited to bulk raw water infrastructure, but includes bulk infrastructure for the provision of water services as well as small water resources (i.e. small dams), bulk raw water, bulk potable water and effluent sanitation infrastructure. RBIG has significant bulk infrastructure projects that it funds, even amongst the ISRDP nodes, namely the Mbizana Regional Bulk Water Supply in Mbizana LM under the Alfred Nzo District and the Sterkfontein Dam Bulk Water Supply Scheme in Maluti-a-phofung under the Thabo Mofutsanyane District (Van



Schalkwyk 2013). With all these efforts made, it must be mentioned that most rural municipalities are very often less able to manage their infrastructure, especially the more sophisticated infrastructure such as water and wastewater treatment works, as compared to the urban municipalities and especially the metropolitan municipalities (Wall 2007).

### **2.3 Conclusion**

The literature review has revealed two main different approaches of measuring QOL, namely objective indicators and subjective well-being. Objective measures work well with secondary data and necessitate gathering of social indicators, which can be grouped to form a compound indicator that designates the QOL of the society. Subjective measures, however, deal with mainly psychological satisfaction and are intended for measuring subjective well-being of different individuals. Subjective measures work well with primary data which is collected by means of personal or telephonic interviews and questionnaires dispatched to respondents. The literature also showed that these two approaches complement each other.

In spite of decades of development assistance in the developing countries, projects related to infrastructure have had no significant influence in dealing with rural service delivery problems such as water and sanitation, supply of electricity and telecommunications, etc. This is mainly due to a lack of adequate technological systems and other fiscal challenges. For housing delivery, demand for affordable housing outweighs supply in both the developed and developing world. Rural residents earn low incomes and cannot afford buying houses for themselves, and they end up staying in shacks or mud houses. This in turn has a negative influence on QOL, as these types of dwelling are characterised by overcrowding and easily succumb to bad weather conditions.

It has also been revealed by the literature that sub-Saharan Africa has poor QOL impacted by poor service delivery as compared to the rest of the developing world. It is evident that globally, there has been an improvement in access to basic services over time. Such improvements provide direct benefits to households in terms of better living conditions, and environmental and health standards. Despite the fact that accessibility to electricity in different communities has a noteworthy impact on day-to-day activities of rural inhabitants, contemplation of other quick measures of access needs to take place to reduce the backlog, especially in Africa. From a service delivery point of view, it is evident that rural areas are lagging behind the urban areas in as far as development and provision of services are concerned.

In order to ensure suitable rural development and good well-being of people living in remote areas, the delivery of basic infrastructure services needs to be accelerated. It has, however, been recognised that rural municipalities are struggling to manage the more sophisticated infrastructure such as waste water treatment due to a lack of appropriate expertise. Greater broad-based efforts are necessary for expanding accessibility to modern energy services to those citizens who live in rural and remote areas and who do not have access to such services – especially energy for cooking – in order to relieve them from the use hazardous biomass. Due to the negative influences of biomass on both human and environmental health, a number of countries have devised other approaches for reducing its use through delivering potentially cleaner sources of energy, of which electricity is the dominant source.

In most countries, and in South Africa in particular, grid electricity does not cover everyone. Rural areas are excluded due to various problems, including the terrain; dispersal, etc. This situation leaves rural dwellers living in the ISRD nodes with no option but to use other sources of energy such as paraffin, candles, coal, and solar energy, and those that cannot afford these revert to wood and animal dung.

From the point of basic service delivery, there seems to be a common problem – especially for the developing world – in the provision of basic sanitation, electricity, SWM and, to a certain extent, clean water in rural areas, even though there are numerous laws governing the provision of these services in many of these countries. This, in one way or the other, has a negative impact on the QOL for people residing in these areas.

An enormous service delivery gap between urban and rural municipalities is prevalent in South Africa.

### **SECTION 3: METHODOLOGY**

In this chapter, what is looked at first is the connotation of rurality/ruralness in South Africa. This is followed by a debate on the choice of the study area, how variables were chosen as well as data collection, and finally, how data processing and analysis took place. This study is empirical by its very nature and therefore follows a positivistic methodological approach for conducting research.

#### **3. THE CONNOTATION OF RURALITY/RURALNESS IN SOUTH AFRICA: ISSUES WITH DEFINITION**

There is no officially recognised definition of rural areas in South Africa. Thus, there is no clear and accepted distinction between the urban and rural areas in the country. In finding a solution to this problematic situation, scholars and policymakers diverted to detecting certain features such as the degree of infrastructural and economic development, in differentiating between these two areas. Typically, whatever is not urban, is considered rural (including tribal areas and commercial farms). An urban area therefore is a classification based on dominant settlement type and land use. It consists of cities, towns, townships, and suburbs (Jacobs & Hart 2012; Stats SA 2003).

In 1995, the Urban Development Strategy provided a distinction between urban areas (cities) based on the size of the settlement, and therefore acknowledged four main categories of city size as follows: large metropolitan areas (over 2 million people); large cities (500 000 to 2 million people); medium sized cities/large towns (100 000 to 500 000 people); and medium sized towns (50 000 to 100 000 people). Because the strategy was more focused on urbanism, rural typologies were excluded and as a result, such narrowly defined settlement types were to be extended to include rural settlements types as well. The expansion of urban settlement typologies was as follows: small towns (less than 50 000 people); displaced urban or dense rural settlements (less than 50 000 people); large rural villages (between 5000 and 50 000 people); and small rural villages and scattered settlements (less than 5000 people). Although the above population figures differentiate between different typologies in South Africa, the mystery of the exact difference between rural and urban settlements is still unsolved. This is because it is challenging to determine the cut-off point between these settlement types. Urban areas are typically densely populated and developed, whilst rural settlements are characterised by a more scattered distribution of the population. However, there are many settlements that have both urban and rural characteristics (Council for Scientific and Industrial Research (CSIR) 2002; Kilian et al. 2005; Local Government White Paper 1998).

In 1997, a more formal definition of rural areas was given by the RDF for South Africa: those sporadically occupied areas in which people farm or are subject to the use of natural resources, including the villages and small towns that are dispersed from side to side in these areas as well as large settlements in the former Bantustan which were created by the apartheid government and survive mainly on migratory labour and remittances. Despite it being officiated, several government departments used this definition mainly because it encapsulates the apartheid conditions experienced by rural dwellers (DRDLR 1997; Jacobs & Hart 2012).

This issue has been exacerbated by the re-demarcation of municipal boundaries, which complicated the administrative purpose of what constitutes a rural area (removal of administrative difference between rural and urban areas and enforcement of the strong interconnections between the countryside and towns) and, by extension, a rural municipality. Even the Constitution of South Africa in its entirety, does not classify municipalities into urban and rural areas, but into three categories, namely metropolitan (category A), local (category B) and district (category C) municipalities. Evidence shows that large metropolitan municipalities such as Tshwane and eThekweni, which are mainly urban, encompass areas that are functionally rural as well (LGBER 2011).

At present, rural municipalities in South Africa are those categorised as B3 and B4 in the typology given by the MIIF. These are small towns and mostly rural municipalities respectively. B3 municipalities are characterised by no large town as a core urban settlement. Typically, these municipalities have a relatively small population, a significant proportion of which is urban and based in one or more small towns. Rural areas in this category are characterised by the presence of commercial farms, as these local economies are largely agriculturally based. The existence of such important rural areas and agriculture sectors explain its inclusion in the analysis of rural municipalities. B4 municipalities on the other hand, are characterised by the presence of at most one or two small towns in their areas, communal land tenure and villages or scattered groups of dwellings and typically located in former homelands. This geographic location of B3 and B4 municipalities is in line with the definition of rural areas provided in the RDF and are concentrated in KwaZulu-Natal, Eastern Cape, Northern Cape and Limpopo. Free State, North West, Mpumalanga and Western Cape also host some rural (mostly B3) municipalities (LGBER 2011; MIIF 2011).

### 3.1 Choice of the study design

Spatially, during the apartheid system, rural areas in South Africa were omitted from infrastructural, social and economic development. This isolation was caused by apartheid laws such as the Group Areas Act (Act No. 36 of 1966). Due to this segregation, the rural population was considerably disadvantaged when it came to quality health and education, work opportunities, provision of basic services, etc. This is consistent with findings from international studies in Britain, which indicate that the provision of services in rural places are limited, fragmented and unevenly distributed (Cloke et al. 2007; Zuffeerey & Chung 2015). The nodal areas originated from these unfortunate parts of the country that are characterised by little or inadequate infrastructure, poor means of communication, poor access to services, poor living conditions, high levels of unemployment, lack of facilities and predominantly occupied by black Africans. They are only in seven provinces; the only two excluded provinces are Gauteng and North West. These impoverished households from rural areas are dependent on a combination of social grants, subsistence agriculture and remittances from family members working in the cities or mines (LGBER 2011; Stats SA 2016a; Stats SA 2016b).

In an attempt to redress such animosity, in 2001, the post-apartheid government identified 13 specific poorest rural areas. These districts were detected based on their understood extreme poverty levels as well as the notable shortage of services and certain amenities. Consequently, they were all earmarked for accelerated development under the ISRDP. It is worth paying attention to the fact that in 2001 the ISRDP had 13 observed poorest rural districts. However, due to the re-demarcation that took place over the past years, it now consists of 14 DMs across different provinces in the country (PSC 2009; Stats SA 2016a; Stats SA 2016b; Table 3.1).

Table 3.1 The study areas (the ISRDP nodes and the local municipalities affected, including the towns within the districts)

Original ISRDP node	Province	District municipality	Local municipalities	Towns located in the district municipalities
Alfred Nzo	Eastern Cape	Alfred Nzo	Matatiele	Cedarville
				Matatiele
			Mbizana	Bizana
			Ntabankulu	Ntabankulu
			Umzimvubu	Mount Ayliff (eMaxesibeni)
Mount Frere				
Chris Hani	Eastern Cape	Chris Hani	Emalahleni	Dordrecht
				Indwe
				Lady Frere
			Engcobo	Engcobo
			Enoch Mgijima (Amalgamation of Inkwanca, Lukhanji and Tsolwana)	Hofmeyr
				Molteno
				Queenstown
				Sada
				Sterkstroom
				Tarkastad
				Whittlesea
			Intsika Yethu	Cofimvaba
				Tsomo
			Inxuba Yethemba	Cradock
				Middelburg
				Mount Zebra National Park
			Sakhisizwe	Cala
Elliot				
Joe Gqabi (Previously known as Ukhahlamba)	Eastern Cape	Joe Gqabi (Previously known as Ukhahlamba)	Elundini	Maclear
				Mount Fletcher
				Ugie
			Senqu	Barkly Easy
				Lady Grey
				Rhodes
				Rossouw
				Sterkspruit
			Walter Sisulu (Amalgamation of Gariiep and Maletswai)	Aliwal North
				Burgersdorp

Continued overleaf

Table 3.1 continued

Original ISRDP node	Province	District municipality	Local municipalities	Towns located in the district municipalities
				Jamestown
				Oviston Nature Reserve
				Steynsburg
				Venterstad
O.R. Tambo	Eastern Cape	O.R. Tambo	Ingquza Hill	Flagstaff
				Lusikisiki
			King Sabata Dalindyebo	Mqanduli
				Mthatha
			Mhlontlo	Qumbu
				Tsolo
			Nyandeni	Libode
Ngqeleni				
Port St Johns	Port St Johns			
Thabo Mofutsanyane	Free State	Thabo Mofutsanyane	Maluti-A-Phofung	Harrismith
				Kestell
				Phuthaditjhaba
Ugu	KwaZulu-Natal	Ugu	Ray Nkonyeni (Amalgamation of Ezingolweni and Hibiscus Coast)	Hibberdene
				Izingolweni
				Margate
				Port Edward / Umtamvuna
				Port Shepstone
				Southbroom / Impenjati
			Umdoni	Pennington
				Scottburgh / Umzinto North
			Umuziwabantu	Harding
			Umzumbe	Umzumbe
Umkhanyakude	KwaZulu-Natal	Umkhanyakude	Big 5 Hlabisa (Amalgamation of The Big 5 False Bay and Hlabisa)	Hlabisa
				Hluhluwe
			Jozini	Ingwavuma
				Jozini
				Mkuze
			Mtubatuba	Mtubatuba
				St Lucia
uMhlabuyalingana	Mbazwana			
	Glencoe			

Continued overleaf

Table 3.1 continued

Original ISRD node	Province	District municipality	Local municipalities	Towns located in the district municipalities
Umzinyathi	KwaZulu-Natal	Umzinyathi	Endumeni	Dundee
				Glencoe
			Msinga	Pomeroy
			Msinga	Pomeroy
			Nquthu	Nquthu
			Umvoti	Greytown
				Kranskop
Zululand	KwaZulu-Natal	Zululand	Abaqulusi	Louwsburg
				Vryheid
			eDumbe	Paulpietersburg
			Nongoma	Nongoma
			Ulundi	Ulundi
				Pongola
Sekhukhune (Previously known as Greater Sekhukhune)	Limpopo	Sekhukhune	Elias Motsoaledi	Groblersdal
				Roosenekal
			Ephraim Mogale	Marble Hall
				Schuinsdraai Nature Reserve
			Fetakgomo – Greater Tubatse (Amalgamated)	Apel
				Burgersfort
				Ohrigstad
				Steelpoort
				Jane Furse
Bohlabela (disbanded in 2005)	Limpopo	Bohlabela, which had two LMs, namely Bushbuckridge and Maruleng, was disbanded with effect from 1 March 2006. Bushbuckridge was transferred to Ehlanzeni DM in Mpumalanga and Maruleng LM was transferred to Mopani DM in Limpopo	Bushbuckridge	Bushbuckridge
				Sabie Park
			Maruleng	Hoedspruit

Concluded overleaf



Table 3.1 concluded

Original ISRD node	Province	District municipality	Local municipalities	Towns located in the district municipalities
John Taolo Gaetsewe (Previously known as Kalahari-Kgalagadi)	Northern Cape	John Taolo Gaetsewe	Ga-Segonyama	Bankhara-Bodulong
				Kuruman
				Headmen
			Gamagara	Deben
				Kathu
				Olifantshoek
			Joe Morolong (Previously known as Moshaweng)	Hotazel
				Santoy
				Van Zylsrus
Central Karoo	Western Cape	Central Karoo	Beaufort West	Beaufort West
				Merweville
				Murraysburg
				Nelspoort
			Laingsburg	Laingsburg
				Matjiesfontein
			Prince Albert	Klaarstroom
				Leeu Gamka
				Prince Albert
Welgemoed				

Source: Harmse 2010; PSC 2009

### 3.2 Data collection and variables

This study is premised on the results of the two censuses that were executed in 2001 and 2011. These two censuses were respectively the second and third censuses conducted in post-democratic South Africa. Both censuses were conducted using de facto census methodology, meaning that people were counted where they were found on the census night. Data was collected using face-to-face interviews from 9 to 31 October for both census years. The Statistical Analysis System (SAS) and SuperCross were used to analyse the census data (Stats SA 2016a; Stats SA 2016b).

Service delivery related variables were extracted from the Census 2001 and Census 2011 unit records using SuperCross software (see Table 3.2) ranging from housing conditions to water and electricity delivery, provision of sanitation, solid waste management and ownership of ICT assets.

Table 3.2 Selected variables used in the study

Service delivery variable	Type of variable	Variables used to calculate composite variables
Housing conditions	Type of dwelling	• Detached dwelling
		• Traditional dwelling
		• Semi-detached dwelling
		• Informal dwelling
		• Backyard dwelling
Water provision	Access to water	• Water inside dwelling
		• Water on site
		• Water on community stand
		• No piped water
Sanitation provision	Type of toilet	• Flush toilet
		• Pit latrine
		• Bucket latrine
		• No toilet
Solid waste management provision	Refuse removal	• Removed by local authority
		• Community/own refuse dump
		• No refuse dump

Concluded overleaf

Table 3.2 concluded

Service delivery variable	Type of variable	<ul style="list-style-type: none"> <li>• Variables used to calculate composite variables</li> </ul>
Energy provision	Energy for cooking	<ul style="list-style-type: none"> <li>• Electricity</li> </ul>
		<ul style="list-style-type: none"> <li>• Gas</li> </ul>
		<ul style="list-style-type: none"> <li>• Paraffin</li> </ul>
		<ul style="list-style-type: none"> <li>• Wood</li> </ul>
		<ul style="list-style-type: none"> <li>• Coal</li> </ul>
		<ul style="list-style-type: none"> <li>• Animal dung</li> </ul>
		<ul style="list-style-type: none"> <li>• Solar</li> </ul>
	Energy for lighting	<ul style="list-style-type: none"> <li>• Electricity</li> </ul>
		<ul style="list-style-type: none"> <li>• Gas</li> </ul>
		<ul style="list-style-type: none"> <li>• Paraffin</li> </ul>
		<ul style="list-style-type: none"> <li>• Solar</li> </ul>
		<ul style="list-style-type: none"> <li>• Candle</li> </ul>
	Energy for heating	<ul style="list-style-type: none"> <li>• Electricity</li> </ul>
		<ul style="list-style-type: none"> <li>• Gas</li> </ul>
		<ul style="list-style-type: none"> <li>• Paraffin</li> </ul>
<ul style="list-style-type: none"> <li>• Wood</li> </ul>		
<ul style="list-style-type: none"> <li>• Coal</li> </ul>		
<ul style="list-style-type: none"> <li>• Animal dung</li> </ul>		
<ul style="list-style-type: none"> <li>• Solar</li> </ul>		
ICT service provision	Household goods owned	<ul style="list-style-type: none"> <li>• Cellphone</li> </ul>
		<ul style="list-style-type: none"> <li>• Computer</li> </ul>
		<ul style="list-style-type: none"> <li>• Landline telephone</li> </ul>

Secondly, FBS provision to indigents is calculated for 2011 using the data from the Non-financial census of municipalities (NFCM). The aim of this is to gauge the provision of FBS to the needy households. The NFCM questionnaire explains FBS policy which was first announced in 2000 and aimed to support low-income households to access free basic services, including water, sanitation and electricity services. The policy for Free Basic Water promotes sustainable access to a basic water supply by subsidising the ongoing operating and maintenance costs of a basic water supply service. The basic water supply service refers to the infrastructure necessary to supply 25 litres of potable water per person per day from a source within 200m of a household and with a minimum flow of 10 litres per minute (in the case of communal water points) or 6000 litres (6 kilolitres (kl)) of potable water supplied per formal connection per month (in the case of house connections). Free basic electricity is an amount of electricity regulated by the department of energy at a national level of government, that should be supplied free of charge to poor households in order to meet the basic

needs. This is currently set at 50 kWh per month per household. Throughout the country, there are regions, especially in rural areas, where sewerage and sanitation, as well as solid waste management are provided at substantively discounted rates in order to accommodate poor households who cannot afford to pay the normal price. This is however done at the discretion of the municipalities involved. Thus there is no universal amount for the actual discount (Stats SA 2012c; Stats SA 2016c).

### 3.3 Data processing and analysis

Data was exported from SuperCross to Excel for the conversion of raw values into percentages. The first step in calculating the service-delivery indices was to categorise each variable as either positively or negatively influencing the particular service-delivery dimension in terms of QOL literature. The following variables were reverse-scored for 2001 and 2011, because they all contributed negatively to the particular services, and ultimately people's QOL:

- Housing: Traditional, informal and backyard dwellings;
- Water: The distance greater than (>) 200 m from the yard and no access to piped water;
- Electricity: Cooking and heating using paraffin, wood, coal and animal dung and lighting with paraffin and candles;
- Sanitation: Pit latrine, bucket latrine and no toilet facility; and
- Refuse removal: Community or own dump and no refuse dump.

Next, all of the housing variables were used to calculate the average housing-delivery score per ISRDP node for 2001 and 2011. The average score ranges between 0% and 100%; with 0% indicating the worst housing delivery and 100% indicating the best housing delivery. Then the same procedure was done for all other classes namely: all water-delivery variables; all electricity for cooking, heating and lighting variables, all sanitation-delivery variables; all refuse removal variables; and all ICT related variables. For all these categories, the average score ranges between 0% and 100%; with 0% indicating the worst delivery or provision or ownership of that particular service and 100% indicating the best housing delivery or provision or ownership of that particular service.

Next, mixed model ANOVAs were run with the DMs and years as fixed effects and the LMs nested in the DMs as random effects to determine if statistically significant changes occurred (at a  $p=0.05$  statistically significance level) from 2001 to 2011 in the average housing-delivery index for each ISRDP node. The same was done for all the other services, including water-delivery index; electricity

for cooking, heating and lighting index; sanitation-delivery index; refuse removal index and ICT services index.

Three DMs, namely Ehlanzeni, Mopani and Thabo Mofutsanyane were excluded from the analysis because these had fewer observations, and including them would therefore render the results dubious and unreliable. Thus, it is dreadful to compute accurate averages using lesser observations. All these three DMs have one LM falling within the definition of the ISRDP nodal area. In the case of Ehlanzeni district, it is only Bushbuckridge LM that is declared as an ISRDP node and for Mopani and Thabo Mofutsanyane districts, it is Maruleng and Maluti a Phofung LMs, respectively.

The asterisks on the figures should be used to interpret the results. The asterisks indicate that statistically significant changes occurred for that particular service within that particular ISRDP node between 2001 and 2011. The ISRDP nodes that do not show asterisks did not experience any statistically significant changes. Also, the direction of the lines indicate whether positive or negative statistical significant changes have occurred within the particular ISRDP nodes between 2001 and 2011 (positive is bottom-up to the right and negative is top-down to the right). The length of the line indicates the strength of the increases or decreases. The longer the line, the bigger the change that has taken place in that particular node.

## **SECTION 4: DISCUSSION AND INTERPRETATION OF RESULTS FOR SERVICE DELIVERY RELATED CENSUS DATA: 2001 TO 2011**

### **4.1 DETERMINING THE CHANGES IN THE QOL DIMENSIONS FROM 2001 TO 2011 FOR THE ISRDP AREA**

In finding out if whether or not there were statistically significant changes that had taken place in the entire ISRDP area as well as in the DMs between 2001 and 2011, the interpretation of results from statistical computations is done in the next sub-sections.

#### **4.1.1 Average housing-delivery index in the ISRDP areas**

All the DMs except Central Karoo and John Taolo Gaetsewe districts, experienced a statistically significant increase ( $p < 0.05$  at a  $p = 0.05$  level of statistical significance) for the housing component index from 2001 to 2011, with Umkhanyakude and Zululand districts reflecting the greatest increases (see Figure 4.1). This is not strange, as government (through the RDP) has been providing free housing since 1996. The focus of the programme was mainly on households residing in informal settlements and to give them decent housing (Pillay et al. 2006; Stats SA 2016a; Stats SA 2016b).

In Umkhanyakude nodal area, the increase can be attributed to the objective of the municipality, which was to increase the rate of housing provision so as to limit the impact of informal housing on the environment (Umkhanyakude 2011). As a result, for this node, Census 2011 shows an increase of 26.6% (from 45.1% to 71.7%) between 2001 and 2011 in the percentage of households who stay in formal dwellings (Stats SA 2014a). Zululand, as part of the former homelands during apartheid, was immensely deprived of proper development, infrastructure and services. The then KwaZulu-Natal Department of Housing targeted rural areas for housing development, and Zululand DM shifted its focus from providing houses in urban areas and to providing housing in rural villages. The district improved its percentage of households living in formal dwellings from 52.5% in 2001 to 73.1% in 2011 (Stats SA 2014a; Zululand 2011).

The main reason for the Central Karoo nodal area not being statistically significant is that the district already had a higher percentage of households living in formal dwellings in 2001 (95.8%) and thus, there was not much of a backlog to deal with; hence, the slight move to 97.7% in 2011 (Stats SA 2014b). This is not a surprise because the ISRDP report for the Department of Social Development conducted in 2006, found that this district resembles an urban node much more closely than it does a rural node (Everatt et al. 2006).

The explanation for the John Taolo Gaetsewe node is similar to that of Central Karoo. In 2001 already, more than 70% of housing in the district was formal dwellings; a percentage moderately higher than other rural nodes for the same year, and hence, the change between the two censuses is not statistically significant (Stats SA 2014c). It is highly possible that government wanted to start with the municipalities with higher backlogs in providing formal dwellings in order to catch up with those that are better off when it comes to housing.

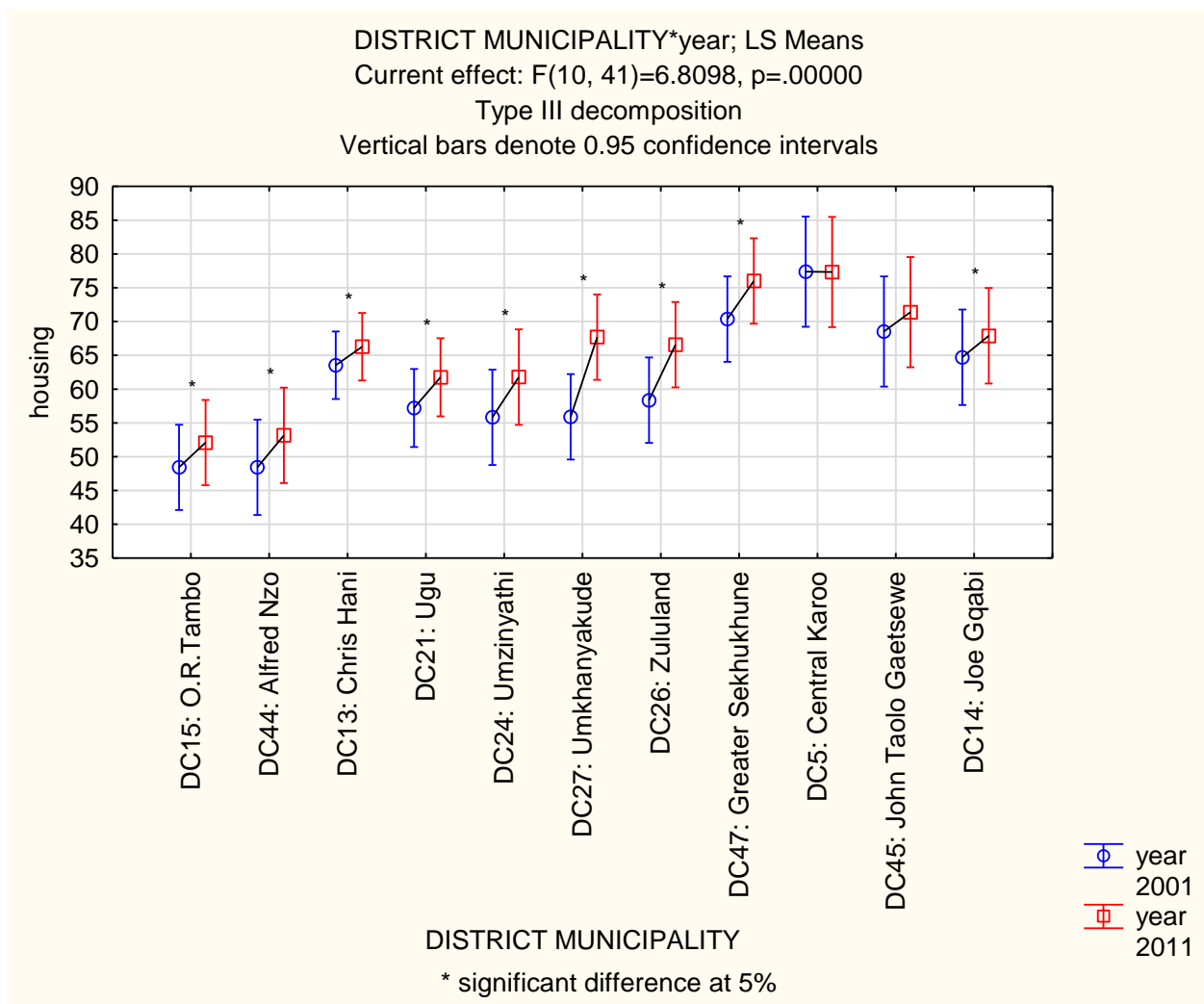


Figure 4.1 Access to housing for citizens in the ISRDP areas – an asterisk (\*) denotes statistically significant ISRDP nodes

#### 4.1.2 Average water-delivery index in the ISRDP areas

There is a well-known saying, “water is life, sanitation is dignity” (Rakgoale 2015). Indeed, the first part of this saying stresses the importance of water to the lives of human beings living on this planet earth. This is because sufficient, but more importantly, safe drinking water is a crucial requirement in ensuring both health as well as well-being of people (Stats SA 2016c).

All the rural nodes except Central Karoo reflected a statistically significant increase in terms of water delivery from 2001 to 2011 (Figure 4.2); thus,  $p < 0.05$  at a  $p = 0.05$  level of statistical significance. The greatest statistically significant improvements in water delivery between 2001 and 2011 were experienced in the Ugu, Umkhanyakude and Greater Sekhukhune nodal areas. The main reasons why these DMs are more statistically significant as compared to the rest of the ISRDP nodal areas are briefly summarised below.

Throughout the years, Ugu DM has been receiving DWAF grants (transfers) which are aimed at supplementing municipal budgets to assist with the construction of water delivery infrastructure, execution of water service delivery and the development of an Asset Management Plan (AMP). As a result, the municipality upgraded the Umtwalume waterworks in order to restore a reliable water supply in that settlement. This in turn resulted in the reduction of water backlog in the district to 54.4%. Additionally, in 2011, the district recorded a national award for a Blue Drop status in its four water treatment plants. The award was for good quality drinking water and also served as a commitment to providing a quality service to the community in the municipal jurisdiction (Ugu 2011).

For Umkhanyakude DM, investment in infrastructure development still remains a priority. During the 2010/2011 financial year, more than R100 million was earmarked for water and sanitation projects. In 2011, the municipality also spent over a million rands on upgrading and maintaining different water projects in the region, including the MKT 2529 water purification canal, Mseleni water project, Nyawoshane water scheme, and Somkhele water project (Umkhanyakude 2011).

In the 2009 to 2010 financial year, Greater Sekhukhune DM invested a total of R85.8 million of capital expenditure in water and sanitation projects in various municipalities in the district (Greater Sekhukhune 2010).

Central Karoo’s change in water delivery again is not statistically significant for the same reasons discussed in paragraph 4.1.1. In 1996 already, about 95.4% of households in this node had access to water from the dwelling or yard. This moved up slightly to 97.1% in 2011. This is also in line with



the literature findings that citizens who reside in formal housing are offered improved access to services and facilities compared to those staying in informal housing (Mahlakanya 2017; Turok & Borel-Saladin 2016; Stats SA 2014b).

While the 2011 Census results for the ISRDP rural nodes show an increase in the percentage of households with access to piped water inside the dwelling, there are obvious inequalities between households in rural nodes and those in urban nodes in terms of accessibility margins. These are very high (about 52.6%) in the urban nodes and low for the rural nodes (20.6%). At the other end of the spectrum, only 1% of households in the urban nodes had no access to piped water whereas in the rural nodes, about 24.1% (or one in every four) of households did not have access to piped water, and there is still a number of households without access to tap water in rural nodal areas (Stats SA 2016b).

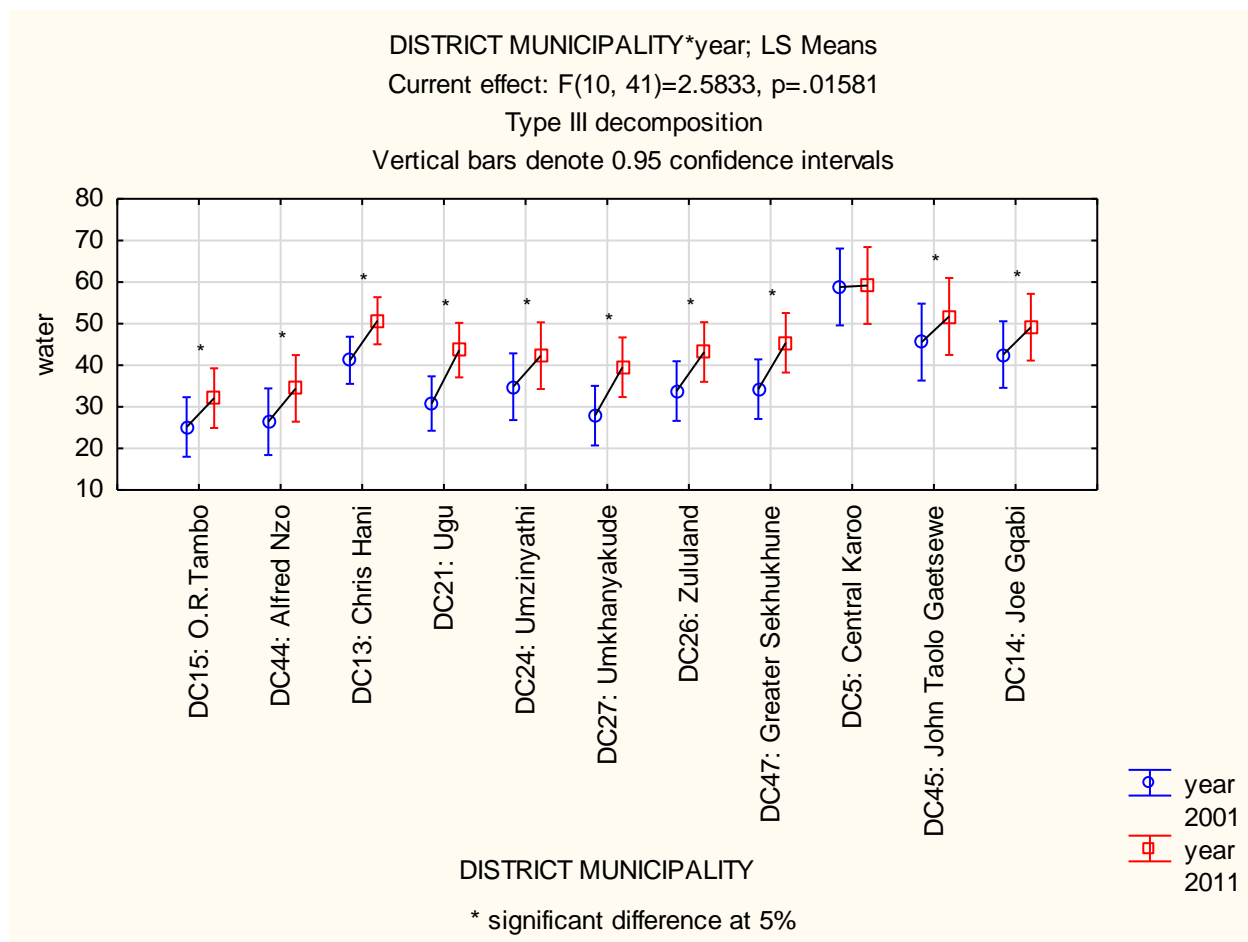


Figure 4.2 Water delivery to citizens of the ISRDP areas

### 4.1.3 Average energy-delivery index in the ISRDP areas

Even though Eskom has a responsibility for bulk generation and transmission of electricity, Schedule 4B of the Constitution allocates the authority to distribute electricity to municipalities in their areas of jurisdiction subject to legislation and regulation by national and provincial government. It is crucial for households to have access to energy for cooking, heating and lighting as this improves their QOL (Stats SA 2016b; Stats SA 2016c).

#### 4.1.3.1 Use of energy for cooking by households in the ISRDP areas

When it comes the usage of energy for cooking index, all ISRDP nodes except Central Karoo and John Taolo Gaetsewe reflected a statistically *not* significant decrease ( $p < 0.05$  at a  $p = 0.05$  level of statistical significance) from 2001 to 2011 (Figure 4.3). In establishing the reason why this is the case, the literature reveals that electricity is not always affordable to everyone, as 10% of households nationally (39.4% in Limpopo, 14.8% in Mpumalanga, 14.4% in KwaZulu-Natal and 13.3% in Eastern Cape) still use wood for cooking since it is cheaper and more readily available. Additionally, the General Household Survey (GHS) 2014 results indicated that the use of electricity as a source of energy for cooking was the lowest in more rural provinces such as Limpopo, Eastern Cape and Mpumalanga, where alternative fuels such as wood are perhaps more accessible and affordable (Stats SA 2015a; Stats SA 2015b).

It is also possible that all other ISRDP nodes, even in 2001, were already using alternative sources of energy such as wood, animal dung and paraffin for cooking, whilst the residents in Central Karoo and John Taolo Gaetsewe only introduced that at a later stage as a result of an increase in electricity tariffs. Furthermore, in February 2010, the National Energy Regulator of South Africa (NERSA) approved an annual average price increase in the Eskom revenue of 24.8% for the Multi-Year Price Determination 2 (MYPD2) (period 2010/2011 to 2012/2013), that will allow Eskom to recover revenue of R85.2 billion calculated from the annual revenues and sales volumes between the 2009/2010 and 2010/2011 financial years (Eskom 2010).

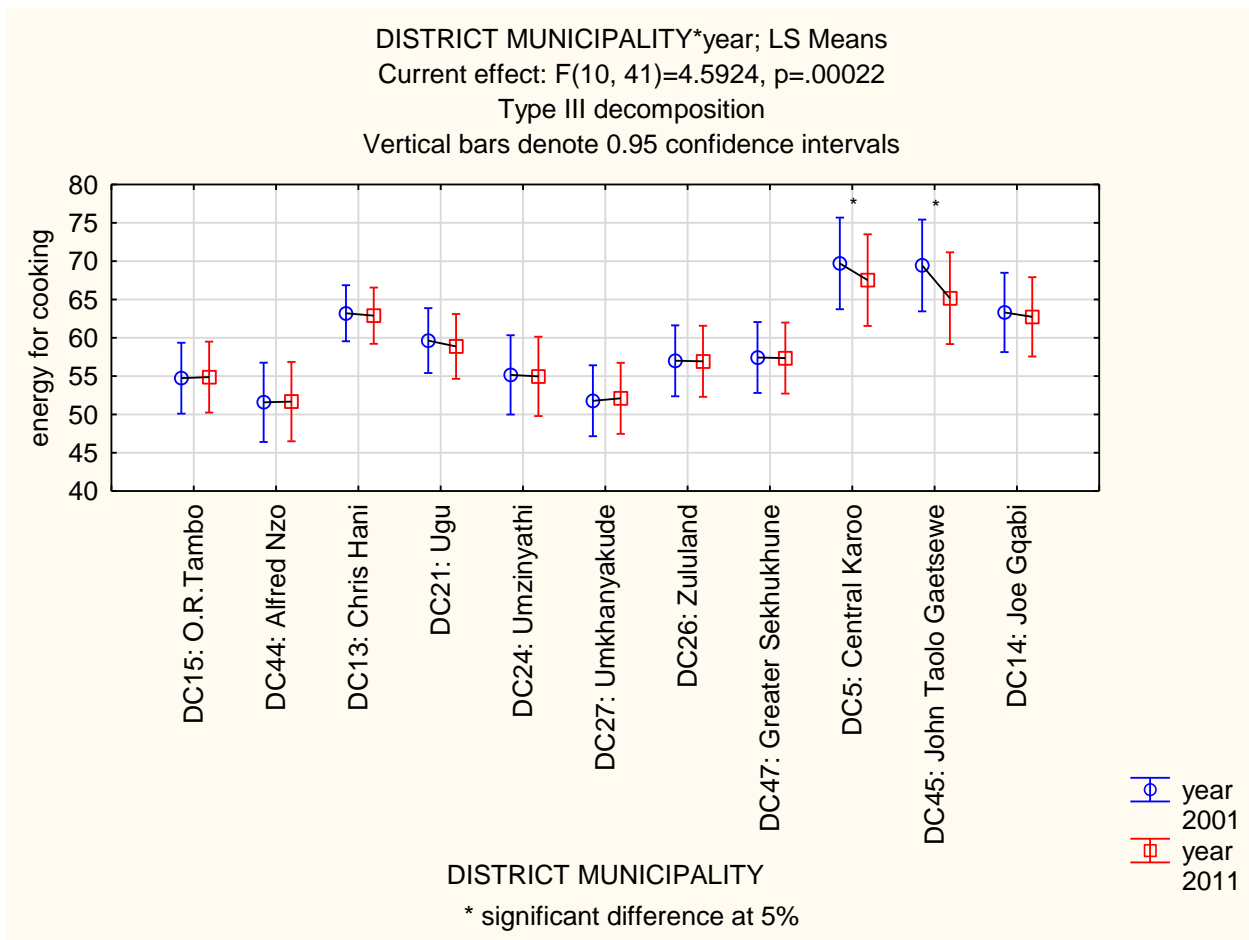


Figure 4.3 Use of energy for cooking by households in the ISRDP areas

#### 4.1.3.2 Use of energy for heating by households in the ISRDP areas

In terms of the use of energy for heating index, all the nodes in the ISRDP areas experienced a statistically significant increase ( $p < 0.05$  at a  $p = 0.05$  level of statistical significance), with the Greater Sekhukhune node showing the greatest increase from 2001 to 2011 (Figure 4.4). This result is the complete opposite of what the energy for cooking index yielded. This is probably because households cannot risk using wood or animal dung for heating, as it is not suitable (they produce fumes that are too strong or dangerous to inhale) to be used indoors. They would rather use other sources of energy to produce heat for themselves.

The Greater Sekhukhune nodal area noted that it had connected 12 346 households to the electricity grid in the 2009/2010 financial year only, spending a total of R129.9 million (and increase of almost 500% from the previous financial year's spending) of capital expenditure on electrification projects. That amount included connections both by Eskom and the three LMs in the district area. This huge

spending compared to the R22 million spent on the electrification of 3698 household projects in the 2008/2009 (previous) financial year signifies that the DM is determined to accelerate access to electricity by residents and local communities in an effort to improve the quality of life for the people of the district. This increase in capital expenditure for electrification lays a foundation for continued strategic roll-out of the infrastructure investment plan (Greater Sekhukhune 2010).

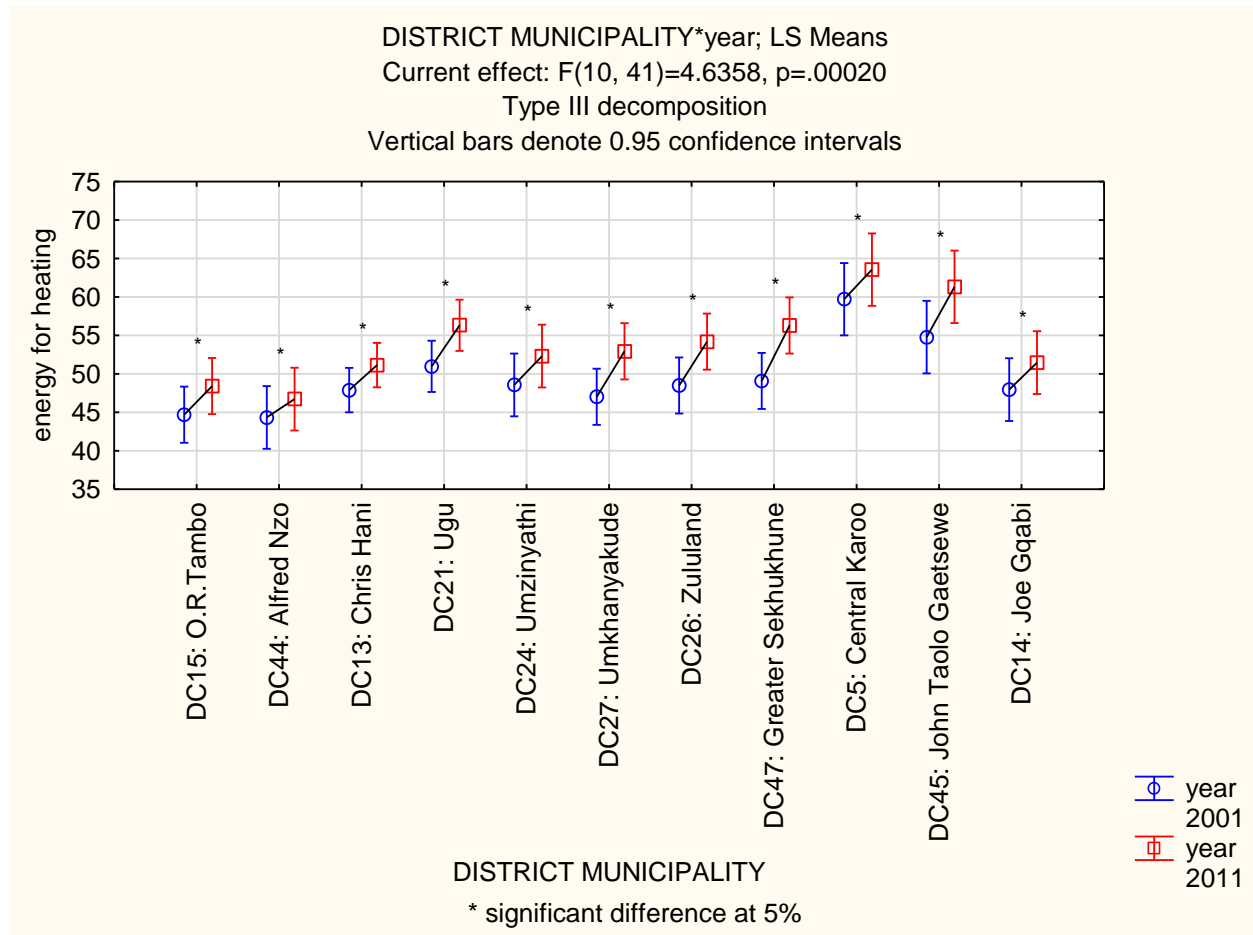


Figure 4.4 Use of energy for heating by households in the ISRDP areas

#### 4.1.3.3 Use of energy for lighting by households in the ISRDP areas

For the usage of energy for lighting index, all rural nodes except Central Karoo DM reflected a statistically significant increase ( $p < 0.05$  at a  $p = 0.05$  level of statistical significance) between 2001 and 2011 (Figure 4.5). The greatest statistically significant improvements in usage of energy for lighting purposes from 2001 to 2011 were experienced in the O.R. Tambo, Zululand and Greater Sekhukhune nodal areas.

Below is a brief discussion as to why these three DMs are more statistically significant compared to the rest of the ISRDP nodal areas.

The O.R. Tambo district has five LMs under its jurisdiction that, in conjunction with Eskom, are responsible for the provision of electricity. In 2011, Eskom connected 1773 households in seven villages belonging to Ngquza Hill LM municipal jurisdiction (Ngquza Hill 2011). For Port St Johns LM, the number of households connected for the 2010/2011 financial year was 2900 households in different villages, as Port St Johns municipality is not providing electricity to the urban areas. This was 80% of the municipal targeted backlog of 3623 for that financial year (Port St Johns 2011). Nyandeni LM, on the other hand, connected 67% (870 households) of the 1304 households it targeted to connect during the 2010/2011 financial year (Nyandeni 2011). Mhlontlo LM electrified 6450 households in three wards (wards 13, 10 and 01) in Phase 1 in its region of Qumbu, and Phase 6 (A and B) was electrified in its Tsolo region. This was 100% of the households that were targeted for this financial year (Mhlontlo 2011). King Sabatha Dalindyebo (KSD) LM has a new electricity substation and a non-operational hydro-electrical scheme that offers excess capacity (KSD 2011).

Furthermore, Eskom made about 149 914 electrification connections in 2011, which included the rural lines in the ISRDP areas (Eskom 2011). This increase is not surprising, because a survey conducted by the Department of Social Development in 2006 produced a similar outcome, which is that the numbers using electricity for lighting purposes had improved in every one of the twenty-one nodes studied. The survey included the rural and urban nodes; hence, the total of twenty-one nodal areas (Everatt et al. 2006).

For Zululand municipality, a total of 19 796 connections were made in the district during the 2010/2011 financial year. This was 33% more than what was connected in the previous year and a noticeable change was seen in Ulundi LM with 13 132 connections made, followed by Abaqulusi LM with 3360 connections finished (Stats SA 2012c; Stats SA 2013). The explanation given in sub-section 4.1.3.2 above is also applicable to this section for Greater Sekhukhune DM.

The main explanation for the reason behind Central Karoo DM being not statistically significant ( $p=0.54$  at a  $p=0.05$  level of statistical significance) is no different to the one given in the previous sub-sections (4.1.1 and 4.1.2). The district already had a higher percentage of households using electricity for lighting in 2001 (83.9%) and thus, there was not much of a backlog to eliminate; hence, the slight move to 89.7% in 2011 (Stats SA 2014b). In addition to the above clarification, the node has a challenge of availability of funding for expansion of services to rural areas (Central Karoo 2011). There has also been an enhanced electricity generation capacity which brought about improved electricity distribution in most of the ISRDP nodal points as a result of hydro-electric power plants

such as Mbashe and Umzimvubu dams for Alfred Nzo, Chris Hani and O.R. Tambo DMs; as well as Kakamas, Gariep and Vanderkloof dams for John Taolo Gaetsewe and Joe Gqabi nodal areas; Lubisi, Ncora and Xonxa dams for Chris Hani DM as well as Drakensberg Pumped-Storage Facility for Umzinyathi, Umkhanyakude and Zululand nodal points (Barta 2012; DWAF 2007; Eskom 2010; Mdwara 2015).

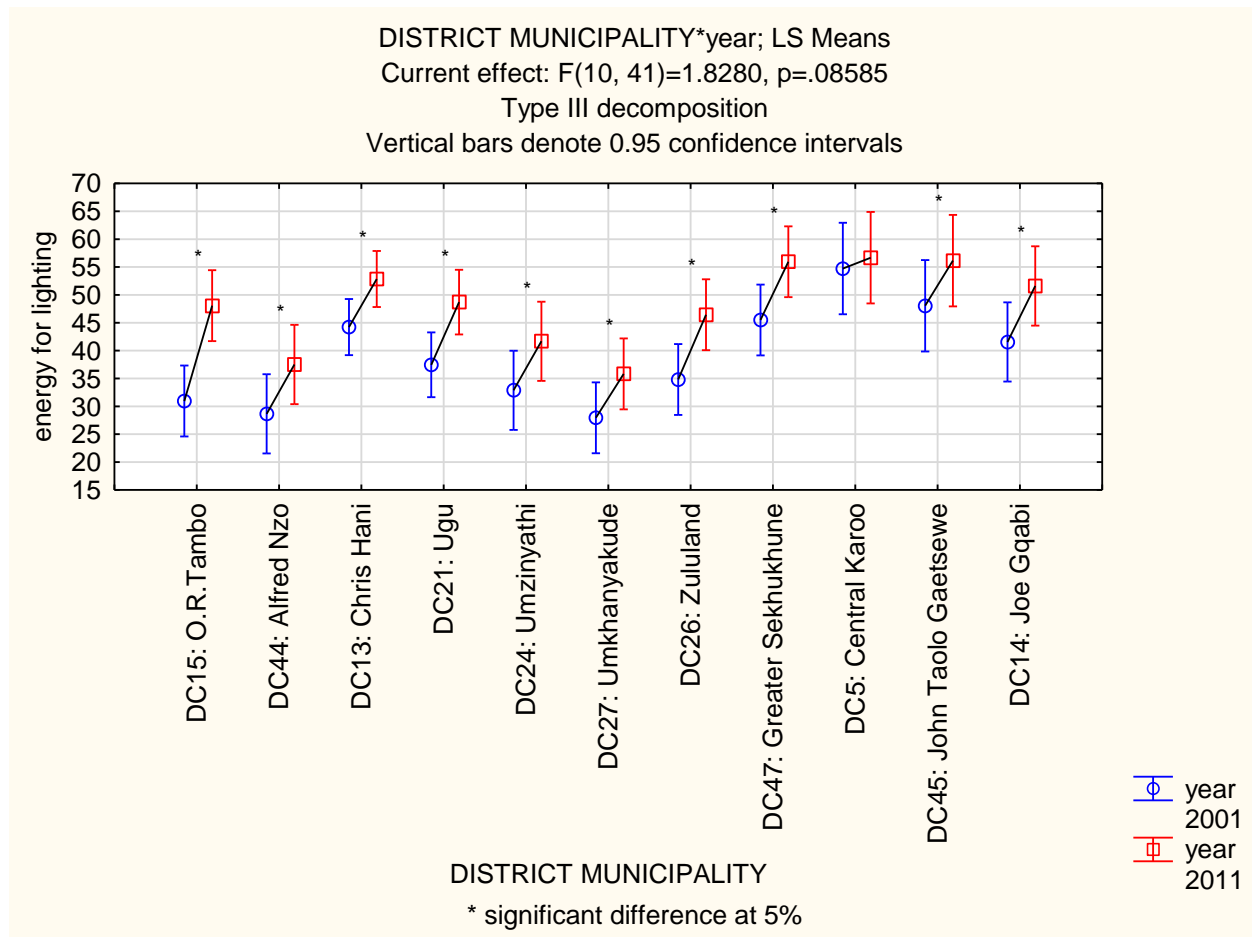


Figure 4.5 Use of energy for lighting by households in the ISRDP areas

#### 4.1.4 Average sanitation-delivery index in the ISRDP areas

Now in this section, it is time to give meaning to the statement made by Rakgoale (2015) in paragraph 4.1.2 above, that sanitation is dignity. Dignified and hygienic sanitation facilities remain a daily challenge for many South Africans, particularly those living in poor rural and peri-urban communities (Stats SA 2016b). Only 4 of the 11 DMs indicated statistically significant increases ( $p < 0.05$  at a  $p = 0.05$  level of statistical significance), namely Chris Hani, Umkhanyakude, Zululand and Joe Gqabi nodes (see Figure 4.6). This is attributable to the fact since 2009 the South African government has set itself the target of achieving universal access to sanitation services by 2014, and access continued

at an average rate of 300 000 households per annum (South African Human Rights Commission (SAHRC) 2012).

In Chris Hani rural node, the improvement in sanitation services is attributable to the fact that during the 2010/2011 financial year, MIG was allocated for the construction of basic sewerage infrastructure as part of the upgrading of poor households, micro-enterprises and social institutions in order to provide for the rehabilitation and upgrading of current municipal infrastructure and the implementation of new infrastructure, as well as the eradication of the bucket sanitation system. It is worth noting that no funds were withheld during the 2010/2011 financial year. The district provided 7280 households with proper sanitation amenities in the Cofimvaba, Mphuthulo, Tsomo, Indwe, Ward 3 of Emalahleni, and Zinguthu areas. This included construction of VIP latrines and bucket toilet eradication (Chris Hani 2011).

In Umkhanyakude DM, as stated in paragraph 4.1.2 above, the district set aside more than R100 million for water and sanitation projects during the 2010/2011 financial year. Moreover, the MIG funds were utilised to achieve the objective that households must be provided with access to basic sanitation. At the beginning of the 2010/2011 financial year, the backlog had been estimated to be 41 037; the district target was to provide VIP latrines to 10 600 households, and the target was achieved (Umkhanyakude 2011).

For the Zululand ISRDP node, in the 2010/2011 financial year an allocation of R188 million was received from MIG, and was successfully spent (100%) by the end of June 2011. Of this amount, 20% (R37.6 million) – which was the second largest percentage – was spent on sanitation infrastructure. Consequently, 59.7% households were granted access to basic levels of sanitation, constituting an increase of 4.5% from the baseline connected in the past (Zululand 2011).

What happened to Joe Gqabi DM is that during the 2010/2011 financial year, the district implemented a rural sanitation programme in Senqu and Elundini LMs to the amount of R40 million. In addition to the above spending, the district received special funding from the DWAF for the upgrade and refurbishment of its three waste water treatment works in Barkly East, Sterkspruit and Oviston (Joe Gqabi 2011).

The Central Karoo node, even though not statistically significant ( $p=0.45$  at a  $p=0.05$  level of statistical significance), is still the highest of all the ISRDP nodes under review. This is because the

node does not have much of a backlog when it comes to sanitation services. The backlog was 14% in 2001 and this dropped to 10% in 2011 (Stats SA 2014b). The district also did not set any new targets in as far as sanitation provision was concerned between the 2009/2010 and 2010/2011 financial years due to lack of funding (Central Karoo 2011).

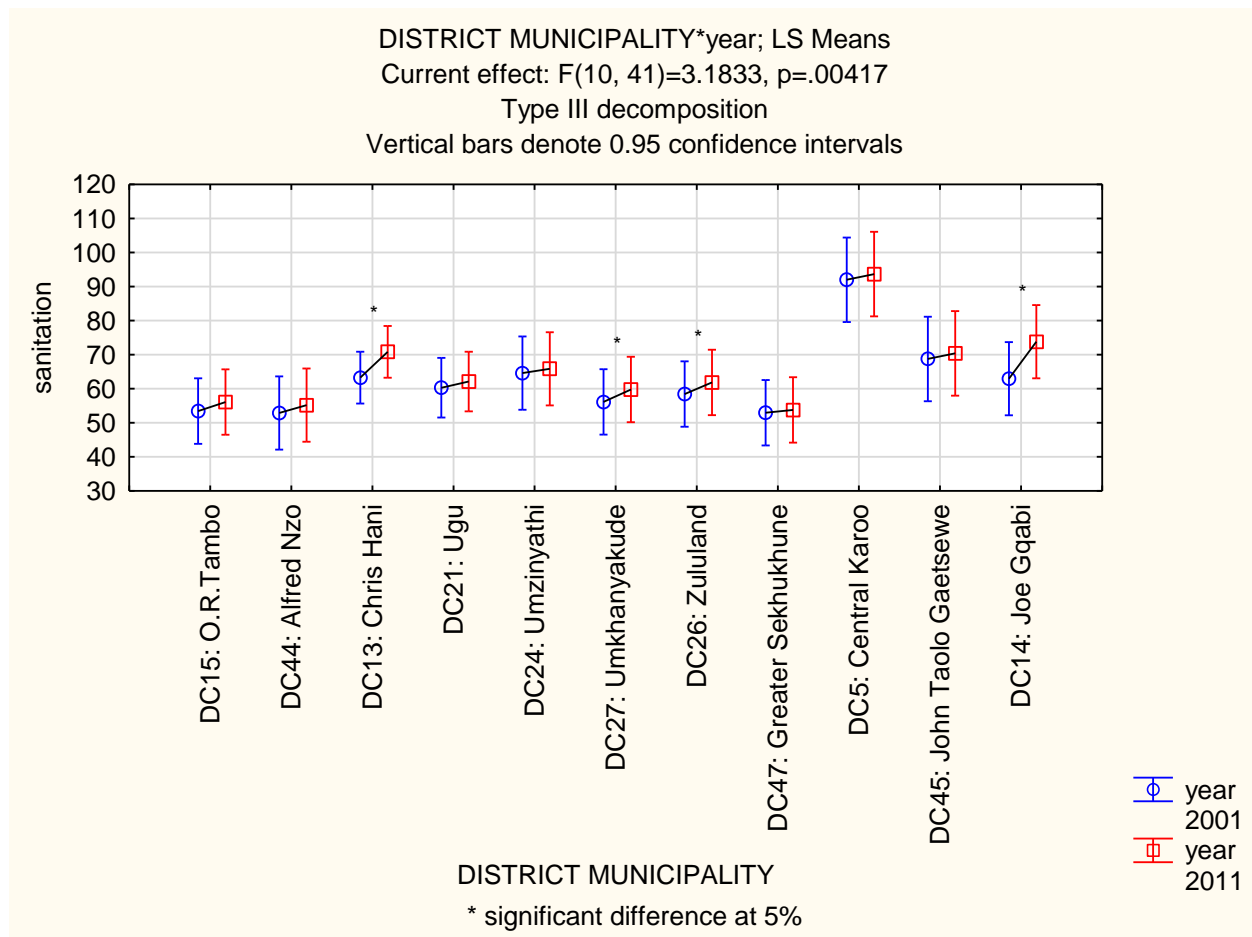


Figure 4.6 Sanitation provision for households in the ISRDP areas

#### 4.1.5 Average refuse-removal delivery index in the ISRDP areas

The impact of waste on the environment and on people's health is also a critical point of concern. Refuse removal (waste management) in South Africa is governed by the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) which came into effect on 1 July 2009. In terms of the refuse removal-delivery index, only two of the 11 ISRDP nodes reflected statistically significant increases ( $p < 0.05$  at a  $p = 0.05$  level of statistical significance) between 2001 and 2011. These are Greater Sekhukhune and Joe Gqabi DM (see Figure 4.7).

The reason behind the significant increase in Greater Sekhukhune ISRDP nodal area is highlighted in its LMs, as this service is a LM function. During the 2009/2010 financial year, Ephraim Mogale



procured two new specialised vehicles for the collection of refuse from different areas in the region (Ephraim Mogale 2010). In Fetakgomo LM, during the 2010/2011 financial year, a pilot project for upgrading refuse removal services was successfully conducted for 4000 households in the Apel, Nkwana and Nchabeleng areas. Additionally, the service was extended to 5000 households in the Mohlaletse area, and all of these benefited from the service (Fetakgomo 2011). For the 2010/2011 financial year, 4309 households benefited from the refuse removal service compared to 4291 that benefited the previous financial year, which constitutes an increase of 18 new households that were added to the programme for Greater Tubatse LM (Greater Tubatse 2011).

In Joe Gqabi DM, as in many other ISRDP nodes, solid waste management is a function of the LMs. The DM has four LMs under its jurisdiction, namely Elundini, Senqu, Maletswai and Gariep. Three municipalities reported refuse removal improvements as follows: in Elundini during the 2010/2011 financial year, waste was collected daily in the business areas and in residential areas it was collected once a week. Waste was collected randomly following requests by business customers (Elundini 2011). In Maletswai LM, the municipality extended access to refuse removal to six schools, the Soul City informal settlement, and refuse removal services were increased to include 13 126 households inclusive of informal settlements (Maletswai 2011). For Gariep LM, the municipality targeted to provide solid waste management services to 8977 households across its boundaries, and it reached one hundred per cent of its target during the 2010/2011 financial year. This means that the Gariep LM has no backlog when it comes to refuse removal (Gariep 2011).

The John Taolo Gaetsewe node reflected an increase between the years under review, even though the increase is not statistically significant ( $p=0.09$  at a  $p=0.05$  level of statistical significance). This is because refuse removal in the Joe Morolong LM (former Moshaweng LM) remains a challenge, seeing that this municipality is characterised by long distances between villages spattered over a huge area, which makes the development of landfill sites that comply with acceptable environmental and disease control standards extremely difficult. Even more challenging is the transportation and logistical nightmare it represents (Joe Morolong 2011).

Central Karoo DM is the highest in percentage terms of all nodes in terms of refuse disposal, even though it is not statistically significant ( $p=0.83$  at a  $p=0.05$  level of statistical significance). Thus the higher percentage of households in this region have access to the service when compared to other nodes. Similar reasons as articulated in the previous paragraphs (4.1.1, 4.1.2 and 4.1.3.3) are still applicable even for this service. The main reason why Central Karoo nodal area is not statistically

significant is that the district already had a higher percentage of households from whom refuse was collected in 2001 (71.8%), and thus there was not much of a backlog to deal with; hence, the slight move to 80.3% in 2011. Moreover, between the 2009/2010 and 2010/2011 financial years, the municipality had been providing the service to the same number of households (1458) at minimum service delivery level standards (Central Karoo 2011; Stats SA 2014b).

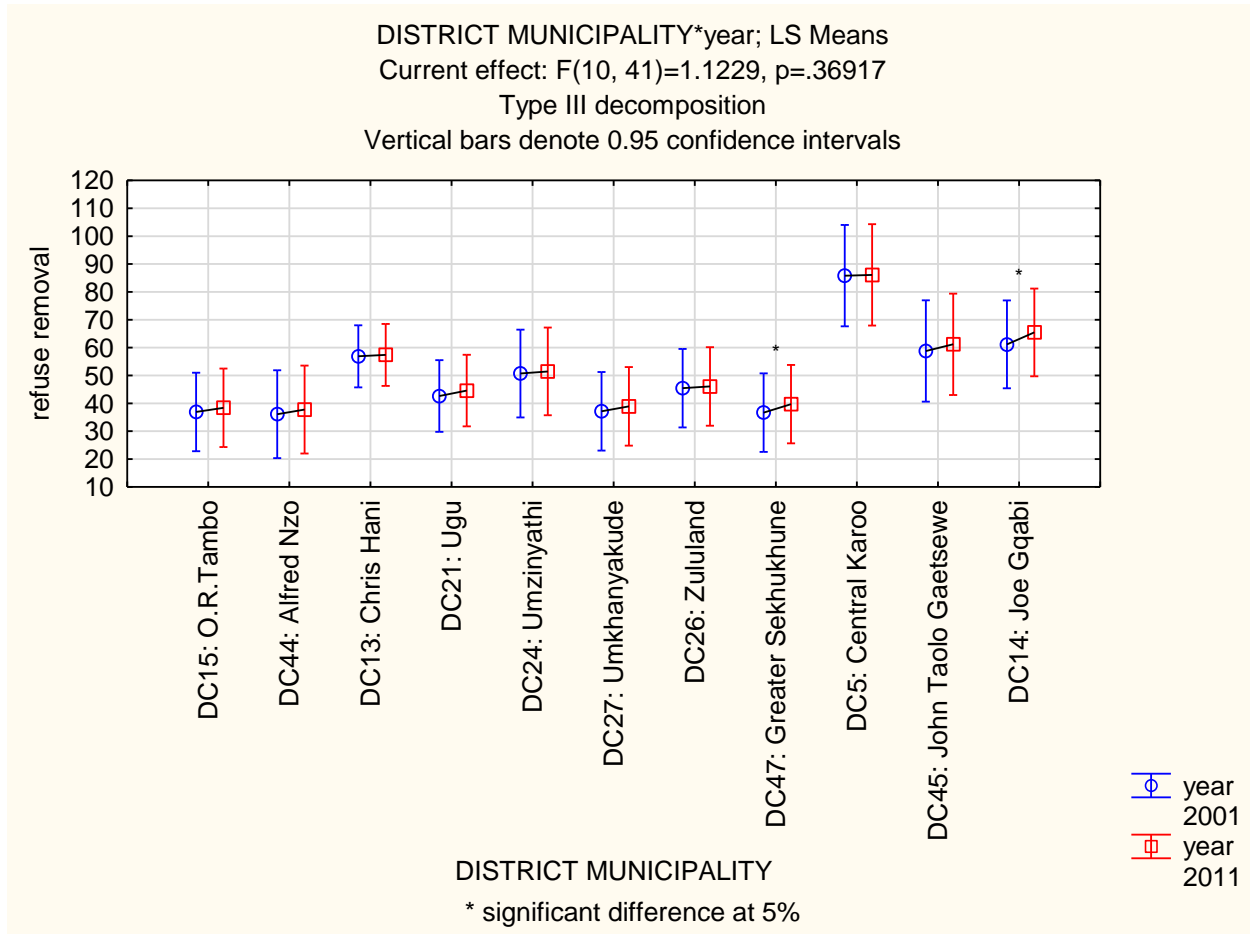


Figure 4.7 Refuse removal delivery for households in the ISRDP areas

#### 4.1.6 Average ICT service delivery index in the ISRDP areas

When analysing this index, a slightly different reasoning will be provided, because ICT services are not supplied by the ISRDP nodes in South Africa. Stated differently, this service is currently neither a function of a DM nor an LM. Households buy these services from their own pockets for their own benefit. In terms of this index, similar to the use of energy for heating index, all the nodes in the ISRDP areas experienced a statistically significant increase ( $p < 0.05$  at a  $p = 0.05$  level of statistical significance), with O.R. Tambo, Alfred Nzo and Greater Sekhukhune nodes showing the greatest increase, and Central Karoo showing the smallest increase between 2001 and 2011 (Figure 4.8). This is probably because we live in a digital world (digital inclusion) and no longer in times of digital

divide. Everyone wants a cellphone or a landline or a personal computer (PC) or a laptop to be in touch with family, friends, colleagues, to do research about certain businesses or about jobs, or to find information about almost everything that pertains to people’s lives (Brändström 2011). ICT allows people to communicate at a distance by voice (verbal) or otherwise (written). Additionally, technology has educational benefits even though it has to be properly managed (Joshi et al. 2013; Saba 2009).

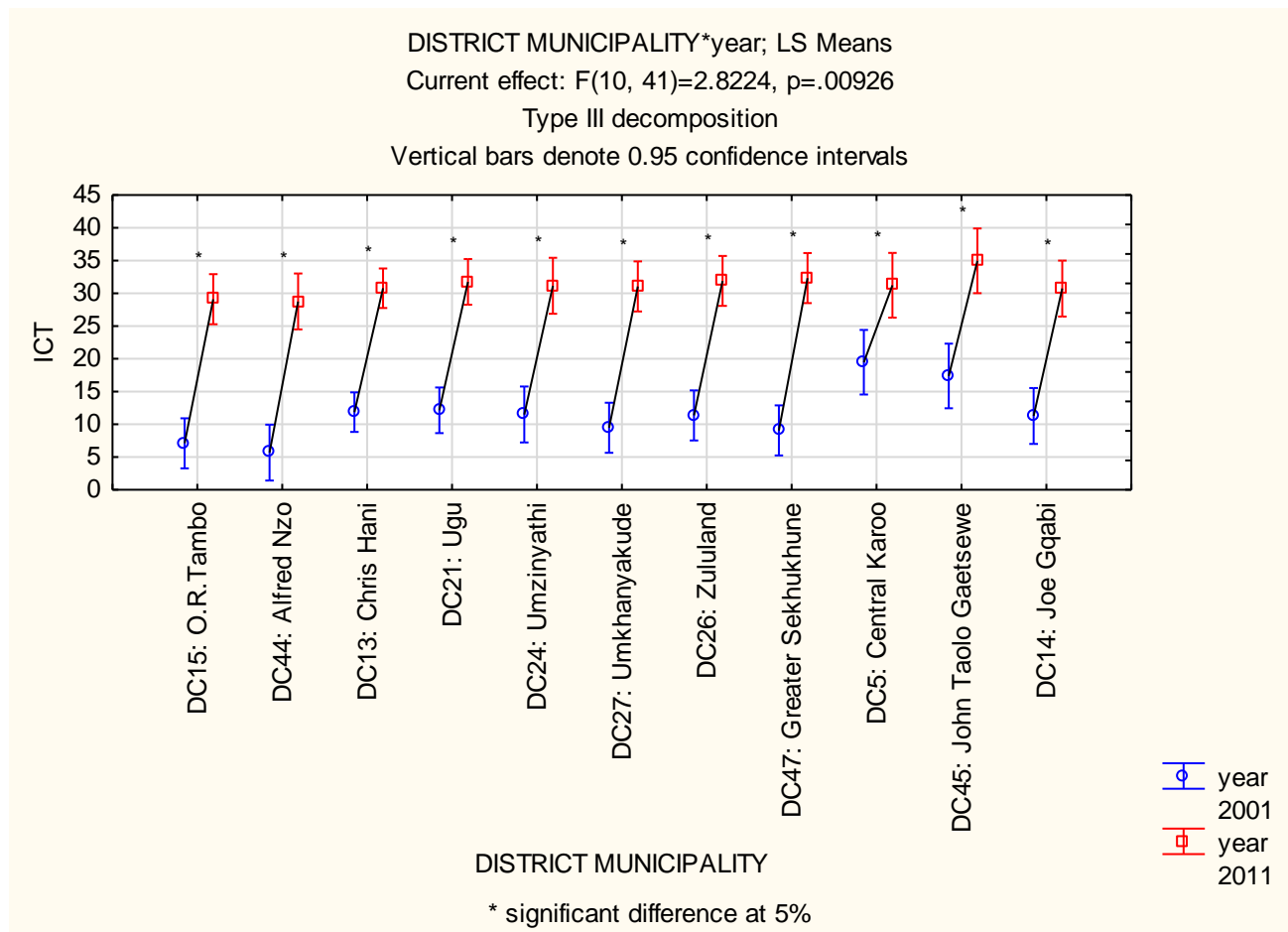


Figure 4.8 ICT service-delivery for households in the ISRDP areas

#### 4.2. FBS PROVIDED TO INDIGENT HOUSEHOLDS IN THE ISRDP HOUSEHOLDS

Commodification of services by municipalities in order for them to generate own revenue (which in turn is used to provide these services) has caused these services to be unaffordable to many residents, especially those in the ISRDP nodes. As per FBS policy, municipalities have to identify indigent households according to certain criteria. These criteria vary from one municipality to another as their circumstances also vary. Some use the threshold of two times the old-age pension amount, while others use the structure of the household's house (whether it is built from mud or a shack, etc.) and indicate that households who are below this household threshold will not pay for services or will have their services subsidised in an attempt to relieve them. FBS consists of water, electricity, sanitation and refuse removal as well as sewerage and sanitation. The amounts of percentages or quantities for these differ from municipality to municipality; however, the generic quantities are 6 kl of water per month per household, and 50 kWh of units of electricity per household per month (DPLG 2007; DPLG 2012; DWAF 2002).

Table 4.1 below reflects the number of indigent households identified by the eleven ISRDP nodes under review as a percentage of total households in the ISRDP area for 2011 as well as those receiving services from these respective nodes.

About 86% of households in the O.R. Tambo ISRDP node are indigent, followed by Alfred Nzo DM and Joe Gqabi DM with 62.5% and 58.7%, respectively. Umzinyathi and Zululand nodes are the lowest of them all with respectively 5.1% and 5.7% of their households being indigent (Table 4.1). In terms of access to FBS, indigent households in Central Karoo ISRDP nodal area are better off when compared to the rest of the other nodes. This is because as far as water and electricity services are concerned, all those households identified as indigent receive these services, and for sanitation and refuse removal, they receive 89.7% and 49.5%, respectively (Table 4.1). Another DM where indigent households are better off when compared to the rest, is Zululand, where between 45.8% and 95.0% of its identified households receive free basic services. Chris Hani also recorded higher percentages than the remaining nodes. Greater Sekhukhune is not providing its identified indigent households with adequate free basic services, except for electricity (which Eskom is providing). All the percentages for the other three services are less than 10% for the identified indigent households (Table 4.1).

Table 4.1 Indigent households as a % of total households per ISRDP area and beneficiaries as a % of identified indigents

ISRDP node	Total number of households in the node	Indigent households identified by the node	Indigent households as a percentage of total households	% of indigents receiving the free services (beneficiaries)			
				Water	Electricity	Sewerage and sanitation	Solid waste management
Alfred Nzo DM	169 261	105 867	62.5%	82.3%	3.0%	43.0%	0.4%
Central Karoo DM	47 984	5 441	11.3%	100.0%	100.0%	89.7%	49.4%
Chris Hani DM	210 852	52 937	25.1%	79.8%	75.0%	63.9%	44.8%
Greater Sekhukhune DM	263 802	37 933	14.4%	2.3%	97.4%	2.3%	8.6%
Joe Gqabi DM	97 775	57 391	58.7%	44.5%	57.3%	22.8%	26.9%
John Taolo Gaetsewe DM	100 194	12 803	12.8%	58.7%	100.0%	35.3%	35.3%
O.R. Tambo DM	298 229	259 000	86.8%	95.0%	4.7%	63.4%	0.3%
Ugu DM	179 440	18 090	10.1%	33.9%	45.1%	33.9%	16.9%
Umkhanyakude DM	128 195	0	-	-	-	-	-
Umzinyathi DM	113 469	5 777	5.1%	0.0%	98.4%	0.0%	49.8%
Zululand DM	157 748	8 957	5.7%	45.8%	95.0%	63.7%	73.6%

Source: Stats SA 2012b; Stats SA 2012c

The Umkhanyakude ISRDP nodal area did not identify any households as indigent during the 2010/2011 financial year. This does not mean that the DM does not have indigent households, but it could mean that either the DM did not provide services to indigent households during the financial year in question due to budgetary constraints, or that citizens of the node were not aware that they have to register to qualify for the FBS (Table 4.1).

## **SECTION 5: CONCLUSIONS, POLICY IMPLICATIONS, LIMITATIONS OF THE STUDY AND RECOMMENDATIONS FOR FUTURE RESEARCH**

The aim of the study was to determine the changes in the service-delivery indices in the ISRDP nodes from 2001 to 2011 as measured through housing (formal dwelling, informal dwelling and traditional dwelling), water (piped (tap) water inside dwelling/yard, piped (tap) water on a communal stand and no access to piped (tap) water), electricity for cooking, heating and lighting, sewerage and sanitation (flush or chemical toilet, pit latrine, bucket latrine), refuse removal (by local authority and/or private company) and ICT indices.

Local government in South Africa is largely understood in terms of service delivery and the South African Constitution, 1996 (Act No. 108 of 1996) assigns municipalities the role to mobilise economic resources towards the improvement of the lives of all citizens. Basic services are the fundamental building blocks of improved quality of life and adequate supplies of safe water and adequate sanitation are necessary for life, well-being and human dignity (Stats SA 2016c). Service delivery quantification will always be arguable, considering the numerous factors and methods that influence it. The literature review has given us insight as where to and when the services were delivered to households in the ISRDP areas. Great strides have been made in the 10 years under review (2001 to 2011) in terms of providing different services to households in the nodes. This is affirmed by high level of statistical significance shown by many of the delivery indices under review.

Central Karoo DM seems to be doing better for all the delivery indices except for the ICT services. This is because it has attained higher percentages for these indices compared to the rest of the ISRDP nodes. It is followed by John Taolo Gaetsewe DM in housing, water, electricity and ICT services. Greater Sekhukhune DM is also doing well with housing, so as Chris Hani DM with water. Joe Gqabi DM is doing better with the provision of sanitation and refuse removal. Ugu DM is appearing better with the ICT services after John Taolo Gaetsewe. For those nodes where electricity increased the main cause of that was attributable to the improved capacity of certain hydro-electric power plants in those areas. Contrary, Alfred Nzo DM seems to be the worst performer for most of the delivery indices followed by O.R. Tambo DM. Greater Sekhukhune DM is doing badly in terms of sanitation and refuse provision. Umkhanyakude DM is not performing well when it comes to electricity distribution.

The housing service delivery index is doing well in most of the ISRDP nodes except for O.R. Tambo and Alfred Nzo. Electricity for cooking is negative as most rural areas (villages in Limpopo and

Eastern Cape mainly) still relied on wood and animal dung for their cooking (Figure 4.3). This is a signal for the bad QOL. The use of wood was particularly noticeable in Limpopo, Mpumalanga, KwaZulu-Natal and Eastern Cape (Stats SA 2015a). In all the rural nodes, the proportion of households using electricity for heating increased during this time period, a sign for a good QOL. Over the same period, the proportion of those using electricity for lighting increased in all except central Karoo DM which was already on a higher levels even in 1996. Municipalities with very large backlogs are predominantly located in rural areas and include Umhlabuyalingana, where 81.5% of households reported not having access to electricity, as well as Jozini (58.4%), Ntabankulu (47.2%), Maphumulo (43.0%), Emadlangeni (42.8%) and Msinga (42.7%) (Stats SA 2016c). Except for Maphumulo, Msinga and Emadlangeni, the other two LMs mentioned above from part of the 11 ISRDP nodes under review, and recorded the highest in terms of percentage when compared to other municipalities.

To summarise, there has been tremendous improvement in the water delivery index in the rural nodal areas over the ten-year period between 2001 and 2011. Even though the rate of delivery in some of the nodes was much lower than the nodal average over the same period, it is probably understandable, considering the heavy backlogs that most of the nodes had to deal with. The fact that some households fetch water at a distance below RDP standards, for instance at a distance greater than 200 m from the yard to even close to a kilometre, has a negative influence on the QOL of residents in such nodes.

Both sanitation and refuse removal indices did not reflect much of an improvement for many of the rural nodes in question. Obvious reasons are that some of the rural nodes – especially in Eastern Cape and KwaZulu-Natal – are still using pit latrines with no ventilation and even worse, the bucket toilet system as a temporary measure for sanitation. This is unacceptable and needs urgent intervention from government as it puts to risk the lives of many innocent people residing in these areas. As far as refuse removal is concerned, a number of rural nodes are faced with the challenge of these services not reaching their rural villages (only urban areas are serviced), and rural dwellers create their own refuse dumps inside their yards or, even worse, some do not have a rubbish dump at all. This impacts negatively on people's QOL.

A visible improvement in the ICT services index was revealed across all nodes between the ten years under review. This shows that the societies in these rural nodes did not lag behind with the change in technology. It is used for educational purposes mainly.

Households living in rural municipalities usually have access to far fewer commodities, and usually also to more inferior services compared to those living in wealthier, particularly more urban municipalities. Although the reasons for the existence of backlogs differ by service and between municipalities, some of the reasons relate to the legacy of unequal development which still haunts former homeland areas, the high levels of poverty that limit households' ability to pay for services, as well as the practical constraints of extending services to far-off rural areas or densely populated informal areas at great expense to the LM (Stats SA 2016c).

The policy for FBS across all four basic services promotes affordable access for poor households to at least a basic level of services, be it water, electricity, sanitation or refuse removal. These indigent households are identified mainly based on affordability. Most nodes seem to be struggling in identifying the indigent households or they lack awareness campaigns to inform people about this service. This is revealed by the small percentage of indigent households over the total number of households in the node. It is also not easy to provide the service to all the beneficiaries, probably because some indigent households, even though registered, are in areas where the service is not available at all, so it cannot be provided to them free of charge by the municipality. Concentration is mainly in urban areas of these rural nodes.

## 5.1 POLICY IMPLICATIONS

Below are the policy implications in relation to this study:

- i. Policymakers need to review the relevance and successfulness of the ISRDP, given the vast amount of time that has passed;
- ii. Government needs to improve housing provision in O.R. Tambo and Alfred Nzo regions as the DMs are not doing well compared to the rest of the ISRDP nodes;
- iii. Policy makers need to improve water delivery in Alfred Nzo DM;
- iv. Greater Sekhukhune, Alfred Nzo and O.R. Tambo ISRDP nodes are behind when it comes to sanitation services compared to the rest of the ISRDP nodes;
- v. Government needs to empower the ISRDP nodal point to devise ways to enable them to generate their own revenue from which more services will be rendered to the needy communities;
- vi. Government needs to improve electricity services for most of the ISRDP nodes, especially in Alfred Nzo and Umkhanyakude DMs as they are not doing well compared to the rest of the ISRDP nodes;



- vii. With such a statistically significant use of ICT services by households in the ISRDP areas, municipalities in these regions may see it necessary to install free Wi-Fi for the residents living in these areas;
- viii. Revamp the irrigation schemes such as the Ncora Irrigation Scheme for food security purposes as well as job creation;
- ix. Encourage PPPs and shared services between nodes sharing boundaries in an attempt to improve service delivery and the delivery of improved infrastructure which will attract investors; and
- x. Devise more ways of subsidising services provided to indigent households as the demand tends to be more than the supply.

## **5.2 LIMITATIONS OF THE STUDY AND RECOMMENDATIONS FOR FUTURE RESEARCH**

The limitations of the study included: Comparison of results between two censuses is also limited by comparability of the questions from one census to the next; change of municipal boundaries resulted in some data being omitted in one of the two years. The Non-Financial Census questionnaire does not have a verification tool, so professionals rely on the indemnity form signed by the municipal officials, binding them that the figures provided to Stats SA are correct. This is more relevant for the indigent household figures. Recommendations for future research include conducting a similar study but testing the quality of these services provided; for instance, is the water that households obtain in the yard of good quality, and what about power outages? Another study would be to compare rural and non-rural nodes in as far as QOL and service delivery are concerned. One can also check if these nodes, when compared to non-nodes, still form part of the ISRDP list, and what happens if non-nodes are worse than nodes.

## 6. REFERENCES

- Adaku E 2016. Rethinking Urban Infrastructure Cost Management in Developing Countries. *Journal of Urban Planning and Development* 142, 1: 05014032.
- Allan K & Heese K 2013. Understanding Why Service Delivery Protests Take Place and Who is to Blame. MunicipalIQ.co.za. Available from [http://www.municipaliq.co.za/publications/articles/sunday\\_indep.pdf](http://www.municipaliq.co.za/publications/articles/sunday_indep.pdf). [Accessed 13 May 2017].
- Arriaga M, Cañizares CA & Kazerani M 2014. Access to Electricity in Canada's Northern and Remote Communities. *IEEE power & energy magazine*: Digital Object Identifier 10.1109/MPE.2014.2317963.
- Auh S & Cook CC 2009. Quality of Community Life among Rural Residents: An Integrated Model. *Social Indicators Research* 94, 3: 377-389.
- Azimoh CL, Klintonberg P, Mbohwa C & Wallin 2017. Replicability and scalability of mini-grid solution to rural electrification programs in sub-Saharan Africa. *Renewable Energy*. 106: 222-231.
- Bandias S & Vemuri SR 2005. Telecommunications infrastructure facilitating sustainable development of rural and remote communities in Northern Australia. *Telecommunications Policy* 29: 237-249.
- Barnes J 2014. Many South Africans still lack proper sanitation facilities. Stellenbosch University. Retrieved from <http://www.sun.ac.za/english/Lists/news/DispForm.aspx?ID=2012>. [Accessed 22 August 2017].
- Barta 2012. *Small scale hydroelectricity issues and prospects*. Workshop on small-scale hydroelectricity.

- Bekink B 2006. Principles of South African Local Government Law LexisNexis. Retrieved from <http://www.chartsec.co.za/documents/speakerPres/HennieBekker/BekkerPublicSectorGovernance7.pdf>. [Accessed 01 June 2017].
- Bonthuys GJ, van Dijk M and Bhagwan JN 2016. A feasibility and implementation model of small-scale hydropower development for rural electrification in South Africa: A case study of Kwa Madiba SSHP Plant. *Water SA* 42, 4.
- Bosman BN 2014. The Department of Human Settlement's Policy on Eradicating Informal Settlements in South Africa: A De-colonial Feasibility Analysis. Master's thesis. Pretoria: University of South Africa, Department of Development Studies.
- Bouabid A & Louis GE 2015. Capacity factor analysis for evaluating water and sanitation infrastructure choices for developing communities. *Journal of Environmental Management* 161: 335-343.
- Brändström C 2011. Using the Internet in Education – Strengths and Weaknesses A Qualitative Study of Teachers' Opinions on the Use of the Internet in Planning and Instruction.
- Central Karoo District Municipality 2005. Central Karoo District Municipality annual report 2004/2005.
- Central Karoo District Municipality 2011. Central Karoo District Municipality annual report 2010/2011.
- Chan YK, Kwan CCA & Shek TLD. 2005. Quality of Life in Hong Kong: The Cuhk Hong Kong Quality of Life Index. *Social Indicators Research* 71, 1/3: 259-289.
- Chikowore T & Willemsse L 2017. Identifying the changes in the quality of life of Southern African Development Community (SADC) migrants in South Africa from 2001 to 2011. *South African Geographical Journal* 10.1080/03736245.1208577.
- Chris Hani District Municipality 2011. Chris Hani District Municipality Annual Report 2010/2011.

- Clark H 2010. Supporting actions to address climate change. Opening remarks on the occasion of the UN-DESA, UNDP, UN Regional Commissions Side Event: Supporting Global, Regional and National Actions to Address Climate Change, Cancun.
- Cloke P, Johnsen S & May J 2007. The periphery of care: emergency services for homeless people in rural areas. *Journal of Rural Studies* 23: 387-401.
- Council for Scientific and Industrial Research (CSIR) 2002. Sustainability Analysis of Human Settlements in South Africa. *Prepared for the Department of Housing by the CSIR Building and Construction Technology*, Pretoria.
- Daley K, Castleden H, Jamieson R, Furgal C & Ell L 2015. Water systems, sanitation, and public health risks in remote communities: Inuit resident perspectives from the Canadian Arctic. *Social Science & Medicine* 135: 124-132.
- Davenport TRH 1977. *South Africa: A Modern History*, Johannesburg: Macmillan: 268.
- Davenport TRH 1991. *South Africa: A modern history (4th ed)*. London: Macmillan.
- De Beer F & Swanepoel H 1998. *Community Development and Beyond: Issues, Structures and Procedures*. Van Schaik Academic, Pretoria.
- De Groot RAF, Van der Veen VG & Sebitosi AB 2013. Comparing solar PV (photovoltaic) with coal-fired electricity production in the centralized network of South Africa. *Energy* 55: 823-37.
- Del Mistro R & Hensher DA 2009. Upgrading informal settlements in South Africa: Policy, rhetoric and what residents really value. *Housing Studies* 24, 3: 333-354.
- Department of Provincial and Local Government (DPLG) 2006. South Africa. National Municipal Infrastructure Grant management unit. Programme management processes and procedures. Pretoria.

- Department of Provincial and Local Government (DPLG) 2007. South Africa. National framework for Municipal Indigent Policies. Pretoria.
- Department of Provincial and Local Government (DPLG) 2012. South Africa. Annual Report. Pretoria.
- Department of Rural Development and Land Reform (DRDLR) 1997. *Rural Development Framework*. Department of Rural Development and Land Reform.
- Department of Rural Development and Land Reform (DRDLR) 2000. *The Integrated Rural Development Programme Strategy*. Department of Rural Development and Land Reform.
- Department of Water Affairs and Forestry (DWAF) 2002. Free Basic Water Implementation Strategy, Version 2, August 2002. Available from <http://www.dwaf.gov.za/Documents/FBW/FBWLocalAuthGuidelinesAug2002.pdf>. [Accessed 25 April 2017].
- Department of Water Affairs and Forestry (DWAF) 2007. South Africa. Annual Report 2006/2007. Pretoria.
- Economic Development Department (EDD) 2014. Republic of South Africa. Pretoria. Retrieved from: <http://www.economic.gov.za/communications/annual-reports>. [Accessed 03 July 2017].
- Elundini Local Municipality 2011. Elundini Local Municipality Annual Report 2010/2011.
- Empowerdex Service Delivery Index (Citydex) 2009. Economic Empowerment Rating Agency Available from [http://www.empowerdex.co.za/Portals/5/docs/Press%20releases/citydex\\_report.pdf](http://www.empowerdex.co.za/Portals/5/docs/Press%20releases/citydex_report.pdf) [Accessed 09 May 2017].
- Ephraim Mogale Local Municipality 2010. Ephraim Mogale Local Municipality Annual Report 2009/2010.

Eskom 2010. Renewable energy: hydroelectric power stations. COP 17 fact sheet. Eskom.

Eskom 2011. Partnering for a sustainable future. Integrated Report. Eskom.

Everatt D, Smith MJ & Solanki G 2006. Researched and written for the Department of Social Development. Strategy & Tactics. Pretoria.

Fan Q 2005. Regulatory factors influencing Internet access in Australia and China: a comparative analysis. *Telecommunications Policy* 29: 191–203.

Fetakgomo Local Municipality 2011. Fetakgomo Local Municipality Annual Report 2010/2011.

Ford JD, Berrang-Ford L, King M & Furgal C 2010. Vulnerability of Aboriginal health systems in Canada to climate change. *Glob. Environmental Change* 20, 4: 668-680.

Fourie J 2007. A Note on Infrastructure Quality in South Africa. University of Stellenbosch. Stellenbosch Economic Working Papers.

Gariep Local Municipality 2011. Gariep Local Municipality Annual Report 2010/2011.

Glanville K & Chang H-C 2015. Mapping illegal domestic waste disposal potential to support waste management efforts in Queensland, Australia. *International Journal of Geographical Information Science* 29, 6: 1042–1058.

Government Gazette Republic of South Africa 2003. Vol. 457 Pretoria 4 July 2003 No. 25088.

Government of the Republic of South Africa 1998. The White Paper on Local Government. Ministry of Provincial Affairs and Constitutional Development, Pretoria.

Greater Sekhukhune District Municipality 2010. Greater Sekhukhune District Municipality Annual Report 2009/2010.

- Greater Tubatse Local Municipality 2011. Greater Tubatse Local Municipality Annual Report 2010/2011.
- Harmse A 2010. Node selection for the Integrated Sustainable Rural Development Programme in South Africa. *Development Southern Africa* 27, 3.
- Hemson D, Meyer M & Maphunye K 2004. Rural Development. The provision of Basic Infrastructure services. Position Paper. Human Sciences Research Council (HSRC). Intergrated Rural and Regional Development.
- Hemson D & Owusu-Ampomah K 2005. State of the nation: South Africa 2004/2005. Michigan State University Press East Lansing, Michigan, 48823-5202, United States of America.
- Henry RK, Yongsheng Z and Jun D 2006. Municipal solid waste management challenges in developing countries – Kenyan case study. *Waste Management* 26: 92–100.
- Housing Association Council (HAC) 2012. Annual Report. Housing Rural America in challenging times.
- Idris K, Shaffril HAM, Yassin SM, Abu Samah A, Hamzah A & Abu Samah B 2016. The quality of Life in rural communities: Residents living near to Tembeling, Pahang and Muar rivers, Malaysia. Public Library of Science doi:10.1371/journal.pone.0150741.
- International Finance Corporation (IFC) 2014. Handshake, IFC's quarterly journal on public-private partnerships. International Finance Corporation, a World Bank Group.
- Jacobs P & Hart T 2012. Rural Innovation Assessment Tool (RIAT). Concept paper series.
- Joe Gqabi District Municipality 2011. Joe Gqabi District Municipality Annual Report 2010/2011.
- Joe Morolong Local Municipality 2011. Joe Morolong Local Municipality Annual Report 2010/2011.

- Jones SA & Silva C 2009. A practical method to evaluate the sustainability of rural water and sanitation infrastructure systems in developing countries. *Desalination* 248: 500–509.
- Joshi A, Meza J, Costa S, Perin DMP, Trout K & Rayamajih A 2013. The Role of Information and Communication Technology in Community Outreach, Academic and Research Collaboration, and Education and Support Services (IT-CARES).
- Kapuria P 2013. A human well-being perspective to the measurement of quality of life: Findings from the city of Delhi. *Applied Research Quality of Life* 11: 125-145.
- Kilian D, Fiehn H, Ball J & Howells M 2005. Background Research Paper produced for the South Africa. Environment Outlook report on behalf of the Department of Environmental Affairs and Tourism. Background Research Paper: Human Settlements. South Africa Environment Outlook.
- King Sabata Dalindyebo (KSD) Local Municipality 2011. King Sabata Dalindyebo (KSD) Local Municipality Annual Report 2010/2011.
- Kirkwood K 1950. The Group Areas Act. Johannesburg: South African Institute of Race Relations.
- Kironji E 2008. Measuring quality of life in South Africa: A household-based development index approach. Doctoral thesis. Pretoria: University of Pretoria, Faculty of humanities.
- Kitchen P & Muhajarine N 2008. Quality of Life Research: New Challenges and New Opportunities. *Social Indicators Research* 85, 1.
- Kole NM 2005. An evaluation of the Integrated Sustainable Rural Development Programme: Highlighting stakeholder mobilisation and engagement. University of Pretoria etd.
- Koma S 2010. The state of local government in South Africa: issues, trends and options. *Journal of Public Administration*, 45, 11:111-120.
- Kusakana K 2014. Techno-economic analysis of off-grid hydrokinetic-based hybrid energy systems for onshore/remote area in South Africa. *Energy* 68: 947-957.



- Lamit H, Ghahramanpouri A & Mohamad SB 2013. An Evaluation of Residents' Quality of Life through Neighborhood Satisfaction in Malaysia. *Environmental Management and Sustainable Development* 2, 1.
- Le Roux FE 2011. The Provision of Low-Cost Housing in South Africa: A Wicked Problem with a Systems Theory Solution. Stellenbosch: Stellenbosch University (Unpublished Masters Dissertation).
- Lenz L, Munyehirwe A, Peters JRG & Sievert M 2017. Does Large-Scale Infrastructure Investment Alleviate Poverty? Impacts of Rwanda's Electricity Access Roll-Out Program. *World Development* 89: 88–110.
- Local Government budget and expenditure review (LGBER) 2011. Delivering municipal services in rural areas. Chapter 12. National Treasury. Pretoria.
- Local Government Turnaround Strategy, working together turning the tide in local government. November 2009. Available at <http://www.info.gov.za/view/DownloadFileAction?id=118277>. [Accessed 03 March 2017].
- Lubka L 2001. Housing in Rural America: Building affordable and Inclusive Communities. American Planning Association. *Journal of the American Planning Association* 67, 1: 118.
- Luiz JM 2002. South African state capacity and post-apartheid economic reconstruction. *International Journal of Social Economics* 29, 8: 594-614.
- Madubansi M & Shackleton CM 2007. Changes in fuelwood use and selection following electrification in the Bushbuckridge Lowveld, South Africa. *Journal of Environmental Management* 83: 416–426.
- Mahadea D 2014. Enterprising and Delivering a Better Quality of Life for All in South Africa: Progress and Prospects. *Mediterranean Journal of Social Sciences* 5, 8.

- Mahlakanya IJ 2017. Comparing the changes in the quality of life of people residing in the rented main shacks, backyard rooms and backyard shacks in the metropolitan municipalities in Gauteng from 2001 to 2011. MPhil thesis. Stellenbosch: Stellenbosch University, Centre for Regional and Urban Innovation and Statistical Exploration (CRUISE).
- Makgetlaneng S 2010. Decentralization as a means to ensure provision of basic social services in the Democratic Republic of Congo. Africa Institute of South Africa. *Africa Insight* 39, 4.
- Makhura MN & Wasike WSK 2003. Patterns of access to rural service infrastructure: The Case of Farming Households in Limpopo Province. *Agrekon* 42, 2.
- Makinde OO 2014. Housing delivery system, need and demand. *Environmental Development Sustainability* 16: 49–69.
- Malecki EJ & Boush CR 2003. Telecommunications Infrastructure in the Southeastern United States: Urban and Rural Variation. *Growth and Change* 34, 1: 109-129.
- Maletswai Local Municipality 2011. Maletswai Local Municipality Annual Report 2010-2011.
- Mandelli S, Barbieri J, Mereu R & Colombo E 2016. Off-grid systems for rural electrification in developing countries: Definitions, classification and a comprehensive Literature review. *Renewable and Sustainable Energy Reviews* 58: 1621–1646.
- Marx C & Engels F 1976. Collected Works. Volume 6. International Publishers, New York.
- McAllister J 2015. Factors Influencing Solid-Waste Management in the Developing World. *All Graduate Plan B and other Reports*. Paper 528.
- Mdwara VV 2015. Identifying the changes in the quality of life of 15 of the poorest rural districts in South Africa from 2001 to 2011. MPhil thesis. Stellenbosch: Stellenbosch University, Centre for Regional and Urban Innovation and Statistical Exploration (CRUISE).

- Melody WH 2000. Telecom development. *Telecommunications Policy* 24: 635-638.
- Meth P 2017. Informal Housing, Gender, Crime and Violence: The Role of Design in Urban South Africa. *The British Journal of Criminology* 57, 2: Pages 402–421. [Online] Available from <https://doi.org/10.1093/bjc/azv125> [Accessed: 31 August 2017].
- Mhlontlo Local Municipality 2011. Mhlontlo Local Municipality Annual Report 2010-2011.
- Moller V 2001. Monitoring quality of life in cities: the Durban case. *Development Southern Africa* 18, 2.
- Muller CFJ 1981. *Five Hundred years: a history of South Africa*; 3rd rev. ed., Pretoria: Academica: 393-96.
- Narayana T 2009. Municipal solid waste management in India: From waste disposal to recovery of resources? *Waste Management* 29, 3: 1163-1166.
- National Planning Commission (NPC) 2011. The National Planning Commission. [Online] Available from <http://www.npconline.co.za> [Accessed 03 September 2017].
- National Rural Electric Cooperative Association (NRECA) 2015. NRECA works with utility co-ops to build crucial rural infrastructure. Rural Cooperatives.
- Ndinda C, Uzodike NO & Winnaar L 2011. From informal settlements to brick structures: housing trends in post-apartheid South Africa. *Journal of Public Administration* 46, 1.1: 761-784.
- Nevondwe L & Odeku K 2012. Challenges of housing delivery in South Africa: Lessons learnt from jurisprudence. *African Journal of Business Management* 6, 45: 11327-11341. [Online]. Available from <http://www.academicjournals.org/AJBM> [Accessed 17 August 2017].
- Ngoc UN & Schnitzer H 2009. Sustainable solutions for solid waste management in Southeast Asian countries. *Waste Management* 29: 1982–1995.

- Ngquza Hill Local Municipality 2011. Ngquza Hill Local Municipality Annual Report 2010/2011.
- Ngwane AK, Yadavalli VSS & Steffens FE 2002. Poverty: deprivations in terms of basic needs. *Development Southern Africa* 19, 4.
- Nleya N 2011. Linking service delivery and protest in South Africa: an exploration of evidence from Khayelitsha. Unisa Press. *Africanus* 50, 1.
- Nyandeni Local Municipality 2011. Nyandeni Local Municipality Annual Report 2010/2011.
- Ogwueleka TC 2009. Municipal Solid Waste characteristics and management in Nigeria. Iran. *Journal of Environmental Health Sciences Engineering* 6, 3: 173-180.
- Organization for Economic Co-operation and Development (OECD) and the World Bank 2006. Liberalisation and Universal Access to Basic Services: telecommunications, water and sanitation, financial services and electricity.
- Pacione M 2003. Urban environmental quality and human wellbeing - a social geographical perspective. *Landscape and Urban Planning* 65: 19-30.
- Pieterse HL & Pretorius MW 2002. A model for telecommunication technology transfer and diffusion into the rural areas of South Africa. *South African Journal for Industrial Engineering* 13, 1: 119-129.
- Pillay U, Tomlinson R & du Toit J 2006. Introduction, in Democracy and Delivery: Urban Policy in South Africa, HSRC Press.
- Port St Johns Local Municipality 2011. Port St Johns Local Municipality Annual Report 2010/2011.
- Public Service Commission (PSC) 2009. An evaluation of integration and coordination in the Integrated Sustainable Rural Development Programme. [Online]. Available from: <http://www.psc.gov.za/documents/2010/72150> [Accessed 12 June 2017].

- Rakgoale N 2015. Welcoming address, Mopani District Municipality Water Summit. Government Building, Giyani. South Africa.
- Rapoza RA & Mickelson A 2013. Overcoming Barriers to Affordable Housing in Rural America. The Low Income Housing Tax Credit. *Journal of Multistate Taxation and Incentives* 10, 30.
- Reader's Digest 1988. *Illustrated History of South Africa: the real story*, New York: Reader's Digest Association: 291-2.
- Republic of South Africa 1913. The Natives Land Act 27. Pretoria: Government Printer.
- Republic of South Africa 1950. The Group Areas Act 41. Pretoria: Government Printer.
- Republic of South Africa 1953. The Reservation of Separate Amenities Act 49. Pretoria: Government Printer.
- Republic of South Africa 1970. The Bantu Homeland Citizenship Act 26. Pretoria: Government Printer.
- Republic of South Africa 1996. Constitution of the Republic of South Africa Act 108. Pretoria: Government Printer.
- Republic of South Africa 1996. Growth, Employment and Retribution: A Macro-economic Strategy. Pretoria. Retrieved from: [http://www.gov.za/sites/www.gov.za/files/gear\\_0.pdf](http://www.gov.za/sites/www.gov.za/files/gear_0.pdf). [Accessed 27 June 2017].
- Republic of South Africa 2003. Municipal Finance Management Act 56. Pretoria: Government Printer.
- Republic of South Africa 2006. Accelerated and Shared Growth Initiative of South. Pretoria. Retrieved from: <http://www.thepresidency.gov.za/docs/reports/asgisa/part2.pdf>. [Accessed 06 July 2017].

- Republic of South Africa 2008. National Environmental Management: Waste Act, (Act No. 59 of 2008): Vol. 525 Cape Town. Government Gazette No. 278.
- Republic of South Africa 2009. New Growth Path: Pretoria. Retrieved from: <http://www.economic.gov.za/communications/51-publications/151-the-new-growth-path-framework>. [Accessed 18 July 2017].
- Romeo V, Brown S & Stuver S 2003. A GIS analysis of illegal dumping in the 78249 zip code of Bexar County, Texas. In: Paper presented at the Esri international user conference, 7–11 July, San Diego, CA.
- Saba A 2009. Benefits of Technology Integration in Education. Boise State University, Education Technology.
- Salfarina AG, Nor Malina M & Azrina H 2011. Trends, Problems and Needs of Urban Housing in Malaysia. *International Journal of Social, Behavioral, Educational, Economic, Business and Industrial Engineering* 5, 2.
- Sambwa A, Nnamdi ND & Ebelechukwu US 2008. Recycling of used DC motors as solar pumps for water supply and water delivery applications in urban poor and rural communities in sub-Saharan Africa. *Desalination* 248: 586–594.
- Sanusi YA 2010. Water, Sanitation, and Human Development in Urban Fringe Settlements in Nigeria. *Theoretical and Empirical Researches in Urban Management* 8, 17.
- Scanlon K, Arrigoitia MF & Whitehead C 2015. Social housing in Europe. *European Policy Analysis* 17: 1-12.
- Simba F, Troter L & Yonah ZO 2012. Sustainable Broadband Connectivity Models for Rural Areas of Tanzania. *African Journal of Science, Technology, Innovation and Development* 4, 2: 150-172.
- Socio-Economic Rights Institute of South Africa (SERI) 2011. Basic Sanitation in South Africa: A Guide to Legislation, Policy and Practice.

- South African Human Rights Commission (SAHRC) 2012. Sanitation Services – Quality of Sanitation in South Africa. Report on the Status of sanitation services in South Africa.
- South Africa (Union of) 1953. *Reservation of Separate Amenities Act*. Union of South Africa Government Printer. Pretoria.
- Stats SA 2003. Census 2001: Investigation into appropriate definitions of urban and rural areas of South Africa. Discussion document. Statistics South Africa. Pretoria.
- Stats SA 2012a. Census 2011 Metadata, Report No. 03-01-47. Statistics South Africa. Pretoria.
- Stats SA 2012b. Census 2011 Statistical release (Revised) – P0301.4, Statistics South Africa. Pretoria.
- Stats SA 2012c. Non-financial Census of Municipalities for the year ended 30 June 2011 (P9115). Statistics South Africa. Pretoria.
- Stats SA 2013. Non-financial Census of Municipalities for the year ended 30 June 2012 (P9115). Statistics South Africa. Pretoria.
- Stats SA 2014a. Census 2011. Provincial profile: KwaZulu-Natal, Report No. 03-01-74 (2011). Statistics South Africa. Pretoria.
- Stats SA 2014b. Census 2011. Provincial profile: Western Cape, Report No. 03-01-70 (2011). Statistics South Africa. Pretoria.
- Stats SA 2014c. Census 2011. Provincial profile: Northern Cape, Report No. 03-01-72 (2011). Statistics South Africa. Pretoria.
- Stats SA 2015a. General household survey (P0318). Statistics South Africa. Pretoria.

Stats SA 2015b. Data story: Households report increased access to basic services as satisfaction with some services decline. Statistics South Africa. Pretoria. Available from: <http://www.statssa.gov.za/?p=4719> [Accessed 09 September 2017].

Stats SA 2016a. Monitoring rural development: Using census data to measure change in the rural nodes, Report No. 03-10-09. Statistics South Africa. Pretoria.

Stats SA 2016b. Quest for nodal development: Evidence from Census 2001 and Census 2011, Report No. 03-10-14 (2001–2011). Statistics South Africa. Pretoria.

Stats SA 2016c. The state of basic service delivery in South Africa: In-depth analysis of the Community Survey data, Report No. 03-01-22 (2016). Statistics South Africa. Pretoria.

The Millennium Development Goals (MGDs) Report 2005. United nations. New York.

The Municipal Infrastructure Investment Framework (MIIF) for South Africa 2011. Round 7 (2009 – 2010): A capital investment perspective. Information Management Unit Development Planning Division, Development Bank of Southern Africa. Midrand, South Africa.

The Presidency 2000. *The Integrated Sustainable Rural Development Strategy (ISRDS)*. Unpublished.

Theofilou P 2013. Quality of Life: Definition and Measurement. *Europe's Journal of Psychology*.

Tredoux M 2009. Informal Housing in Cape Town: delivery, formalisation and stakeholder viewpoints. Master's thesis. Stellenbosch: Stellenbosch University, department of sociology.

Troschinetz AM 2005. Twelve factors influencing sustainable recycling of municipal solid waste in developing countries. Master's Thesis, Michigan Technological University.



- Tshikotshi V 2009. The challenges of eradicating informal settlements in South Africa by 2014. The case of Seraleng sustainable human settlement, Rustenburg local municipality, North West Province. Master's thesis. Johannesburg: University of the Witwatersrand, Faculty of Engineering and Built Environment.
- Turok I & Borel-Saladin J 2016. Backyard shacks, informality and the urban housing crisis in South Africa: stopgap or prototype solution? *Housing Studies* 31, 4: 384-409.
- Ugu District Municipality 2011. Ugu District Municipality Annual Report 2010/2011.
- Umkhanyakude District Municipality 2011. Umkhanyakude District Municipality Annual Report 2010/2011.
- UN Habitat. (2001). National Trend in Housing Production Practices. Nigeria: United Nations Centre for Human Settlements 4: 60–69).  
Available at: <http://www.chs.ubc.ca/archives/files/HS-313.pdf>.
- United Nations (UN) 2003. The Challenge of Slums: Global Report on Human Settlements. United Nations Human Settlements Programme, UNHabitat.
- United Nations Development Programme (UNDP) 2009. The energy access situation in developing countries: A Review Focusing on the Least Developed Countries and Sub-Saharan Africa.
- United Nations Development Programme (UNDP) 2011. Towards an Energy Plus Approach for the Poor: A review of good practices and lessons learned from Asia and the Pacific.
- Van der Merwe H & Steyl I 2005. Solid waste management in intensively farmed rural areas: a Western Cape case study. *Acta Academica* 37, 3: 184-211.
- Van Ruijven BJ, Schers J &, Van Vuuren DP 2012. Model-based scenarios for rural electrification in developing countries. *Energy* 38: 386-97.
- Van Schalkwyk C 2013. Banking on bulk infrastructure. *W&S Africa*.

- Wall K 2007. Challenges facing municipal infrastructural management in South Africa. *Town and Regional Planning*, 51: 26 – 36.
- World Bank 2006. *World Development Indicators*. Washington DC: World Bank.
- World Bank 2015. The International Bank for Reconstruction and Development. Washington DC. [Online] Available from: [www.worldbank.org](http://www.worldbank.org) [Accessed 08 July 2017].
- World Energy Outlook (WEO) 2014. Paris: International Energy Agency (IEA).
- World Health Organization (WHO) 2006. Meeting the Millennium Development Goals (MDGs) drinking water and sanitation target: the urban and rural challenge of the decade.
- World Health Organization (WHO) 2014. Progress on drinking water and sanitation. WHO Library Cataloguing-in-Publication Data.
- Zufferey C & Donna Chung D 2015. 'Red dust homelessness': Housing, home and homelessness in remote Australia. *Journal of Rural Studies* 41: 13-22.
- Zululand District Municipality 2011. Zululand District Municipality Annual Report 2010/2011.
- Zurbrügg C 2002. Urban Solid Waste Management in Low-Income Countries of Asia: How to Cope with the Garbage Crisis. Presented for: Scientific Committee on Problems of the Environment (SCOPE) Urban Solid Waste Management Review Session, Durban, South Africa.