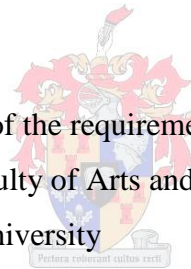


**APPLYING THE CITY DEVELOPMENT INDEX (CDI) TO MEASURE THE
QUALITY OF LIFE OF THE LOCAL MUNICIPALITIES IN THE NORTHERN
CAPE BETWEEN 2001 AND 2011**

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in Urban and Regional Science in the Faculty of Arts and Social Sciences at Stellenbosch

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DECLARATION

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ABSTRACT

The quality of life (QOL) concept is important because it influences people's behaviour. Consequently, knowing what people perceive as a good or poor QOL will allow planners to predict their behaviour. After 20 years of democracy South Africa still struggles with issues such as poverty and inequality. The Northern Cape has a unique settlement pattern that makes it very difficult to reach all of the municipalities equally and to provide services of the same standard. The aim of this study is therefore to determine if the QOL has increased or decreased for the municipalities of the Northern Cape and to determine which municipalities are doing better than what others are. The City Development Index (CDI) will be used to determine the QOL in the municipalities of the Northern Cape for 2001 and 2011 in order to make the comparisons. The CDI results show that the figures for 2011 are mostly above 0.5. The results point out that income and infrastructure remain two significant issues in the Northern Cape. This study will allow planners to use the QOL results in the Northern Cape and adjust their plans accordingly in an effort to have an improved QOL by enhancing the provision and distribution of scarce resources, infrastructure, service delivery and facilities.

Keywords and phrases: Quality of life (QOL); City Development Index (CDI); Health dimension; Education dimension; City product dimension; Waste dimension; Infrastructure dimension; Local municipalities of the Northern Cape.

OPSOMMING

Die konsep van lewensgehalte is belangrik want dit beïnvloed hoe mense optree. Indien ons dus weet wat mense as goeie lewensgehalte beskou sal dit navorsers help om hulle gedrag te voorspel. Na 20 jaar van demokrasie sukkel Suid Afrika steeds met aangeleenthede soos armoede en ongelykheid. Die Noord-Kaap het 'n unieke nedersettingspatroon wat dit baie moeilik maak om dienste aan al die munisipaliteite op gelyke vlak te voorsien. Daarom is die doel van hierdie studie is om te evalueer of die lewensgehalte gestyg of gedaal het vir die munisipaliteite van die Noord-Kaap en om te bepaal watter munisipaliteite beter vaar as ander. Die Stadsontwikkelingsindeks (CDI) se resultate toon dat die resultate vir 2011 meestal oor 0.5 is in die Noord-Kaap. Die resultate toon ook dat inkomste en infrastruktuur steeds 'n groot probleem in die Noord-Kaap is. Hierdie studie sal beplanners help om die lewensgehalte van die mense van die Noord-Kaap te verbeter deur hul planne aan te pas in 'n poging om die lewensgehalte van die mense te verbeter terwyl hulle skaars hulpbronne, infrastruktuur, dienslewering en fasiliteite beter kan voorsien en gebruik.

Trefwoorde en frases: Lewensgehalte, Stadsontwikkelingsindeks [CDI], Gesondheidsdimensie, Onderwysdimensie, Stadsprodukdimensie, Afvaldimensie, Infrastruktuurdimensie, Plaaslike munisipaliteite van die Noord-Kaap.

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ACRONYMS AND ABBREVIATIONS

		Page
ABET	Adult Basic Education and Training.....	49
CDI	City Development Index.....	i
ECD	Early Childhood Development.....	2
GEAR	Growth, Employment and Redistribution.....	2
GDP	Gross Domestic Product.....	4
HDI	Human Development Index.....	4
HDR	Human Development Report.....	6
IDPs	Integrated Development Plans.....	19
IDT	Independent Development Trust.....	2
MPI	Multidimensional Poverty Index.....	10
NDP	National Development Plan.....	3
NPC	National Planning Commission.....	3
OECD	Organisation for Economic Co-operation and Development.....	1
ONS	Office for National Statistics.....	1
QOL	Quality of life.....	iii
RDP	Reconstruction and Development Programme.....	2
SACN	South African Cities Network.....	4
SKA	Square Kilometre Array.....	19
Stats SA	Statistics South Africa.....	v
TB	Tuberculosis	49
UNDP	United Nations Development Programme.....	1
UN-Habitat	United Nations Human Settlements Programme.....	4
WIP	Wellbeing and Progress Index.....	9

SECTION 1: SETTING THE SCENE

No consensus exists as to what constitutes happiness, it can be understood as an emotion: “are you happy?” or an evaluation: “are you happy with life overall?” (Hall 2014). Happiness as a concept is also closely related to the concepts of quality of life, well-being, human satisfaction and development, and often times researchers use these terms interchangeably (Marans 2012; Office for National Statistics [ONS] 2011). Quality of life (QOL) as a concept is used in this article, which in itself is a multidimensional term (Clarke & McGillivray 2007). The United Nations Development Programme (UNDP) (1990) defines QOL as the process that provides people with more options to live a long and healthy life by having access to education and enough resources to maintain a decent living standard. Aspects such as political freedom, human rights and personal self-respect also constitute QOL. Other definitions describe QOL as people’s perceptions and evaluations of how positive or negative their lives are, which in turn will determine their experiences, and ultimately influence their level of satisfaction, happiness or well-being (Dasgupta & Weale 1992; McCrea, Shyy & Stimson 2006; Organisation for Economic Co-operation and Development [OECD] 2013). Hence, people’s QOL is influenced by many different factors, including their socio-cultural background and characteristics, socio-economic conditions and environmental factors, amongst others. QOL measures are divided into objective and subjective indicators. Objective indicators measure QOL quantitatively, while subjective indicators measure QOL by looking at people’s own perceptions, preferences and experiences. Objective and subjective QOL are often combined into QOL models and indices to obtain a better understanding of a person's overall QOL (Diener & Suh 1997; Marans 2012; ONS 2011; Rappaport 2008).

For most South Africans their QOL was influenced by government policies – first the racially oppressive apartheid policy and second the post-apartheid policies. During apartheid, the race groups were forced to reside in separate group areas, each containing its own services, facilities and resources. The apartheid government reserved the highly skilled jobs and services for the white people only, resulting in poorly developed homelands for black people. The aforementioned resulted in black people migrating to cities in search of job opportunities and better living conditions. Many of these black migrants settled on the periphery of cities in informal settlements, which were characterised by no service provision, high crime rates,

extreme poverty and generally very poor living conditions (Bhorat & Kanbur 2006; Harrison, Todes & Watson 2008; Leibbrandt, Woolard & Woolard 2007).

In 1991 the Less Formal Township Establishment Act tried to speed up urban land development for low-income groups. This was further supported by the Independent Development Trust (IDT) that had started housing subsidies for the poor which were later taken over by the government. In 2004 the "Breaking New Ground" policy was issued by the Department of Housing, and was aimed at sustainability. This meant that all new developments had to be "compact, mixed land-use, diverse, life-enhancing environments with maximum possibilities for pedestrian movement" (Harrison, Todes & Watson 2008). It was believed that the QOL of all South Africans would be improved by the implementation of the post-apartheid government's Reconstruction and Development Programme (RDP) in 1994, which promised to address the inequalities in infrastructure and service provision, create jobs, provide housing, water, electricity, and telecommunication, and develop human resources (i.e. develop skills and build the economy) (Corder 1997). The Growth, Employment and Redistribution (GEAR) policy was launched in 1996 to stabilise the economy and to allow South Africa to compete with international markets. GEAR was ultimately aimed at creating more jobs (Harrison, Todes & Watson 2008). High unemployment has been blamed for the income problems and the inequity shown by income figures, and increases in the poverty levels in South Africa (Bhorat & van der Westhuizen 2005). Since infrastructure development has a very big impact on economic growth, emphasis has been placed on the National Infrastructure Plan which has 18 strategic projects, including projects that would improve electricity provision, water and sanitation projects and projects to improve communications (Bogetić & Fedderke 2006; South Africa [Republic of] 2014a). Policies were implemented through municipal waste sector plans to improve waste removal in municipalities (Department of Environmental Affairs 2012).

Efforts were made by the government to make healthcare more affordable, available and accessible to the poor by making it available free of charge at public facilities (Gilson & McIntyre 2007). Education has been placed under a lot of pressure with poor quality education in the early years that put learners at a disadvantage in secondary education which in turn leads to high dropout rates. No-fee schools were implemented to help make education affordable for all, and early childhood development centres (ECD) were opened to try to improve the quality of education in the early years. (Mouton, Louw & Strydom 2012; OECD

2008; Van der Berg et al 2011). Despite all the efforts by the post-apartheid government to create an equal QOL for all South Africans, the QOL of South Africans still remains highly skewed. Many people remain unemployed. This results in chronic poverty and in turn negatively influences people's health and productivity. The provision of basic services also remains highly skewed, and many are unable to afford these necessities (Davids & Gaibie 2011; Higgs 2007; Møller 2013; Waldner 2011). Additionally, poverty and inequality are still highly correlated with race, while access to housing, water, food, health and education services remains problematic due to poor planning (Kaplan, Wheeler & Holloway 2009; Simkins 2011). According to the National Development Plan (NDP) South Africans are still denied the chance to live their lives in the way that they would like to, and – thus essentially, development efforts are not reaching their goals (National Planning Commission [NPC] 2011).

The situation is no different in the Northern Cape, which, in addition to all the aforementioned impediments, struggles with a unique settlement pattern, that is characterised by isolated urban and quasi-urban areas, scattered over a province which is approximately 1 000 km in length from the west to the east. This unique settlement pattern negatively impacts the province's service-delivery provision capabilities. The slump in the global economy impacted on the Northern Cape settlements in that agricultural export had been affected, causing significant job losses. This also caused the collapse of many mining settlements, the closure of railway settlements and a large dependence on state welfare due to the loss of job opportunities (Province of Northern Cape 2012). Additionally, the Northern Cape struggles with a negative net migration. In 2011, for example, the Northern Cape recorded 69 527 out-migrants compared to 62 792 in-migrants (South Africa [Republic of] 2012a). The provincial government is intent on eradicating informal settlements and the use of bucket toilets, while also making sure that all citizens have access to electricity for lighting and to water within a reasonable distance. This is hampered by the lack, and poor state of, critical infrastructure in rural areas and the exponential growth of informal settlements in urban areas. In terms of the water situation, it is a scarce commodity in the Northern Cape (Province of Northern Cape 2012). Most municipalities provide free basic services to its indigent households, which places a financial burden on these municipalities. Many towns are serviced by mobile clinics, but because the Northern Cape is such a large province, it has the lowest frequency for mobile clinic visits in the country (once in 6.7 weeks on average) (Province of Northern Cape 2003).

Various indices have been developed to measure the QOL throughout the world and in South Africa (Bilbao-Ubillos 2013; Higgs 2007; Møller 2013; Naudé, Rossouw & Krugell 2009; OECD 2011; South Africa [Republic of] 2012b; UNDP 1990, 2006, 2011; Porter, Stern & Green 2014). The two internationally accepted indices to measure QOL include the Human Development Index (HDI) and the City Development Index (CDI) (Bilbao-Ubillos 2013, UN-Habitat [United Nations Human Settlements Programme] 1996). The HDI measures human development using life expectancy (demonstrating the ability to live a long and healthy life), education (demonstrating knowledge and access to education) and purchasing power (which is related to the Gross Domestic Product [GDP]). The CDI has been developed from the HDI as a way of determining the QOL of smaller areas. Two additional dimensions, namely infrastructure and waste, have been added to the calculations of the CDI (Bilbao-Ubillos 2013; UN-Habitat 1996).

Although these measures are world-renowned, their application remains limited in South Africa. Additionally, their application in the Northern Cape is even more limited. Statistics South Africa (Stats SA) (South Africa [Republic of] 1996) applied the HDI in South Africa to measure the provincial QOL in 1980, 1991 and 1996, while the Western Cape government applied the HDI and CDI to determine the QOL of the municipalities and towns in 2005 (using Census 2001 data) (Province of Western Cape 2005). The HDI and CDI were also applied to measure the QOL of those people residing within the municipalities of the Northern Cape in 2009, but this report experienced certain challenges associated with data availability (Myburg & Kruger 2009). The CDI was also applied by the South African Cities Network (SACN) to rank nine of the largest municipalities in South Africa according to their level of development (SACN 2002).

Consequently, the aim of this study is twofold: 1) to calculate the CDI to determine if the QOL in the local municipalities in the Northern Cape has increased or decreased between 2001 and 2011; and 2) to apply the CDI to determine which of the local municipalities performed the best and the worst in terms of QOL in 2001 and 2011.

SECTION 2: MEASURING QUALITY OF LIFE: EXPERIENCES FROM THE LITERATURE

2.1 What is quality of life (QOL)?

Initially, the focus of QOL studies was much more on individuals and the ways in which their personalities shaped their satisfaction with their lives (Berry & Okulicz-Kozaryn 2009). Early researchers defined QOL in a preferential nature, usually linked to religion in some way and success in life seeming to play a role as well. It was found that people set their own criteria for what made them happy and this was usually linked to their aspirations and objectives for their lives. Hence, the evaluation for QOL also included a weighing of positive versus negative experiences/aspects in their lives, and if the positive outweighed the negative, they could assume their QOL as being high (Diener 1984).

Recently QOL studies started looking at the links between urban form and QOL. In short, this means that the QOL perceptions of persons living in the city are influenced by the way in which the cities are planned. This cannot be confirmed to be the same in all types of cities and countries of the world, since there is not enough empirical evidence available as yet (Bardhan, Kurisu & Hanaki 2011). A lot of attention was given to the ways in which urban development influenced people's lives. City life produced positive and negative benefits to people since it allowed them to move up on the social ladder on the one hand, but on the other hand their morals were lost, and social interaction became scarce and superficial and resulted in the loss of relationships and bonds with family members. People also became isolated in the urban environment since there is not so much interaction with neighbours. Most of the people living in an urban environment are strangers to each other, despite the fact that the space between them became smaller (houses are more compact and closer to one another), in contrast to the rural setting where families have close contact and everyone knows each other. The levels of dissatisfaction were raised for individuals who could not adapt to this new setting (Berry & Okulicz-Kozaryn 2009). Culture plays an important role in how people perceive their QOL, since different cultures have different values by which they live (Urzúa et al 2013).

Another important part of QOL is sustainable development, which comprises three dimensions: the economic, environmental and social dimensions (Tanguay et al 2009). Social sustainability has two dimensions, namely social equity and sustainability of the community. This is where social inclusion or exclusion, social cohesion, social interaction and participation and many other QOL aspects come into play (Bardhan, Kurisu & Hanaki 2011). Social sustainability links to QOL through Maslow's hierarchy of five needs. They move from objective psychological needs to safety needs, belonging needs, and esteem needs and end with a subjective self-actualization (Bramley et al 2009).

Even though there is no single definition for QOL there is agreement that different human needs and the ability of people to pursue their goals, to be successful and to be happy with their lives is important. This necessitates that many variables be put together to make up a good measure for QOL (OECD 2011). Different meanings are attached to the term QOL, but it is mostly linked to measurable, theoretic attributes that are interlinked and influence one another. Examples of these are income, access to services, access to health facilities and life expectancy (Diener 1984). QOL is also described as the measure by which the needs of a person are met or the extent to which a community feels satisfied with various aspects of urban living (Bardhan, Kurisu & Hanaki 2011). The Human Development Report (HDR) (UNDP 1990) defines human development (which they strongly link to QOL) as having two facets. The one is capabilities (and is linked to health, knowledge and skills) and the other facet asks what do people do with these capabilities (do they participate in social, cultural or political activities) (UNDP 1990).

2.2 Approaches to measuring QOL

There are three major approaches to measuring QOL. They are the philosophical, the objective and the subjective approaches (Diener & Suh 1997). Philosophical approaches to measure QOL followed three main trends. The first looked at characteristics of a good life, the second approach looked at how people satisfy their primary needs, and the third option looked at things like feelings of satisfaction, contentment, pleasure or joy, etc. This approach is very close to the subjective measurement of QOL. Unfortunately, people's choices might not always make them happy, which is contradictory to these approaches and makes the use of these approaches a problem (Diener & Suh 1997). Humans are also complex beings and

what makes them happy today might not make them happy tomorrow, since their emotional state plays a big role (Calvo et al 2012).

The two more recent and more widely used approaches, to measuring QOL are objective and subjective QOL. Objective QOL (also called social measures of QOL) considers quantitative statistics in measured units (Diener & Suh 1997). Objective measurement uses variables like life expectancy, mortality, income, wealth (regarding possessions), education levels, health (D'Acci 2011), environment (rural or urban), time (amount of time spent on travel to work and leisure, etc.), housing (brick house or informal dwelling), crime (number of murders and thefts, etc) (Marans 2012), divorce, and access to services (e.g. clinics, hospitals, recreational facilities, etc) (McCrea, Shyy & Stimson 2006).

There are many strengths and weaknesses linked to the objective measurement of QOL. The first strength is that it can be quantified since it was measured with quantitative tools; the second strength is that it can easily be defined; the third is that it can be measured with precision; and the fourth that it is convenient to make comparisons between regions (Diener & Suh 1997). The fifth and most notable advantage of using economic and social indicators to define QOL is that these can be used to monitor progress over time and compare performance while also checking the impact of policy interventions (Clark & McGillivray 2007). Conversely, the weaknesses in using objective measurements are firstly that the choice of which variables to use is a subjective one; secondly, it is often argued that this is not an accurate way to measure QOL since having a high income does not necessarily mean you experience high QOL (Diener & Suh 1997; Marans 2012). The third weakness is that an assumption is usually made as to what the community perceives as good or bad, and this could be risky in this complex world with heterogeneous societies. The fourth weakness is that the variables that are used are fallible in the sense that they are sometimes not accurate. For example, rape incidents are highly underreported, sometimes due to cultural influences, and the figures therefore might be questioned. Fifth the fact that the variables are often combined into a single index hides the influence that the different variables have on each other. The sixth and biggest criticism against objective measurement is the fact that it does not portray the people's personal experience of their QOL (Diener & Suh 1997).

The other well-known approach to measure QOL, namely subjective measurement, looks at the individual's perception of his/her QOL (Diener & Suh 1997; Seaford 2013). These

indicators record how a person experiences and reports his own QOL. Subjective QOL considers three interweaved components, namely "life satisfaction, pleasant effect, and unpleasant effect". This is closely related to moods and emotions that people experience (Diener & Suh 1997). Examples of variables that are used are usually responses to questions regarding satisfaction with life, work, finances or housing (Bellani & D'Ambrosio 2011), or they report on levels of anxiety (Seaford 2013). People tend to rate their own happiness against what they see people around them do, and by comparing their lives with those of others (Diener & Suh 1997).

Subjective measurement of QOL also has its strengths and weaknesses. The first advantage of subjective QOL is that one can capture the feelings that are important to an individual. Secondly, such measurement can easily be adjusted if found to be inadequate. Thirdly, if similar measures are repeated, they can be compared over domains such as countries (Diener & Suh 1997). Fourth, people are individuals who experience life according to their own perceptions and characteristics. Experiences from the past create a set of judgements by which people judge life. This could also be a weakness, since the personal judgment of QOL can be contaminated by a series of bad experiences and personal relations with other people, which influence their judgement (Marans 2012). Secondly a weakness can be that some people naturally adapt to situations and may give the answers they think the interviewer would expect to receive. Thirdly the methods may have shortcomings. Finally, different societies, nations, cultures and individuals have different perceptions of what they perceive to be good or bad (Diener & Suh 1997).

Objective QOL and subjective QOL are complementary, should be used together and should never be seen as competing with each other. They can rather supplement each other to help researchers understand the true conditions of society better. Objective measurements will always contain a subjective side in the sense that when the data is collected, there is some measure of subjectivity involved when a question is interpreted by the respondent (Helliwell, Layard & Sachs 2013). Subjective variables may sometimes explain the results found by the objective results and vice versa (Diener & Suh 1997).

2.3 Measuring quality of life: Studying QOL models and indices

Different models and indices are used all over the world to measure QOL. By looking at these models and indices, the fact that there is so much disagreement over what the definition of QOL is, just becomes more visible. No two studies were the same or used the same variables to calculate QOL. Most of these indices were developed with the aim of helping countries do better planning and to help with human development or to improve life in the poorer countries. Topics that were studied were access to income, knowledge, longer lives, political freedom, human rights, access to services, housing, self-reported satisfaction with life or health, crime, environmental quality, and tolerance. These studies were usually done for a large number of countries all over the world, and they aimed to be repeated from year to year. Most of these studies also ranked the countries in order to show that those countries with higher development, better planning processes and better lives for their citizens were the ones performing the best (Better life index - OECD 2011; CDI - UN-Habitat 1996; Gross National Happiness Index – Ura et al 2005a & 2005b; HDI - UNDP 1990, 2006, 2011; Social progress index – Porter, Stern & Green 2014; World happiness report - Helliwell, Layard & Sachs 2013;). D'Acci (2011) took these studies a step further, with the WIP, by taking different studies and comparing them and proving that, depending on what variables were used, the results of these studies showed very different rankings for QOL.

The HDR proved that countries in the northern hemisphere tended to do better with regard to GDP, since the developed countries of the northern hemisphere have more access to resources and innovation. The countries in the southern hemisphere were beginning to show increased income levels, but this has not filtered down to all levels of the society yet, and income remains highly unequal. The same can be said about the health and education variables. Countries in the southern hemisphere have increased spending on these factors, but the standard is still not on par with that of the northern hemisphere countries (UNDP 2011). The Social Progress Index and the World Happiness Report made it clear that the population size of a country and high GDP did not guarantee that a country would attain a high ranking for QOL. Countries that did well in terms of QOL had very different population sizes. Rather, it became clear that poor social conditions and extreme poverty were the biggest factors bringing down QOL (Porter, Stern & Green 2014; Helliwell, Layard & Sachs 2013)). The World Happiness Report found that Latin America, the Caribbean and sub-Saharan Africa showed significant increases in average happiness. It found that social support has increased

in sub-Saharan Africa and that the perceived freedom to make key choices was the factor most affected by the world economic crisis (Helliwell, Layard & Sachs 2013).

The CDI highlights that areas with a higher income attained a higher CDI, and that the infrastructure, waste and city product indicated governance issues and urban poverty (UN-Habitat 1996). The Better Life Index found that life satisfaction decreased as unemployment increased. The index also found that in the United States households moved in with each other when their housing conditions deteriorated and that the number of persons whose medical needs could not be met because of financial constraints increased. The youth was struck hardest by unemployment and most people did not trust the government (OECD 2013). The Gross National Happiness Index, done in Bhutan, found that more people were happy in the urban areas than in the rural areas. Urban areas did better in terms of health, living conditions and education while rural areas did better with community vitality, cultural resilience and good governance (Ura et al 2012a).

The studies done in South Africa showed the same trends as the international studies. They also disagreed widely over which variables should be used, but most of them agreed that poverty was the biggest issue in South Africa. The South African quality of life trends study showed that apartheid had a negative impact on the lives of a large proportion of South Africans. Many of these studies were influenced by the political changes taking place at the time of the study. For example, at the start of the anti-apartheid era, people were positive about their lives and looked forward to better lives (Møller 2013). The quality of life study in post-apartheid South Africa showed that black people, who were the most oppressed during apartheid, were the most optimistic about the future after apartheid ended. This did not, however, mean that their lives improved significantly since apartheid had ended. Most studies found that crime, satisfaction with basic services and living standards remained issues in QOL studies in South Africa (Davids & Gaibie 2011; Møller 2013). The non-monetary quality of city life in South Africa study (Naudé, Rossouw & Krugell 2009) proved that the international trend (i.e. different variables gave different rankings) also applied to South Africa. It also proved that doing further analysis on data with the help of statistical analysis techniques gave further differences in the rankings of the cities used for the study (Naudé, Rossouw & Krugell 2009).

The South African Multidimensional Poverty Index (MPI) highlighted the lack of data on mortality, life expectancy, births, transport, satisfaction with services and access to opportunities, as a big challenge when doing QOL studies in South Africa, as this hampered accurate assessments on issues such as health, child mortality and subsequently, poverty levels. Data was also not always available at municipality level or town level. The same study, however, highlights the drivers of poverty (South Africa [Republic of] 2014b). Indicators that were used for South African studies were nutrition, access to electricity, access to water, transport, toilet facilities, unemployment, poverty head counts, poverty gaps, satisfaction with services, education levels, geographic location, access to opportunities, child mortality and life expectancy (Davids & Gaibie 2011; Higgs 2007; Møller 2013; Naudé, Rossouw & Krugell 2009; South Africa [Republic of] 2012b; South Africa [Republic of] 2014b).

2.4 Conclusion

In conclusion the literature review showed that there were many different definitions of QOL. We saw that there were many different ways of measuring QOL, of which the two most important ones were objective measurement and subjective measurement. Even though both of them have their strengths and weaknesses, they should not be seen as competing against each other, but rather as complementing each other. Finally, we saw that there are many different ways in which the QOL was calculated in the world and in South Africa. Since limited studies on QOL had been done in South Africa, and none of which specifically focused on the Northern Cape, the aim of this study was to apply the CDI to determine if the QOL in the local municipalities in the Northern Cape has increased or decreased between 2001 and 2011, and to apply the CDI to determine which of the local municipalities performed the best and the worst in terms of QOL in 2001 and 2011.

SECTION 3: METHODOLOGY

This section discusses the study area, data collection and data processing and analysis techniques that were used to objectively calculate the QOL of the local municipalities in the Northern Cape by calculating the CDI for 2001 and 2011 and comparing the results. The Northern Cape is the largest province in South Africa, covering approximately 30% of its landmass. Despite this, it is inhabited by only 2% of the population of South Africa, making it the least populated province in South Africa. The Northern Cape is divided into five district municipalities and 27 local municipalities, with the capital city being Kimberley, which is located in the Sol Plaatje municipality (South Africa [Republic of] 2013b).

The CDI is calculated by means of five dimensions, with health (a long and healthy life), education (knowledge) and city product (decent standard of living) being three dimensions used in the HDI as well. Two dimensions are added to calculate the CDI, namely waste (solid waste removal and waste water), and infrastructure (comprising water, sewerage, telephone and electricity provision). To calculate the health dimension, child mortality and life expectancy were used. To calculate the education dimension, literacy and gross enrolment were used. To calculate the city product, the GDP was replaced by the mean income (as recommended by UN-Habitat 1996). Since the wastewater figures were not available for all the municipalities, these were left out of the calculation according to the UN recommendations (UN-Habitat 1996). Figure 3.1 indicates the dimensions to which the 2001 and 2011 variables were applied and how they were applied in order to calculate the CDI for the local municipalities in the Northern Cape, and the data sources from which the variables were obtained.

HEALTH DIMENSION		
2001 variable name	2011 variable name	Data sources
Age variable from census 2001 - Five-year age groups was used for the life expectancy template.	Age in completed years variable from census 2011- Five-year age groups was used for the life expectancy template	Stats SA Census 2001 & 2011
Number of deaths by age and municipality – is not published by Stats SA, but was used as part of the calculation for life expectancy	Number of deaths by age and municipality – is not published by Stats SA, but was used as part of the calculation for life expectancy	Stats SA – Unpublished data from Stats SA
Life expectancy - is calculated from using the template used for the calculation of life expectancy for the mid-year estimates report (South Africa [Republic of] 2013a). The number of deaths by age group and the number of persons by age group for each municipality is used in the template	Life expectancy - is calculated from using the template used for the calculation of life expectancy for the mid-year estimates report (South Africa [Republic of] 2013a). The number of deaths by age group and the number of persons by age group for each municipality is used in the template	Stats SA Census 2001 & 2011
Infant (child) mortality per municipality was used	Infant (child) mortality per municipality was used	Department of Health

Figure 3.1 continued overleaf

Figure 3.1 continued

CITY PRODUCT DIMENSION		
2001 variable name	2011 variable name	Data source
<p><u>Similar calculations was used for 2001 and 2011:</u></p> <p>Mean income (was used instead of GDP as per United Nations Human settlements Program – UN Habitat (1996) document recommendation. This was done due to unavailability of GDP data on municipality level in South Africa).</p> <p>This variable was derived from the annual household income variable in Census 2001 & 2011 data. Since the groupings differ so much and the sizes of the groupings are so wide the usual method for finding the mid points of the groups could not be applied.</p> <p>Stats SA developed the following methodology to calculate the income variable groupings' mid points:</p> <p>The no income group was multiplied by zero. The next group (R1-R4800) used 2/3 of the highest amount of the group. From there on all the groups (from R4801-R9600 up to R1 228 801-R2 457 600) took the top and bottom amount, multiplied them with each other and calculated the square root of the answer. Since the last group (R2 457 601 and more) did not have a maximum amount the amount was simply multiplied by two and used as is.</p> <p>Then the income groupings' midpoints (just calculated) was multiplied with the number of persons falling into that income group (in a new column). This column's answers were added together and divided by the total number of persons earning income, and this gives the average income per municipality.</p>		<p>Stats SA - Census 2001, 2011</p>

Figure 3.1 continued overleaf

Figure 3.1 continued

EDUCATION DIMENSION		
2001 variable name	2011 variable name	Data sources
<p>Literacy - Was calculated using the highest education level variable and the definition that persons older than 20 who has completed seven years of education or more are considered literate (Province of Western Cape 2005 - Development Bank of South Africa gave guidance for this definition).</p>	<p>Literacy - Was calculated using the highest education level variable and the definition that persons older than 20 who has completed seven years of education or more are considered literate (Province of Western Cape 2005 - Development Bank of South Africa gave guidance for this definition).</p>	<p>Stats SA - Census 2001, 2011</p>
<p>Gross enrolment ratio – The definition as given by Eustat on their website was used: The number of persons attending school (present school attendance) in each municipality, divided by the number of persons between the ages of 6 and 22, for each municipality (Eustat 2014).</p>	<p>Gross enrolment ratio – The definition as given by Eustat on their website was used: The number of persons attending school (present school attendance) in each municipality, divided by the number of persons between the ages of 6 and 22, for each municipality (Eustat 2014).</p>	<p>Stats SA - Census 2001, 2011</p>
WASTE DIMENSION		
2001 variable name	2011 variable name	Data sources
<p>Solid waste disposal – was calculated by using the refuse disposal variable (from census 2001) and adding all refuse removal types together and calculating the percentage for each municipality</p>	<p>Solid waste disposal – was calculated by using the refuse disposal variable (from census 2011) and adding all refuse removal types together and calculating the percentage for each municipality</p>	<p>Stats SA - Census 2001, 2011</p>

Figure 3.1 continued overleaf

Figure 3.1 continued

INFRASTRUCTURE DIMENSION		
2001 variable name	2011 variable name	Data sources
Water supply - calculated by using main water supply variable (from census 2001). All the variables for people with water within 200m of their household was added together and the percentage was calculated for each municipality.	Water supply - calculated by using piped water variable (from census 2011). All the variables for people with water within 200m of their household was added together and the percentage was calculated for each municipality.	Stats SA)– Census 2001, 2011
Sewerage – Calculated by using the toilet facility variable (from census 2001). Flush toilet, chemical toilet, and pit toilet with ventilation was added together and the percentage was calculated for each municipality	Sewerage – Calculated by using the toilet facilities variable (from census 2011). Flush toilet, chemical toilet, and pit toilet with ventilation was added together and the percentage was calculated for each municipality	Stats SA - Census 2001 & 2011
Electricity usage – calculating by using all those using electricity from energy or fuel for lighting variable (from census 2001) was calculated for each municipality	Electricity usage – percentage of all those using electricity for energy or fuel for lighting variable (from census 2011) was calculated for each municipality	Stats SA - Census 2001 & 2011
Telephone/cell phone – for this one it was decided to use the telephone facilities variable (from census 2001) and add together the telephone and cell phone to calculate access for each municipality	Telephone/cell phone – for this one it was decided to add together the landline/telephone variable and the cell phone variable (from census 2011) and calculate the access for each municipality.	Stats SA - Census 2001 & 2011

Figure 3.1 Application of the variables and data sources

Figure 3.2 shows how the CDI was calculated. The calculations for the CDI were done as stipulated by the UN-Habitat (2006). Microsoft Excel was used for all calculations, and to create the bar and radar graphs. ArcGIS 10.1 was used to visualise the CDI and its components with the help of thematic maps. This indicates at a glance where the areas with high scores are located and where the areas with low scores are located. The results from the CDI calculations give a score between 0 and 1. A score close to 1 or equal to 1 is seen to represent a high QOL, while a score that is close to zero or equal to zero is considered to represent a low QOL. Scores that fall in the middle represent an average level of QOL (in other words a score of 1.0 to 0.6 would represent a high QOL, and a score of 0 to 0.49 would be a low QOL, while 0.5 to 0.59 would be an average QOL) (UN-Habitat 2006).



Figure 3.2 Calculating the CDI and its dimensions

SECTION 4: USING THE CDI TO MEASURE THE QOL OF THE LOCAL MUNICIPALITIES IN THE NORTHERN CAPE

Section 4 compares the 2001 and 2011 CDI scores for the local municipalities in the Northern Cape. The final composite score is discussed first, followed by a discussion of the individual CDI dimensions. Bar charts present the 2001 and 2011 scores, while the maps provide a visual representation of the CDI scores and dimension scores for 2001 and 2011. The dark colours on the maps represent the highest scores and the light colours indicate the lowest scores.

4.1 The composite results of the CDI for the local municipalities in the Northern Cape (2001 and 2011)

The CDI is a composite score of the health dimension, the education dimension, the city product dimension, the waste dimension and the infrastructure dimension. (The composite result is highly dependent on the dimension results and therefore the reasons for the results will be discussed in more detail under the dimensions.) The three municipalities that performed the best in terms of the CDI for 2001 were Kgatelopele (0.81), Nama Khoi (0.79) and Gamagara (0.77) (Figure 4.1). The three municipalities that performed the best in terms of the CDI for 2011 were Richtersveld (0.86), Kgatelopele (0.86) and Nama Khoi (0.82). The top three municipalities for 2011 fell into the top ten for the highest mean income and city product scores (South Africa [Republic of] 2011a). This is related to the fact that a high CDI is correlated to a high income and city product (UN-Habitat 1996). The reason for the high incomes in these areas is the fact that there are established mines in all three municipalities supplying work to the people. Richtersveld and Nama Khoi has alluvial diamonds and Kgatelopele has lime (Kgatelopele municipality 2013; Nama Khoi municipality 2013; Richtersveld municipality 2014).

The three municipalities that performed the worst in terms of the CDI for 2001 were Joe Morolong (0.40), Ga-Segonyana (0.56) and Kai !Garib (0.59) (Figure 4.1). The municipalities that performed the worst in terms of the CDI for 2011 were Joe Morolong (0.58), Kai !Garib (0.58) and Ubuntu (0.61). These three municipalities were at the bottom of the infrastructure dimension scores and mean income (South Africa [Republic of] 2011a). Joe

Morolong and Ga-Segonyana are tribal areas with not much economic activity taking place there and thus incomes are low. They are also heavily reliant on mines as only source of employment and the mines cannot provide enough work. Kai !Garib is a farming area heavily reliant on seasonal work when the fruit is harvested. Farm workers do not get paid high wages and during out of season gets paid nothing. Poverty is very high in this municipality (Ga-Segonyana municipality 2013; Joe Morolong municipality 2014; Ubuntu municipality 2009).

The municipalities that recorded the biggest increase in the CDI from 2001 to 2011 were Joe Morolong (0.40 to 0.57), Karoo Hoogland (0.61 to 0.73) and Richtersveld (0.75 to 0.86), mostly because they had significant increases in many dimensions. Karoo Hoogland is expanding their tourism opportunities with exiting new developments like Square Kilometre Array (SKA) telescopes and the existing Southern African Large Telescope and Karoo Array telescope projects (Joe Morolong municipality 2014; Karoo Hoogland municipality 2009; Richtersveld municipality 2014). The municipalities that had the biggest decrease in the CDI from 2001 to 2011 were Ubuntu (0.64 to 0.61), Thembelihle (0.67 to 0.65) and Kai !Garib (0.59 to 0.58), probably because all three of them had recorded significant decreases in the health dimension. All three these municipalities list poor health facilities and lack of staff at clinics as challenges in their Integrated Development Plans (IDPs) (Kai !Garib municipality 2014; Thembelihle municipality 2013; Ubuntu municipality 2009).

Figure 4.2a shows that most of the municipalities scored high in 2001, and that the municipalities with average scores were located centrally and on the North West side of the province. The lowest scoring municipality was also located on the North West side. Figure 4.2b shows that the pattern remained the same except that there were no low scoring municipalities in 2011.

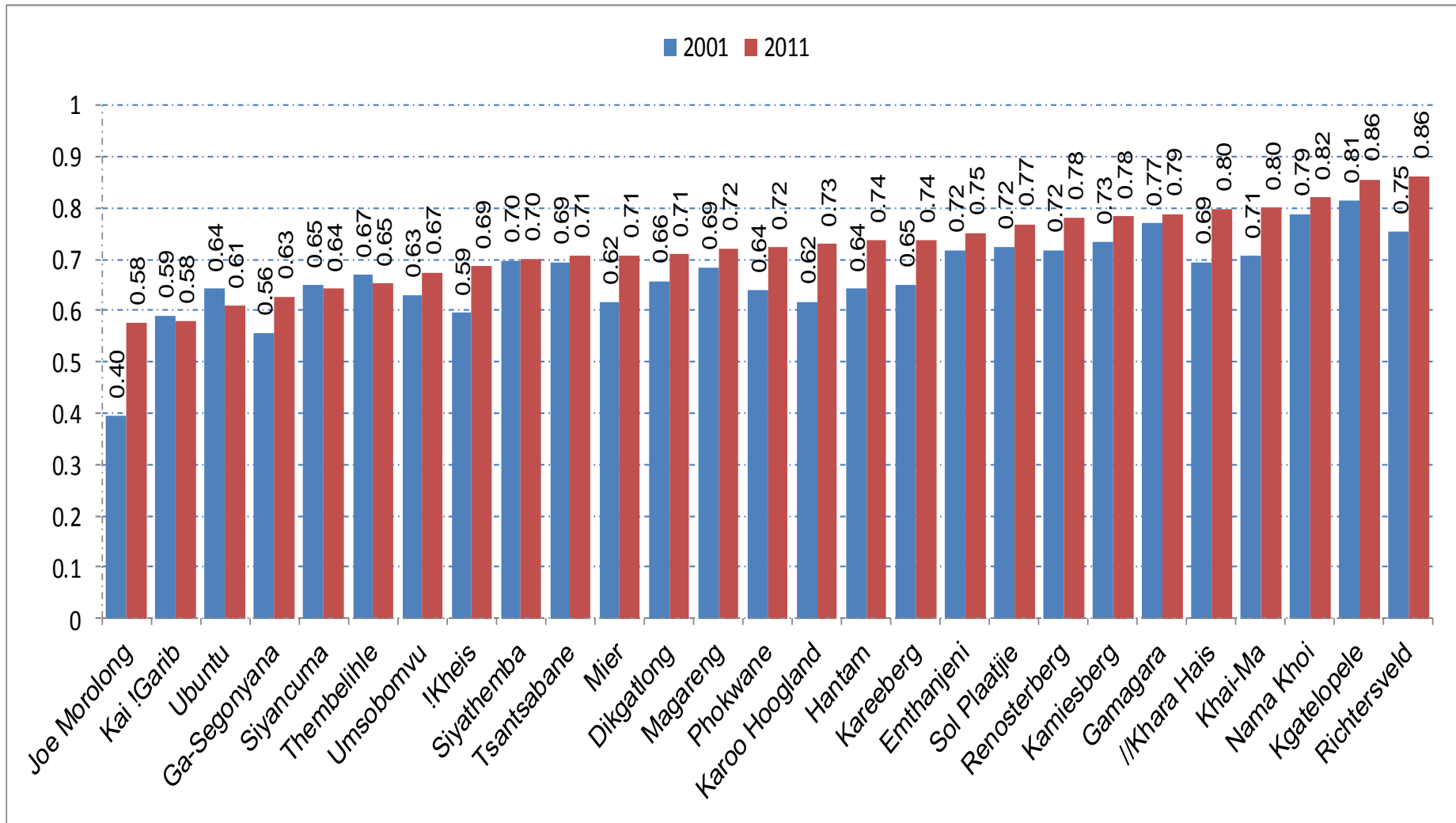


Figure 4.1 The CDI scores per municipality in the Northern Cape (2001 and 2011).

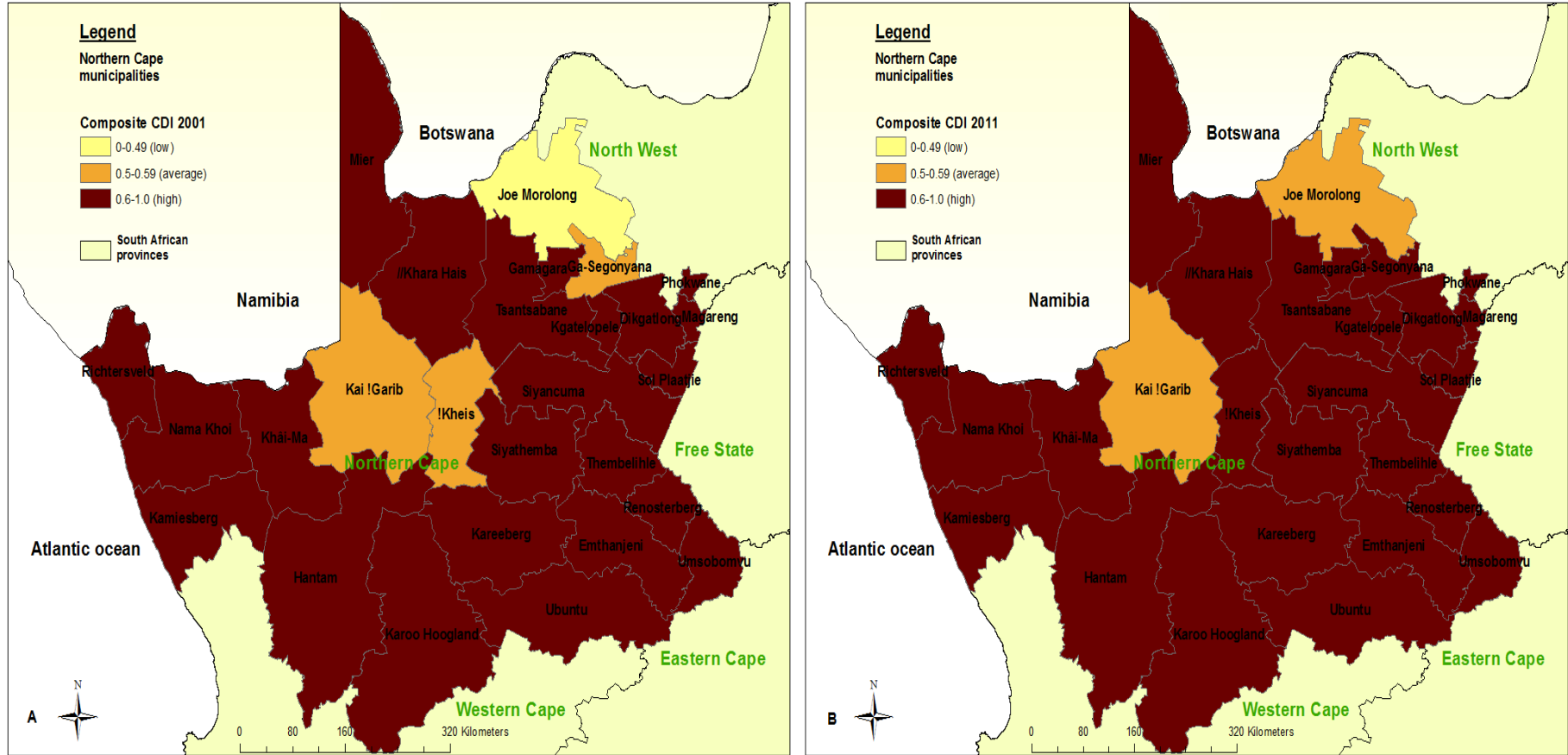


Figure 4.2a (2001) & b (2011) The CDI scores per municipality in the Northern Cape

4.2 The health dimension scores of the CDI for the local municipalities in the Northern Cape

The health dimension of the CDI was calculated by using life expectancy and child mortality. The three municipalities that performed the best in 2001 were Mier (0.96), Renosterberg (0.89) and Kgatelopele (0.88) (Figure 4.3). The three municipalities that performed the best in 2011 were Richtersveld (0.95), Kgatelopele (0.86) and Renosterberg (0.86). The driving force for this was probably that all three had high life expectancies (top 10) and had recorded significant decreases in infant mortality (South Africa [Republic of] 2001 & 2011a). Renosterberg has a very small population and it is mostly holiday makers that go there. Kgatelopele and Richtersveld are established mining towns and the mines supply health services to their employees, while Kgatelopele has a private hospital (Kgatelopele municipality 2013; Renosterberg municipality 2011; Richtersveld municipality 2014).

The three municipalities that performed the worst in 2001 were Tsantsabane (0.35), //Khara Hais (0.37) and Sol Plaatje (0.37) (Figure 4.3). The three municipalities that performed the worst in 2011 were Ubuntu (0.11), Kai !Garib (0.14) and Umsobomvu (0.26). The cause of this poor performance is probably because they all had low mean incomes and high infant mortality rates (top 3). Gilson and McIntyre (2007) found that poor households neglect their health due to the cost implication attached to it. The bottom three municipalities for 2011 also listed in their IDPs insufficient health services and irregular visits by mobile clinics as challenges (Kai !Garib municipality 2014; Ubuntu municipality 2009; Umsobomvu municipality 2012).

The municipalities that had the biggest increase in this dimension from 2001 to 2011 were Richtersveld (0.66 to 0.95), //Khara Hais (0.37 to 0.64) and Karoo Hoogland (0.47 to 0.74). This was stimulated by increases in life expectancy and decreases in infant mortality. A reason for this could not be found (South Africa [Republic of] 2001 & 2011a). The municipalities that had the biggest decrease in this dimension from 2001 to 2011 were Siyancuma (0.79 to 0.32), Ubuntu (0.55 to 0.11) and Thembelihle (0.75 to 0.32), probably because they experienced a decrease in life expectancy and an increase in infant mortality (South Africa [Republic of] 2001 & 2011a). All three these municipalities experience challenges with access to health services, lack of personnel at clinics and distances to health

facilities. They also have problems with high HIV/AIDS prevalence (Siyancuma municipality 2012; Thembelihle municipality 2013; Ubuntu municipality 2009).

Figure 4.4a shows that the 2001 high-scoring municipalities were located to the north, northwest, west and central east. Average scoring municipalities were located more centrally and on the southeastern side. Low-scoring municipalities were located more to the south, east and north. Figure 4.4b shows that the high-scoring municipalities had moved more to the western and northern part of the province with only one located in the east. The average scorers had moved more to the north-western side, and low scorers moved to the centre and mostly eastern side in 2011.

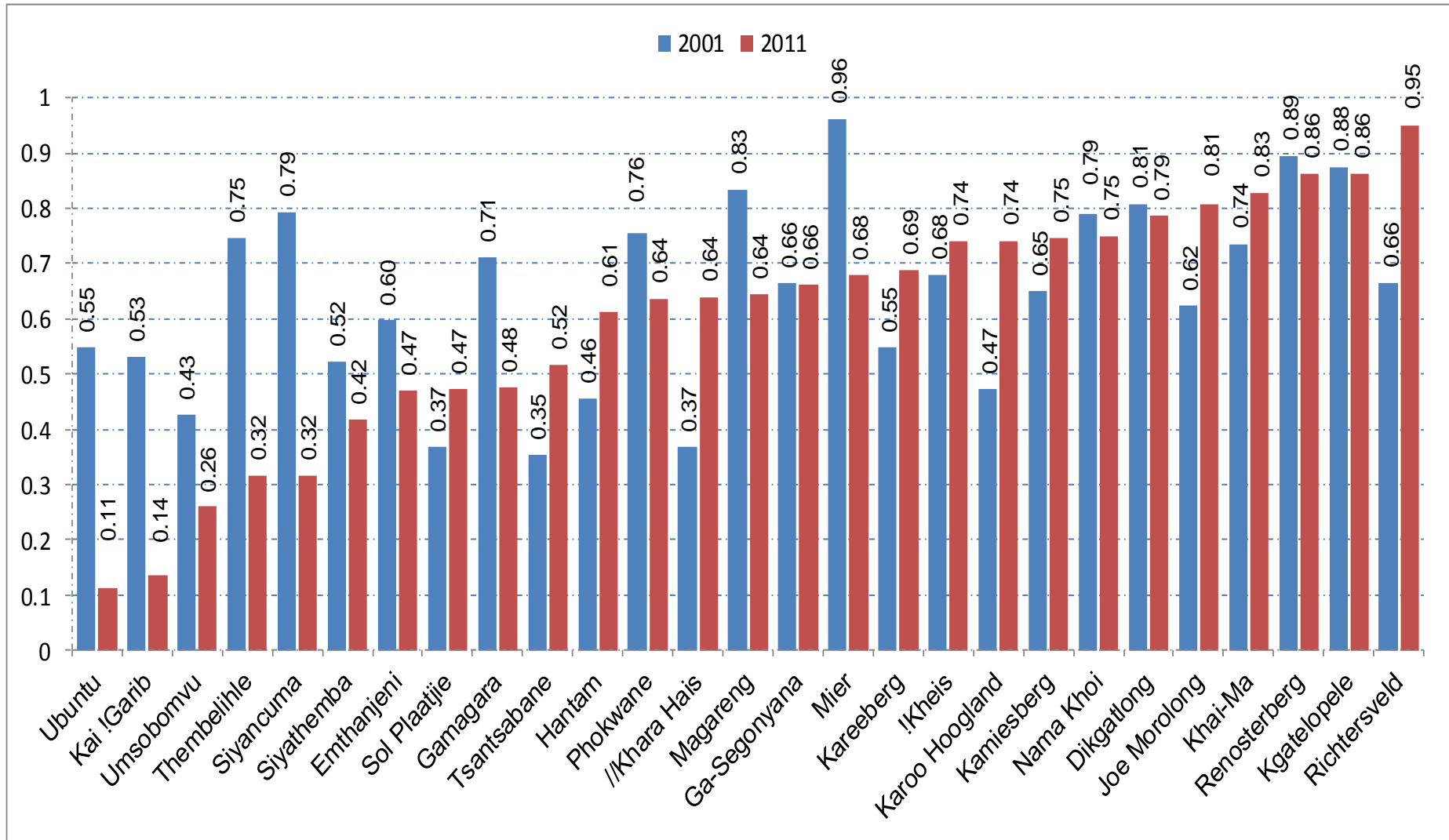


Figure 4.3 The health dimension scores for the CDI per municipality in the Northern Cape (2001 & 2011).

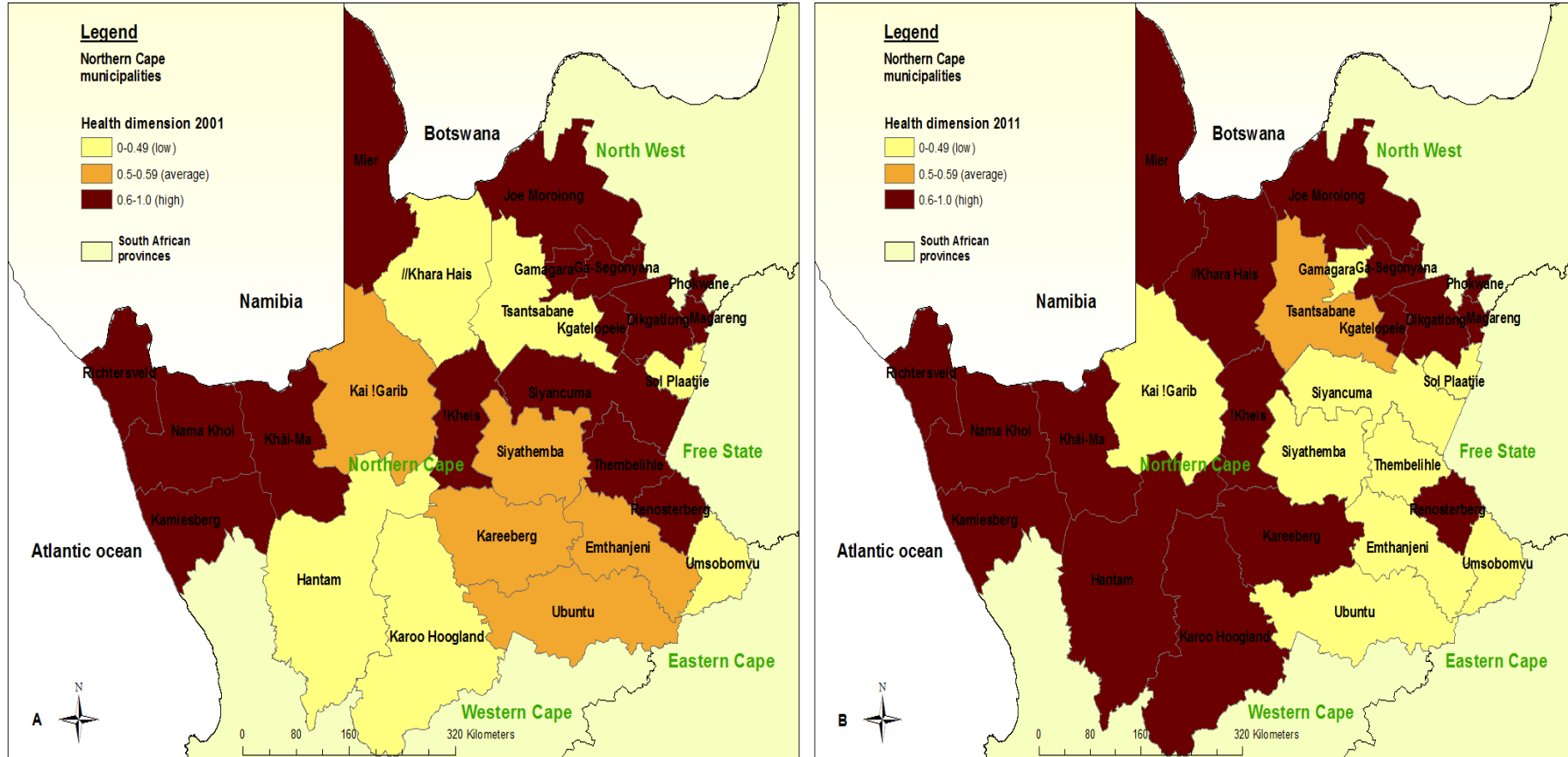


Figure 4.4a (2001) & b (2011) The health dimension score for the CDI per municipality in the Northern Cape

4.3 City product dimension scores of the CDI for local municipalities in the Northern Cape

The city product dimension was calculated by using the mean income of each municipality. The three municipalities that performed the best in 2001 were Kamiesberg (0.84), Kgatelopele (0.84) and Gamagara (0.76) (Figure 4.5). The three municipalities that performed the best in 2011 were Gamagara (0.92), Sol Plaatje (0.88) and Tsantsabane (0.87). These three municipalities had a decrease in people earning no income; all three were at the top with regard to mean household income and all of them had a decrease in unemployment rates (South Africa [Republic of] 2001 & 2011a). The mine in Kathu (Gamagara) has expanded substantially as well as the mines in Tsantsabane. Sol Plaatje is the economic hub of the province, most economic development takes place there and all the administrative headquarters of the government departments are located there (Gamagara municipality 2012; Sol Plaatje municipality 2010; Tsantsabane municipality 2011).

The three municipalities that performed the worst in 2001 were Joe Morolong (0.53), Dikgatlong (0.61) and Mier (0.61) (Figure 4.5). The municipalities that performed the worst in 2011 were Joe Morolong (0.71), Dikgatlong (0.74) and Magareng (0.76). These three municipalities all had high unemployment rates, high percentages of persons earning no income and were high on the list for the poverty head count (South Africa [Republic of] 2001 & 2011a; South Africa [Republic of] 2014b). These municipalities have very little economic potential and new development. Joe Morolong is a tribal area which does not support much development. All these municipalities list a lack of economic development as well as high unemployment as their challenges (Dikgatlong municipality 2013; Joe Morolong municipality 2014; Magareng municipality 2013).

The municipalities that had the biggest increase in the city product dimension between 2001 and 2011 were Ga-Segonyana (0.63 to 0.81), Joe Morolong (0.53 to 0.71) and Mier (0.61 to 0.78) which was probably stimulated by the decreases in persons earning no income and additionally Joe Morolong and Ga-Segonyana had decreases in unemployment (South Africa [Republic of] 2001 & 2011a). Many development efforts have been aimed at these areas although most of them only supplied temporary relief (Ga-Segonyana municipality 2013; Joe Morolong municipality 2014; Mier municipality 2013). The only municipality that showed a decrease in the city product dimension between 2001 and 2011 was Kamiesberg and this was

probably driven by the fact that many established businesses closed down which resulted in job losses (Kamiesberg municipality 2013).

Figure 4.6a shows that in 2001, there were no low-scoring municipalities and only one average scoring municipality located on the North West side of the province. All the other municipalities had scores over 0.7. In 2011, there were only high-scoring municipalities as all the scores were over 0.8.

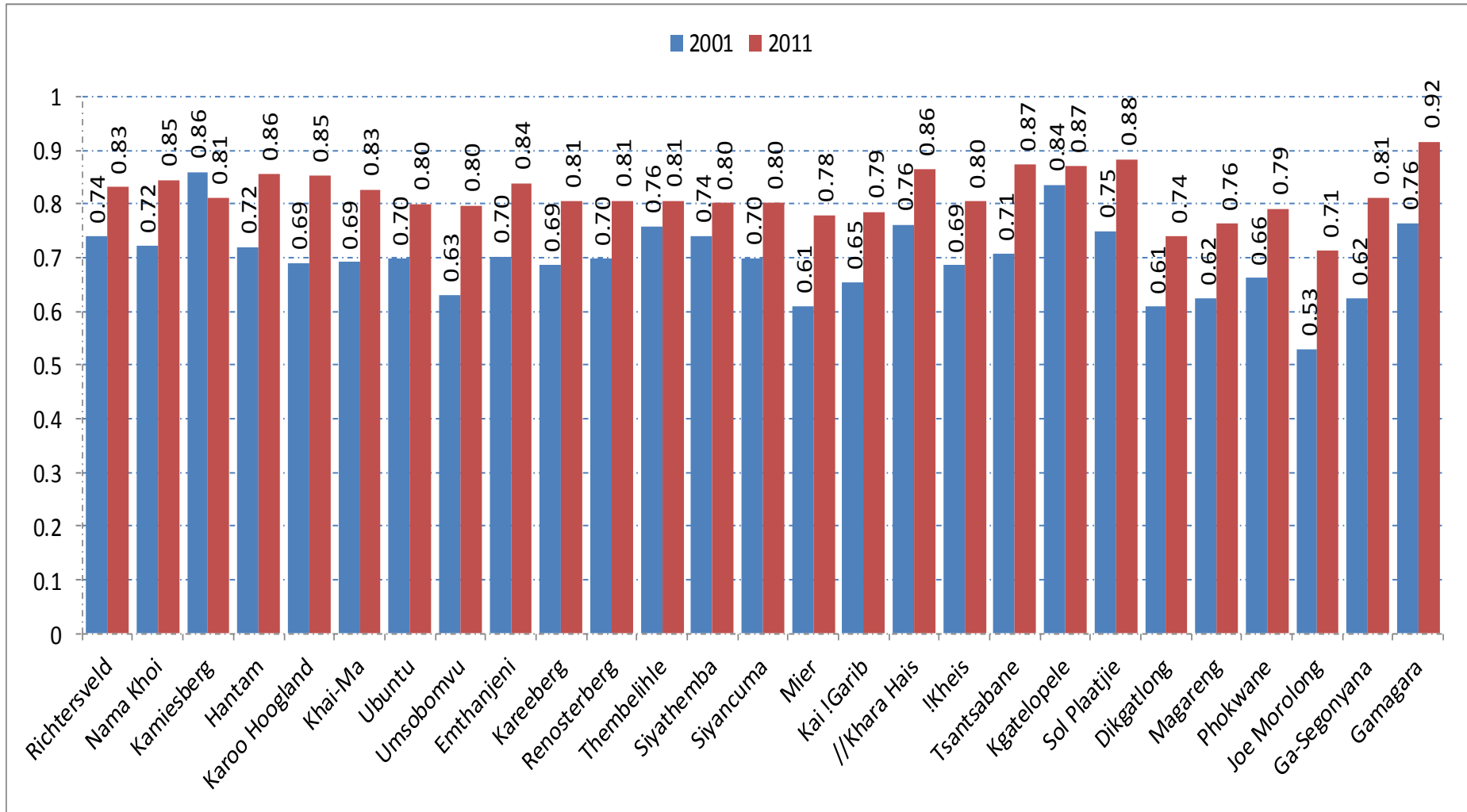


Figure 4.5 The city product dimension score of the CDI per municipality in the Northern Cape (2001 and 2011).

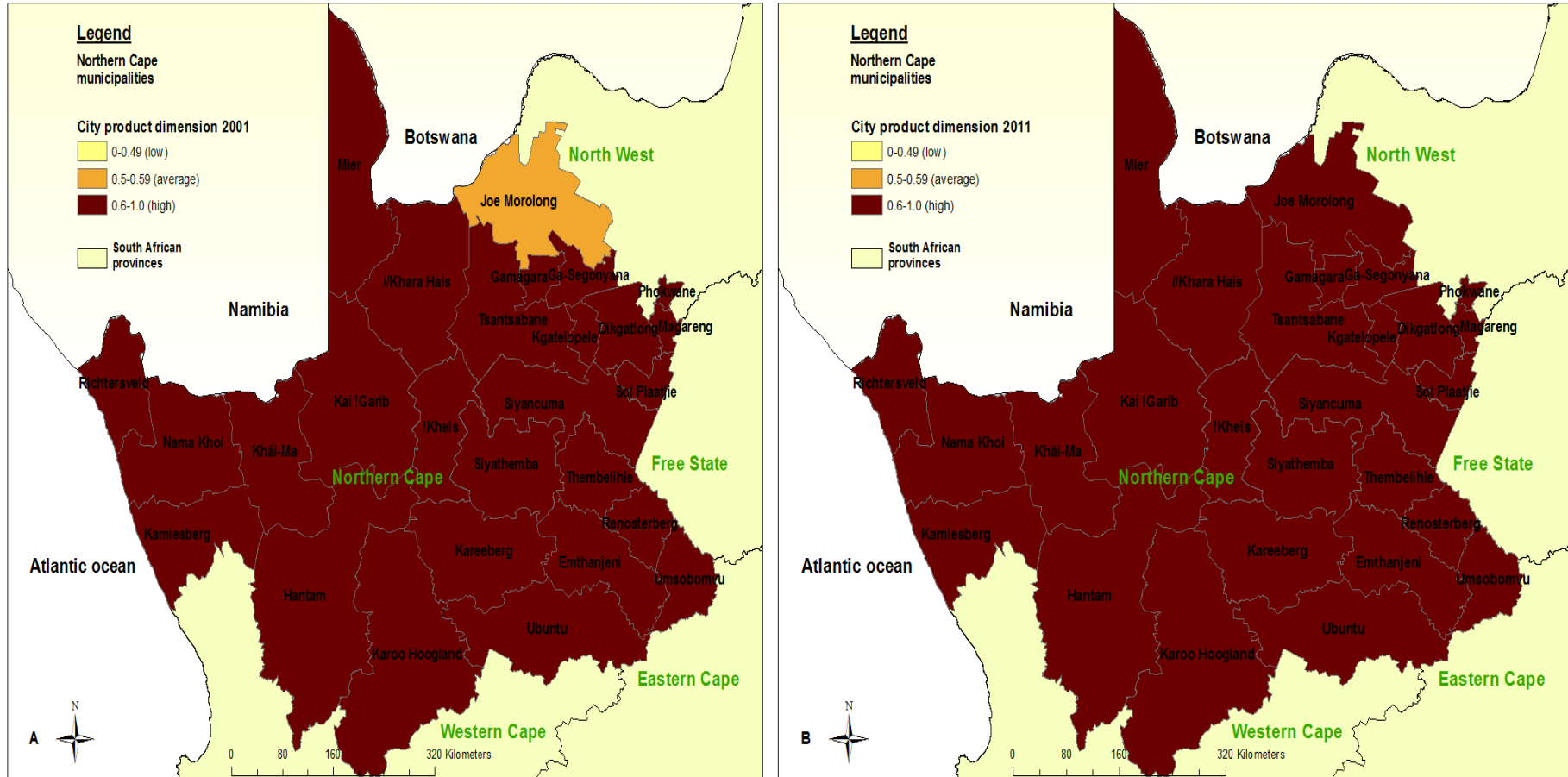


Figure 4.6a (2001) and b (2011) The city product dimension score for the CDI per municipality in the Northern Cape

4.4 The education dimension scores of the CDI for local municipalities in the Northern Cape

The education dimension was calculated by using the literacy rate and gross enrolment rate. The three municipalities that performed the best in 2001 were Tsantsabane (0.83), Sol Plaatje (0.80) and Nama Khoi (0.79) (Figure 4.7). The three municipalities that performed the best in 2011 were Sol Plaatje (0.84), Ga-Segonyana (0.81) and Gamagara (0.81). This was possibly driven by the fact that they were in the top ten for recording a low percentage of persons with no schooling, and had high gross enrolment ratios and literacy rates. Additionally these three municipalities were at the top for obtaining tertiary education (South Africa [Republic of] 2011a). The literature identified low-quality education, not completing secondary schooling, low levels of tertiary education, high illiteracy rates and poverty as challenges for education (Mouton, Louw & Strydom 2012; OECD 2008; Van der Berg et al 2011). The reason why these municipalities do well with education is that they have FET colleges, Gamagara's college is supported by the mine, Sol Plaatje had the National Higher Education centre that helped students get degrees from partner universities (Province of the Northern Cape 2005).

The municipalities that performed the worst in 2001 were Siyancuma (0.55), !Kheis (0.57) and Joe Morolong (0.58) (Figure 4.7). The municipalities that performed the worst in 2011 were Karoo Hoogland (0.65), Kai !Garib (0.66) and Kareeberg (0.68). These municipalities had high percentages of persons with no schooling, few people completed secondary education, and they had low literacy rates as well as low gross enrolment ratios (South Africa [Republic of] 2001 & 2011a). All these municipalities listed a shortage of secondary schools and long distances to schools as challenges (Kai !Garib municipality 2014; Kareeberg municipality 2013; Karoo Hoogland municipality 2009).

The municipalities that showed the biggest increase from 2001 to 2011 were Gamagara (0.62 to 0.81), Siyancuma (0.55 to 0.70) and Joe Morolong (0.58 to 0.71). This was probably due to increased gross enrolment ratios (South Africa [Republic of] 2001 & 2011a). The municipalities that had the biggest decrease from 2001 to 2011 were Tsantsabane (0.83 to 0.76), Kamiesberg (0.78 to 0.71) and Karoo Hoogland (0.69 to 0.65). This was driven by a decrease in the gross enrolment ratios for all three. Tsantsabane did not have enough schools and proper services at the schools; Kamiesberg did not have enough ECD centres, and Karoo Hoogland experienced high illiteracy levels and large numbers of teenage pregnancies

resulting in dropout from school (South Africa [Republic of] 2001 & 2011a; Kamiesberg municipality 2013; Karoo Hoogland municipality 2009; Tsantsabane municipality 2011).

Figure 4.8a shows that there were no low-scoring municipalities for 2001, and that the ones that had average scores were located on the North West side, on the east and in the centre of the province. All the other municipalities had scores over 0.6. Figure 4.8b shows that all the municipalities recorded high scores for 2011.

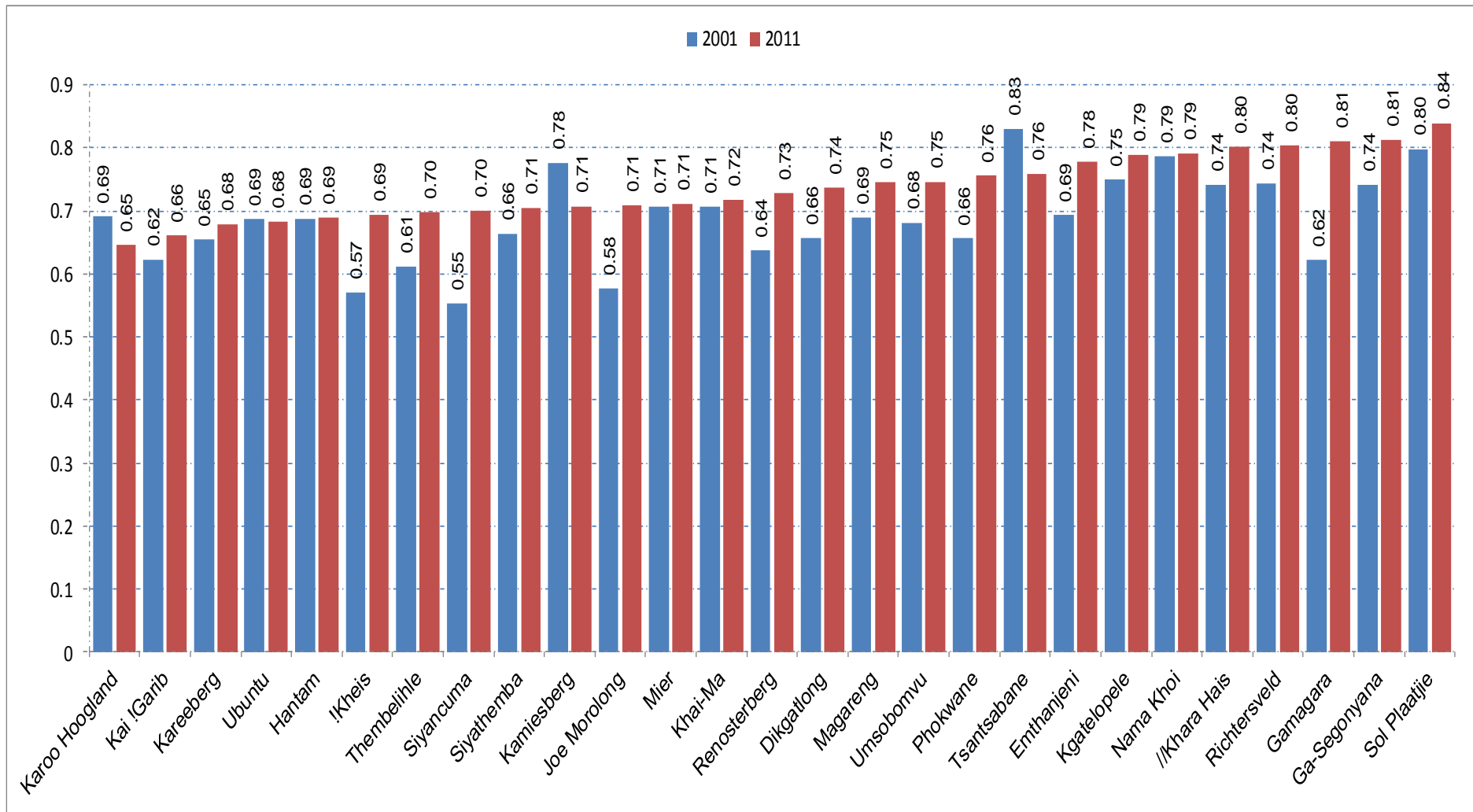


Figure 4.7 The education dimension scores for the CDI per municipality in the Northern Cape (2001 and 2011).

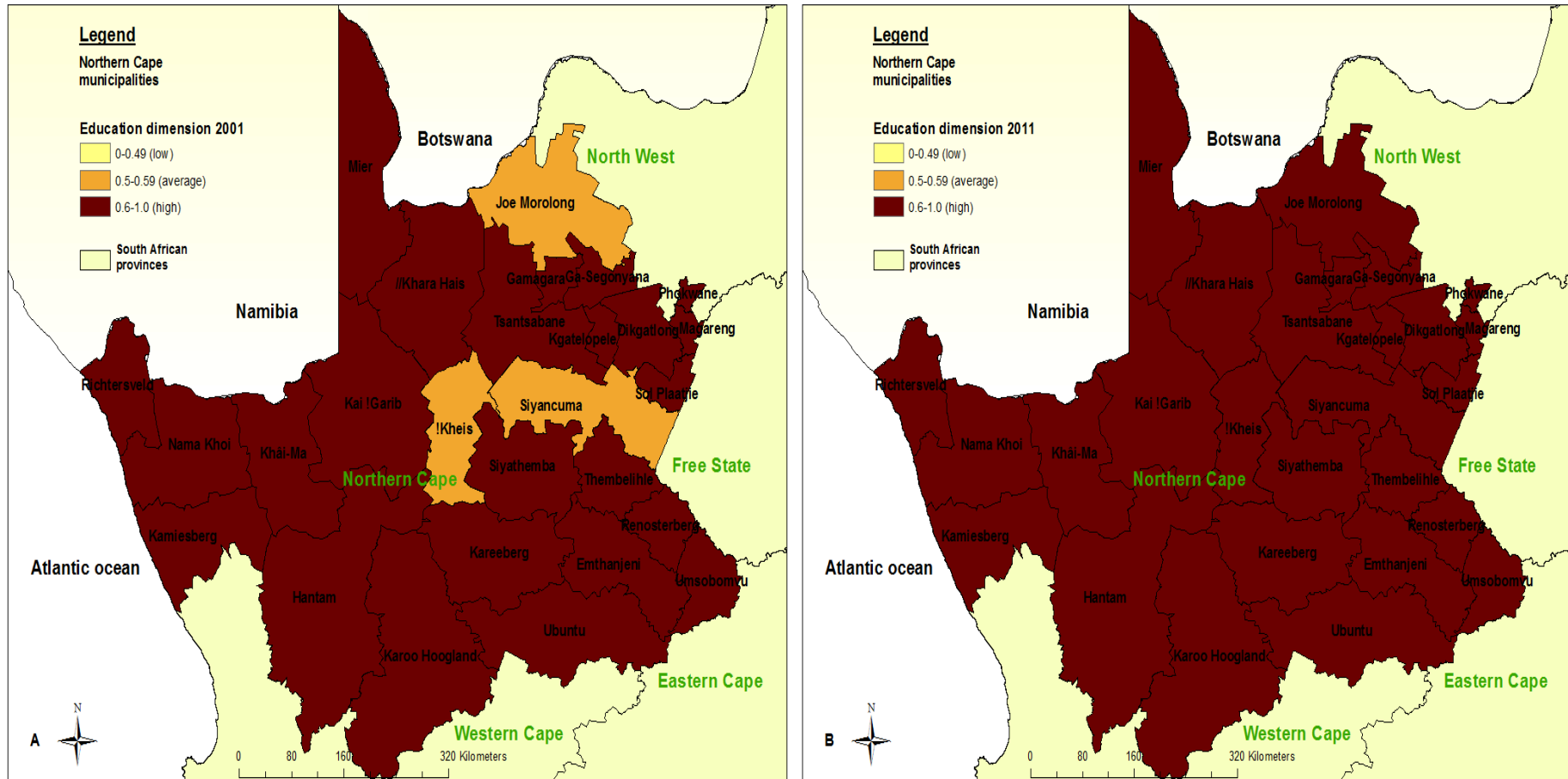


Figure 4.8a (2001 & b (2011) The education dimension score for the CDI per municipality in the Northern Cape

4.5 The waste dimension scores of the CDI for local municipalities in the Northern Cape

The waste dimension score was calculated using waste removal. The three municipalities that performed the best in 2001 were Sol Plaatje (0.92), Gamagara (0.90) and Nama Khoi (0.88) (Figure 4.9). The three municipalities that performed the best in 2011 were Gamagara (0.93), Kgatelopele (0.92) and //Khara Hais (0.90). The stimulation for this was probably that these areas had a high mean income. Again these areas are affluent since it is established mining towns and //Khara Hais is rich in agricultural activity (Gamagara municipality 2012; Kgatelopele municipality 2013; //Khara Hais municipality 2012). People in low-income areas do not pay for services which places a financial burden on the municipalities (Department of Environmental Affairs and Tourism 2000).

The municipalities that performed the worst in 2001 were Joe Morolong (0.00), Ga-Segonyana (0.21) and Mier (0.26) (Figure 4.9). The three municipalities that performed the worst in 2011 were Joe Morolong (0.07), Ga-Segonyana (0.22) and Kai !Garib (0.56). These municipalities all had a low mean income (South Africa [Republic of] 2011a) and additionally Kai !Garib listed an insufficient budget as a challenge, while Joe Morolong and Ga-Segonyana had no licensed landfill sites and a lack of resources (Ga-Segonyana municipality 2013; Joe Morolong municipality 2014; Kai !Garib municipality 2014).

The municipalities that showed the biggest increase from 2001 to 2011 were Mier (0.26 to 0.67), Phokwane (0.46 to 0.70) and Thembilihle (0.61 to 0.74), which was probably driven by the increase in mean income resulting in more revenue being collected (South Africa [Republic of] 2001 & 2011a). The municipalities that showed the biggest decrease from 2001 to 2011 were Tsantsabane (0.84 to 0.66), Sol Plaatje (0.92 to 0.86) and Dikgatlong (0.64 to 0.59), which might be due to insufficient landfill sites or the complete lack thereof listed in their IDPs (Dikgatlong municipality 2013; Sol Plaatje municipality 2010; Tsantsabane municipality 2011).

Figure 4.10a shows that the low-scoring municipalities were located in the centre, to the north and to the North West side of the province in 2001. Figure 4.10b shows that the low-scoring municipalities were located to the North West side and in the centre of the province.

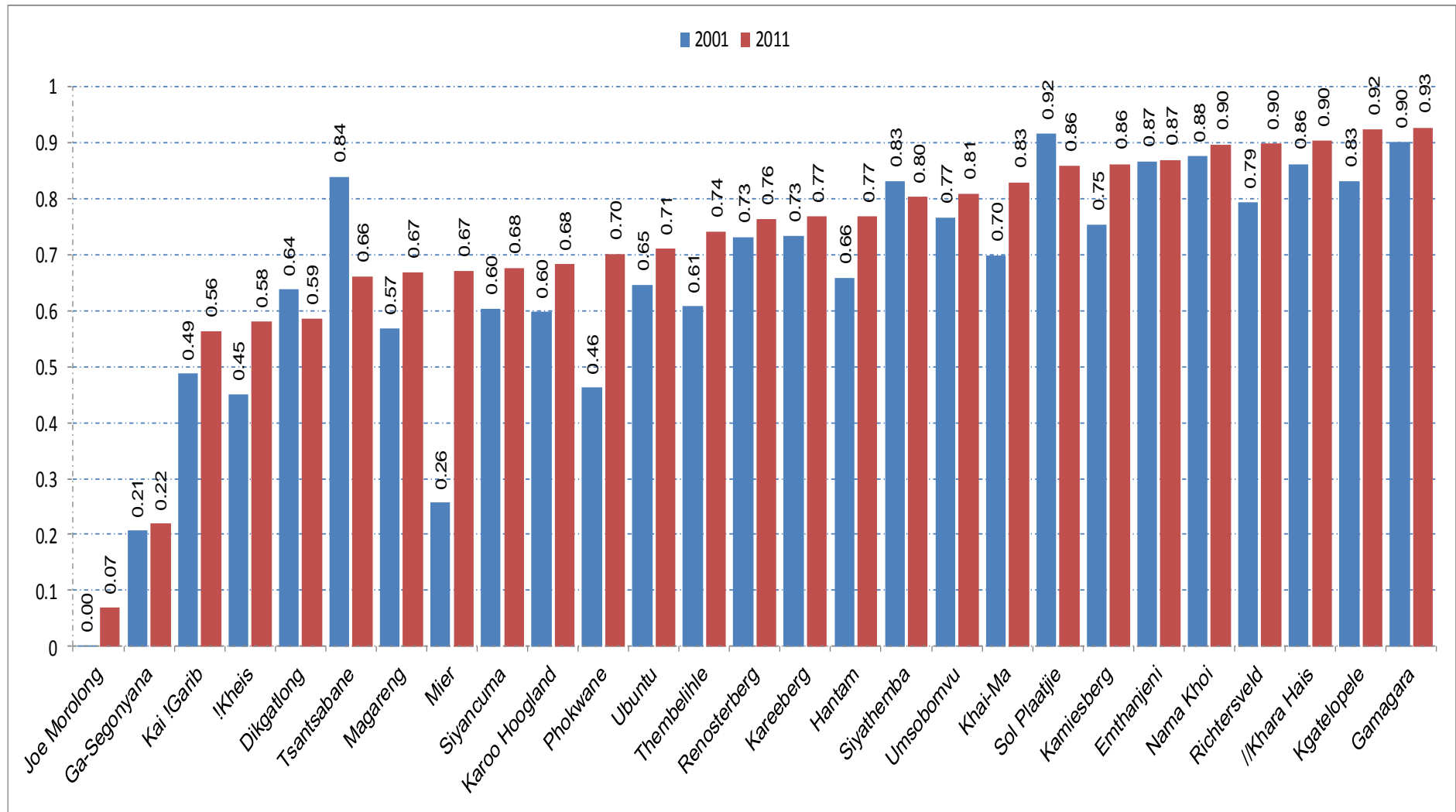


Figure 4.9 The waste dimension score of the CDI per local municipality in the Northern Cape (2001 and 2011)

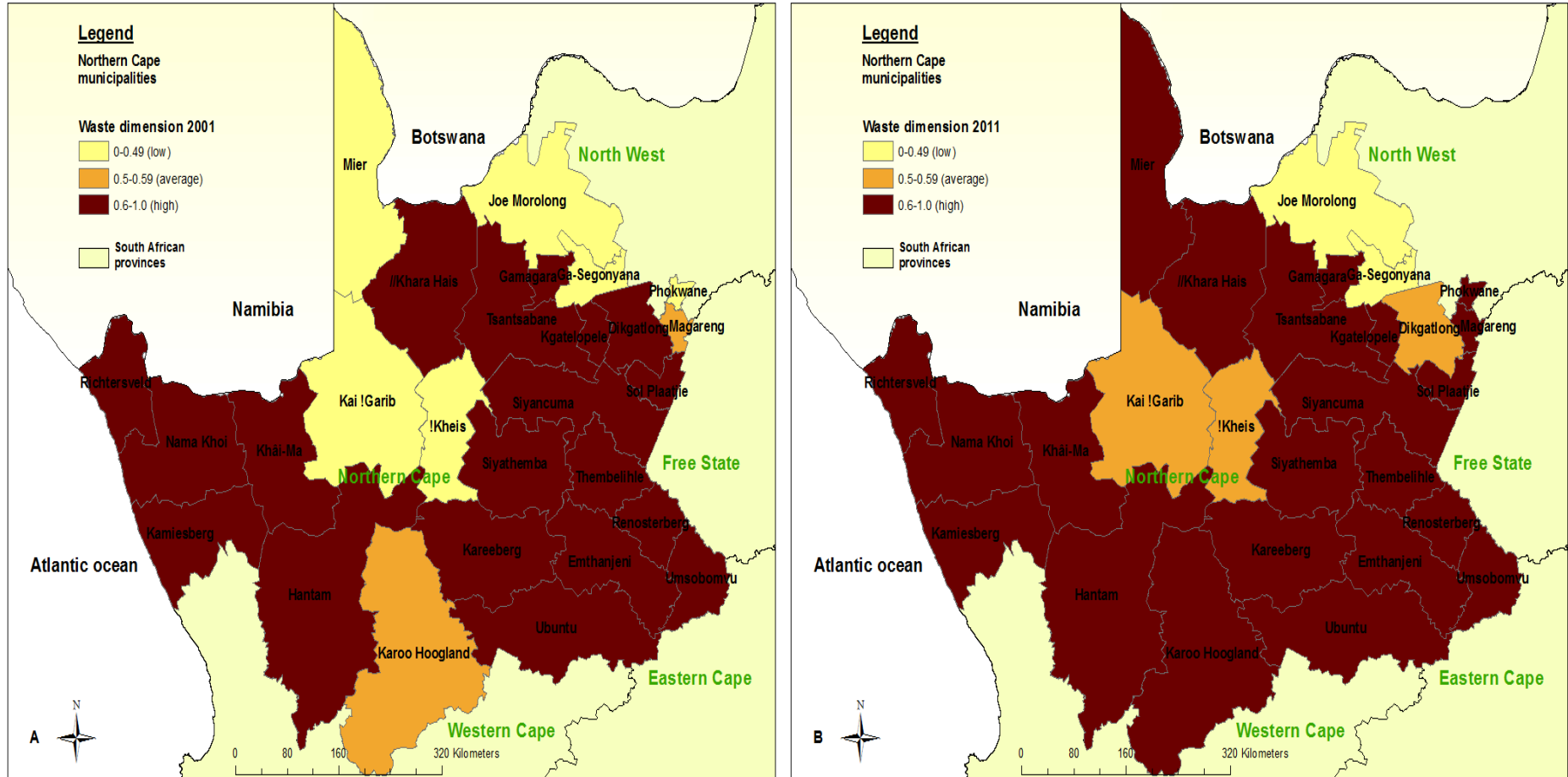


Figure 4.10a (2001) & b (2011) The waste dimension score for the CDI per municipality in the Northern Cape

4.6 The infrastructure dimension scores of the CDI for local municipalities in the Northern Cape

The infrastructure dimension was calculated by using water supply, sewerage, electricity and telephone access. The three best performing municipalities in 2001 were Gamagara (0.85), Richtersveld (0.83) and Sol Plaatje (0.79) (Figure 4.11). The three best performing municipalities in 2011 were Kgatelopele (0.83), Richtersveld (0.82) and Nama Khoi (0.82). This was driven by the fact that they all had very good access to water, sanitation, electricity and telephones, with most of them being the top scorers for these variables (South Africa [Republic of] 2001 & 2011a).

The three municipalities that performed the worst in 2001 were Joe Morolong (0.25), Ga-Segonyana (0.55) and Mier (0.55) (Figure 4.11). The three municipalities that performed the worst in 2011 were Joe Morolong (0.59), !Kheis (0.61) and Ga-Segonyana (0.63). This is stimulated by the fact that these municipalities have highly unequal access to services and they all recorded the lowest scores for water and sanitation. Joe Morolong and !Kheis were also in the bottom ten for electricity and telephone provision (South Africa [Republic of] 2001 & 2011a). South Africa still struggles with delivering water, sewerage systems and electricity to rural areas (Bogetić & Fedderke 2006; Fourie 2005). The IDPs of these municipalities listed non-payment for services, high cost of supplying infrastructure, poor maintenance of infrastructure and the absence of infrastructure as challenges (Ga-Segonyana municipality 2013; Joe Morolong municipality 2014; !Kheis municipality 2013). Poverty also played a role since they all had high poverty headcounts and a high SAMPI, which correlates to the conviction that poor service delivery, elevates poverty levels (South Africa [Republic of] 2014; UN-Habitat 1996).

The municipalities that showed the biggest increase from 2001 to 2011 were Joe Morolong (0.25 to 0.59), Kamiesberg (0.62 to 0.79) and Mier (0.55 to 0.69). All of these municipalities listed improvements in infrastructure in their IDPs (Joe Morolong municipality 2014; Kamiesberg municipality 2013; Mier municipality 2013). The municipalities that showed the biggest decrease from 2001 to 2011 were Gamagara (0.85 to 0.81), Tsantsabane (0.74 to 0.72) and Richtersveld (0.83 to 0.82). Gamagara listed excessive growth in the area as a challenge, placing a heavy load on service delivery, while Tsantsabane and Richtersveld had difficulties in revenue collection which placed financial constraints on the delivery of

services (Gamagara municipality 2012; Richtersveld municipality 2014; Tsantsabane municipality 2011).

Figure 4.12a shows that the low-scoring municipalities were located on the North West side of the province while the average scoring municipalities were located to the northern, central and eastern and the North West side. Figure 4.12b shows that the only average scoring municipality was located on the North West side of the province.

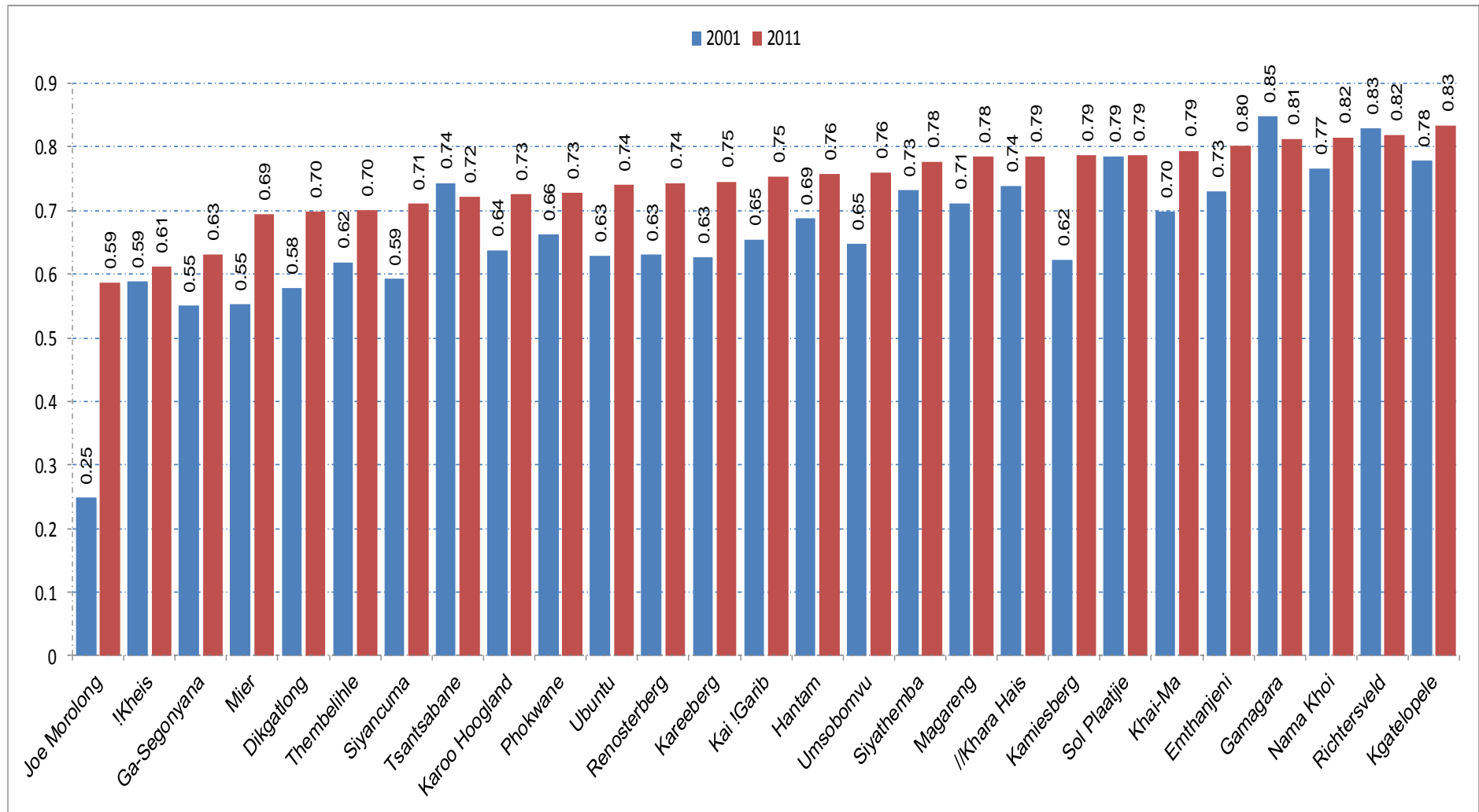


Figure 4.11 The infrastructure dimension score of the CDI per local municipality in the Northern Cape (2011 and 2011).

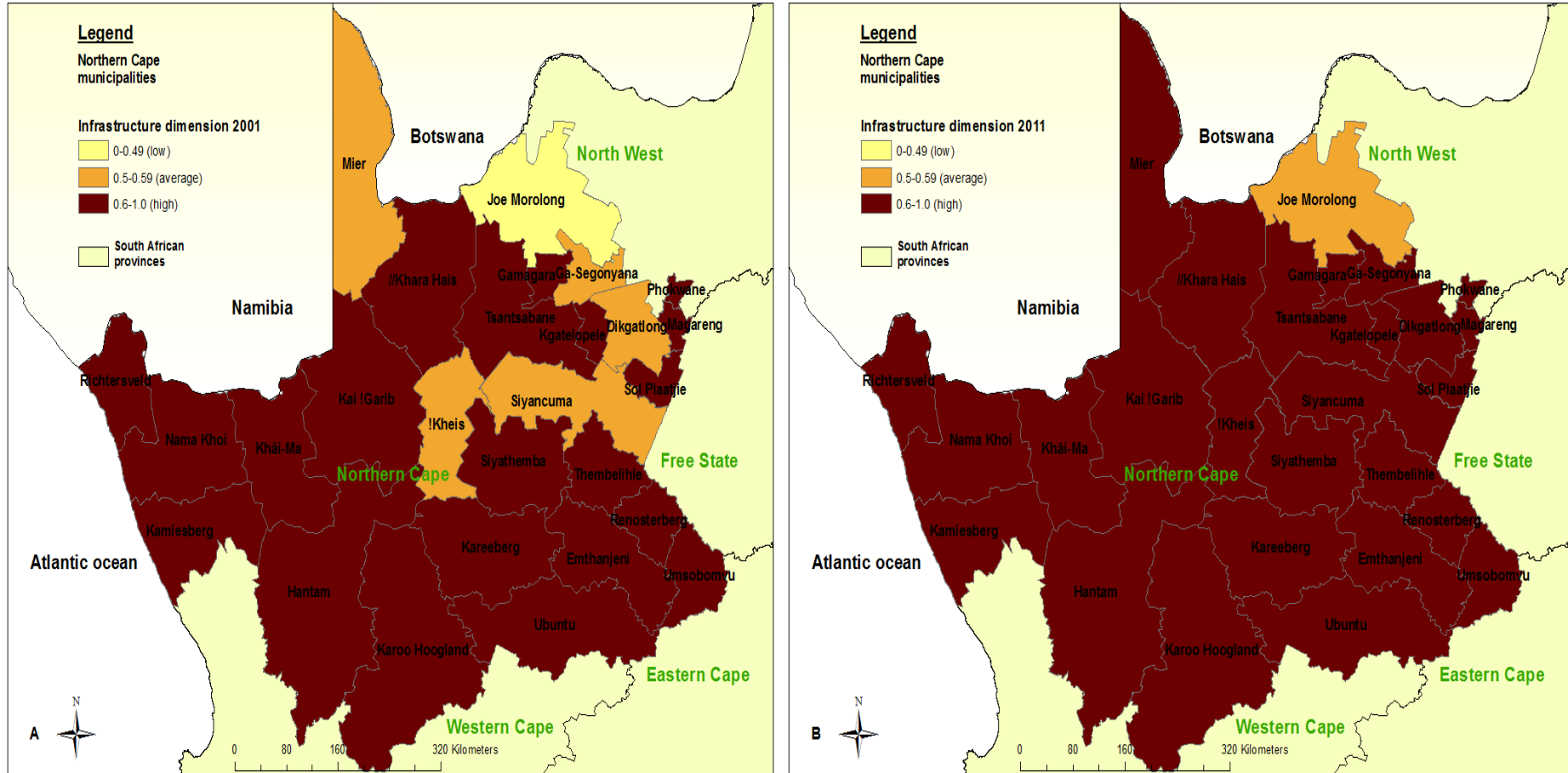


Figure 4.12a (2001) & b (2011) The infrastructure dimension score for the CDI per municipality in the Northern Cape

SECTION 5: CONCLUSION: IDENTIFYING THE GAPS THAT HAMPER PROGRESS IN TERMS OF QOL FOR THE NORTHERN CAPE LOCAL MUNICIPALITIES

Section 5 concludes this study by summarising the results and comparing the CDI dimensions before looking at policy implications. This will help municipalities to identify gaps in planning and to pinpoint areas that need priority attention.

5.1 Discussion, conclusions and policy implications

The aim of this study was twofold: 1) to calculate the CDI to determine if the QOL in the local municipalities in the Northern Cape has increased or decreased between 2001 and 2011; and 2) to apply the CDI to determine which of the local municipalities performed the best and the worst in terms of QOL in 2001 and 2011.

The literature review revealed that defining QOL is not easy. Many different definitions exist to define QOL. QOL looks at what makes people happy, urban development and its impact on people, and today sustainability also comes into play (Diener 1984). The most important aspect of QOL seems to be that the positive should outweigh the negative. There are three major approaches to measuring QOL namely the philosophical, objective and subjective approaches. The objective and subjective approaches are the ones mostly used today in QOL studies all over the world. Both of these have strengths and weaknesses and the choice of which variables to use remains difficult. The choice of approach also depends on the availability of data and resources. The two approaches should, however, not be seen as competing against each other, but rather as complementary, as a combination of the two can explain the results much better and they can supplement each other to help researchers understand the true conditions experienced in society (Diener & Suh 1997; Helliwell, Layard & Sachs 2013; Marans 2012; OECD 2011; Seaford 2013)

There are many different models and indices that are used to study QOL and most of them were applied internationally. Some examples of these are: the HDI (UNDP 1990), CDI (UN-Habitat 1996), the Better Life Index (OECD 2011), the Well-being and Progress Index (WIP) (D'Acci 2011) the World Happiness Report (Helliwell, Layard & Sachs 2013), and the Social Progress Index (Porter, Stern & Green 2014). In South Africa there were also many different

QOL studies, for example: the Everyday quality of life in South Africa (Higgs 2007), the Non-monetary quality of city life in South Africa (Naudé, Rossouw & Krugell 2009), the Quality of life in post-apartheid South Africa (Davids & Gaibie 2011), the Living Conditions Survey (South Africa [Republic of] 2012b), the South African quality of life trends (Møller 2013), and the South African MPI (South Africa [Republic of] 2014b). The most important finding from all these studies was that they can be applied in different ways and the variables used will determine the results. The most important factor is finding a method to calculate the QOL that will address the issues at hand and that can give trends over time.

Table 5.1 shows the names of the municipalities that recorded the highest and lowest scores for 2001 and 2011 and that had increased or decreased their scores from 2001 to 2011 for the composite CDI and its dimensions.

There were many problems with QOL in the Northern Cape. Poverty was identified as the major problem regarding all dimensions in the Northern Cape. The composite CDI revealed that there are not enough economic opportunities in the Northern Cape municipalities and unemployment is generally high in most of the municipalities. The health dimension revealed that the people of the Northern Cape are not getting proper medical care, mostly because there is a shortage of medical facilities and staff and this results in high infant mortality and low life expectancy. The city product revealed income inequality and low mean income as a result of poor economic development and high unemployment. The education dimension revealed that there are too few opportunities for the people of the Northern Cape to get tertiary education. The quality of education is also poor enhanced by a shortage of schools and teachers in some areas. The waste dimension revealed that the lack of and poor maintenance of landfill sites is a challenge and that the licensing of landfill sites should receive priority. The infrastructure dimension revealed that service delivery is expensive in the Northern Cape and there were still large disparities in service delivery between different municipalities where only certain services were delivered properly (Bhorat & Vvan der Westhuizen 2005; Bogetić & Fedderke 2006; Department of Environmental Affairs and Tourism 2000; Gilson and McIntyre 2007; Mouton, Louw & Strydom 2012; OECD 2008; Province of Northern Cape 2003; Van der Berg et al 2011).

Table 5.1 The three municipalities that recorded the highest and lowest scores for 2001 and 2011 and that had increased or decreased their scores from 2001 to 2011 for the composite CDI and its dimensions.

	Composite CDI	Health dimension	City product dimension	Education dimension	Waste dimension	Infrastructure dimension
Highest scores						
2001	Kgatelopele (0.81)	Mier (0.96)	Kamiesberg (0.84)	Tsantsabane (0.83)	Sol Plaatje (0.92)	Gamagara (0.85)
	Nama Khoi (0.79)	Renosterberg (0.89)	Kgatelopele (0.84)	Sol Plaatje (0.8)	Gamagara (0.9)	Richtersveld (0.83)
	Gamagara (0.77)	Kgatelopele (0.88)	Gamagara (0.76)	Nama Khoi (0.79)	Nama Khoi (0.88)	Sol Plaatje (0.79)
2011	Richtersveld (0.86)	Richtersveld (0.95)	Gamagara (0.92)	Sol Plaatje (0.84)	Gamagara (0.93)	Kgatelopele (0.83)
	Kgatelopele (0.86)	Kgatelopele (0.86)	Sol Plaatje (0.88)	Ga-Segonyana (0.81)	Kgatelopele (0.92)	Richtersveld (0.82)
	Nama Khoi (0.82)	Renosterberg (0.86)	Tsantsabane (0.87)	Gamagara (0.81)	//Khara Hais (0.90)	Nama Khoi (0.82)
Lowest scores						
2001	Joe Morolong (0.4)	Tsantsabane (0.35)	Joe Morolong (0.53)	Siyancuma (0.55)	Joe Morolong (0)	Joe Morolong (0.25)
	Ga-Segonyana (0.56)	//Khara Hais (0.37)	Dikgatlong (0.61)	!Kheis (0.57)	Ga-Segonyana (0.21)	Ga-Segonyana (0.55)
	Kai !Garib (0.59)	Sol Plaatje (0.37)	Mier (0.61)	Joe Morolong (0.58)	Mier (0.26)	Mier (0.55)
2011	Joe Morolong (0.58)	Ubuntu (0.11)	Joe Morolong (0.71)	Karoo Hoogland (0.65)	Joe Morolong (0.07)	Joe Morolong (0.59)
	Kai !Garib (0.58)	Kai !Garib (0.14)	Dikgatlong (0.74)	Kai !Garib (0.66)	Ga-Segonyana (0.22)	!Kheis (0.61)
	Ubuntu (0.61)	Umsobomvu (0.26)	Magareng (0.76)	Kareeberg (0.68)	Kai !Garib (0.56)	Ga-Segonyana (0.63)
Increased from 2001 to 2011	Joe Morolong	Richtersveld	Ga-Segonyana	Gamagara	Mier	Joe Morolong
	Karoo Hoogland	//Khara Hais	Joe Morolong	Siyancuma	Phokwane	Kamiesberg
	Richtersveld	Karoo Hoogland	Mier	Joe Morolong	Thembilihle	Mier
Decreased from 2001 to 2011	Ubuntu	Siyancuma	Kamiesberg	Tsantsabane	Tsantsabane	Gamagara
	Thembilihle	Ubuntu		Kamiesberg	Sol Plaatje	Tsantsabane
	Kai !Garib	Thembilihle		Karoo Hoogland	Dikgatlong	Richtersveld

Radar graphs provide a visual summary of all the aforementioned findings as well as clearly indicating, at a glance, which dimensions need attention in each municipality. Radar graphs plot each dimension on its own axis radiating from a central point. The closer the points are to the centre, the poorer the performance for that dimension. Figure 5.1 shows the radar graphs for the CDI and its dimensions.

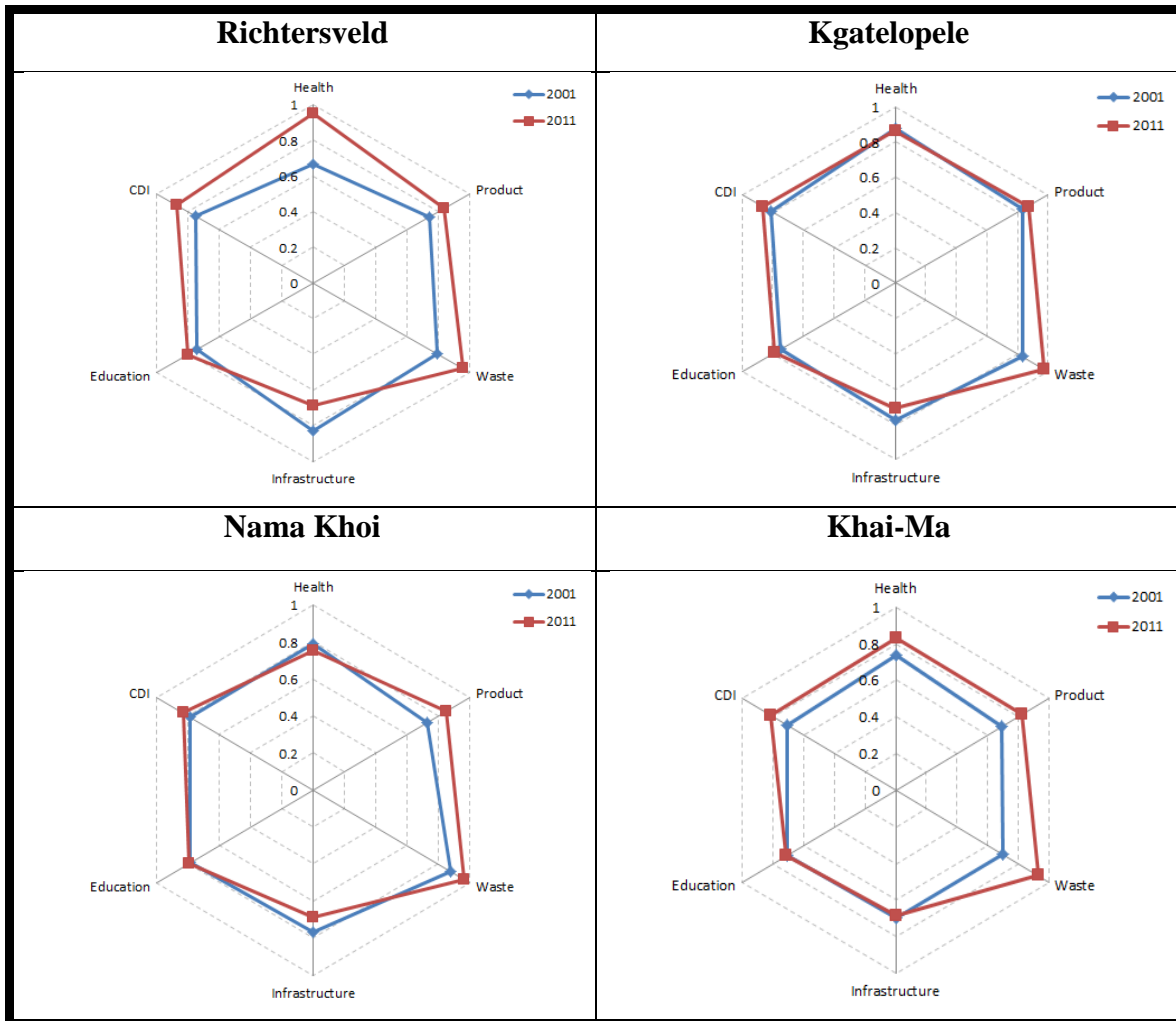


Figure 5.1 continued overleaf

Figure 5.1 continued

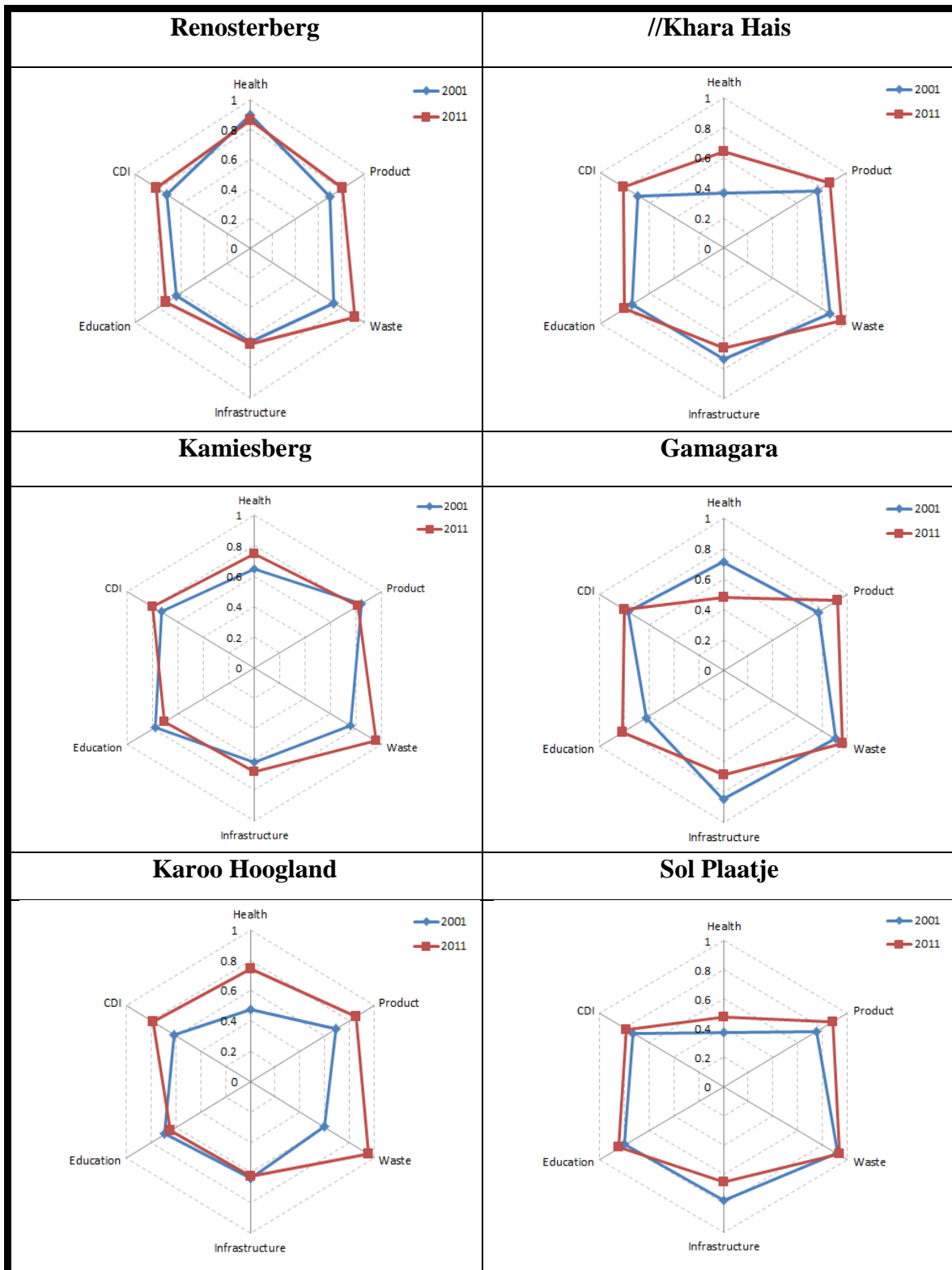


Figure 5.1 continued overleaf

Figure 5.1 continued

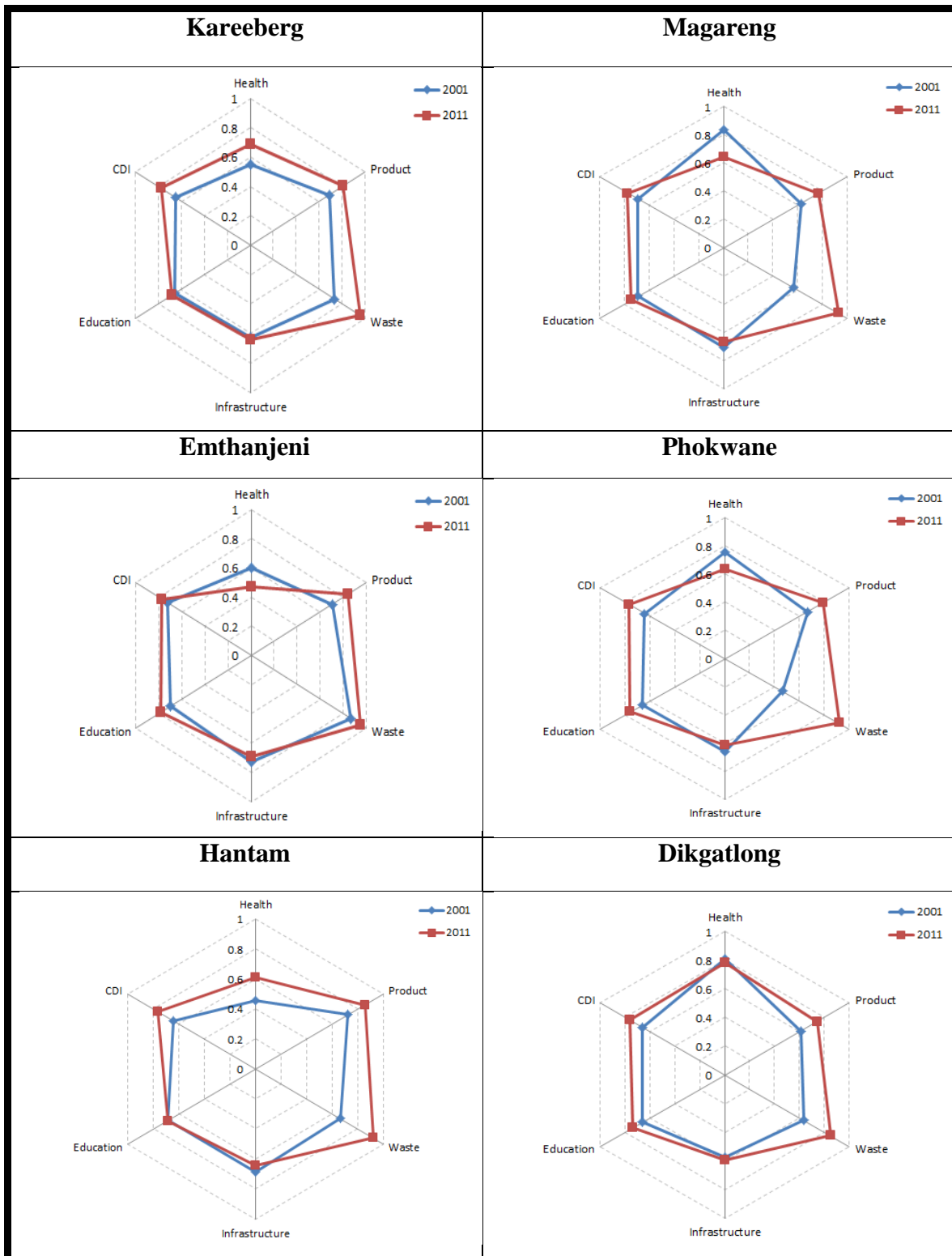


Figure 5.1 continued overleaf

Figure 5.1 continued

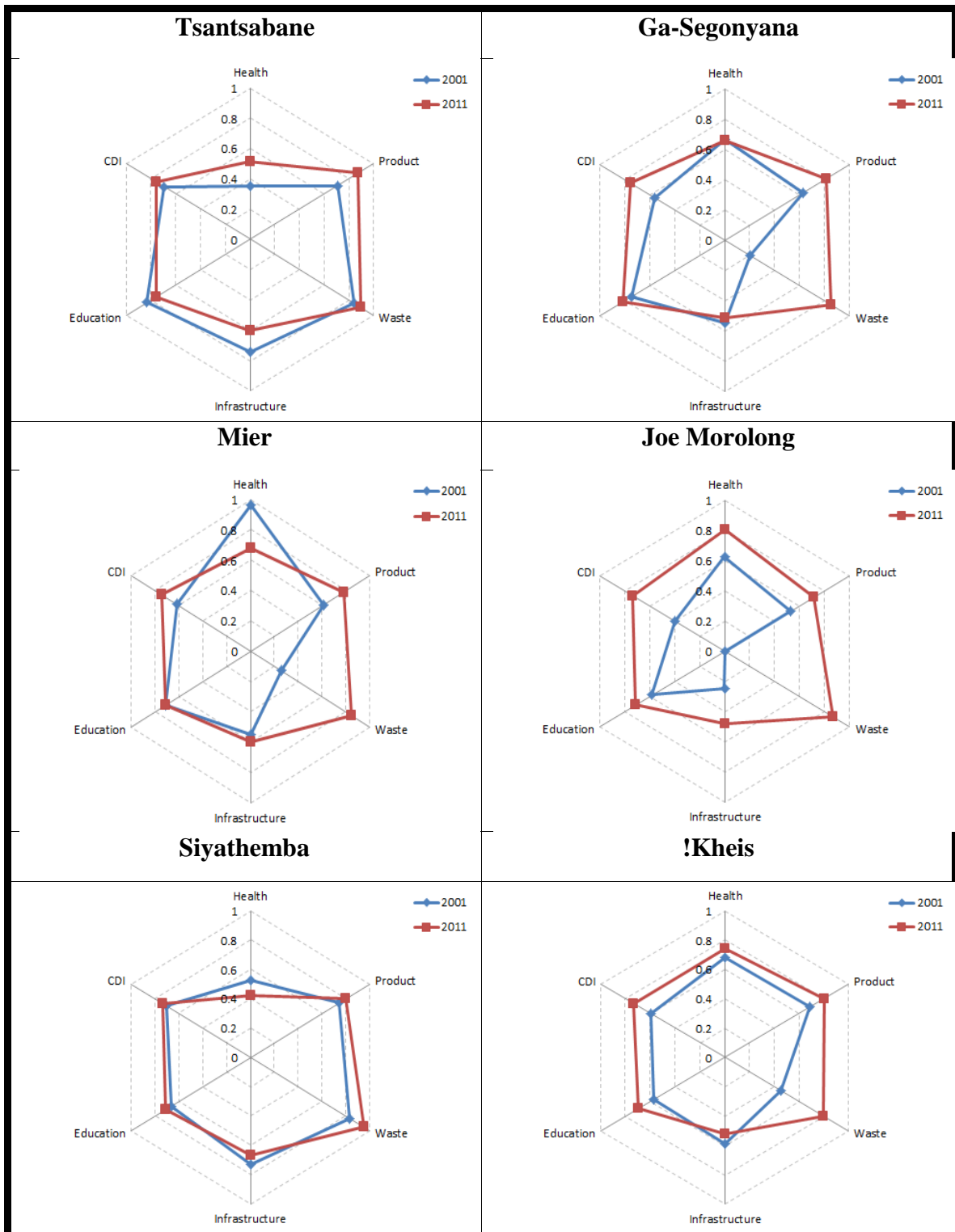


Figure 5.1 continued overleaf

Figure 5.1 continued

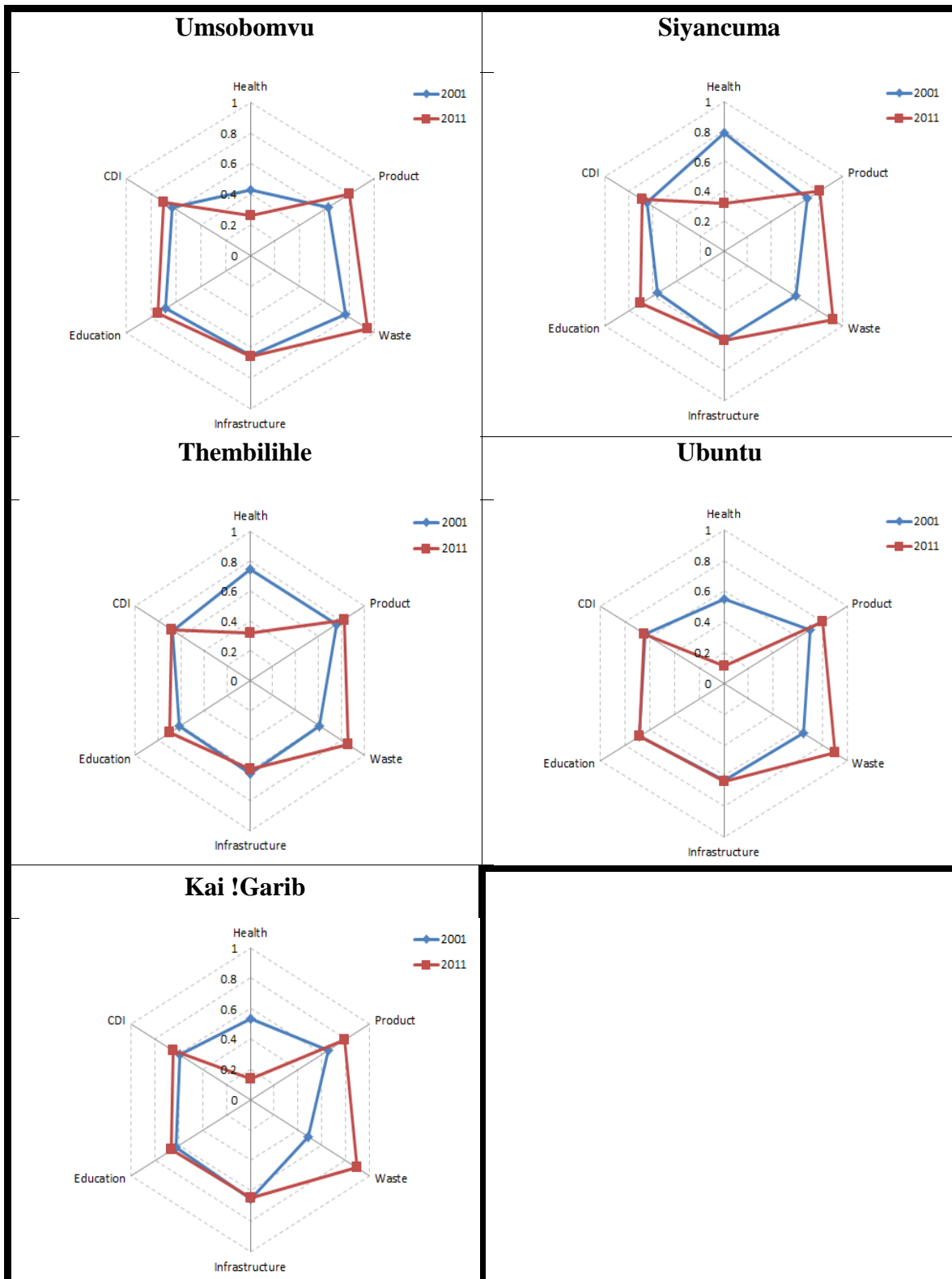


Figure 5.1 Radar graphs of all the dimensions of the CDI for the local municipalities in the Northern Cape (2001 and 2011)

The following problem areas were revealed in the results:

1. Siyancuma municipality should be an area of priority since it is the only municipality that showed up as performing badly in all the dimensions. The closure of railway stations in a large number of towns in this municipality has resulted in job losses. This also resulted in the termination of services to the people of these towns since Spoornet is no longer supplying it to these towns. There is very poor access to health facilities, education facilities and social services in this municipality.
2. Kai !Garib experiences challenges with a shortage of teachers, long distances to schools. HIV/AIDS and Tuberculosis (TB) is a challenged made bigger by a lack of health staff, irregular visits by mobile clinics and lack of equipment at clinics. Very little economic opportunities exist.
3. Thembilihle - insufficient staff at health facilities and distance to health care facilities is a challenge. There are no day care facilities and a shortage of ECD and Adult Basic Education and Training (ABET) centres available. The influx of unskilled workers from the farms prioritises the need for ABET facilities. Electricity facilities and sewerage plants need maintenance urgently. There are challenges with supplying water to informal areas and to the small farming initiatives. New landfill sites are needed for the waste removal project.
4. Ubuntu have challenges regarding no economic development, and insufficient health services. Closure of railway stations caused problems with service delivery and people moving out of the municipality. Challenges with access to health services and staff at clinics are experienced.
5. Siyathemba has a high HIV/AIDS prevalence and this increased the death rate. There is a high dependence on grants since there is no economic growth in the municipality.
6. Tsantsabane experiences little economic opportunities and access to health services. Poverty also negatively influences the ability of people to pay for services.
7. Joe Morolong does get support from the mines and has been a priority area for development in the province, but many challenges still remain. The licensing of the landfill site for waste removal needs to be completed and supply of water and electricity needs to be worked on. Non-payment for services need to be addressed by supplying meters to houses and poor infrastructure needs maintenance. The small number of clinics (28) supplying services to a large number of villages (163) needs to be a matter of concern. Some villages do not have schools making it difficult for students to attend school due to distances they have to travel and unreliable transport.

8. Mier - provision of services is difficult due to long distances between settlements. Water is scarce and has to be delivered from a long distance and this impacts sanitation since this needs water. There is a high dependency on grants in the area since there are little economic growth and opportunities for growth. Distance to health facilities creates a challenge and distance to schools also becomes a challenge when transport is unreliable.
9. Dikgatlong generally has no new development and a lack of employment opportunities as a result. Poverty resulting from high unemployment puts strain on service delivery since non-payment is high and there are a large number of indigents.

These revelations can assist the provincial departments together with the Office of the Premier and the local authorities in addressing the challenges in order to improve the QOL of these municipalities.

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