

# Basic service delivery and fragile regions in South Africa

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**Theophilis Meintjes**

**B.Comm (HONS)**

**127 94 341**

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Supervisor: Prof. W.F. Krugell

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## ABSTRACT

In 1994, the newly elected ANC-led government adopted the Reconstruction and Development Programme (RDP) as its socio-economic policy framework. This policy spelt out key pillars of delivery, including meeting basic needs and developing human resources. It is clear that over the past fifteen years, great strides have been made towards redressing past social inequalities and meeting the RDP commitment. Addressing these challenges will require new approaches. Today, researchers look beyond poverty headcounts and poverty gaps to broader concepts of capabilities and vulnerability. This dissertation examines vulnerability at a sub-national level in South Africa. The general objective of this dissertation is to construct indicators of local fragility using data from South Africa. The aim is to extend the work by Naudé *et al.* (2008) on measures of the fragility of regions in South Africa. It extends the work by Naudé *et al.* (2008) in three ways: data from the recently released Community Survey 2007 are used, the unit of analysis is local municipalities instead of magisterial districts, and the factor scores generated by principle component analysis are used to construct a fragility index. The Breede Valley Local Municipality was found to be the only municipality that remained in the top-5 least fragile regions in 2001 and 2007. In conclusion, this dissertation achieved its objective of constructing an indicator of local fragility.



## OPSOMMING

In 1994 het die nuut verkose ANC-regering die HOP (Heropbou- en Ontwikkelingsprogram) as hulle sosio-ekonomiese beleid aangeneem. Hierdie beleid dien as die basis vir diensverskaffing en sluit die bevrediging van behoeftes asook die ontwikkeling van menslike hulpbronne in. In die afgelope vyftien jaar het die regering baie pogings aangewend om sosiale ongelykhede te oorkom deur die doelwitte van die HOP te bereik. Om hierdie doelwitte te bereik, is dit egter nodig om nuwe metodologieë te volg en daarom word daar in hedendaagse navorsing nie net van die tradisionele metodologie (om armoede te meet met “per persoon”-metodes en om net te kyk na die armoede-gapings tussen groepe) gebruik gemaak nie. Die aandag word deesdae gevestig op breër konsepte soos bekwaamheid en kwesbaarheid. Hierdie verhandeling bestudeer kwesbaarheid op sub-nasionale vlak in Suid Afrika en die doel daarvan is om ’n plaaslike kwesbaarheidsindeks te ontwikkel deur die werk van Naudé *et al.* (2008), wat ook kwesbaarheid op sub-nasionale vlak studeer het, uit te brei. Die voorgenoemde uitbreiding word op die volgende maniere gedoen: eerstens bevat die data wat in hierdie studie gebruik word ekstra inligting in die vorm van die 2007 gemeenskapsopname, tweedens word die plaaslike munisipaliteite eerder as die plaaslike magistrale distrikte gebruik en laastens word die faktortellings wat verkry is uit die prinsipiëlekomponentanalise gebruik om die indeks te bou. Dit is interessant om op te let dat die Breedevallei-munisipaliteit die enigste is wat in 2001 en in 2007 in die lys van die vyf minste kwesbare munisipaliteite voorkom.

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## Chapter 1: Introduction

### 1.1 Background

In 1994, the newly elected ANC-led government adopted the Reconstruction and Development Programme (RDP) as its socio-economic policy framework and spelt out key pillars of delivery, including meeting basic needs and developing human resources. Table 1.1 gives a brief overview of the 2008 development indicators published by the Presidency (South Africa, 2008).

**Table 1.1: Development indicators, 2008**

| Indicator                                              |            |
|--------------------------------------------------------|------------|
| Average annual real per capita GDP growth, 1994-2007   | 1.75%      |
| Unemployment rate (narrow definition), September 2007  | 23.0%      |
| Unemployment rate (broad definition), September 2007   | 34.3%      |
| Gini coefficient, 2005                                 | 0.69       |
| Population below R462 per month, 2005                  | 48%        |
| Households in formal dwellings, 2007                   | 70.5%      |
| Households with access to water infrastructure, 2007   | 87.2%      |
| Households with access to sanitation, 2007             | 72.6%      |
| Households with access to electricity, 2007            | 72.0%      |
| Life expectancy for males, 2007                        | 48.4 years |
| Life expectancy for females, 2007                      | 51.6 years |
| HIV/Aids prevalence, total population, 2007            | 11.1%      |
| Literacy rate, 2006                                    | 74.4%      |
| Turnout of registered voters for local elections, 2006 | 48.4%      |
| Contact crimes per 100'000 of population, 2007         | 1403.7     |
| Property crimes per 100'000 of population, 2007        | 1090.0     |

*Source: South Africa (2008)*

The report indicates that for the period 1994 to 2008 there has been positive growth in real GDP per capita, a reduction of unemployment, fewer people live in poverty and more people have access to basic services (South Africa, 2008). It is clear that over the past fifteen years, great strides have been made towards redressing past social inequalities and meeting the RDP commitment. However, Table 1 shows that the challenge of ensuring a better life, remains. Economic growth rates are still low, inequality has increased from 1995 to 2005, and life expectancy is low, while poverty and crime rates are high.

Addressing these challenges will require new approaches. Today, researchers look beyond poverty headcounts and poverty gaps to broader concepts of capabilities and vulnerability. Vulnerability refers to the risk that non-poor households will become poor, and that poor households will remain in poverty (Dercon, 2005). Analyses of vulnerability or fragility have

typically been undertaken at the household level or at national level. At the level of households, fragility is seen as an *ex ante* measure of poverty, specifically transient poverty (Holzman & Jorgenson, 2000; Günther & Klasen, 2007). The focus is on the risk of households falling in or remaining in poverty because of shocks due to the characteristics of the households, or because of external shocks. At a country level, the concept of fragile states has received increased attention. Fragile states are those that are unable to execute the basic functions that contribute to the security and well-being of the population (Torres & Anderson, 2004). Such states typically experience wide-ranging problems including poverty, inequality, economic security risks and weakened competitiveness.

There is also a small but growing literature that focuses on the vulnerability or fragility of regions. Naudé, McGillivray and Rossouw (2008) argue that vulnerability of place is distinct from national economic vulnerability and household vulnerability. A region or a place can be fragile across a number of domains including geography and the environment. Regional-level shocks to income and regional-level government capacity may be sources of covariate risk that have an impact on households' incomes and well-being capabilities.

This sub-national level approach to the challenges of low growth, poverty and inequality may be of particular relevance in the case of South Africa. Naudé *et al.* (2008) point out that South Africa is not a fragile state and that it is not seen as being economically vulnerable. However, "South Africa has a number of characteristics that, in the absence of strong institutions, could render it more vulnerable" (Naudé *et al.*, 2008:4). The first of these is the high level of spatial inequality. Bosker and Krugell (2008) find a heavily diverging regional income distribution, where relatively poor regions are likely to remain poor and become even poorer and the richest regions will retain their lead in income levels. Rossouw and Naudé (2008) find significant variation across space in non-income quality of life. A second characteristic of South African regions that may make it more vulnerable is the capacity of its local governments. The Constitution recognises local government to have a developmental as well as a service role in meeting the basic needs of communities and improving living conditions (Harris, 1999). However, local governments have struggled to fulfil this responsibility as has been clearly marked by violent protests over poor service delivery (Botes, Lenka, Marais & Sigenu, 2007).

## **1.2 Problem statement**

This dissertation examines vulnerability at a sub-national level in South Africa. The aim is to extend the work of Naudé *et al.* (2008) on measures of the fragility of regions in South Africa.

## **1.3 Motivation**

In the fifteen years since the transition to democracy in South Africa, real GDP per capita has grown at an average annual rate of 1.75 per cent. The government's 2008 development indicators also show that in 2007, the broad, unofficial unemployment rate was 34 per cent. The depth of poverty decreased from 1995 to 2005: in 1995 the average person's income was 12 per cent below the poverty line of R250 per month, while in 2005 it was 7 per cent below the poverty line. In 2005, approximately 23 per cent of the population lived below the poverty line of R250 per month and 48 per cent lived below the poverty line of R462 per month. Over the period, income inequality has grown, as shown by the increase in the Gini coefficient from 0.64 in 1995 to 0.69 in 2005 (South Africa, 2008). In sum, there is little evidence of accelerated or shared growth and still a significant risk that non-poor households will become poor and that poor households will remain in poverty. It is this vulnerability that serves as the motivation for this study.

The focus of the study is on the vulnerability of places. Bird, McKay and Shinyekwa (2007) show that research on spatial pockets of poverty finds that the characteristics of places are significant predictors of poverty once household characteristics have been controlled for. As stated above, vulnerability of place is distinct from national economic vulnerability and household vulnerability. Naudé *et al.* (2008) argue that there are sub-national level factors that have an impact on household incomes, capabilities and the way in which they accumulate assets. Vulnerability may be due to fragility in the economic and environmental spheres as well as fragility related to governance and institutions. This may lead to transient poverty as well as the occurrence of geographic poverty traps (Naudé *et al.*, 2008:3).

This approach to fragile regions may be of particular relevance in the case of South Africa. As explained in Section 1.1, the spatial economy is characterised by significant inequality and weak institutions. Earlier analyses of poverty and inequality have typically used national level databases to examine development indicators. For example, Hirschowitz and Orkin (1997)

analysed living conditions according to race, gender, urbanisation and employment. The 1994 October Household Survey was used and the findings showed stark contrasts between different groups. Africans, who constitute 76 per cent of the population, were more likely to be affected by inequality and relative deprivation. Africans were found to be more likely than other population groups to live in shacks in urban areas and in traditional dwellings in non-urban areas, and to have less access to domestic infrastructure such as water, sanitation and electricity. Budlender (1999) examined access to basic services across ten deciles of households defined on the basis of income. She used the 1995 October Household Survey and Income and Expenditure Survey and found that access to household services is closely correlated with income. For example, in the bottom decile, 18 per cent of households relied on water sources that are situated more than a kilometre from their dwelling, where in the top three deciles, this was the case for less than one per cent of households (Budlender, 1999:205). Her conclusion was that a household that has poor access to basic services will enjoy lower levels of well-being and have fewer opportunities to earn income (Budlender, 1999:218). Ngwane, Yadavalli and Steffens (2003) examined deprivation in terms of basic needs by comparing the progress in service delivery at the provincial level between 1995 and 1999, using the October Household Surveys. They found that nationally, the lack of formal housing seemed to be on the increase, while the proportion of households deprived of safe water was unchanged over the period (Ngwane *et al.*, 2003: 556). The analysis again highlighted disparities between rural and urban areas in South Africa. An example is the differences in the use of electricity as an energy source for heating: in 1999, approximately 77 per cent of households in urban areas were using electricity, compared to 16 per cent in rural areas (Ngwane *et al.*, 2003:560). The comparisons of provincial progress also showed the more rural provinces to be at a disadvantage, for example, a relatively high proportion of households in the Eastern Cape and Limpopo Province still did not have any toilet facilities. Le Roux Booysen (2003) examined the progress that the provinces had made in delivering the RDP, through the use of reconstruction and development indices. The analysis employed data from surveys by the Development Bank of Southern Africa, the Advertising Research Foundation, the Institute of Race Relations, the Health Systems Trust, the Election Task Group, the South African Policy Service and the 1996 Census. He found that provinces that are more urbanised have advantages over the more rural provinces in the delivery of infrastructure, the facilitation of demographic transition and the improvement of standards in secondary education (Le Roux Booysen, 2003:42). The most recent analysis is that of Leibbrandt *et al.* (2006) that examines patterns of access poverty and inequality with a comparison of 1996 and 2001 Census data. They found that in both 1996 and

2001, almost two thirds of households occupied formal dwellings. In the inter-censal period, the proportion of Africans in formal dwellings increased from 53 per cent to 60 per cent. The proportion of households in formal dwellings increased in all provinces, especially in Limpopo. With regard to other basic services, Leibbrandt *et al.*'s (2006) results show improvements in access to water, electricity, sanitation and refuse removal, specifically for the Black population and across all provinces. In this literature, however, the level of geographical disaggregation was limited to studies of the urban-rural divide or comparisons of provinces. The analyses did not allow for further distinctions of the fragility of regions.

Recent work by Naudé *et al.* (2008) has aimed to fill this gap by constructing indicators to identify and analyse local vulnerability. They argue that this is important for a number of reasons:

- The indicators may be used to identify municipalities that require support from provincial or national government, or from donors;
- It may be used to monitor whether local governments are becoming more or less vulnerable and whether there are spill-over effects onto neighbours; and
- The indicators may also provide information on the sources of vulnerability.

Such information is of particular relevance as failures of local government have led to protests and unrest. The Centre for Development Support at Free State University (see Botes *et al.*, 2007), has published four case studies of delivery failures and protests in the Phumelela, Khutsong, Phomolong and Nelson Mandela Bay municipalities. They found that deficient service delivery has been caused by poor governance, individual political struggles within local government, a lack of communication, an ineffective client interface, inefficient management and issues of affordability and unfunded mandates.

In summary, South Africa faces significant challenges such as low economic growth, and high rates of poverty and inequality. At sub-national level, inequality and weak institutions create a significant risk that non-poor households will become poor and that poor households will remain in poverty. This dissertation extends the work of Naudé *et al.* (2008) by constructing indicators to identify and analyse local vulnerability. The extension is significant for three reasons: 1) it provides results at the level of local policymakers by considering municipalities instead of magisterial districts, 2) it uses data of a more recent vintage in the form of the Community Survey of 2007 – this includes data on access to basic services that were not included in earlier

work, and 3) the construction of the index used principle component analysis which allows one to consider the stochastic properties of the results. Specifically, the indicators include measures of the delivery of basic services from the most recent community survey.

#### **1.4 Objectives**

The general objective of this dissertation is to construct indicators of local fragility using data from South Africa. It extends the work by Naudé *et al.* (2008) in three ways: data from the recently released Community Survey 2007 are used, the unit of analysis is local municipalities instead of magisterial districts, and the factor scores generated by principle component analysis are used to construct a fragility index.

This objective will be achieved through a number of specific objectives. This dissertation presents:

- A review of the literature of the fragility of states, households and regions;
- A review of the literature of the challenge of poverty in South Africa and how the government has been able to meet the RDP commitment. The focus is specifically on local government and pro-poor local economic development;
- Principle component analysis of data to construct indicators of local fragility; and
- A ranking of municipalities by their fragility index score and discussion of the results.

#### **1.5 Method**

To achieve the above objectives this study will undertake a literature review as well as empirical analysis. The analysis involves the construction of a fragility index for each municipality. The empirical method will be principle component analysis using data from Global Insight's Regional Economic Explorer database and the Community Survey of 2007.

#### **1.6 Delimitation**

The dissertation is structured as follows: The following chapter presents a brief overview of earlier studies of vulnerability and fragility. The literature is grouped into three parts: studies that have focussed on fragile states, studies that have examined the vulnerability of households and studies that have observed fragile regions. Chapter 3 presents the South African literature.

There is still a lack of economic analysis of fragility and vulnerability in South Africa – the focus has mostly been on poverty and/or deprivation. Spatially disaggregated analysis is particularly rare. The literature review takes special cognisance of studies of local government and pro-poor local economic development. The analysis of data and construction of indicators of local fragility is undertaken in Chapter 4. A ranking of municipalities by their fragility index scores and a discussion of the results are also presented in this chapter. In the final chapter, a number of conclusions are drawn and recommendations are made.

## **Chapter 2: Fragile states, fragile households, fragile regions**

### **2.1 Introduction**

Chapter 1 indicated that although the South African government has made some significant progress in meeting the RDP commitment, challenges of low economic growth and high rates of poverty and inequality remain. To address these challenges will require new approaches. Today, researchers look beyond conventional measures of poverty to broader concepts of capabilities and vulnerability. Vulnerability refers to the relationship between poverty, risk and efforts to manage risk (Alwang, Siegel & Jorgensen, 2001). Analysis of vulnerability, or fragility, has typically been undertaken at the household level or at national level. There is, however, also a growing literature that focuses on the vulnerability or fragility of regions. Naudé *et al.*'s (2008) argument was put forward, that vulnerability of place is distinct from national economic vulnerability and household vulnerability.

The objective of this dissertation is to measure local vulnerability. To achieve this, Chapter 2 provides a review of the literature on the fragility of states, households and regions. Section 2.2 starts at the aggregate level of fragile states. The section presents the description and the importance of studying them. The focus is on the challenges of fragile states and the consequences of state failure. Section 2.3 explores the national-level description of fragility as well as the measurement of fragility on national level. Section 2.4 presents the bottom-up view of the vulnerability of households. Here the focus is on the risks due to characteristics of households, or hazards due to the external environment, that may cause households to fall into poverty or remain in poverty. Finally, at a mezzo level, Section 2.5 examines the literature on fragile regions. In Section 1.1 it was argued that a region or a place can be fragile across a number of domains, including geography and the environment. Regional-level shocks to income and regional-level government capacity may be sources of covariate risk that have an impact on households' incomes and well-being capabilities. The focus of Section 2.5 is to provide an overview of the growing literature on fragile regions and to highlight possible measures of such fragility. Section 2.6 offers a brief summary and the conclusions of the chapter.



## 2.2 Failed, weak or ineffective states

### 2.2.1 Description and challenges

Self-governing states have the responsibility to provide certain functions that supply security and the well-being for the general public (Torres & Anderson, 2004). States that cannot provide these basic functions are characterised as fragile, weak or ineffective states (DFID, 2005). Torres and Anderson (2004:3) define difficult environments (fragile states) as *“those areas where the state is unable or unwilling to harness domestic and international resources effectively for poverty reduction”*.

According to Torres and Anderson (2004) the following challenges are outlined for weak and stronger states. For weak but willing states, the challenges include mobilising their resources to alleviate poverty and gaining international recognition. For stronger but willing states, the challenges include keeping sovereign territory, assisting weaker states to alleviate poverty and effectively allocating resources. Table 2.1 outlines some of the challenges faced by fragile states.

**Table 2.1: The challenges for fragile states**

|                                            |                                                                                                                                                                                                                                                                                      |
|--------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Country ownership and leadership           | <ul style="list-style-type: none"><li>• They argued that fragile state may lack the capacity or the will to provide basic services.</li></ul>                                                                                                                                        |
| Budget alignment                           | <ul style="list-style-type: none"><li>• Fragile state may lack the support of an established budget and this in turn may result in donors not supporting the state in the form of aid.</li></ul>                                                                                     |
| Result orientation                         | <ul style="list-style-type: none"><li>• Since fragile states lack in capability they often find it difficult to measure the results and outcome of aid allocated.</li></ul>                                                                                                          |
| Aid instruments, conditions and allocation | <ul style="list-style-type: none"><li>• Fragile states often find it difficult to establish concrete policies to assist the donors in the poverty alleviation programmes, and to allocate the aid effectively as well as establish accountability of the aid distribution.</li></ul> |

Source: Leader and Colenso (2005:57)

Concerns over fragile states stem from the domestic and international impacts that weak or ineffective states have on human rights, security and prosperity (Leader & Colenso, 2005; Chauvet & Collier, 2002; Françoise & Sud, 2006; DFID, 2005). The consequences of fragility are outlined in Table 2.2 below. It illustrates that fragile states are unable to deliver basic

services to communities or reduce poverty. Such states are often unable to protect the basic human rights of citizens. Repressive regimes are likely to violate rights to stay in power. Fragile states are also more vulnerable to conflict, terrorism and organised crime. This leaves the population vulnerable while weakening international systems and presenting a threat to global security. These impacts of fragility in turn depend on the severity of the vulnerability of the state.

**Table 2.2: Global and local impacts of a fragile state**

|                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Poverty                          | <ul style="list-style-type: none"> <li>• Little or no progress in achieving the Millennium Development Goals.</li> <li>• Unable to deliver basic social services including sanitation, water &amp; electricity, medical aid and education.</li> </ul>                                                                                                                                                                                                                           |
| Conflict and humanitarian crises | <ul style="list-style-type: none"> <li>• Weak and unresponsive government can lead to civil conflict and inter-state wars.</li> <li>• Particularly vulnerable to humanitarian crises caused by civil war, food insecurity, or natural disasters.</li> <li>• Sources of chronic refugee flows placing strain on neighbouring states and international humanitarian response.</li> <li>• Fuelling proliferation of conventional weapons and stoking regional conflict.</li> </ul> |
| Human rights violations          | <ul style="list-style-type: none"> <li>• Unable to protect the basic human rights of their citizens, giving rise to unchecked opportunities for murder, rape, slavery, mutilation, extortion, theft, intimidation, and discrimination.</li> <li>• Weak but repressive regimes may violate rights to stay in power.</li> </ul>                                                                                                                                                   |
| Global security threats          | <ul style="list-style-type: none"> <li>• Providing safe havens for international terrorists and illicit arms trade.</li> <li>• Lacking capacity to detect, investigate, and counter terrorist activity.</li> <li>• Ineffective controls on biological, nuclear and radioactive materials.</li> </ul>                                                                                                                                                                            |
| Organised crime                  | <ul style="list-style-type: none"> <li>• Serving as bases for international criminal activity, including the trafficking of drugs, people, and illegal goods.</li> <li>• Production sites for narcotics.</li> </ul>                                                                                                                                                                                                                                                             |
| Reduced global prosperity        | <ul style="list-style-type: none"> <li>• Depressing international trade and investment.</li> <li>• Unable to provide the regulatory framework and basic security required to promote economic growth.</li> <li>• Threats to global energy security where energy production or transmission is disrupted.</li> </ul>                                                                                                                                                             |
| Weakened international systems   | <ul style="list-style-type: none"> <li>• Unable to fulfil international obligations e.g. to protect the global environment, counter infectious disease, contain money laundering, etc.</li> <li>• Unable to fulfil obligations to other states in protecting foreign nationals, maintaining effective diplomatic relations, and cooperating to address global challenges.</li> </ul>                                                                                            |

Source: Torres and Anderson (2004:8)

Torres and Anderson (2004) classify the severity of the vulnerability of a state as follows:

- *State collapse*: This is one of the most severe cases of a fragile state. This implies that the state entirely ceases to function (e.g. in Somalia the institutional structures that incorporated alien concepts to the existing Somalia were imposed by colonial rule. This resulted in a discrepancy that led to a series of civil wars and finally destroyed state functioning).

- *Loss of territorial control:* When a state loses or does not have control over certain territories due to civil conflict (e.g. in Sudan the North and South are divided due to civil conflict).
- *Low administrative capacity:* This state is characterised by the low administrative capacity and lack of effective policy execution due to low or absent resources, labour and administration (e.g. Guinea-Bissau is divided into eight regions and these in turn are subdivided into thirty-seven sectors, which makes it difficult to administer). One of the contributing factors of low administration capacity in a fragile state is the exacerbating effect of HIV / AIDS.
- *Political instability:* In a state where political instability transpires due to inconsistent leaders or changes in inconsistent leaders, the government's authority to act as ruler is jeopardised and often leads to coup d'Etat (e.g. The Central African Republic since its independence was ruled by presidents who were not democratically elected or who took power by force).
- *Neo-patrimonial politics:* In a state where the economic and political system is dominated by other neo-patrimonial politics<sup>1</sup> and this leads to the state being unable or unwilling to perform basic state functions. In such events the political logic of a system shifts from state goal focused to an egocentric state.
- *Conflict:* Is identified by a state with fragile political institutions, where governments find it difficult to administer the demands set upon them due to increasing and frequent conflict (Putzel, 2003). When political processes deteriorate over time, conflict arises, which can in turn contribute to worsen political processes or institutions.
- *Repressive politics:* This includes states that are effective but show a repressive attitude to the people and these states therefore do not focus on sustainable development or poverty alleviation.

From the above it is clear that a diversity of fragile states may exist and overlaps may exist in their impacts and severity of vulnerability. Therefore, it is important to understand the definition of a fragile state within the context of a specific study and the policies that can assist in, for example, the alleviation of poverty. The fragile state must, in as far as possible, be

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<sup>1</sup> Neo-patrimonial politics refers to a structure of the state where only those with connections have the power and not those in high positions. The term includes corruption and undermines political institutions and the rule of law (Amundsen, 1999).

distinguished from other fragile states for analytical purposes to assist in the policy formulation process (Torres & Anderson, 2004).

### **2.2.2 The importance of studying fragile states**

It is estimated that fragile states are home to around 871 million people that live in harsh socio-economic conditions, with 33% of the population living on less than 1\$ a day (DFID, 2005). The Department for International Development (2005) stresses three key arguments for studying fragile states:

- *Firstly, the widespread poverty.* Poverty in these states contributes to a large number of danger signals. Some of which include the increasing number of people dying earlier or living with chronic diseases (primarily as diseases like malaria, tuberculosis and HIV / AIDS are untreated), the number of uneducated people within the population is higher than other developing states, more deaths of children under the age of five occur in fragile states and economic growth is lower.
- *Secondly, the costs of late response to crises are high.* Collier and Hoeffler (2004) estimate that the cost of a civil war in a low-income fragile state can reach up to \$54 billion, which includes direct costs (lives lost and military expenses) and indirect costs (loss of economic growth and development). The underlying solution is preventing states from falling into or acting in civil wars as it is more cost effective to prevent than to react afterwards. A recent study from Chalmers (2004) estimates that every £1 spent on prevention generates over £4 in savings to the international community.
- *Thirdly, fragile states can destabilise regional and global security.* Fragile states often lose supreme authority over its sovereign territory and laws, which results in creating ungoverned spaces<sup>2</sup>. These ungoverned spaces provide a safe haven for refugee flows (terrorists, drug- and human traffickers), which increases the risk of regional and global security.

A fragile state that is unsuccessful in the delivery of services that satisfy basic needs has demoralising impacts on the population, which can often last years and even decades. Supplementary to that, the effects that accompany the impacts can even ripple far beyond the borders of a state itself. Border-sharing states often bear burdens in case of state failure for

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<sup>2</sup> Ungoverned spaces are spaces created by a failed state, since the state lost control over its sovereign territory and laws and is now unable to act as supreme authority to supply basic protection to the people (Françoise & Sud, 2006).

one of the states. Some of these burdens, which often take the form of conflict spill-overs, include lower economic growth, refugee flows, arms races and the spread of diseases like HIV / AIDS.

Françoise and Sud (2006) outline the following domestic, neighbouring and global effects of state failure:

- *Domestic effects:* The effects of state failure on a domestic level are brutal. It is well-known that when a state is unsuccessful in the delivery of services and basic needs that the state's population faces demoralising impacts and suffers. The effects of state failure is devastating as the disintegration of public authority causes violence among the people who will have supreme power over the state and the "development aid" it receives. This violence / civil war causes immense emigration flows to other states. Civil wars contribute to higher mortality rates, loss of social capital and lower economic growth rates for several years, even after the war ended (World Bank, 2003). Nonetheless, even if the war ended, the chances of a civil war taking place again, as stated in a World Bank study, is almost certain as most countries that reach the end of a war face a 44% risk of returning to warfare in five years (World Bank, 2003).
- *Neighbouring effects:* The effects of state failure also ripple out to regional level. The same civil war that takes place on domestic state level can be carried out through spill-overs to the neighbouring state, which can lead to devastating failure effects in the next-door state. Sharing borders with a fragile / failed state results in lower economic growth rates. A World Bank study estimated that states sharing a border with a fragile / failed state results in a 1.6 percentage point lower economic growth than non-sharing states (Chauvet & Collier, 2005). Another effect of civil war is the tendency to encourage arms races. In the event of a civil war, states increase their military expenditure, as this is a strong determinant for the neighbouring states' expenditures. The increase in military expenditure promotes region-wide spending on weaponry. The spread of diseases like HIV / AIDS and Malaria is furthermore problematic as refugees flee from fragile / failed states to neighbouring states.
- *Global effects:* As the world becomes more aware of trade liberalisation and globalisation, the ripple effects of failed states on a global level increase. More states lose control over what takes place in their region and this results in more lawless ungoverned spaces. These regions allow terrorists, as well as drug- and human traffickers to increase (Rice, 2003). A World Bank study indicates that 95% of the world's opium production comes from countries interacting in civil wars (World Bank,

2003). The need arises for agencies to facilitate the obliteration of the global risks caused by failed states.

In this section of Chapter 2, the conceptualisation of fragile states was examined. The definition includes governments having the responsibility to provide basic needs and services. If the governments fail, and as a result allow the state to fail, this may lead to demoralising effects. The following sections will explore fragility at a national, household and regional level.

## **2.3 Economies that are vulnerable to shocks**

This section of Chapter 2 has two parts. Firstly, this section takes a closer look at the description of economies that are fragile or vulnerable to external shocks and secondly, a section follows with a focal point on the measurement of fragility or vulnerability of these types of economies. Briguglio (2003:2) defines the term 'vulnerability' as "proneness to harm or damage originating from external forces". The Briguglio *et al.* (2004) paper furthermore explains that vulnerability is the economy's exposure to external shocks and it is generally characterised by smallness or remoteness.

### **2.3.1 The description of vulnerable states**

According to Briguglio (2003) the economies that are typically studied with regard to vulnerability are the Small Island Developing States (SIDS), since they are remote and require special policy approaches to effectively address and alleviate development issues. The next section will focus on the (1) economic conceptualisation of small states, (2) economic characteristics of small states, and (3) economic implications for small states with regard to vulnerability.

#### **2.3.1.1 The economic conceptualisation of small states**

In the past fifty years, the number of small states has increased dramatically in the global economy. These states are generally argued to have a limited economic growth rate due to their small size and vulnerability. Armstrong and Read (2003) argue that in general there is no concord in the economic literature on how to define the size of small states. Read (2001:1-3) outlines the following conceptual variables of small states:

- *Population:* This measurement of size is seen as the most commonly used indicator, since the data is easily accessible as well as easy to interpret. This indicator is also seen in economic theory as a useful conceptual measure for the size of both the domestic market as well as the labour force. The problem, however, arises when the threshold or benchmark population size has to be determined. The population size that has served as the benchmark in recent literature, which was adopted by the institutions in the early 1970s, is around one million.
- *Gross domestic product (GDP) or Gross national product (GNP):* These are indicators of aggregate economic activity, which is a useful measure of the size of the state, as well as providing other means to measure the market size or potential for scale economies. The critical issue for developing or small states, however, is the low growth performance of GDP or GNP. Armstrong and Read (2003) argue that this indicator is not an appropriate measure for the size of small states since the focal point is the size of the state and not the low economic growth.
- *Geographic areas:* This indicator is distinguished by its ability to be uncorrelated with indicators such as economic growth, which characterises it as a non-economic measure. It measures the availability of land and therefore provides a good indication of the natural resources in the state.
- *Terms of trade:* The large industrialised economies can easily influence their net trade, thus the prices of imports and exports. With regard to standard economic theory, the economies that are unable to influence the terms of trade are seen as small-sized states or small open economies.
- *Composite size measure:* Few attempts that have been made to develop a composite measure by combining two or more variables of size for small states succeeded to fully explain or provide further information into the insight and analysis of economic growth. The results usually show a correlation with the simple measure of population.

#### 2.3.1.2 *The economic characteristics of small states*

According to Armstrong and Read (2002), even though the literature with regard to the characteristics of small states have reached a relative consensus, there is little evidence that explains to what extent the characteristics can affect the state's economic performance and structure. They outline the following economic characteristics of small states:

- The small states are argued to have a sub-optimal size<sup>3</sup>, which signifies that the demand for domestic goods and services lies below the minimum efficient scale<sup>4</sup> output. The large-scale manufacturing industries therefore find it difficult to be competitive, since the production cost would be high.
- With regard to the resources of small states, they have certain limitations in terms of their land area, natural resources and work force. However, these limitations may have certain advantages in terms of growth. For example, the small states that possess wealth resources like oil and gold.
- The small states are viewed to have small-sized populations that constrain the domestic supply of labour; the advantage, however, advocates the view that labour consists of a special skilled work force in a high value-added sector, rather than a labour intensive manufacturing sector.
- Since the economic activity in small states is limited, the range of output in these types of economies would be specialised and relatively undiversified. Low output exacerbates exports in the small states, which will result in the state being vulnerable to external shocks in terms of the instability of export prices.
- Small states are argued to have better cohesion and integration, which facilitates consensus in terms of decision-making. This social homogeneity contributes to social capital formation, which provides a better environment for growth.

#### *2.3.1.3 The economic growth implications for small states*

The characteristics mentioned above illustrate the limitation a small state can possess and as a result can have dire implications on the growth and development of the economy. Therefore, the growth challenges of a small state are associated with a high degree of risk. Easterly and Kraay (2000) argue that small states experience large volatilities as a result of their exposure to external shocks and remoteness or concentration of their economy. In other words, it is more expensive and riskier for small states to grow and develop in relation to larger economies. Cordina (2004) studied economic growth and vulnerability. His results indicate that vulnerable economies tend to have a higher per capita capital output but lower consumption since the

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<sup>3</sup> According to Armstrong and Read (2003:103), in economic terms, "small states are 'too small', such that their growth and development process is impeded by their being unable to generate a 'critical mass' of domestic economic activity. In this respect, small states can therefore be regarded as 'sub-optimal' economies and this analytical perspective is useful for understanding the critical constraints of small size on their growth processes".

<sup>4</sup> The minimum level output of goods or services at which production is feasible.



available resources are used to fight back vulnerability, as well as indicating that vulnerability tends to slow down the convergence between developing states. Armstrong and Read (2003:105-106) put together three conditioning variables that have a strong correlation with the growth in small states:

- *The openness of the economy:* Since small states have limited economic growth as a result of their size, they have the desire to have structural openness to trade. This openness requires that the economy relies on export-driven rather than import-led policies. According to Armstrong and Read (1998), the openness of the economy has critical impacts on the international competitiveness of small states. However, export-driven policies have a significant effect on growth, since modest increases in export result in tremendous growth for the small state.
- *Human capital:* As mentioned above, this conditioning variable is viewed as an advantage towards small states, since it promotes a highly-skilled workforce. Economic theory with regard to endogenous growth models implies that human capital formation has significant impacts on growth and labour production. The long-term effects of growth and productivity can be maintained by investing in education, training and learning-by-doing.
- *Convergence:* The interaction and relation of small states with other regions such as larger economies with high growth rates have a beneficial growth effect. In other words, the location or region of the state has a strong growth implication for the economy.

### **2.3.2 The measurement of economic vulnerability at national level**

From the discussion above it is clear that the implication of the characteristics of small states is that they have vast exposure to external shocks. According to Briguglio (1995), these states are more vulnerable to external shocks, that they have no control over, than larger states. In other words, when larger states experience some degree of turmoil in their economies, the small states suffer tremendously in terms of their economic growth. Read (2001:26) outlines the following sources of vulnerability:

- *Economic vulnerability:* The economic vulnerability of small states refers to the openness of the economy as well as the interaction between states. These factors contribute to the economic vulnerability of these types of states. Another concern for these states is the remoteness and isolated nature of their economies.

- *Political and strategic vulnerability:* The small states have political and structural vulnerability because they are susceptible to external political shocks caused by larger states. The structures of small states are too fragile to maintain their territorial integrity and own political stability with regard to their foreign policy.
- *Environmental vulnerability:* Briguglio (1995) also mentioned that the small states are too fragile to overcome natural disasters that can have an impact on the development of the economy. For example, the volcanic eruption in Montserrat that had a negative impact on the GDP.

According to Read (2001), the measurement of the impact of vulnerability was based on the view that GDP per capita did not adequately reflect the limitations on the growth and development of the economy. This has led to measures being constructed to quantify the vulnerability. Briguglio (1995) attempted to construct a vulnerability index. Since the index was supposed to measure economic vulnerability he used economic vulnerability variables. However, variables like GDP and other correlated variables were not used since the index was supposed to measure economic fragility rather than economic performance. He suggested that the variables should be standardised.

Briguglio (1995:1621) then formulated vulnerability as:

$$V_{ij} = \frac{(X_{ij} - \text{Min } X_i)}{(\text{Max } X_i - \text{Min } X_i)} \quad 2.4$$

where  $i = 1, 2, 3$  and  $j = 1, 2$ ,  $V_{ij}$  denotes the degree of fragility arising from the  $i^{\text{th}}$  variable in country  $j$  and  $X_{ij}$  denotes the  $i^{\text{th}}$  variable included in the fragility index for country  $j$ .  $\text{Max } X_i$  and  $\text{Min } X_i$  denote the minimum and maximum values of the  $i^{\text{th}}$  variable of all the countries. If  $X_{ij}$  is equal to the minimum value of the same variable then  $V_{ij}$  would be equal to zero, which would explain the minimum vulnerability arising from that same variable. In other words, if the gap between the countries' vulnerability becomes greater than the minimum value of the same variable, then the country would have a higher vulnerability. For that reason, the index would rank countries between one and zero.

Turvey (2007), however, argued that when examining the measurement of vulnerability, a geographical assessment needs to be included to further expand the vulnerability

measurement. She also reported that including a geographical assessment into the vulnerability measure to construct a Composite Vulnerability Index (CVI) would broaden the view of economic vulnerability.

This dissertation will set out to extend the work of Naudé *et al.* (2008) with regard to the measures of fragility of regions in South Africa. Therefore, the work of Turvey's (2007) with regard to the CVI would also be complementary to this study. In the next section, the vulnerability of households and measures thereof are explored.

## **2.4 Fragile households**

Alwang *et al.* (2001) explored the concept of vulnerability and the different views as reported by the vulnerability literature in terms of poverty, risk, risk management and vulnerability. In their study the vulnerability of poor households is also examined. According to Alwang *et al.* (2001:27) the poor households (1) are more susceptible to risks, (2) have less access to basic needs and services, (3) are less likely to claim social capital, (4) are less likely to receive social services following disasters, and (5) are vulnerable since they are closer to or already below the vulnerability threshold. They also added that the dimensions of households are an important measurement of vulnerability since many households that are not poor may fall into poverty. On the issue of vulnerability they concluded that the measure should incorporate different components of vulnerability.

Prowse (2003) explored the understanding of vulnerability in terms of chronic poverty. In his paper emphasis is placed on the fragility of households. He explains that the outcome of risk is largely determined by the way the poor households respond to it. He concluded that the outcome of vulnerability measures is essential when exploring chronic poverty, since it differentiates the chronic and temporarily poor from one another.

According to De León (2006) natural disasters also have vast deteriorating effects on poor households. He developed a procedure to measure four types of vulnerability of households caused by natural disaster. The procedure included structural, functional, social and economic income and each type of vulnerability is measured by a parameter directly correlated to the type of vulnerability. He furthermore added that this type of procedure identifies options to reduce

the degree of vulnerability; however, the procedure requires data collected from household surveys on a national level to be effective, which is regarded as a limitation.

When measuring the vulnerability of households, Ligon and Schechter (2002) are key authors. They constructed a simple measure of vulnerability of households that is derived from the difference between the utility a household would consume and the expected consumption of a specific utility. Ligon and Schechter (2002:2) define the vulnerability of households by means of:

$$V^i(c) = U^i(z) - EU^i(c^i) \quad 2.5$$

where  $V^i(c)$  is the vulnerability of household  $i$ ,  $U^i(z)$  is the utility consumed by household  $i$ ,  $z$  represents the certainty-equivalent consumption, in other words, if the household consumes more or equal to  $z$ , then the household would be vulnerable, and  $EU^i(c^i)$  denotes the expected consumption of household  $i$ . Ligon and Schechter (2002:22) concluded that they correctly captured the effect that risk has on the welfare of households. They used data from Bulgaria to measure household vulnerability and found that if poverty is eliminated, the welfare would increase by 14%. They also reported that the most effective way to reduce vulnerability is by stimulating education among households.

An earlier study by Dercon (2001) explores an ex-ante measure of vulnerability and its links to poverty at household level, since he argued that it is an important dimension of deprivation and poverty. When constructing the measurement for vulnerability at household level, he argued that there are some limitations with regard to the information required to construct the measure, since it is not possible to hypothesise on survey data. Dercon's work focuses on an outcome-based measurement, which measures vulnerability to income poverty, low education and other non-economic variables like malnutrition. He concludes that what matters in this measurement are not the values of the determinants, but rather the ability of mobilising them, for example increasing education among children. In later literature, Chaudhuri (2003) also explores an ex-ante measure of vulnerability. He argued that a household's poverty level is a measure of the household's quality of life or well-being. He furthermore added that the household's current state of poverty is not a good indication of what the expected state of poverty is going to be in future. He added that when looking at policy interventions and measures, the focus should be on the household's vulnerability to poverty, rather than on who the poor households are.

Recent literature on the development of the measurement of vulnerability at household level suggests different approaches of estimating and capturing the risk associated with the vulnerability of poor households. Ligon and Schechter (2004) report that the different measures can be mixed to fit the specific needs of the study conducted. They also found that measures like the ones that Chaudhuri, Jalan and Suryahadi (2002), and Pritchett, Suryahadi and Sumarto (2000) use, focus on the expected headcount of poor or vulnerable households and are simple and comprehensive.

Chaudhuri *et al.* (2002) estimated the vulnerability of households and based their measurement on the following definition. Chaudhuri *et al.* (2002:4) defined vulnerability as “the ex-ante risk that a household will, if currently non-poor, fall below the poverty line, or if currently poor, will remain in poverty”. The model they used when estimating household vulnerability is given as:

$$V_{ht} = \Pr(c_{h,t+1} \leq z) \quad 2.6$$

where  $c_{h,t+1}$  is denoted as the per capita consumption level of households at time  $t+1$ . They denoted  $z$  as the appropriate consumption poverty line. Note that the vulnerability at time  $t$  is estimated in terms of the expected consumption of the same households at time  $t+1$ . The assessment of household vulnerability that Chaudhuri *et al.* (2002) use is set out to assist poverty alleviation policies, and therefore to aid policy makers to understand what the expected vulnerability is going to be, since today poor households may not be poor tomorrow and vice versa - today's non-poor households may be poor tomorrow.

Pritchett *et al.* (2000) also explored vulnerability at household level and set out to quantify vulnerability to poverty. Pritchett *et al.* (2000:3) define the measurement of vulnerability as “the risk a household will fall into poverty at least once in the next few years”. In other words, they measured the vulnerability of households in terms of a probability. They formulated the risk that a household will have to fall into poverty as:

$$R(n, PL) = 1 - [(1 - P(e_{t+1}^h < PL)) * \dots * (1 - P(e_{t+1}^h < PL))] \quad 2.7$$

where,  $R(n, PL)$  is denoted as the risk that a household will have to fall into poverty,  $n$  is denoted as the time periods,  $PL$  is denoted as the poverty line,  $e$  is denoted as the current consumption expenditure. Therefore, the vulnerability of household ( $h$ ) for ( $n$ ) periods is the

probability ( $P$ ) of the household experiencing one or more episodes of poverty during ( $n$ ) periods.

Ligon and Schechter (2004) found that the best measure to use when estimating household vulnerability is the one proposed by Chaudhuri *et al.* (2002); however, only if the environment is stationary and the consumption expenditure is estimated without error. On the other hand, if the distribution of the household's consumption is non-stationary, then the measure constructed by Pritchett *et al.* (2000) will provide the best estimation.

This section explored the vulnerability of the poor at household level. The literature suggests that the focus should be on vulnerability and its links to the poor rather than on who the poor are. With regard to the measurement of vulnerability on this level, the literature suggests that the information required to effectively measure vulnerability is difficult to come by and that there are no formal or strict ways of measuring vulnerability. However, a more specific focus on the fragility of regions would give a better insight into how to address the underlying problem of poverty alleviation. The next section will take a closer look at the fragility of regions.

## **2.5 Fragile regions**

In the previous two sections, fragility at national and household level was explored, since most of the research that has been done on fragility includes national and household related types of studies. However, a third strand of research comes to mind when examining fragility, which is the fragility of regions. Naudé *et al.* (2008) put forward the argument that vulnerability of place is distinct from national economic vulnerability or household vulnerability. A focus on country-level vulnerability does not take into account geography and the environment that may influence the vulnerability of people, where they live. A focus on household level vulnerability cannot explain spatial pockets of poverty. The characteristics of place can be a source of covariate risk to household income. Regional-level shocks to income or regional government capacity can have an impact on household incomes and wellbeing capabilities (Naudé *et al.* 2008:1). This section takes a closer look at the conceptualisation of fragility of place and measures thereof.

### **2.5.1 The conceptualisation of fragility of place**

Following Naudé *et al.* (2008), this dissertation takes the view that vulnerability at the level of a place can influence poverty and poverty in itself may be a source of vulnerability for a region.

Fragility of states and small open economies, as described in Sections 2.2 and 2.3, is an aggregate-level phenomenon, but its nature also translates to risks to household income in specific places. At a specific place, vulnerability is a function of the economic geography of socio-political forces in the region (Turvey, 2007). As argued above, regional-level income shocks or regional-level government capacity can be sources of covariate risk (Naudé *et al.*, 2008). Thus, there may be different constructs that measure the vulnerability of a place, such as economic fragility, environmental fragility or the fragility of governance and institutions.

Fragility of households, as described in Section 2.4, should also be related back to the specific places where people live. Household-level analysis typically focuses on the risk that the non-poor households will become poor and that poor households will remain in poverty. Household characteristics have an impact on household incomes, capabilities and the way that assets are accumulated. Naudé *et al.* (2008) argue that this approach does not lend itself readily to the analysis of non-income vulnerability. Günther and Klasen (2007: 3) recognise that one problem is due to the fact that 'equal incomes do not translate into equal outcomes for all ... different people are faced with different environments for translating income gains into non-income wellbeing gains'. Measures of these environments may shed light on the existence of spatial pockets of poverty.

Currently, work related to the fragility of places is limited. Contributions to the literature that is associated with this line of investigation focus on the multi-dimensional nature of poverty and the existence of spatial poverty traps.

According to the view of Holzmann and Jørgensen (2000) in terms of social protection and the risk management thereof, the risk management instruments should include a twofold function, which comprises protecting basic livelihoods and promoting risk taking. In order to reduce vulnerability for the poor, they suggested that these instruments should be part of development policy, since it assists the poor in coping with shocks. They concluded that there is still much to be done, since the challenge for poverty alleviation policies, however, remains to effectively

address vulnerability issues for the poor. Furthermore, Günther and Klasen (2006) explored the measurement of chronic non-income poverty. They used panel data from Vietnam from 1992 and 1997 to distinguish the different views of chronic and transient poverty. They argued that there were vast developments in the field of mobilising the well-being of the poor; however, there were some poor individuals who did not benefit from the transient and still suffer from chronic poverty. In other words, they perceived vulnerability as chronic rather than transient. Günther and Klasen (2006) found the following:

- *Firstly:* Günther and Klasen (2006) argue that the non-economic dimension of poverty has more dynamics than the economic dimensions. They emphasised the non-economic indicators such as education as being more stable than the economic indicators such as income. They therefore argue that it is more important to study the non-economic dimensions of poverty since they provide better insight into the dynamics of quality of life and well-being.
- *Secondly:* They also found that a low correlation prevails between the non-economic and economic indicators. They explained that this might be true given the low correlation between the non-economic and economic poverty and high heterogeneity in intra-household measures, or in other words, the individual's poverty dynamics of non-economic poverty.
- *Thirdly:* They found significantly stable results for the number of well-being or quality of life that the individuals were deprived from.

Bird *et al.* (2007) explored the isolation of poverty with the view that the measure should not be at aggregate level, but rather at a finer resolution. They used a series of indicators, from the Uganda National Households Survey of 1999/2000, of access to infrastructure and services to construct their composite indices to measure the relationship between isolation and poverty dimensions. They concluded that isolation might be an important cause of poverty, since the individual has less interaction with the market, has less chances of benefiting from developmental programmes and is not able to make use of facilities.

Hulme, Moore and Shepherd (2001) examined the meanings of chronic poverty using a multi-dimensional sense. They argued that research on poverty should focus on the broadest concepts as well as multi-dimensional aspects since the currently poor are likely to be poor in several ways, which include economic and non-economic indicators. They also reported that poor people or individuals do not care about the level of their income, rather about the loss of



their primary source of living. Therefore, if taken into consideration that vulnerability is measured as a probability (Pritchett *et al.*, 2000), the poor people see poverty as a probability to suddenly lose the control to cope with disasters. He concluded that research in the field of poverty and thus vulnerability should be aimed at focusing on the poor people that are poor for extended periods, since poverty may be an important source of vulnerability. Two recent studies have been conducted to measure fragility at a finer resolution.

Binzel and Brück (2007) analysed fragility at micro-level. They added to the fragile state literature in the following ways: (1) they linked the practitioners and donors with the economic research by defining fragile states in a systematic manner, (2) they explored a micro-economic approach that reports on the causes as well as the effects of fragility, and (3) they bridged the gap between fragility and conflict. They found that the strength of their conceptual framework, which serves as a basis for micro-econometric impact studies, can be used for impact studies on fragility as well as conflict. They also suggested that surveys that are based on intra-household questions, after the event of natural disasters, for instance, is a necessity for conducting fragile state impact studies; however, since fragility is a latent variable, they furthermore suggested that appropriate instruments are also needed.

Carter and Barrett (2005) examined the economics of poverty traps. Their paper uses an asset-based approach to effectively identify poverty traps and chronic poverty. They reported that identifying an asset poverty line and threshold would simplify the attempt to distinguish between structural or stochastic poverty transitions, as well as to serve as a further refinement of poverty measurements. Carter and Barrett (2005:32) concluded that the use of an asset-based approach to analyse poverty could have the following benefits: (1) it could measure whether there were enough assets or economic conditions for the people to assist them in wangling themselves out of poverty, (2) this approach can assist in formulating safety nets and relief programmes, and (3) it rectifies the problem of financial exclusion that underlies poverty traps. Thus, they argued that the measurement should not only measure who the poor are, but should also assist in the identification of conditions and policies needed to effectively address alleviating poverty.

In tandem with these conceptualisations of the fragility of regions, there also exists the literature that examines the quality of life and quality of places. In the next section this dissertation will briefly explore the literature on the quality of life at sub-regional level.

### 2.5.2 The concept of quality of life and quality of place

The concept of quality of life has received increased attention in both theoretical and empirical literature (Møller, 2004; Stilwell, 2004; Rossouw, 2007). The literature shows that development economists have over the past few decades changed their view of the concept of quality of life. In Table 2.3 Sumner (2003) constructed the evolution of the concept of quality of life since the Second World War.

**Table 2.3: The evolution of the concept of quality of life since the Second World War (1950s - 2000s)**

| Period | Meaning of quality of life           | Measurement of quality of life                                         |
|--------|--------------------------------------|------------------------------------------------------------------------|
| 1950s  | Economic well-being                  | GDP growth                                                             |
| 1960s  | Economic well-being                  | GDP growth per capita                                                  |
| 1970s  | Basic needs                          | GDP growth per capita + basic needs                                    |
| 1980s  | Economic well-being                  | GDP per capita, but rise of non-monetary factors                       |
| 1990s  | Human Development / Capabilities     | Human development and sustainability                                   |
| 2000s  | Universal right, livelihood, freedom | The Millennium Development Goals and "new" areas: risk and empowerment |

Source: Sumner (2003)

Sumner (2003) argues that the meaning of poverty and thus the concept of quality of life has been closely correlated to the position and views of the development economist in each decade. Since the 1950s, the concept of quality of life has moved away from pure economics to include more multi-dimensional approaches. Sumner (2003) identified and categorised the following measurements of quality of life with regard to poverty:

- *The measurement of poverty using primarily economic quality of life*

Economic measurements have been struggling to remain focused on one central theme of the meaning of quality of life. The economic measurement defines quality of life as higher income per capita, higher consumption per person and raised living standards (economic welfare). Table 2.4 outlines the commonly-used economic quality of life measures as grouped by Sumner (2003).

**Table 2.4: Economic measures of quality of life**

Indicator

**Income per capita**

- GDP per capita
- Real wage
- Unemployment rate\*

**Income poverty lines**

- % of the population living under a dollar-a-day\*
- % of the population living under the national poverty line
- % of the population vulnerable to poverty through variance of income or assets

**Income inequality**

- Poverty gap and severity indices at US\$1 per day per capita\*
- Expenditure of bottom quintile as percentage of total expenditure\*
- Gini co-efficient

Source: Sumner (2003) Note: \* denotes the indicator as a Millennium Development Goal

The economic measurements of quality of life are useful and popular with policymakers, since they entail quick, rough-and-ready, short-run, aggregate inferences to make assessments and are more responsive than the non-economic quality of life indicators. However, economic measures of quality of life have some disadvantages that include: (1) the lack of non-market activity, unrecorded informal sector work, domestic housework or subsistence activity, (2) they are static measures and therefore only the vulnerability measures capture the dynamics of poverty, and even more is that the household can move in and out of poverty, and (3) the measures take only limited differential experiences, since the only assessment of differential experience is inequality measurements and economic quality of life is usually headcount based. Even though the economic measurements of quality of life have some disadvantages and there are some debates regarding the meaning of poverty, this measurement still remains popular, since the measurement is perceived as more objective to quantification as they are tangible. In contrast are the non-economic measurements that are more subjective (Sumner, 2003).

- *The measurement of poverty using non-economic quality of life*

The non-economic measure of quality of life is perceived to be more dominant with regard to the meaning of quality of life. This type of measurement is defined to be parallel to Sen's capability approach. Sen (1984) argued that economic development can be defined as "an expansion of people's capabilities, and development is seen as a process of liberation from the enforced

necessity to 'live less and be less'. Table 2.5 outlines the commonly-used non-economic quality of life measures as grouped by Sumner (2003).

**Table 2.5: Non-economic measures of quality of life**

| Indicator                                                                                                                                                                                                                                                                                                                                                             |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Education</b>                                                                                                                                                                                                                                                                                                                                                      |
| <ul style="list-style-type: none"> <li>• Education enrolment rates*</li> <li>• Survival to the final primary or secondary school grade/completion of primary or secondary school*</li> <li>• Literacy rates*</li> </ul>                                                                                                                                               |
| <b>Health and nutrition</b>                                                                                                                                                                                                                                                                                                                                           |
| <ul style="list-style-type: none"> <li>• Malnutrition rates*/food or calorie consumption per capita/body mass index</li> <li>• Mortality and morbidity rates*/ life expectancy/ not expected to survive to forty years/infection rates*</li> <li>• Health service usage - skilled personnel at birth*/ contraceptive prevalence rate*/ immunisation rates*</li> </ul> |
| <b>Environment</b>                                                                                                                                                                                                                                                                                                                                                    |
| <ul style="list-style-type: none"> <li>• Access to 'improved' water sources*</li> <li>• Access to 'adequate' sanitation*</li> <li>• Household infrastructure - permanent material used for walls of home and electricity supply</li> </ul>                                                                                                                            |
| <b>Empowerment and participation</b>                                                                                                                                                                                                                                                                                                                                  |
| <ul style="list-style-type: none"> <li>• Participation in general and local election voting (decision-making at various levels)</li> <li>• Extent of knowledge of local projects and district budgets (access to information)</li> <li>• Number, size and revenue of active NGOs (potential for civil society monitoring)</li> </ul>                                  |

Source: Sumner (2003) Note: \* denotes the indicator as a Millennium Development Goal

What advantages can non-economic measurements of quality of life have for policymakers? Firstly, it is clear that these measures can also be linked to the quality of the places where the policymakers have to supply interventions. When policymakers need to make more medium to longer run assessments, these non-economic measures of quality of life are more useful, since they address the outcomes or "ends" of policy rather than the inputs or "means". The World Bank (2001) argues that, even though the non-economic measurements are slow and more expensive to collect, they have additional benefit to the policymakers with regard to being adaptable to disaggregation. Even the non-economic measurements of quality of life have some limitations. On the one hand, there is the limitation in the availability of data, and on the other, there are some difficulties in the precise measurement of the stated social capabilities (Sumner, 2003). According to Sumner (2003) measurements that are based on non-economic quality of life indicators are useful to assess longer-term trends as well as provide better quality of life outcomes; however, as stated above, the non-economics quality of life measures suffer

significant limitations. If both economic and non-economic quality of life measures have flaws, one should ask if perhaps the composite measures of poverty fill the gap.

- *The measurement of poverty using composites of poverty indicators*

Sumner (2003) argues that there are a few composite measures of quality of life. These measures include (see Table 2.6): (1) International Fund for Agricultural Development (IFAD)'s indices, (2) the World Health Organisation (WHO)'s Quality of Life (QOL) indicators and (3) the Human Development Indices (HDI).

**Table 2.6: The composite indicators of quality of life measures**

| Component indicator |                                           |                                                                               |                                                                                                          |
|---------------------|-------------------------------------------|-------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|
|                     | Longevity                                 | Knowledge                                                                     | Decent living standards                                                                                  |
| <b>HDI</b>          | Life expectancy at birth                  | Adult literacy rate; Combined enrolment rate                                  | Adjusted income per capita                                                                               |
| <b>GDI</b>          | Female and male life expectancy at birth  | Female and male adult literacy rate; Female and male combined enrolment ratio | Female and male earned income share                                                                      |
| <b>HPI</b>          | % of people not expected to live to forty | Adult literacy rate;                                                          | % of people without clean water;<br>% of people without health services;<br>% of undernourished children |

Source: UNDP (1990)

Sumner (2003) argued that the composite indicators that are more commonly used are the Human Development Index (HDI), Gender Development Index (GDI) and the Human Poverty Index (HPI).

In this section, fragility and quality of life (at sub-national level) literature as well as the measurement thereof was explored. In recent literature, few attempts have been made to address this shortcoming with regard to the measurement of vulnerability on a sub-national level. However, the efforts made are still inadequate and not indicative enough. The next section will conclude Chapter 2.

## 2.6 Summary and conclusions

Fragile states are seen as those areas where the governments are unable or unwilling to provide basic needs and services and thus not effectively distributing the resources. In this

chapter, a review of the literature of fragility of states, households and regions was explored. If a state is not governed correctly, it may lead to devastating effect for countries. There are many ways a state can collapse and become fragile. It is important to study fragile states, since they are home to approximately 871 million people (DFID, 2005). Fragility can be measured in three basic manners, which include:

- *Fragility on national level:* This concept of vulnerability is measured on country level. Most of the studies conducted were done on the Small Island Developing States (SIDS). Small states are measured since they are seen as remote and vulnerable to external shocks. The literature suggests that when measuring fragile states, the estimation should include non-economic variables as well, since using only economic variables does not quantify the vulnerability.
- *Fragility on household level:* Furthermore, the literature suggests that doing an aggregated measure on national level does not adequately explain vulnerability. The literature furthermore suggests that when measuring vulnerability on household level, the current as well as the expected consumption of a household should be included since households that are poor today, may not be poor tomorrow and vice versa - households that are not poor today may be poor tomorrow.
- *Fragility on regional level:* If the measurement of vulnerability on household level is not sufficient, a more refined estimation is needed. Naudé *et al.* (2008) suggested that a different view be followed to understand vulnerability, one which aims to examine the fragility of place. The most important measure of vulnerability is on regional level, since it can give more insight into the quality of life and on how to alleviate poverty.

Since it is important to examine vulnerability on regional level, the next section will take a closer look at poverty and places in South Africa.

## Chapter 3: Poverty and places in South Africa

### 3.1 Introduction

In Chapter 1 it was argued that over the past fifteen years great strides have been made to redress past social inequalities and meet the RDP commitment. However, the challenge of ensuring a better life for all, remains. Low economic growth rates and high rates of poverty and inequality create the risk that households will remain in poverty or even more households may fall into poverty. Fragility or vulnerability may be of particular relevance at sub-national level in South Africa. Naudé *et al.* (2008) point out that South Africa is not a fragile state and that it is not seen as being economically vulnerable. However, "South Africa has a number of characteristics that, in the absence of strong institutions, could render it more vulnerable" (Naudé *et al.*, 2008:4). The first of these is the high level of spatial inequality. Bosker and Krugell (2008) find a heavily diverging regional income distribution, where relatively-poor regions are likely to remain poor and become even poorer and the richest regions will retain their lead in income levels. Rossouw and Naudé (2008) find significant variation across space in non-income quality of life. A second characteristic of South African regions that may make it more vulnerable is the capacity of its local governments. The Constitution recognises local government to have a developmental as well as a service role in meeting the basic needs of communities and improving living conditions (Harris, 1999). However, local governments have struggled to fulfil this responsibility as has been clearly marked by violent protests over poor service delivery (Botes *et al.*, 2007).

Earlier analyses have focussed on ex-post measures of poverty and inequality and the literature on fragility or vulnerability is limited within the South African context. The literature does show a number of approaches that, when taken together, shed light on the issues of poverty and places in South Africa and inform this study's objective to construct indicators of local fragility. This chapter provides an overview of the South African literature in the following order. Firstly, there are studies that have used national level databases to examine development indicators. A second strand of research includes the studies of perceived quality of life that use national level surveys that include a life satisfaction question. For a more local perspective, a third strand of research comes from specific surveys of so-called quality of place. Finally, a fourth line of enquiry has been to examine cases where poor service delivery has led to protests and unrest.

### **3.2 The challenge for poverty alleviation**

Since the attainment of democracy in 1994, South Africa has been faced with the difficult challenge of poverty alleviation. Reardon (2000) argues that the challenges that poverty alleviation projects hold for the poor, are in the domains of governance and institutions. According to Bardhan (1989:3), institutions are the social rules, conventions and other elements of the structural framework of social interaction. According to Hoff, Braverman and Stiglitz (1993), institutions are a public system of rules that define the kinds of exchanges that can occur among individuals and that structure their exchanges in terms of incentives. Bardhan (1989) furthermore added that institutions are the rules of the playing field. Therefore, if the playing field for the poor is to be levelled, the institutions have to be changed or the assets of both the poor and the institutions have to be increased.

The remainder of Chapter 3 will attempt to analyse poverty and places in South Africa in terms of national-level studies, quality of life studies, local economic development studies and the role of local government.

#### **3.2.1 *National-level studies***

The majority of the population of South Africa lives in poverty, even though South Africa is classified as an upper-middle income country. Since the attainment of democracy in 1994, policy makers have attempted to alleviate poverty through redistribution, since the apartheid era denied people the right to develop their assets. In early research on this topic, Carter and May (1997) explored the economics of livelihood generations and class in rural South Africa using data from the national living standards survey in 1993. Their paper sets out to contribute to the ongoing debate of poverty alleviation in South Africa. They concluded that poverty is not a matter of having only a few assets, but also of constraints in terms of the effective use of those assets. They furthermore suggested that policies need to be structured in terms of poverty and livelihood.

An earlier study by McGrath and Whiteford (1994) explores inequality and the size distribution of income in South Africa. They used income data from different sources, such as the 1991 Population Census of the RSA as well as other income and expenditure surveys. They found that from the 1970s through the 1980s, income was distributed from the whites to the blacks.



During the period of 1985 to 1990, the per capita incomes of whites decreased by almost five percent while the per capita income of Africans increased by over six percent (Simkins, 1991:9). McGrath and Whiteford (1994) report that even though income was redistributed, the distribution was in favour of the whites and not the Africans. They furthermore found that income distributed to the African households only flowed to the richest decile, while the economic condition of the poorest group has worsened. Their study concluded that little has been done to alleviate the problem of income distribution and increasing the income gap between African households.

Whiteford, Posel and Kelatwang (1995) examined the profile of poverty, inequality and human development. They used data from the Living Standards and Development Survey (LSDS) from 1993 as well as the 1991 Population census. They also calculated a poverty gap for the magisterial districts. The measurement was based on the total poverty gap for the four former TBVC (Transkei, Bophuthatswana, Venda and Ciskei) states and for the nine provinces minus their TBVC components from the LSDS survey. They reported on the multidimensionality of poverty and concluded that poverty should include as many facets as possible as well as go beyond the point of examining only income poverty measures; poverty must include human development as well. They found that the most commonly-used indicator of poverty is the head count measure, and they found that 45.7 per cent of individuals live in poverty. They also found that children are the most fragile to poverty, since they completely rely on their parents to provide their basic needs. They found that 54 per cent of children live in poverty.

Hirschowitz and Orkin (1997) explored the living conditions in South Africa according to race, gender, urbanisation and employment using the 1994 October Household Survey. They found definite contrasts between groups. Africans, who constitute more than 70 per cent of the population, were more likely to be affected by inequality and relative deprivation, as well as having less access to domestic infrastructure such as water, sanitation and electricity. Whiteford and Van Seventer (2000) also explored the South African income distribution in the 1990s. They investigated different characteristics of income distribution among different households and population groups in South Africa. For example, the direction of the impact of inequality was hypothesised. They studied the racial distribution of income and found that an inverse effect had taken place between the white and African groups, where the whites were on the decline since the 1970s and receiving a smaller percentage of income than the Africans, who received a greater percentage share of the income (Whiteford & Van Seventer, 2000:12).

Also, when the income of households was examined, they found that the poorest deciles of the spectrum received a declining share of income and the richest an increasing share of the income (Whiteford & Van Seventer, 2000:14). They concluded that although a definite shift of income distribution during the 1990s existed, the prospects for a decline in equality, however, were not good, since the poor only became poorer and the rich richer.

Leibbrandt, Woolard and Borat (2000) analysed different techniques to understand the nature of household inequality in South Africa, since inequality is one of the major themes in South African history and most of the economic planning is based on this. When they studied the importance of race in national inequality, they furthermore explained that it is important to differentiate between the different sub-groups of the population, since inequality existed *between* as well as *within* different sub-groups. Leibbrandt *et al.* (2000) outlined the sources of income by means of:

- *Remittances*: These transfers of funds come from absent family members and marital maintenance in the form of an alimony;
- *Wage income*: Income generated from casual employment and value added services such as subsidised housing, food and transport etc;
- *Capital income*: This includes income from pension funds, rent income from owning housing, dividends and interest;
- *State transfers*: These include transfers from government grants, unemployment insurance policies, social pensions and poor relief; and
- *Self-employment*: This type of income is generated from formal and informal business activities.

They concluded that even though the inequality *between* different sub-groups is smaller than the inequality *within* sub-groups, South Africa's income inequality is among the highest in the world, where the biggest contributor to income inequality within sub-groups exists in the African households.

Carter and May (1997) explored the composition of livelihood generation as well as different groups in rural South Africa, to determine not just who the poor is, but also to establish why they are poor. They used data sets from a National Living Standard Survey of 1993. Sen (1981) suggested that the populations that are poor, and thus vulnerable, can be grouped together since they share the same income claiming strategies. Sen's work directs the thought of

poverty assessment into a new direction. One that not only studies the poor by assessing their income, but includes a wider spectrum of what the poor, and thus the vulnerable, embrace as assets. Sen's approach examines the relationship of people to the resources that they hold and the commodities that they require to meet their basic needs, since people who do not have access to their basic needs are seen as vulnerable. Carter and May's (1997) results suggest that if the limitations for the poor to effectively use their assets or endowments are lifted through policies, it could be beneficial to the poor community. They mentioned that the policies may range, for instance, if policies were formulated to promote local financial institutions it would result in financial constraints being lifted for the rural households. They concluded that rural communities in South Africa have a fundamentally heterogeneous nature, and thus, if this characteristic is not taken into consideration when forming policies for poverty alleviation, it may result in undermining development issues in rural areas of South Africa. They also suggested that shared economic growth may offer a powerful basis for poverty alleviation.

In another effort to examine poverty beyond income, Budlender (1999) examined access to basic services across ten deciles of households defined on the basis of income. She used the 1995 October Household Survey and Income and Expenditure Survey and found that access to household services is closely correlated with income. For example, in the bottom decile, 18 per cent of households relied on water sources that are situated more than a kilometre from their dwelling, where in the top three deciles, this was the case for less than one percent of households (Budlender, 1999:205). Her conclusion was that a household that has poor access to basic services will enjoy lower levels of well-being and have fewer opportunities to earn income (Budlender, 1999:218).

In a related approach, Ngwane *et al.* (2003) examined deprivation in terms of basic needs by comparing the progress in service delivery at the provincial level between 1995 and 1999, using the October Household Survey. They found that nationally, the lack of formal housing seemed to be on the increase, while the proportion of households deprived of safe water was unchanged over the period (Ngwane *et al.*, 2003: 556). The analysis again highlighted disparities between rural and urban areas in South Africa. An example is the differences in the use of electricity as an energy source for heating: in 1999, approximately 77 per cent of households in urban areas were using electricity, compared to 16 per cent in rural areas (Ngwane *et al.*, 2003:560). The comparisons of provincial progress also showed the more rural provinces to be at a

disadvantage; for example, a relatively-high proportion of households in the Eastern Cape and Limpopo Province still did not have any toilet facility.

Le Roux Booysen (2003) examined the progress that the provinces had made in delivering the RDP, through the use of reconstruction and development indices, which he called RDIs. The analysis employed data from surveys by the Development Bank of Southern Africa, the Advertising Research Foundation, the Institute of Race Relations, the Health Systems Trust, the Election Task Group, the South African Policy Service and the 1996 Census. He found that provinces that are more urbanised have advantages over the more rural provinces in the delivery of infrastructure, the facilitation of demographic transition and the improvement of standards in secondary education (Le Roux Booysen, 2003:42). The most recent analysis in this first category is that of Leibbrandt *et al.* (2006) that examines patterns of access poverty and inequality with a comparison of 1996 and 2001 Census data. They found that in both 1996 and 2001, almost two-thirds of households occupied formal dwellings. In the inter-censal period, the proportion of Africans in formal dwellings increased from 53 per cent to 60 per cent. The proportion of households in formal dwellings increased in all provinces, especially in Limpopo. With regard to other basic services, Leibbrandt *et al.*'s (2006) results show improvements in access to water, electricity, sanitation and refuse removal, specifically for the African population and across all provinces.

Breier and Visser (2006) also examined community-based provisions of development services in rural South Africa. Their study combined economic and case study analyses to draw conclusions for development policy. They used the simple game-theory model of public goods provision as the main focal point. They furthermore suggested and concluded that the rural communities are best equipped to overcome the free-riding problems when social capability is strong, and there are appropriate social norms for cooperation and individual members of the community expect a sufficiently high proportion of other community members to contribute. However, the focal point of developmental issues is that service delivery should remain a key element for addressing the problem of poverty alleviation.

Burger (2005) contributes to the dialogue on how to maximise the impact of pro-poor service delivery. She assembled a case study-based analysis using four of the post-1994 trends in service delivery in South Africa. She concluded that:

- Decentralisation and increased participation from the community can help to maintain historical distributions of privilege;
- In water services, community ownership is not a sufficient condition for effective service delivery to individuals in rural communities;
- Private outsourcing does not imply an anti-poor bias; and
- Elimination of user fees is not necessarily the most efficient way to ensure access to services for poor households.

Over the past fifteen years, great strides have been conducted to redress past social inequalities and meet the RDP commitment, which the local ANC government adopted in 1994. The challenge of ensuring a better life for all, however, remains, since economic growth rates are still low, inequality has increased, life expectancy is low and poverty is still high. The challenge for poverty alleviation, however, lies far beyond measures that only include income inequality. A further study into quality of life is needed, since this expands the understanding of poverty and further explains to what extent poverty contribute to the vulnerability or fragility of the economy. In the next section, quality of life studies are examined.

### **3.2.2 *Quality of life studies***

A strand of research that is related to poverty and places, is the study of perceived quality of life that uses national level surveys that include a life satisfaction question. Examples include Powdthavee (2003) who used cross-sectional data from the 1993 SALDRU survey to examine the relationship between subjective wellbeing and socio-economic variables. He finds that wellbeing rises with income, unemployment is detrimental to wellbeing and happiness is U-shaped with age. In a similar fashion, Møller and Devey (2003) used the October Household Surveys of 1995 and 1998 to examine trends in living conditions and satisfaction among poorer, older South Africans. In their study they focused on policies and programmes that have been implemented since the attainment of democracy in 1994 and focused on how they influence the income of the older poor population. They found that access to services is strongly correlated with income, but that over the period 1995 to 1998, poorer and older households did record gains in access to clean water, electricity and home ownership. Their results also show that access to services that satisfy basic needs improves from the poor to the rich households and conclude that the most effective mechanism for poverty alleviation is to facilitate the build-up of a supportive pension fund (Møller & Devey, 2003:468).

In all of the above cases, however, the level of geographical disaggregation was limited to studies of the urban-rural divide or comparisons of provinces. The analyses did not allow for further distinctions of the performance of local governments in meeting the basic needs of their communities.

In the 1980s, Møller (1989) examined the nature of poverty and the way it affects South African lives. Møller (1994) reported that only a month after the first democratic election in South Africa the white and black populations were equally satisfied with their lives. She poses the question of whether this life satisfaction is going to last. Only eighteen months later, Møller (1995) reported that the satisfaction euphoria did not last. More on the subject of satisfaction after the attainment of democracy in 1994, Møller and Dickow (2002) explored the quality of life surveys and the role they played in managing the democratic transition. They reported that national level projects in the field of quality of life have tracked subjective wellbeing, life satisfaction and happiness. They found that in developing countries the average person is happy with the quality of their life; this, however, is not the case for South Africa where the average person is not happy with the quality of their life. Since the attainment of democracy in 1994, quality of life research received more attention. Møller (1999) concluded that there is some optimism for the future, and the majority of South Africans stand a good chance of reconciling with better levels of happiness in the future. The next section will provide literature on the local perspective of the local economic development in South Africa.

### ***3.2.3 The local perspective on local economic development***

For a more local perspective on poverty and places, a third strand of research comes from specific surveys of so-called quality of place. "Since the attainment of democracy in South Africa the apartheid era has left a bitter legacy of retarded economic development. Local Economic Development (LED) has been identified by the South African government as a key strategy through which issues of development and, more importantly, poverty alleviation can be addressed by local governments" (Binns & Nel, 2002:8). An example is the Human Sciences Research Council survey of 5700 South Africans' perceptions of service delivery in 1995 (Møller & Jackson, 1997). Within this line of work, it is also possible to distinguish between urban and rural settings.

With specific focus on cities, Møller (2001) reported on the quality of life in the Durban metropolitan area. She found that background factors, such as access to formal housing and access to services, accounted for only 10 per cent of the variance in life satisfaction. However, general neighbourhood satisfaction (including satisfaction with dwelling, disinclination to move from the neighbourhood/Durban, perceived improvements in the neighbourhood over the preceding year and changes in the crime situation), along with the background factors, explained 33 per cent of variance in life satisfaction (Møller, 2001:233-234). More recently, Westaway (2006) reported on the satisfaction with personal and environmental quality of life in the informal housing settlement of Doornkop in Soweto, and Naudé *et al.* (2008) developed indicators of the quality of life in South Africa's metropolitan cities.

Since the attainment of democracy in 1994, South Africa has aimed at significantly changing the country for its citizens; however, when exploring the rural policy, it is clear that the government's resources and capacity constraints have only been barriers to implementing effective strategies for change (Binns & Nel, 1999). Studies on the quality of life, in a more rural setting, include Sotshongaye and Møller (2000) who examined self-assessed development needs among rural women in Ndwedwe in KwaZulu-Natal. Here, the women, from the better-serviced Mavela ward, cited piped water and electricity in the home as important development needs. In the more remote Cibane ward, the women indicated that more basic needs such as safe water, housing and access roads were priorities (Sotshongaye & Møller, 2000:117). Clark (2003) reported on concepts and perceptions of wellbeing from a comparison of a rural village called Murraysburg and an urban township known as Wallacedene in the Western Cape Province. The three most important aspects of 'the good life', in both these locations, were given as jobs, housing and education. A particularly high premium was placed on jobs and housing in Wallacedene, while more emphasis was placed on education in Murraysburg (Clark, 2003:180).

There is also a growing literature on LED in South Africa that is receiving attention from government and academia alike (Rogerson, 1996; 1997; 2004; Tomlinson, 2003). Binns and Nel (2002) examined LED in the post-apartheid era of South Africa. The South African government identified LED as a key strategy for addressing certain problems in the country, such as poverty alleviation. Furthermore, when exploring the local perspective a review of the local economic development in South Africa is necessary. Early studies such as the one by Rogerson (1996a) set out to examine urban poverty in the informal economy in South Africa on a regional level. His study was based on conditions and trends within the Gauteng Province

and found that policy intervention in the areas of human development such as education, health, and housing is a key element to the survival of informal enterprises within Gauteng. Furthermore, Rogerson (1996b) added that with diminishing defence expenditure, the military industry was encouraged to convert the current production to more informal non-military products. Rogerson (1996b:1) reports that in the Gauteng region, "the question of defence conversion is critically important for local policy makers and should be linked to new local economic development initiatives".

Later studies supporting LED and local pro-poor policy include Rogerson and Rogerson (1997), who examined certain aspects linked to small enterprises owned by the previously disadvantaged black groups and the development thereof. He used a survey of small black enterprises operating in Johannesburg. He found that the government in this city must set out to change their role and act as an incubator to stimulate development in the black-owned small enterprises. In the post-apartheid era of South Africa, urban poverty is a growing trend.

In Rogerson's (1999) paper, he examines eight case studies of LED initiatives. His results show that local municipalities can make a difference by contributing in the following ways: (1) improving access to local municipal services, (2) creating more employment opportunities, (3) protecting the community from crime and natural disasters, and (4) integrating and coordinating local municipal policies. He concluded that in these case studies the policy makers, more specifically the LED practitioners, are struggling to integrate their initiatives with the goal to alleviate poverty. Rogerson (2000) argued that the burden for economic responsibility has undergone dramatic restructuring from national to local government level. He furthermore responds that the South African LED policies have a strong pro-poor focus. In Rogerson's (2002) paper, he attempts to conceptualise a different approach towards pro-poor policies and strategies in urban South Africa, using a sectoral analysis, which sets out to assist the national LED framework. He argues that this analysis can be used in such a way that sectoral targeting can be implemented effectively to give assistance to pro-poor LED interventions. Rogerson's (2004) paper on pro-poor LED in South Africa aims to explore the working of the changed public procurement system with the main focus on its relevance and applicability as a tool for LED.

Rogerson (2004) examined the working of the public procurement system in an attempt to aid pro-poor LED intervention, interventions that can be used on poor and fragile places. He found



the following policy recommendations that can also be useful to apply on poor and fragile places:

- *Firstly*, he argues that to make the current municipal officers more aware of the intervention needed for the public procurement system to be effective, is not the solution. He suggests an aggressive solution from the local engineers and construction professionals to make use of more labour-friendly technology of construction.
- *Secondly*, he suggests that the necessary support must be in place for the current procurement system to reinforce empowerment to the defined groups of individuals or enterprises that need these specified procurement requirements to successfully compete for the world that has been reserved for them. Or, the government may follow a different approach, which is to adopt the international practice of “offering back”. Arrowsmith, Meyer and Trybus (2000) report that when this approach is followed, the local government would achieve their policy goals and targets by giving the defined groups of individuals or enterprises a second chance to make their tenders for work successfully.
- *Thirdly*, he added that to make more improvements the contracting specification offered by the local municipal officers can be structured to facilitate and promote participation by the targeted groups and enterprises. Further improvements can be made to aid the process where these tender documents are made freely available and in more vernacular languages and even where the tender date is stretched out longer.
- *Fourthly*, improvements to aid the current procurement operations to run effectively can be made with regard to the supply-side considerations and interventions. Rogerson (2004) argues that although these deficiencies have been recognised at national level, the network of delivery and distribution for the supply-side programmes that have been enacted have thus far failed to meet the basis requirements and needs. He furthermore argues that to make this procurement succeed as an LED strategy, the deficiencies must be rectified.
- *Fifthly*, the supply-side deficiencies mentioned above should receive specific attention from the local municipal officers to aid the solution in more than one way. Take for instance information; the local authorities can make information freely and effectively available to the target groups and enterprises to aid in the competition for business. He furthermore argues that in some local authorities, the lack of tender advice is the only problem, where in other local authorities only the quality of the tender advice needs to be addressed.

- *And lastly*, in order to improve and develop tender services to the emerging contractors and targeted groups, financial services in the form of non-profit services can be distributed among them, which limits the contractor to attain funds from loan sharks. Or, the local municipal authorities can buy, or assist in buying, bulk from suppliers. This would further reduce the cost of the contractor.

When the concept of self-reliance in the context of rural LED in South Africa is examined, Nel and Binns (2000) are key authors. They argued that circumstances, in a world where the global economy is ever changing, obligate the communities to be pro-active in the poverty alleviation process, thus improving their quality of life. Nel and Binns (2001) reviewed the LED policy, particularly with an emphasis on enhancing development requirements placed on the local government. Nel and Binns (2002) furthermore added that promoting tourism as a key strategy to get the rural community to be self-reliant can lead to economic upliftment, community development and the alleviation of poverty in South Africa. Breier and Visser (2006:301) argued that “rural development works most effectively when beneficiary communities are active project participants and not the passive recipients of assistance”.

Rogerson (2006) explored market development approaches to develop SMMEs (small, medium and micro enterprises) in South Africa. He found that the conventional approach of donor or state-subsidised provision of support services to targeted SMME beneficiaries has not proven to be effective in alleviating poverty or promoting development in the area of enterprise business development. He furthermore argues that a new approach is necessary, one which is followed internationally and is based on a movement that makes the markets work for the poor. This approach does not eliminate the role of the government; however, it suggests a re-alignment and defines new roles for the state at all levels in terms of providing a market or environment that is self-enabling in providing public goods in terms of basic needs and services. He added that aid in the form of business development services to small enterprises should come from other small enterprises. The advantages associated with this approach include: it is demand-led rather than supply-driven, which makes the market-led development the focal point; it can be sustained for a longer period even after the active donor or government support has ceased; and it has the potential for high impact or delivery of support. He concluded that the focal point of this approach should be enabling rather than directly interventionist, sectorally-focused and lastly be orientated towards market-development.

Naudé *et al.* (2008) explored regional development in South Africa. They measured the local economic vulnerability / fragility of sub-regional South Africa using datasets from 354 magisterial districts and constructed a local vulnerability index (LVI). The LVI is based on income per capita as well as a vulnerability intervention index (VII). They concluded that there are some sub-regional factors that will affect the households' wellbeing, income and capabilities. Furthermore, they explained that these factors can lead to poverty as well as geographical poverty traps. They added that the focal point of all poverty alleviating strategies should aim to examine the vulnerability of local places.

This section explored the local conditions with regard to development in South Africa. In conclusion to this section, it must be stated that after the attainment of democracy in 1994, some policy restructuring has taken place in the field of local economic development; however, the inefficiency of local policy did not contribute to address the underlying problem of poverty. Further research based on those of Naudé *et al.* (2008) is necessary to fully understand the wide spectrum of poverty. Only then can one structure and effectively implement policies that address the underlying problem. In the next section, the links between poverty and local government are examined using case studies that focus on some of the local protests in South Africa.

#### **3.2.4 Impacts of poverty on the local government**

Finally, a fourth line of enquiry has been to examine the links between poverty and the local government. This section will explore cases where poor service delivery has led to protests and unrest in the local government. The Centre for Development Support at Free State University (see Botes *et al.*, 2007), has published four case studies of delivery failures and protests in the Phumelela, Khutsong, Phomolong and Nelson Mandela Bay municipalities. They found that deficient service delivery has been caused by poor governance, individual political struggles within local government, a lack of communication, an ineffective client interface, inefficient management, and issues of affordability and unfunded mandates. A further study into the reasons, impacts and lessons learned for local protests will now be explored. Botes *et al.* (2007) report that they found that local protests were set off by poor service delivery.

#### *3.2.4.1 Reasons for local protests*

*Poor governance:* Governance refers to the institution's ability to make decisions. In the case studies of Botes *et al.* (2007), it is poor governance that promoted local protests. For example, in the Phumelela case study, the council lacked basic decision making and direction, which resulted in poor service delivery and finally set off the protests.

*Individual political struggles:* Botes *et al.* (2007) reported that in all of the case studies, political in-fighting was evident. For example, in the Phomolong case study the struggles were between local groups, whereas in the Phumelang case study, the struggle originated from provincial level.

*Poor communication:* Again, in all four case studies, Botes *et al.* (2007) noted that poor communication was present. They furthermore argue that local protests are mostly promoted by the institutional lack of transparency. They also found that most of the ward committees were not very effective in the municipalities. They explained that the factors that should be avoided in the context of ward committees include: When ward committees are established, they should not become a replica of the existing configuration of political power in the elected council; the ward committee should not form part, act or be seen as an exclusive communication channel for the ruling party; and lastly the ward committee should not be used to generate a platform from which a losing candidate sets out to re-fight the municipal elections.

*Ineffective client interface:* Botes *et al.* (2007:4) refer to the client interface as "the point where citizens meet the state, whether at the representative level (the councillor) or the administrative level". They furthermore added that if a client interface is effective, it should be responsive. This, they explained, was a reason for the protests, since the lack of getting the residents' problems addressed was evident.

*Ineffective management:* Ineffective technical-, poor financial- and the lack of general management are indications in three different spheres that contributed to the protests. Botes *et al.* (2007) added that one factor contributing indirectly to the protests is ineffective financial management. For example, in the Phumelela case study ineffective financial management resulted in the municipality losing their credit record, which led to the lack of maintenance.

*Housing administration and management:* Many of the local protests recorded were due to poor housing administration and management. For example, in the Nelson Mandela Bay case study,

protest was promoted because the local municipalities could not manage to effectively allocate housing subsidies to individual applicants.

*The economic impact of poor service delivery:* When the people of the municipality experience poor service delivery, they get frustrated and lose faith in the effectiveness and professionalism of their municipalities. For example, in Warden, the poor infrastructure and inconsistent electricity supply had a negative impact on the business sector in that region.

*Affordable issues:* This refers to the amounts that the people are being charged for the basic needs and services that the municipality should provide. Botes *et al.* (2007:9) report that in some municipalities “the community was not satisfied with all the services from the municipality, and the services are not affordable. The community was promised free water and electricity, but until now they are still not available”.

*Regional identities at local municipal level:* Botes *et al.* (2007) found that regional deprivation is one of the central focal points of local protests. They furthermore added that in the Phomolong case study, a memorandum was handed over to the local municipality stating that the community no longer wants to be part of the Matjhabeng Municipality, which provided services only to the residents of Welkom, in terms of their employment, leadership and services.

*Strategic planning:* Botes *et al.* (2007) report that local-level planning takes place in terms of the Integrated Development Plans (IDPs). However, this is not the case for the Nelson Mandela Bay district, since they are still awaiting the approval of their IDP. IDPs generally reflect the municipality’s priorities; however, since they are still awaiting approval, it resulted in a local protest. The community’s response to the IDP is that they are asking for better service, and instead they received an IDP, which could not even be implemented.

*Intergovernmental relations:* Botes *et al.* (2007) argue that there is adequate evidence that the system of intergovernmental relations has failed the local government. In the Nelson Mandela case study, the underlying problem was that the province is slowing down the development process, since the finances do not reach the municipality in time for the year it is intended to be applied.

*The lack of appropriate youth development:* It is evident in many of the cases where protests have been recorded that young people were at the forefront. Botes *et al.* (2007) report that an urgent need exists for effective development programmes to be implemented for the youth.

#### 3.2.4.2 Impacts of local protests

*Damage to public infrastructure:* The protests left some destructive impacts, including some destruction of the public and private infrastructure. Some of the negative externality included: the burning of vehicles, libraries and councillor housing. Botes *et al.* (2007:13) reported that in the Khutsong district, the damage was estimated at R70 million; where damage to housing was estimated at R5 million.

*Declining service payments and a decrease in service delivery:* Botes *et al.* (2007:13) reported in the Khutsong case study that by June 2006, the payment levels for services dropped from 50% to less than 20%. Eskom was one of the main companies that was hit the hardest; their payments dropped from 87% to 43%. In Khutsong the local protests resulted in service delivery to come to a standstill.

*Economic impacts:* The economic impact varied from place to place. In the black township the impact was more severe than in the white areas. This was mainly due to barricaded entrances and nobody was allowed in. Botes *et al.* (2007:14) reported that in Henneman the economic impact was a daily loss of R250 000 as a result of the protests.

*Impacts on the education system:* The education systems in Khutsong, Phomolomg and Nelson Mandela Bay were disrupted by the local protests. Since April 2007, there has been no schooling in Khutsong whatsoever (Botes *et al.*, 2007:14). In Phomolong the pass rate dropped from 65% to 59% in 2005. In some districts the teachers were prompting the children to participate in the local protests in order to take advantage of the situation and send the children home.

This section explored the impacts of poverty on the local government by making use of case studies that focus on the local protests in South Africa, especially in the Phomolong, Phumelela, Khutsong and Nelson Mandela Bay districts. The impact of local protest can leave an economy disrupted for long periods. Therefore, it is important to understand the factors that contribute to

local protests so that effective remedies can be employed in an early stage to alleviate the problem. In the next section, Chapter 3 will be concluded.

### **3.3 Summary and conclusions**

This chapter set out to provide an overview of poverty in South Africa with regard to national-level studies, local economic development, delivery of basic needs and services and quality of life studies. Since the attainment of democracy in 1994, South Africa has been faced with a difficult challenge of poverty alleviation. The challenge for poverty alleviation, however, lies far beyond measures that only include income inequality. Harris (1999) argues that the constitution recognises local government to have a developmental as well as a service role in meeting the basic needs of communities and improving living conditions; therefore the government made great strides to redress past social inequalities and meet development programme goals. However, the challenge for South Africa still remains, seeing as:

- Some policy restructuring has taken place in the field of local economic development; however, the inefficiency of local policy implementation did little to alleviate the underlying problem of poverty. Further research based on that of Naudé *et al.* (2008) is necessary to fully understand the wide spectrum of poverty;
- Local governments have struggled to fulfil their responsibilities as has been clearly marked by the violent protests over poor service delivery (Botes *et al.*, 2007); and
- Studies show that access to basic needs and services, and thus the quality of life, improves from the poor to the rich households.

The focus, however, remains on the poor, and literature lacks the ability to facilitate research on fragility / vulnerability that can be an excellent ex-ante measure of poverty. It is necessary to establish in which places the people are exposed to these vulnerabilities on a sub-national level. The focus of Chapter 4 is to attempt to use cross-sectional data to construct a measure of fragility.

## Chapter 4: Construction of a Local Fragility Index

### 4.1 Introduction

There is a range of possible measures of the fragility of a place or region. Chapter 2 argued that the analysis of fragile regions lies between the aggregate level of fragile states or small open economies and the disaggregated level of fragile households. Work related to the fragility of regions is limited, but it is possible to draw on both the other literatures for possible measures of local fragility.

This dissertation follows the work of Naudé *et al.* (2008) who found that the vulnerability of place is due to vulnerability in many different fields. The domains that they put forward as indicators of the vulnerability of a place include the size of the local economy as well as the diversity and openness of the local economy. Remoteness and developmental level are also taken into account. Remoteness is measured by the distance to a major hub and developmental level by indicators such as the Human Development Index, poverty and unemployment rates. Governance is measured by local government capital expenditure and the fragility of the environment by land degradation (Naudé *et al.*, 2008: 9-10).

It is clear that these measures can throughout be linked to the fragility of the places where the policymakers have to supply interventions. When policymakers need to make medium to longer run assessments, these measures of fragility are useful, since they address the outcomes or “ends” of policy rather than the inputs or “means”. The aim of this dissertation is to extend the work of Naudé *et al.* (2008) in two important ways. Firstly, the spatial unit of analysis is the local municipality, compared to the magisterial districts used in that earlier index. The municipality does not provide as fine a disaggregation as magisterial districts, but it brings the analysis to the level where local policymakers make decisions and undertake interventions. Secondly, the data used includes new data from the most recent 2007 Community Survey that focuses specifically on the delivery of basic services at local level. Chapter 2 and 3 argued that basic services are important to mitigate local vulnerability.



The chapter is set out as follows. In Section 4.2, the data and measures of the local fragility index are explained. Section 4.3 discusses the principle component analysis used to construct this dissertation's local fragility index. In Section 4.4, the results of the analysis are presented and the local municipalities are ranked by the local fragility index. Section 4.5 concludes.

## **4.2 Data and measures**

As stated above, the construction of the local fragility index is inspired by Naudé *et al.* (2008), but differs in a number of ways. The first is the geographical level of analysis. Since December 2000, the demarcation of local governments in South Africa includes six metropolitan municipalities, 231 local municipalities and 46 district municipalities. However, this dissertation will focus only on the 231 local municipalities and the metropolitan municipalities. The district municipalities cover large, sparsely populated rural areas and are excluded for their lack of population size and diversity. The data is presented in accordance with 2005 boundaries.

The data for the measurement of local fragility comes from the 2001 Census and 2007 Community Survey and is sourced from the Regional Economic Explorer (REX) database compiled by Global Insight (see [www.globalinsight.co.za](http://www.globalinsight.co.za)). The REX database is compiled from various sources, such as the Income and Expenditure Surveys, the October Household Surveys and the Labour Force Surveys. A range of possible measures of local fragility is available. Local demographics are measured by total population and population density. The state of the local economy is captured by variables such as GDP per capita, primary production as a percentage of GDP and exports as a percentage of GDP. Variables such as the human development index, poverty rate, unemployment rate and urbanisation rate are used as measures of the local level of development. The environment is measured in terms of rainfall and the percentage of degraded land. Other possible measures of local fragility include the local crime rate and levels of delivery of basic services such as water, electricity, sanitation and refuse removal.

The method of the construction of the local fragility index is principal component analysis. Local fragility is a latent variable that cannot be directly measured. Principle component analysis can, however, identify groups of variables that measure such a construct. A principle component analysis involves the following steps: (1) screen the data, (2) extract factors, (3) determine the communality, and (4) calculate the factor scores. The factor scores can then be used to

construct an aggregate index value for the construct that is measured. The index can then be used in further analyses to identify fragile regions or places.

### 4.3 Principle component analysis

The analysis was done using SPSS 15 and the data for the municipalities pooled for the periods 2001 and 2007<sup>5</sup>. The first step, as suggested by Briguglio (1995), is to standardise the variables by calculating a z-score by means of the formula:

$$z_{ik} = \frac{x_{ik} - \bar{x}_k}{\sigma_k} \quad 4.1$$

where  $x_{ik}$  is the raw value of variable  $k$  for the local municipality  $i$ ;  $\bar{x}_k$  is the mean value of variable  $k$  for all local municipalities, and  $\sigma_k$  is the standard deviation of the variable  $k$ . The z-score of variable  $k$  has a mean value of zero and a standard deviation of one.

In the second step, the data is screened using a correlation matrix. For the principle component analysis to deliver useful results, the measures should be correlated, although not perfectly correlated (Field, 2005). If two variables are correlated by more than  $r = .9$ , then one of the two variables should be dropped from the analysis. The correlation matrix showed that population and population density were highly correlated ( $r = .941$ ), and thus population was dropped from the analysis. Urbanisation rate and the households with access to refuse removal were also highly correlated ( $r = .931$ ), and as a result households with access to refuse removal was dropped. Also, overall crime and violent crime showed a high correlation ( $r = .995$ ) and violent crimes was dropped from the analysis.

The third step of the analysis is to determine whether the principle component analysis is appropriate. Table 4.1 shows the test statistics for KMO and Barlett's test.

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<sup>5</sup> The complete SPSS output of the Principle Component Analysis is presented in Appendix C

**Table 4.1: KMO and Barlett's test**

| KMO and Barlett's test                           |                    |                  |
|--------------------------------------------------|--------------------|------------------|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. |                    | <b>0.871</b>     |
| Bartlett's Test of Sphericity                    | Approx. Chi-Square | <b>6,675.036</b> |
|                                                  | df                 | <b>190</b>       |
|                                                  | Sig.               | <b>0.000</b>     |

KMO is a measure of sampling adequacy and represents the ratio of the squared correlation between variables to the squared partial correlation between variables. The statistics range between 0 and 1. A value close to 1 indicates that patterns of correlations are relatively compact where principle component analysis should yield distinct and reliable factors. Field (2005) indicates that values between .8 and .9 are required and here the KMO statistic is .871, which falls into that range. It is concluded that principle component analysis is appropriate for the data.

Bartlett's measure tests the null hypothesis that the original correlation matrix is an identity matrix. The test is significant, which means that the R-matrix is not an identity matrix and that there are relationships between the variables that can be included in the analysis. Again, the conclusion is that principle component analysis is appropriate.

When the factors were extracted to determine the linear components within the data set of local municipalities, it was found that five factors had eigen-values<sup>6</sup> greater than 1. Field (2005) explains that only factors with eigen-values greater than 1 should be extracted. He furthermore adds that the eigen-value of each factor represents the variance explained by that particular linear component. In Table 4.2, there are five factors that explain approximately 75 per cent of the total variance. Table 4.2 also presents the eigen-values after the rotation.

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<sup>6</sup> When two variables are correlated, their scatter-plot forms an ellipse. This ellipse has some dimensions, which includes a height and length dimension. These dimensions are called eigenvectors and are independent from each other. The length or height of an eigenvector is called an eigen-value. Thus, the eigen-values for a data set explain the dimensions of the data. In other words, an eigen-value show how evenly the variance of the matrix is distributed (Field, 2005)

**Table 4.2: Total variance explained**

| Component | Total Variance Explained |               |              |                                     |               |              |                                   |
|-----------|--------------------------|---------------|--------------|-------------------------------------|---------------|--------------|-----------------------------------|
|           | Initial Eigen-values     |               |              | Extraction Sums of Squared Loadings |               |              | Rotation Sums of Squared Loadings |
|           | Total                    | % of Variance | Cumulative % | Total                               | % of Variance | Cumulative % | Total                             |
| 1         | 9.099                    | 45.494        | 45.494       | 9.099                               | 45.494        | 45.494       | 6.836                             |
| 2         | 2.002                    | 10.010        | 55.503       | 2.002                               | 10.010        | 55.503       | 2.901                             |
| 3         | 1.505                    | 7.524         | 63.027       | 1.505                               | 7.524         | 63.027       | 2.005                             |
| 4         | 1.332                    | 6.660         | 69.688       | 1.332                               | 6.660         | 69.688       | 1.826                             |
| 5         | 1.076                    | 5.378         | 75.066       | 1.076                               | 5.378         | 75.066       | 1.446                             |
| 6         | 0.898                    | 4.491         | 79.557       |                                     |               |              |                                   |
| 7         | 0.814                    | 4.071         | 83.628       |                                     |               |              |                                   |
| 8         | 0.638                    | 3.190         | 86.818       |                                     |               |              |                                   |
| 9         | 0.527                    | 2.634         | 89.452       |                                     |               |              |                                   |
| 10        | 0.444                    | 2.222         | 91.675       |                                     |               |              |                                   |
| 11        | 0.355                    | 1.777         | 93.452       |                                     |               |              |                                   |
| 12        | 0.278                    | 1.391         | 94.843       |                                     |               |              |                                   |
| 13        | 0.256                    | 1.282         | 96.125       |                                     |               |              |                                   |
| 14        | 0.231                    | 1.156         | 97.281       |                                     |               |              |                                   |
| 15        | 0.162                    | 0.812         | 98.093       |                                     |               |              |                                   |
| 16        | 0.130                    | 0.651         | 98.744       |                                     |               |              |                                   |
| 17        | 0.094                    | 0.472         | 99.216       |                                     |               |              |                                   |
| 18        | 0.076                    | 0.381         | 99.596       |                                     |               |              |                                   |
| 19        | 0.052                    | 0.262         | 99.859       |                                     |               |              |                                   |
| 20        | 0.028                    | 0.141         | 100.000      |                                     |               |              |                                   |

Table 4.3 shows the communalities before and after extraction. The communalities represent the amount of variance in each variable that can be explained by the five factors that have been retained. For example, 58 per cent of the variance associated with GDP per capita is shared variance, or 82 per cent of the variance with exports (as percentage of GDP) is shared variance. In terms of the variance associated with households (piped water inside dwelling, electricity for cooking, electricity for heating, electricity for lighting, flush toilets and households living in brick structures), the shared variance ranges between 79 percent and 92 percent.

**Table 4.3: Communalities**

| <b>Communalities</b>                                                           |                |                   |
|--------------------------------------------------------------------------------|----------------|-------------------|
|                                                                                | <b>Initial</b> | <b>Extraction</b> |
| GDP per capita (constant 2000 prices)                                          | 1.000          | 0.584             |
| Population density (no. of people per km <sup>2</sup> )                        | 1.000          | 0.594             |
| Urbanisation rate (% of people in urban areas)                                 | 1.000          | 0.744             |
| Proportion of primary production (agriculture and mining as % of regional GVA) | 1.000          | 0.827             |
| Exports (as % of GDP)                                                          | 1.000          | 0.819             |
| Trade (exports + imports as % of GDP)                                          | 1.000          | 0.814             |
| Human Development Index                                                        | 1.000          | 0.886             |
| Poverty (% of people in poverty)                                               | 1.000          | 0.815             |
| Unemployment rate (% according to expanded definition)                         | 1.000          | 0.611             |
| Average annual rainfall (mm)                                                   | 1.000          | 0.529             |
| Degraded land (% of total area)                                                | 1.000          | 0.524             |
| Total land cover km <sup>2</sup> (forests, water bodies and wetlands)          | 1.000          | 0.513             |
| Overall crime index                                                            | 1.000          | 0.804             |
| Property crime index                                                           | 1.000          | 0.821             |
| % households with piped water inside dwelling                                  | 1.000          | 0.839             |
| % households that use electricity for cooking                                  | 1.000          | 0.916             |
| % households that use electricity for heating                                  | 1.000          | 0.885             |
| % households that use electricity for lighting                                 | 1.000          | 0.817             |
| % households with flush toilet                                                 | 1.000          | 0.880             |
| % households living in brick structures                                        | 1.000          | 0.790             |

The final step in the analysis is the component matrix that shows the factor loadings for the five factors identified through the principle component analysis. Table 4.4 shows the rotated component matrix. The rotated matrix, as argued by Field (2005), maximises the loading of each variable on one of the extracted factors whilst minimising the loading on all other factors and consequently the rotation results present a clearer understanding with regard to which variable relates to which factor.

From the rotated matrix in Table 4.4 it is clear that some variables load onto more than one factor. The relationships have to be interpreted with caution. The aim is to measure the underlying construct of fragility or vulnerability, but the way that the measures are constructed dictates the interpretation. For example, high levels of access to basic services would be positively associated with less vulnerable places. High levels of crime would be positively associated with more vulnerable places.

**Table 4.4: Rotated Component Matrix**

| Rotated Component Matrix                                                       |           |        |       |        |        |
|--------------------------------------------------------------------------------|-----------|--------|-------|--------|--------|
|                                                                                | Component |        |       |        |        |
|                                                                                | 1         | 2      | 3     | 4      | 5      |
| % households that use electricity for cooking                                  | 0.911     |        |       |        |        |
| % households that use electricity for lighting                                 | 0.889     |        |       |        |        |
| % households that use electricity for heating                                  | 0.870     |        |       |        |        |
| % households with piped water inside dwelling                                  | 0.857     |        |       |        |        |
| Human Development Index (HDI)                                                  | 0.778     | 0.436  |       |        |        |
| % households with flush toilet                                                 | 0.777     | 0.457  |       |        |        |
| Poverty (% of people in poverty)                                               | -0.732    |        |       |        |        |
| % households living in brick structures                                        | 0.727     |        |       |        | -0.405 |
| Urbanisation rate (% of people in urban areas)                                 | 0.644     | 0.553  |       |        |        |
| Unemployment rate (% according to expanded definition)                         | -0.569    |        |       | -0.430 |        |
| Property crime index                                                           |           | 0.812  |       |        |        |
| Overall crime index                                                            |           | 0.790  |       |        |        |
| Degraded land (% of total area)                                                |           | -0.488 |       |        |        |
| Trade (exports + imports as % of GDP)                                          |           |        | 0.884 |        |        |
| Exports (as % of GDP)                                                          |           |        | 0.876 |        |        |
| Proportion of primary production (agriculture and mining as % of regional GVA) |           |        |       | 0.822  |        |
| GDP per capita (constant 2000 prices)                                          |           |        |       | 0.633  |        |
| Population density (nr of people per km <sup>2</sup> )                         |           |        |       |        | 0.634  |
| Average annual rainfall (mm)                                                   |           |        |       |        | 0.595  |
| Total land cover km2 (forests, water bodies and wetlands)                      |           | 0.419  |       |        | -0.476 |

Factor 1 contains the measures of the access to basic services and includes the percentage of households that uses electricity, the percentage of household that uses piped water, percentage of households with sanitation, percentage of households with brick housing, the human development index and urbanisation rate. The literature presented in Chapter 3 suggested that people that have poor access to basic services tend to have lower levels of well-being as well as fewer opportunities to gain higher income. The literature also explains that people living in rural areas tend to have more disadvantages than people living in urbanised areas. Field (2005) also suggested that when the factor loadings are squared, the amount of variance accounted for by a variable is estimated. For example, urbanisation accounts for 41 per cent of the variance and human development accounts for 61 per cent of the variance.

Factor 2 seems to present the environment in which people live with indicators of crime and land cover. Møller (2001) reported that crime and urbanisation along with other factors explain 33 per cent of variance in life satisfaction. Higher levels of crime indicate greater vulnerability.

Fragile places would have a greater percentage of degraded land and less forests, water bodies and wetlands.

Factor 3 captures the openness of the local economy to trade. The measure is trade in terms of exports and imports as a percentage of GDP. The literature presented above suggests that *when an economy cannot influence its terms of trade and thus influences its exports*, then the economy or municipality is seen as small and vulnerable to external shocks. Small or vulnerable municipalities, as argued by Read (2003), have the desire to be open to trade, however, economic growth rates in the small municipalities is not as high as in larger municipalities, since they are smaller, which is regarded as a limitation. When smaller municipalities can participate in trade and follow export-driven policies, the municipality can experience higher economic growth rates.

Factor 4 represents the local economy. Higher GDP per capita would leave a local municipality less vulnerable, but higher unemployment would render it more fragile. In South Africa, significant attempts have been made to address income inequality. McGrath and Whiteford (1994) reported that even though income has been redistributed and diversified, however, only the richest of the poor have gained access to this benefit and unemployment rates are still high. *This leaves the poorest people, and thus the most vulnerable, in the municipality with less income and no employment*, which may results in a fragile place becoming even more fragile.

Factor 5 contains more measures of the effect that the nature and environment have on fragile places. The literature presented above explains that if a place is vulnerable to natural disasters, this has an impact on development and well-being. People living in too high density areas or not in brick housing may suffer more than people living in a safe urban environment.

In this section of Chapter 4, the principle component analysis was done to obtain a better understanding of what goes on behind the construction of the LFI. The five factors were extracted and scores calculated. In the following section, the local municipalities are ranked accordingly to their fragility in the LFI<sup>7</sup>.

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<sup>7</sup> The complete rankings of municipalities by the Local Fragility Index is presented in Appendix A.

#### 4.4 Results

For a discussion of fragility it is useful to consider the geography of municipalities and the rankings of the top and bottom decile of fragility. A higher ranking in the LFI (more positive value) reflects a less fragile place and a low ranking in the LFI (more negative value) reflects a high fragile place. Table 4.5 presents the top-30 municipalities with the lowest fragility in 2001.

**Table 4.5: The local fragility and rankings of the top 30 local municipalities with the least fragility in 2001**

| Local Municipality                                       | 2001 Ranking | Local Fragility Index |
|----------------------------------------------------------|--------------|-----------------------|
| Breede Valley Local Municipality                         | 1            | 9.6                   |
| Kruger National Park District Management Area            | 2            | 9.27                  |
| Hantam Local Municipality (including Namaqualand DMA)    | 3            | 8.57                  |
| St Lucia Park District Management Area                   | 4            | 6.94                  |
| Rustenburg Local Municipality                            | 5            | 6.39                  |
| Saldanha Bay Local Municipality                          | 6            | 5.61                  |
| uMhlathuze Local Municipality                            | 7            | 5.36                  |
| Sol Plaatjie Local Municipality                          | 8            | 5.25                  |
| Thabazimbi Local Municipality                            | 9            | 4.18                  |
| Thaba Chweu Local Municipality                           | 10           | 4.11                  |
| Benede District Management Area                          | 11           | 4.01                  |
| Kalahari District Management Area                        | 12           | 3.41                  |
| Kgatelopele Local Municipality (Dan-Lime)                | 13           | 2.79                  |
| Cederberg Local Municipality                             | 14           | 2.68                  |
| Kareeberg Local Municipality                             | 15           | 2.53                  |
| Richtersveld Local Municipality                          | 16           | 2.48                  |
| Tsantsabane Local Municipality                           | 17           | 2.4                   |
| Karoo Hoogland Local Municipality (Frasuwil)             | 18           | 2.36                  |
| Mier Local Municipality                                  | 19           | 2.2                   |
| Metsimaholo Local Municipality                           | 20           | 2.09                  |
| Oudtshoorn Local Municipality (including South Cape DMA) | 21           | 1.98                  |
| Breede River/Winelands Local Municipality                | 22           | 1.93                  |
| Knysna Local Municipality                                | 23           | 1.91                  |
| Bitou Local Municipality (Plettenberg Bay)               | 24           | 1.88                  |
| Local Municipality of Madibeng                           | 25           | 1.88                  |
| Thembelihle Local Municipality                           | 26           | 1.87                  |
| Gamagara Local Municipality                              | 27           | 1.82                  |
| Letsemeng Local Municipality                             | 28           | 1.81                  |
| Lowveld District Management Area                         | 29           | 1.73                  |
| Steve Tshwete Local Municipality (Middelburg)            | 30           | 1.7                   |



Table 4.5 shows that the Breede Valley Local Municipality had the lowest fragility in 2001, followed by the Kruger National Park, Hantam Local Municipality, St Lucia Park municipality and Rustenburg Local Municipality. In 2001, the Breede Valley Local Municipality was home to approximately 146 000 people with a low population density of 48.76/km<sup>2</sup>. Factors that added to the area being the least fragile place in South Africa in 2001, could have been the extended access to public services such as access to flush toilets and running water in dwellings, refuse removal, electricity for cooking, heating and lighting. There is also a very low poverty rate in the Breede Valley Local Municipality and only 9.4 per cent of households living on less than \$2 per day. The low unemployment rate (around 13 per cent) in the Breede Valley Local Municipality also added to the low fragility of the area. Ranked second lowest fragile is the Kruger National Park. The low population density could be the main driver for this low fragility. The third lowest fragile place in 2001 was the Hantam Local Municipality, which is home to approximately 19 500 people. From this 19 500 people living in the Hantam Local Municipality, less than 2 per cent of households receive income of less than \$800 per year, and less than 3 per cent of households lived on less than \$2 per day. Fourth in the ranking is the St Lucia Park municipality. In the 5<sup>th</sup> place is Rustenburg Local Municipality, which is home to approximately 280 000 people between the ages of 15 and 65. They have a below average unemployment rate of around 22 per cent. Less than 3 per cent of households live on \$800 per year and less than 13 per cent live on less than \$2 per day, which is good support for the low fragility ranking.

In Table 4.6, the bottom-30 municipalities in 2001 with the highest fragility are given. In 2001, the municipality with the highest level of fragility was Mbizana Local Municipality, followed by the Thulamela Local Municipality, Mhlontlo Local Municipality, Umzimvubu Local Municipality and Ntabankulu Local Municipality. The Mbizana Local Municipality is home to approximately 122 000 people. In this municipality there is very poor access to basic services. Less than 10 per cent of the community has access to electricity for lighting and less than 3 per cent has access to electricity for cooking and heating. The second highest ranking of fragility is the Thulamela Local Municipality, where approximately 310 000 people live. Access to basic services in this municipality (such as electricity for cooking, heating and lighting) ranges from 8 and 20 percent.

**Table 4.6: The local fragility and rankings of the bottom-30 local municipalities with the highest fragility in 2001**

| Local Municipality                         | 2001 Ranking | Local Fragility Index |
|--------------------------------------------|--------------|-----------------------|
| Mbizana Local Municipality                 | 1            | -3.81                 |
| Thulamela Local Municipality               | 2            | -3.3                  |
| Mhlontlo Local Municipality                | 3            | -3.2                  |
| Umkhumbi Local Municipality                | 4            | -3.05                 |
| Ntabankulu Local Municipality              | 5            | -3.02                 |
| Engcobo Local Municipality                 | 6            | -2.9                  |
| Bushbuckridge Local Municipality           | 7            | -2.83                 |
| Elundini Local Municipality                | 8            | -2.75                 |
| Msinga Local Municipality                  | 9            | -2.69                 |
| Mutale Local Municipality                  | 10           | -2.67                 |
| Aganang Local Municipality                 | 11           | -2.64                 |
| Nkandla Local Municipality                 | 12           | -2.56                 |
| Imbabazane Local Municipality              | 13           | -2.45                 |
| Intsika Yethu Local Municipality           | 14           | -2.43                 |
| King Sabata Dalindyebo Local Municipality  | 15           | -2.3                  |
| Nyandeni Local Municipality                | 16           | -2.29                 |
| Senqu Local Municipality                   | 17           | -2.27                 |
| Mbhashe Local Municipality                 | 18           | -2.24                 |
| Umkhumbi Local Municipality (Umkhumbi)     | 19           | -2.19                 |
| Mnquma Local Municipality                  | 20           | -2.17                 |
| Emalahleni Local Municipality              | 21           | -2.16                 |
| Umkhumbi Local Municipality (Khiphinkunzi) | 22           | -2.12                 |
| Nquthu Local Municipality                  | 23           | -2.1                  |
| Sakhisizwe Local Municipality              | 24           | -2.09                 |
| Lepelle-Nkumpi Local Municipality          | 25           | -2.08                 |
| Qaukeni Local Municipality (Ingquza Hill)  | 26           | -2.05                 |
| Umdoni Local Municipality                  | 27           | -1.98                 |
| Great Kei Local Municipality               | 28           | -1.89                 |
| Greater Letaba Local Municipality          | 29           | -1.88                 |
| Vulamehlo Local Municipality               | 30           | -1.88                 |

To summarise this section, it is now clear that the LFI gives a good indication as to where the fragile places in South Africa are. It also shows that the key role that the delivery of basic services play in mitigating fragility. Many of the least and most fragile places are remote and have small economies, but those with better service delivery are less vulnerable. However, to make a comparison, a further analysis of the fragile places in 2007 is needed. The same applies for the analysis of fragility in 2007 as in 2001, where the higher ranking in the LFI (more positive value) reflects a less fragile place and a low ranking in the LFI (more negative value)

reflects a highly fragile place. Table 4.7 presents the top-30 municipalities with the lowest fragility in 2007.

**Table 4.7: The local fragility and rankings of the top-30 local municipalities with the least fragility in 2007**

| Local Municipality                             | 2007 Ranking | Local Fragility Index |
|------------------------------------------------|--------------|-----------------------|
| City of Johannesburg Metropolitan Municipality | 1            | 7.55                  |
| Breede Valley Local Municipality               | 2            | 6.35                  |
| City of Tshwane Metropolitan Municipality      | 3            | 5.72                  |
| City of Cape Town Metropolitan Municipality    | 4            | 5.64                  |
| Ekurhuleni Metropolitan Municipality           | 5            | 5.44                  |
| Sol Plaatje Local Municipality                 | 6            | 5.41                  |
| Saldanha Bay Local Municipality                | 7            | 5.08                  |
| Stellenbosch Local Municipality                | 8            | 4.94                  |
| Drakenstein Local Municipality                 | 9            | 4.91                  |
| uMhlathuze Local Municipality                  | 10           | 4.78                  |
| Bitou Local Municipality (Plettenberg Bay)     | 11           | 4.67                  |
| Overstrand Local Municipality                  | 12           | 4.6                   |
| Thaba Chweu Local Municipality                 | 13           | 4.47                  |
| Midvaal Local Municipality                     | 14           | 4.43                  |
| eThekweni Metropolitan Municipality            | 15           | 4.34                  |
| Nelson Mandela Bay Metropolitan Municipality   | 16           | 4.25                  |
| Knysna Local Municipality                      | 17           | 4.12                  |
| St Lucia Park District Management Area         | 18           | 4.02                  |
| Buffalo City Local Municipality                | 19           | 3.85                  |
| Rustenburg Local Municipality                  | 20           | 3.77                  |
| Kruger National Park District Management Area  | 21           | 3.76                  |
| Nokeng tsa Taemane Local Municipality          | 22           | 3.64                  |
| The Msunduzi Local Municipality                | 23           | 3.3                   |
| Tlokwe Local Municipality (Potchefstroom)      | 24           | 3.12                  |
| Metsimaholo Local Municipality                 | 25           | 2.94                  |
| Lesedi Local Municipality                      | 26           | 2.87                  |
| George Local Municipality                      | 27           | 2.71                  |
| Sunday's River Valley Local Municipality       | 28           | 2.7                   |
| Mossel Bay Local Municipality                  | 29           | 2.69                  |
| Kalahari District Management Area              | 30           | 2.64                  |

Between 2001 and 2007 there were 11 local municipalities that remained in the top-30 rankings. The biggest climber of the 11 local municipalities was the Bitou Local Municipality (Plettenberg Bay), which was ranked 24<sup>th</sup> in 2001 and ranked 11<sup>th</sup> in 2007. The biggest dropper, the Kruger National Park District, was the 2<sup>nd</sup> highest ranking in 2001 and the 21<sup>st</sup> highest ranking in 2007.

The Breede Valley Local Municipality is the only municipality that maintained a position in the top-5 municipalities from 2001 to 2007. The City of Johannesburg Metropolitan Municipality, City of Tshwane Metropolitan Municipality, City of Cape Town Metropolitan Municipality and the Ekurhuleni Metropolitan Municipality joined the group of top-5 local municipalities with the lowest fragility. These top-5 municipalities, along with others, climbed through the rankings and became less fragile. Table 4.8 presents the bottom-30 municipalities in 2007 with the highest fragility.

**Table 4.8: The local fragility and rankings of the bottom-30 local municipalities with the highest fragility in 2007**

| Local Municipality                             | 2007 Ranking | Local Fragility Index |
|------------------------------------------------|--------------|-----------------------|
| Kagisano Local Municipality                    | 1            | -4.04                 |
| Ratlou Local Municipality (Setla-Kgobi)        | 2            | -3.84                 |
| Aganang Local Municipality                     | 3            | -3.46                 |
| Moshaweng Local Municipality                   | 4            | -3.16                 |
| Moses Kotane Local Municipality                | 5            | -2.95                 |
| Greater Taung Local Municipality               | 6            | -2.9                  |
| Tswaing Local Municipality                     | 7            | -2.65                 |
| Blouberg Local Municipality                    | 8            | -2.46                 |
| Greater Tubatse Local Municipality             | 9            | -2.41                 |
| Elias Motsoaledi Local Municipality            | 10           | -2.35                 |
| Lepelle-Nkumpi Local Municipality              | 11           | -2.35                 |
| Dannhauser Local Municipality                  | 12           | -2.3                  |
| Molemole Local Municipality                    | 13           | -2.19                 |
| Tsolwana Local Municipality                    | 14           | -2.18                 |
| Bushbuckridge Local Municipality               | 15           | -2.07                 |
| Molopo Local Municipality                      | 16           | -1.92                 |
| uPhongolo Local Municipality                   | 17           | -1.87                 |
| Maruleng Local Municipality                    | 18           | -1.84                 |
| Mogalakwena Local Municipality                 | 19           | -1.8                  |
| Greater Letaba Local Municipality              | 20           | -1.74                 |
| Nkomazi Local Municipality                     | 21           | -1.73                 |
| Hlabisa Local Municipality                     | 22           | -1.64                 |
| Lephalale Local Municipality                   | 23           | -1.63                 |
| Inkwanca Local Municipality                    | 24           | -1.51                 |
| Ramotshere Moiloa Local Municipality (Zeerust) | 25           | -1.5                  |
| Ga-Segonyana Local Municipality                | 26           | -1.48                 |
| Tokologo Local Municipality                    | 27           | -1.45                 |
| Nquthu Local Municipality                      | 28           | -1.4                  |
| Senqu Local Municipality                       | 29           | -1.39                 |
| Ulundi Local Municipality                      | 30           | -1.38                 |

When the bottom-30 local municipalities with the highest fragility are analysed, only four of the municipalities featured in both years. This said, it can be concluded that 26 of the most fragile places in South Africa in 2001 were better off in 2007, and not featuring in the most fragile 30 municipalities. The four municipalities that stayed in the bottom 30 group were: Bushbuckridge Local Municipality, Aganang Local Municipality, Senqu Local Municipality and the Nquthu Local Municipality. The biggest climber was Aganang Local Municipality, climbing 8 places. The biggest dropper of the bottom-30 group was Senqu Local Municipality. Therefore, it is now clear which municipalities were the most fragile in 2001 and 2007 as well as the municipalities that were the least fragile in 2001 and 2007. However, the analysis does not provide reasons for why they were the biggest climbers or droppers.

In the discussion that follows, this dissertation will attempt to break down the index into the five factors used to construct the index, with the intention to give reasons as to why the municipalities were moving up or down the rankings. The factor loadings of the 5-top least fragile municipalities are given in Table 4.9.

**Table 4.9: Factor loadings of the top-5 least fragile municipalities.**

| LFI Ranking | Local Municipality                             | Factor 1 | Factor 2 | Factor 3 | Factor 4 | Factor 5 |
|-------------|------------------------------------------------|----------|----------|----------|----------|----------|
| 1           | City of Johannesburg Metropolitan Municipality | 0.46     | 1.79     | 0.54     | 1.80     | 2.95     |
| 2           | Breede Valley Local Municipality               | 0.24     | -0.20    | 2.16     | 4.87     | -0.72    |
| 3           | City of Tshwane Metropolitan Municipality      | 0.36     | 1.29     | 0.72     | 1.44     | 1.90     |
| 4           | City of Cape Town Metropolitan Municipality    | 0.87     | 1.10     | 0.71     | 0.16     | 2.80     |
| 5           | GP - Ekurhuleni Metropolitan Municipality      | 0.07     | 1.40     | 0.76     | 1.11     | 2.10     |

As seen in Table 4.9, the variance in the City of Johannesburg Metropolitan Municipality was mostly explained by factors 2, 4 and 5. The leap of the City of Johannesburg Metropolitan Municipality into the top-30 least fragile decile may be as a result of better economic growth and production in the municipality. The variance in the municipality may also be explained by the result of factor 2 or, in other words, less crime. The crime rate can also be the effect of stronger regulations and actions in terms of the police force in the municipality. The Breede Valley Local Municipality's sustaining its position in the top-5 least fragile places may have been driven mainly by factors 3 and 4. This municipality is home to approximately 152 921 people and had an annual population growth rate of 1.3 per cent between 2001 and 2006. It also sustained a low unemployment rate of approximately 17 per cent, which is below the national average. They currently have an initiative to develop opportunities to increase growth rates through the



absorption of the current labour force, since the municipality has a low economic growth rate of around 2.56 per cent (Breede Valley Local Municipality IDP, 2007-2012). Factor 3 represents a driver for exports. The municipality is a main exporter of wine, which could have also contributed to the sustained position in the top-5 least fragile places. The City of Tshwane Metropolitan Municipality's position in the top-5 can be explained by increases in factors 2, 4 and 5. The municipality has an increasing rate of urbanisation and improved service delivery. The municipality's jump into the top-5 could have been supported by the local municipalities' Integrated Development Plan, which would invest around R2 billion. They have other initiatives that help the municipality to acquire a position into the top-5, such as investment in industrial exports, upgrading the inner city, and the development of small business support programmes. The City of Cape Town Metropolitan Municipality was mainly driven by factor 5, which could be the increase in income per capita from R58 478 in 2001 to R84 656 in 2005 (Global Insight South Africa, Regional Explorer, 2007). The Ekurhuleni Metropolitan Municipality was also mainly driven by factor 5, which could also have been the increase in income per capita from R42 407 in 2001 to R63 079 in 2005 (Global Insight South Africa, Regional Explorer, 2007).

#### **4.5 Summary and conclusion**

In the literature presented in the previous chapters, many different methods for the measurement of vulnerability / fragility on different levels were explored. This chapter set forward the method used by Naudé *et al.* (2008) and constructed a Local Fragility Index for the 231 local municipalities and 6 metropolitan municipalities, at sub-national level. The data used came from the 2001 Census and 2007 Community Survey and is sourced from the Regional Economic Explorer (REX) database. The construction of the local fragility index was done using the principle component analysis, which identified the five factors used to construct the index. The index was constructed and the results show that the local fragility index provides a reasonable description of the geographical identification of the most and least fragile municipalities in South Africa. The results also showed that the list for top-5 most and least fragile municipalities did not remain the same for 2001 and 2007. The only exception was the Breede Valley Local Municipality, which remained in the top-5 least fragile list, moving from the first position in 2001 to the second position in 2006. The least fragile municipalities in 2001 include the Breede Valley Local Municipality, Kruger National Park, Hantam Local Municipality, St Lucia Park and Rustenburg Local Municipality, and in 2007 the City of Johannesburg Metropolitan Municipality, Breede Valley Local Municipality, City of Tshwane Metropolitan

Municipality, City of Cape Town Metropolitan Municipality and Ekurhuleni Metropolitan Municipality. The most fragile municipalities in 2001 include the Mbizana Local Municipality, Thulamela Local Municipality, Mhlontlo Local Municipality, Umzimvubu Local Municipality, Ntabakulu Local Municipality and Engcobo Local Municipality, and in 2007 the Kagiso Local Municipality, Ratlou Local Municipality, Aganang Local Municipality, Moshaweng Local Municipality and Moses Kotane Local Municipality. The focus, however, should not be placed on which municipality is ranked where, but rather on why the municipality moved up or down the ranking. In the next chapter, the dissertation will be summarised and concluded, as well as provide recommendations for further research.

## **Chapter 5: Summary, Conclusions and Recommendations**

### **5.1 Introduction**

Since the attainment of democracy in 1994, the government of South Africa has been faced with the difficult challenge of poverty alleviation. In response, government adopted the RDP as its social policy framework. The focus was on the delivery of services to satisfy basic needs and aid development. Today, research suggests that new approaches are required to address the challenge of poverty: the focus has to be extended beyond poverty to vulnerability and fragility and interventions have to be targeted to the places where vulnerable people live. In this dissertation, the fragility of municipalities in South Africa was measured through the construction of a Local Fragility Index. This final chapter presents a summary, the conclusions and recommendations of the research.

### **5.2 Summary**

Chapter 1 introduced the research and stated the problem that this dissertation set out to examine: to measure vulnerability at sub-national level in South Africa. The motivation for the research draws on the facts of the immense challenge of poverty that South Africa faces, the inequality that characterises the spatial distribution of economic opportunities and the lack of capacity of local governments that may make South African regions more vulnerable. There is still a significant risk that non-poor people will become poor and poor people will remain in poverty. Chapter 1 outlined the general objective of the study, which was to construct indicators of local fragility in South Africa and briefly outlined the method used to construct the local fragility index.

In Chapter 2, the literature on fragility at national, household and regional level was explored. This dissertation examined some measurements associated with fragility on these three levels. Naudé *et al.* (2008) argued that vulnerability of place, or in other words fragility of local municipalities, is distinct from national or households economic fragility. Chapter 2 started off by conceptualising fragile states and found that governments have the responsibility to provide basic services. If the government fails to provide these services, it will hamper growth and development and may ultimately cause the state to fail. Furthermore, this chapter pointed out that economies that are small or remote are more vulnerable to external shocks. When the



vulnerability of poor households was examined, this chapter found that the focus should be placed on the vulnerability and its correlation with poverty. It also found that the information required to measure fragility on this level is hard to come by. In Chapter 2, a third strand of research was explored, which focussed on the fragility at sub-national level. Working down from the national level, the focus on a specific place may show that vulnerability is a function of the economic geography and socio-political forces of a region. As such, regional-level income shocks or regional level government capacity can be sources of covariate risk that leave households vulnerable. Working up from the household level, analysis of the environment in which poor households live, may shed light on the existence of spatial pockets of poverty.

In Chapter 3, the case for South Africa was explored. The focus was on poverty and places in South Africa. An overview was presented of national level research, local economic development research, and a study of the impacts of local protests. It found that most of the research in South Africa uses national-level data and focuses on poverty in terms of the different races and rural-urban divide. It was also shown that the measures of poverty should include non-economic variables as well, such as access to basic services. The literature showed that poverty can be alleviated through local economic development initiatives, but often local policies do not succeed. The chapter also found that when the governments do not succeed in addressing poverty, the local communities protest against them. These protests were also found to have devastating impacts on the local economy of the municipality. The chapter concluded that when policies are formulated, the focus should remain on the poor, and that there is still a lack of research on fragility, which could act as an appropriate ex-ante measure of poverty.

Chapter 4 described the empirical analysis and construction of the local fragility index. The aim was to extend the work of Naudé *et al.* (2008) in two important ways. Firstly, the spatial unit of analysis was the local municipality, compared to the magisterial districts used in the earlier index. Secondly, the data used included new data from the most recent 2007 Community Survey that focused specifically on the delivery of basic services at local level. The method used to construct the index was a principle component analysis. Making use of this method allows one to screen the data, extract factors, determine communalities and calculate factors scores that are then used to construct the index. This chapter found that the rankings in the top-5 most and least fragile municipalities, for 2001 and 2007, did not stay the same. The most fragile municipality in 2001 was Mbizana Local Municipality and Kagisano Local Municipality in

2007. Breede Valley Local Municipality was the least fragile in 2001 and the City of Johannesburg Metropolitan Municipality in 2007.

### **5.3 Conclusions**

In conclusion, this dissertation achieved its objective of constructing an indicator of local fragility. The achievement of the specific objectives allows one to draw a number of conclusions:

- In Chapter 2, the review of the literature of fragile states and households clearly showed that the literature on fragile regions is small but growing. Further analysis of the link between the fragility of places and the vulnerability of households to poverty is clearly needed.
- In Chapter 3, the overview of the South African literature showed that the challenge of poverty in South Africa remains. However, researchers should in future look at broader concepts such as fragility and vulnerability and focus on the places where the poor and vulnerable live. Policy interventions have a place-specific character and it will be useful to know more about the places that require assistance.
- In Chapter 4, the construction of the local fragility index indicated that it is possible to identify the places in South Africa that are more and less fragile. This information may then be used to undertake specific policy interventions. The construction of the index also highlighted the importance of basic service delivery as a way to mitigate the vulnerability of households to poverty.

### **5.4 Recommendations for further research**

At the start, this dissertation argued that South Africa has a number of characteristics that in the absence of strong institutions could render it more vulnerable. Where this dissertation demonstrated a way to measure the vulnerability, more research is required when it comes to institutions; specifically governance at local level. Once fragile places have been identified, local policy interventions have to be designed and implemented and the literature shows that local governments have been less than successful. In a number of places there have been violent protests over poor service delivery.

An example of the need for a closer look at local governance would be the National Treasury's recent proposal that the responsibility for housing should be shifted from provincial to municipal

level (Ensor, 2008). Also, the funds that are allocated to provinces for housing should be allocated to the municipal level. The provincial governments feel that this shift would have a positive impact on housing delivery since the municipalities may overcome the lack in capacity and technical expertise to effectively provide and deliver this basic service. Whether the plan would work this well, is clearly a case for future research.

Future research should aim to identify fragile local governments and make policy recommendations for improved governance and delivery.

### ***Summary of key authors mentioned in this dissertation***

|                                   |                                                                                                                           |                                                                                                                                                                    |                                                                                                                                                                                                                                            |
|-----------------------------------|---------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Alwang, Siegel & Jorgensen (2001) | Vulnerability: a view from different disciplines.                                                                         | This paper presents a selective review of the literature from several disciplines to examine how they define and measure vulnerability.                            | They found that the measurement of the forms of vulnerability require different tools and different measurement systems.                                                                                                                   |
| Armstrong & Read (1998)           | Trade and growth in small states: the impact of global trade liberalisation.                                              | This paper addresses the impact of global trade liberalisation upon the growth prospects of small states.                                                          | They found that export-driven policies have a significant effect on growth, since modest increases in export result in tremendous growth for small states.                                                                                 |
| Armstrong & Read (2002)           | The phantom of liberty: economic growth and the vulnerability of micro-states.                                            | This paper is concerned with the relationship between economic growth in small states and their vulnerability.                                                     | Their results suggest that any discussion of economic vulnerability needs to distinguish between the instability effects of external dependence and the growth effects of trade and these may be very difficult to disentangle.            |
| Armstrong & Read (2003)           | The determinants of economic growth in small states.                                                                      | Their paper provides a critical survey of the principal theoretical issues and empirical findings relating to the analysis of the economic growth of small states. | Their discussion of the empirical evidence relating to small states in their paper demonstrates that their small size is not necessarily a hindrance to sustained economic growth and the attainment of high levels of per capita incomes. |
| Binns & Nel (1999)                | Beyond the development impasse: the role of local economic development and community self-reliance in rural South Africa. | The paper examines the concepts of self-reliance and local economic development in the context of development challenges.                                          | They found that research, in terms of LED should not reject the concept of development, but rather strive to formulate different paths to reach the same goal.                                                                             |
| Binns & Nel (2002)                | Supporting local economic development in post-apartheid South Africa.                                                     | This paper reviews current Local Economic Development policy in South Africa.                                                                                      | They found that greater levels of intervention will be needed to fully address the massive scale of the current local development needs.                                                                                                   |
| Binzel & Brück (2007)             | Analyzing conflict and fragility at the micro level.                                                                      | Their paper offers a framework for the analysis of fragility at the household level.                                                                               | They found that the strength of their conceptual framework, which serves as a basis for micro-econometric impact studies, can be used for impact studies on fragility as                                                                   |

well as conflict.

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| Bird, McKay & Shinyelawa (2007)               | Isolation and poverty in Uganda: applying an index of isolation.                                              | This paper uses available quantitative data to develop composite indices of isolation for Uganda based on a series of indicators of access to infrastructure and services, and uses this to examine the relationship between isolation and different aspects of poverty. | They concluded that isolation might be an important cause of poverty, since the individual has less interaction with the market, have less chances of benefitting from developmental programs and are not able to make use of facilities. |
| Bosker & Krugell (2008)                       | Regional income evolution in South Africa after apartheid.                                                    | Their paper uses (spatial) Markov chain techniques to describe the evolution of the entire cross-section regional income distribution in terms of its intra-distributional characteristics during the post-Apartheid period.                                             | They found a heavily diverging regional income distribution, where relatively poor regions are likely to remain poor and become even poorer and the richest regions will retain their lead in income levels.                              |
| Botes, Lenka, Marais, Matebesi & Sigen (2007) | The cauldron of local protests: reasons, impacts and lessons learned.                                         | The paper discusses the reasons, impacts and lessons learned from local protests, using four case studies.                                                                                                                                                               | The paper concluded and suggested the lessons learned from local protests.                                                                                                                                                                |
| Breier, & Visser (2006)                       | Community-based provision of development services in rural South Africa.                                      | They combined economic and case study analysis to draw conclusions for development policy.                                                                                                                                                                               | They found that the rural communities are best equipped to overcome the free riding problems when, social capability is strong.                                                                                                           |
| Briguglio (1995)                              | Small island development states and their economic vulnerabilities.                                           | In his paper the major vulnerabilities faced by SIDS are discussed and when possible quantified in the form of an index.                                                                                                                                                 | His paper found that SIDS are more vulnerable to external shocks for which they have no control over.                                                                                                                                     |
| Briguglio (2003)                              | The vulnerability index and small island developing states: a review of conceptual and methodological issues. | His paper argued that economic backwardness may be associated with limited resilience and/or limited ability to cope with and to manage vulnerability.                                                                                                                   | His paper found that SIDS tends to be more economically vulnerable than other groups of countries.                                                                                                                                        |

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| Briguglio, Cordina, Farrugia & Vella (2004) | Economic vulnerability and resilience: concepts and measurements.                                                         | Their paper briefly reviews the work already done on economic vulnerability and extends research work carried so far towards developing a conceptual and methodological framework for the definition and measurement of economic resilience. | Their paper has show that GDP per capita is positively related to economic resilience and negatively related to inherent economic vulnerability. Furthermore, per capita GDP is found to be more sensitive to resilience variables than to vulnerability variables. |
| Budlender (1999)                            | Patterns of poverty in South Africa.                                                                                      | The paper examines the economic status of men and woman living in households with different incomes.                                                                                                                                         | He found that woman are disadvantaged compared with men in terms of economic status and earnings.                                                                                                                                                                   |
| Burger (2005)                               | What we have learnt from post-1994 innovations in pro-poor service delivery in South Africa: a case study-based analysis. | She assembled a case study-based analysis using four of the post-1994 trend in service delivery in South Africa.                                                                                                                             | She found that decentralisation and increased participation from the community can help to maintain historical distributions of privilege.                                                                                                                          |
| Carter & Barret (2005)                      | The economics of poverty traps and persistent poverty: an asset-based approach.                                           | Their paper uses an asset-based approach to effectively identify poverty traps and chronic poverty.                                                                                                                                          | Thus, they found that the measurement should not only measure who the poor are, but also assist in the identification of conditions and policies needed to effectively address alleviating poverty.                                                                 |
| Carter & May (1997)                         | Poverty, livelihood and class in rural South Africa.                                                                      | This paper disaggregates and explores the economics of livelihood generation and class in rural South Africa.                                                                                                                                | They found that poverty is a matter of not only having few assets, but also of constraints which limit the effectiveness with which those assets are used.                                                                                                          |
| Carter & May (1999)                         | One kind of freedom: poverty dynamics in post-apartheid South Africa.                                                     | They explored the composition of livelihood generation as well as different groups in the rural South Africa.                                                                                                                                | They found that rural communities in South Africa have a fundamentally heterogeneous nature.                                                                                                                                                                        |
| Chaudhuri (2003)                            | Assessing vulnerability to poverty: concepts, empirical methods and illustrative examples.                                | In his paper, he makes the case for broadening the scope of poverty assessments to take account of vulnerability to poverty and outline a conceptual and                                                                                     | He found that households who are vulnerable to transitory poverty are in a sense more likely to be only transitorily poor, whereas households who are structurally poor are more likely to be chronically                                                           |

|                                     |                                                                                                          | empirical approach for doing so.                                                                                                                                                                                | poor.                                                                                                                                                                                            |
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| Chaudhuri, Jalan & Suryahadi (2002) | Assessing household vulnerability to poverty: a methodology and estimates for Indonesia.                 | Their paper estimated the vulnerability of households.                                                                                                                                                          | They found that the distribution of vulnerability across different segments of the population can differ markedly from the distribution of poverty.                                              |
| Chauvet & Collier (2002)            | Development effectiveness in fragile states: spillovers and turnarounds.                                 | Their paper attempts to quantify some neglected potential effects of aid, thereby improving overall guidance on aid effectiveness.                                                                              | They found that even with the very limited distinction between technical assistance and other forms of aid, the issue of what form of aid is appropriate at what time is important.              |
| Clark (2003)                        | Concepts and perceptions of human well-being: some evidence from South Africa.                           | This paper reported on the concepts and perceptions of wellbeing from a comparison of a rural village called Murraysburg and an urban township known as Wallacedene.                                            | The paper found that three aspects were important to maintain a "good life" and includes: jobs, housing and education.                                                                           |
| Collier & Hoeffler (2004)           | The challenge of reducing the global incidence of war                                                    | This paper explores some impact that war have on a country                                                                                                                                                      | They found that the cost of a civil war in a low-income fragile state can reach up to \$54 billion                                                                                               |
| Cordina (2004)                      | Economic vulnerability and economic growth: some results from a neo-classical growth modelling approach. | His paper incorporates economic vulnerability within a neo-classical economic growth model to seek an explanation to the observation that a number of vulnerable economies enjoy high per capita output levels. | His results show that vulnerable economies tend to have a higher per capita capital output but lower consumption.                                                                                |
| De Leon (2006)                      | Vulnerability: a conceptual and methodological review.                                                   | He developed a procedure to measure four types of vulnerability of households caused by natural disaster.                                                                                                       | He found that there are many different views on vulnerability stemming from different research groups around the globe, which is indicative of the fact that this field remains "unsettled" yet. |
| Dercon (2001)                       | Assessing vulnerability to poverty.                                                                      | The paper explores an ex-ante measure of vulnerability and its links to poverty at household level.                                                                                                             | He found that what matters in this measurement are not the values of the determinants, but rather the ability of mobilising them.                                                                |



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| Francois & Sud (2006)             | Promoting stability and development in fragile and failed states.            | Their article examines the causes of state failure and explores the development approaches being proposed to deal with failed states.                             | They found that rebuilding weak states is an arduous process that cannot be accelerated through massive external assistance.                                                                                                                                                                                                                |
| Günther & Klasen (2006)           | Measuring chronic non-income poverty.                                        | Their paper examines conceptual and empirical issues surrounding ways to measure chronic and transitory poverty from a non-income perspective.                    | They found that there is more dynamics in non-income dimensions of poverty than commonly presumed although particularly the education and nutrition indicators are somewhat more stable than income poverty.                                                                                                                                |
| Harris (1999)                     | The challenge of local government delivery.                                  | His article focuses on the challenges facing transformed local government in actually delivering the developmental role and services set out in the Constitution. | He found that improved service delivery will have to come from improved and better-directed performance.                                                                                                                                                                                                                                    |
| Hirschowitz & Orkin (1997)        | Inequality in South Africa: findings from the 1994 October Household Survey. | This paper explores inequality and relative deprivation as the main problems to be addressed in SA.                                                               | They found that that large-scale development programmes are required to overcome the inequalities of the past.                                                                                                                                                                                                                              |
| Hoff & Stiglitz (2001)            | Modern economic theory and development.                                      | This paper describes the changes in economic theory as regards to the difference of industrialised and developing countries.                                      | They found that formal theory now extends to many areas of imperfect information and incomplete contracting.                                                                                                                                                                                                                                |
| Hoff, Braverman & Stiglitz (1993) | The economics of rural organization: theory, practice, and policy.           | They explained some phenomenon surrounding developmental issues.                                                                                                  | They found that the shift in the development is a function of governments from that of "planning and programming" to that of "market facilitation"; and emerging revisions in the theory of market failure - and, thus, of the theory of public intervention - from "structural" failure to neo-institutionalise/transaction cost failures. |



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| Holzman & Jorgensen (2000)                 | Social risk management: a conceptual framework for social protection and beyond.                                                    | Their paper proposes a new definition and conceptual framework for Social Protection grounded in Social Risk Management.                                                                                                                          | They found that there is still much to be done, since the challenge for poverty alleviation policies, however remains, to effectively address vulnerability issues for the poor. |
| Hulme, Moore & Shepherd (2001)             | Chronic poverty: meanings and analytical frameworks.                                                                                | They examined the meanings of chronic poverty using a multi-dimensional sense.                                                                                                                                                                    | They found that the poor people or individuals do not care about the level of their income, rather about the loss of their primary source of living.                             |
| Le Roux Booysen (2003)                     | The extent of, and possible explanations for, provincial disparities in progress on reconstruction and development in South Africa. | The aim of the article is to assess the early progress of South Africa's nine provinces in delivering on the Reconstruction and Development Programme (RDP).                                                                                      | He found that provinces that are more urbanised have advantages over the more rural provinces.                                                                                   |
| Leader & Colenso (2005)                    | Aid instruments in fragile states                                                                                                   | Their paper describes the limitations of the current approach to the selection of aid instruments in fragile states as well as a selection of aid instruments that appear to offer promise for achieving a range of objectives in fragile states. | They found that budget support can be very useful in some fragile states if sufficient safeguards are put in place.                                                              |
| Leibbrandt, Poswell, Naidoo & Welch (2006) | Measuring recent changes in South African inequality and poverty.                                                                   | They examine patterns of access poverty and inequality with a comparison of 1996 and 2001 Census data.                                                                                                                                            | They found that urbanised provinces are in an advantageous starting position, compared with more rural provinces in terms of delivery on reconstruction and development.         |
| Leibbrandt, Woolard & Bhorat (2000)        | Understanding contemporary household inequality in South Africa.                                                                    | They analysed different techniques to understand the nature of household inequality in South Africa.                                                                                                                                              | They found that inequality <i>between</i> different sub-groups is smaller than the inequality <i>within</i> sub-groups.                                                          |

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| Ligon & Schechter (2002)   | Measuring vulnerability: the director's cut.                                                                                                                            | They constructed a simple measure of vulnerability of households which is derived from the difference between the utility a household would consume and the expected consumption of a specific utility. | They found that education is the most useful way to reduce vulnerability.                                                                                                                                                                                                                                        |
| Ligon & Schechter (2004)   | Evaluating different approaches to estimating vulnerability.                                                                                                            | This paper argues that a household with very low expected consumption expenditures but with no chance of starving may well be poor.                                                                     | They found that the best measure to use when estimating household vulnerability is the one proposed by Chaudhuri <i>et al.</i> (2002) and if the distribution of the household's consumption is non-stationary, then the measure constructed by Pritchett <i>et al.</i> (2000) will provide the best estimation. |
| McGrath & Whiteford (1994) | Inequality in the size distribution of income in South Africa.                                                                                                          | This paper explored the inequalities in SA, and focussed on the 1991 population survey, and other income and expenditure surveys.                                                                       | They found that income distributed to the African households only flowed to the richest decile, whilst the economic condition of the poorest group has worsened.                                                                                                                                                 |
| Møller & Devey (2003)      | Trends in living conditions and satisfaction among poorer older South Africans: objective and subjective indicators of quality of life in the October Household Survey. | The paper explores how the poorer households have benefitted from government interventions.                                                                                                             | They found that the most effective mechanism for poverty alleviation is to facilitate the build-up of a supportive pension fund.                                                                                                                                                                                 |
| Møller & Dickow (2002)     | The role of quality of life surveys in managing change in democratic transitions: the South African case.                                                               | They explored the quality of life surveys and the role it played in managing the democratic transitions.                                                                                                | They found that , in South Africa the average person is not happy about the quality of their life, as is not the case in other developing countries.                                                                                                                                                             |
| Møller (1989)              | Can't get no satisfaction: quality of life in the 1980s.                                                                                                                | The paper examined the nature of poverty and the way it affects the South African lives.                                                                                                                | She found that satisfaction with community services and infrastructure is the only area in which perceived inequality has narrowed during the 1980s.                                                                                                                                                             |

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| Møller (1994)                       | Post election euphoria.                                                                                  | The paper examines happiness and satisfaction with life after the first democratic election of south Africa.                                                   | She found that in the future, levels of happiness and satisfaction might lag below black ones.                                                                                    |
| Møller (1995)                       | Waiting for Utopia: Quality of life in the 1990s.                                                        | The paper explored the quality of life during the 1990s.                                                                                                       | She found that the narrowing gap between perceived quality of life of black and white people reflects the growing concern for the previously under privileged.                    |
| Møller (1999)                       | South African quality of life trend in the late 1990s: major divides in perceptions.                     | The paper reports on trend data collected from national surveys.                                                                                               | She found that the majority of South Africans stand a good change of reconciling with better levels of happiness.                                                                 |
| Møller (2000)                       | Happiness trends under democracy: where will the new South African set-level come to rest?               | The paper reports on factors which include life satisfaction, happiness and expectations for the future.                                                       | She found that when determining levels of subjective quality of life, coping mechanisms may play an important role.                                                               |
| Møller (2001)                       | Monitoring quality of life in cities: The Durban case.                                                   | She reports on results from the pilot study.                                                                                                                   | She found that satisfaction with housing and the neighbourhood, as indicated by disinclination to move, were major factors contributing to life satisfaction of Durban residents. |
| Møller (2004)                       | Researching quality of life in a developing country: lessons from the South African case.                | This paper reports on the South African Quality of Life Trends Project, which commenced in the late 1970s, and spans over twenty-five years.                   | They found that groups higher up in the apartheid pecking order scored higher on life satisfaction than those lower down.                                                         |
| Naudé, McGillivray & Rossouw (2008) | Measuring the vulnerability of sub-national regions.                                                     | The paper sets out to discuss the measurement of vulnerability, condition the local vulnerability index as well as include geographical indicators in the LVI. | They found that the 'vulnerability of place' is a potentially important concept that needs to be taken into consideration in dealing with human wellness within a country.        |
| Nel & Binns (2001)                  | Initiating 'developmental local government' in South Africa: evolving local economic development policy. | Their paper review recent local economic development policy and legal developments with regards to requirements and expectations.                              | They found that in contrast to other developing countries some innovative strategies are being examined which would break the traditional mould of state-centred planning.        |

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| Ngwane, Yadavalli & Steffens (2003)   | Poverty in South Africa: statistical inference for decomposable poverty measures.                                               | This article explores some of the other decomposable poverty measures.                                                                            | They found large differences in poverty levels in the two top and bottom provinces.                                                                                                                                                    |
| Powdthavee (2003)                     | Is the structure of happiness equations the same in poor and rich countries? The case of South Africa.                          | This paper explores happiness trends in poor and rich countries. He used cross-sectional data from the SALDRU93 survey.                           | He found that happiness trends overall are the same, and that this is crucial information since people everywhere are the same.                                                                                                        |
| Pritchett, Suryahadi & Sumarto (2000) | Quantifying vulnerability to poverty: a proposed measure, applied to Indonesia.                                                 | The paper proposes a simple expansion of static poverty measures to include vulnerability.                                                        | They found significant differences across groups that would have been missed by the static measures of current consumption expenditures deficit poverty.                                                                               |
| Prowse (2003)                         | Towards a clearer understanding of vulnerability in relation to chronic poverty.                                                | The paper explored the understanding of vulnerability in terms of chronic poverty.                                                                | He found that the outcome of vulnerability is necessary when exploring chronic poverty, since it differentiates the chronic and temporarily poor from each other.                                                                      |
| Read (2001)                           | Growth, economic development and structural transition in small vulnerable states.                                              | This paper reviews the critical theoretical and policy issues relating to growth, economic development and structural transition in small states. | It is evident that small states are likely to be extremely sensitive to the impact of globalisation because of the interaction between their high degree of integration in the international economy and their inherent vulnerability. |
| Reardon (2000)                        | Challenges in fighting rural poverty in the globalizing economy of Latin America: focus on institutions, markets, and projects. | The paper focuses on the links between specific types of asset poverty and how poor households fare in various playing fields.                    | He found that the older heads of the household have generated assets; however, they are not educated.                                                                                                                                  |
| Rogerson (1996a)                      | Urban poverty and the informal economy in South Africa's economic heartland.                                                    | The paper describes urban poverty and the informal economy in the economic hub of South Africa.                                                   | His results show the limited possibilities for using the informal economy as a means of resolving pressing issues of poverty in South Africa's cities.                                                                                 |
| Rogerson (1996b)                      | Defence economic restructuring and conversion in South Africa.                                                                  | He examines issues of defence economic restructuring and conversion in South Africa.                                                              | He found that the Gauteng region emerges as the national 'gunbelt' of South Africa and contains an incipient military 'industrial district.                                                                                            |



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| Rogerson (1997)        | The changing post-apartheid city: emergent black-owned small enterprises in Johannesburg.                | This paper is concerned with the post-apartheid city and the changing racial complexion of small enterprises developing in the inner city of Johannesburg.                        | The findings point to the important and changing role of the inner city as incubator for developing black small enterprises in post-apartheid South Africa.                                                                   |
| Rogerson (1999)        | Local economic development and urban poverty alleviation: the experience of post-apartheid South Africa. | His paper reviews the experience of eight case studies of local economic development (LED) initiatives.                                                                           | He found that LED practitioners are currently struggling to find means to integrate their LED initiatives with the task of poverty alleviation.                                                                               |
| Rogerson (2000)        | Local economic development in an era of globalisation: the case of South African cities.                 | His paper focuses on the issue of LED planning in South Africa.                                                                                                                   | He found that several lessons may be learned from the South African experience in terms of LED planning.                                                                                                                      |
| Rogerson (2000)        | Local economic development in an era of globalisation: the case of South African cities.                 | This paper focuses on the issue of LED planning in South Africa as a case study in the local consequences and reactions to globalisation of city regions in the global periphery. | He found that the burden for economic responsibility has undergone dramatic restructuring from national to local government level.                                                                                            |
| Rogerson (2002)        | Pro-poor interventions for local economic development: the case for sectoral targeting.                  | His paper examines the directions of pro-poor LED interventions in the urban developing world.                                                                                    | He found that sectoral targeting can be deployed usefully to support the crystallisation of pro-poor urban LED interventions.                                                                                                 |
| Rogerson (2004)        | Pro-poor local economic development in South Africa: the application of public procurement.              | The paper is concerned with the application of a set of new initiatives for public procurement.                                                                                   | He found that there is growing interest by local authorities in the potential of applying targeted procurement for the achieving objectives for pro-poor local economic development.                                          |
| Rossouw & Naudé (2008) | The non-economic quality of life on a sub-national level in South Africa.                                | In their paper the main contribution was to construct objective indicators of the non-economic quality of life for 354 sub-national magisterial districts in South Africa.        | They find significant variation across space in non-income quality of life as well as that income does matter for the overall quality of life, non-income components of the quality of life can make an important difference. |

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| Rossouw (2007)                      | Sub-national differences in the quality of life in South Africa.                                      | The thesis explores measurements of non-economic quality of life indicators.                                                                                                               | She found that indicators such as annual rainfall, temperature and hours of sunshine can be seen as important indicators for quality of life.                                                    |
| Sen (1981)                          | Public action and the quality of life in developing countries.                                        | He explored developing countries and how they performed in terms of quality of life indicators.                                                                                            | He found that the nature of the economic problems faced by these countries has often tended to be ignored.                                                                                       |
| Sumner (2003)                       | Economic and non-economic well-being: a review of progress on the meaning and measurement of poverty. | His paper discusses advances in the measurement of quality of life and poverty over the last fifty years.                                                                                  | He found that although the measures give a deeper insight into the state of quality of life, it lacks the ability to pinpoint the exact headcount of the poor.                                   |
| Tomlinson (2003)                    | The local economic development mirage in South Africa.                                                | He explores the understanding of LED.                                                                                                                                                      | He found that LED, presented as a progressive government policy, is becoming ever more marginalized.                                                                                             |
| Torres & Anderson (2004)            | Fragile states: defining difficult environments for poverty reduction.                                | This paper explores fragile states with regards to development and aid.                                                                                                                    | They found that the key challenge highlighted by fragile states is how to make development aid effective in places that lack basic levels of state capacity and commitment to poverty reduction. |
| Turvey (2007)                       | Vulnerability assessment of developing countries: the case of small-island developing states.         | This article puts forward a spatial perspective in framing the methodology for vulnerability assessment of developing countries, with special reference to small-island developing states. | She found that including a geographical assessment into the vulnerability measure to construct a Composite Vulnerability Index (CVI) would broaden the view of economic vulnerability.           |
| Whiteford & Van Seventer (2000)     | South Africa's changing income distribution in the 1990s.                                             | They studied development trends explained by development in the labour market.                                                                                                             | They found that income from whites to previously disadvantaged population groups accelerated considerably during the 1990s.                                                                      |
| Whiteford, Posel & Kelatwang (1995) | A profile of poverty, inequality and human development in South Africa.                               | They used data from the Living Standards and Development Survey from 1993 as well as the 1991 Population census and calculated a poverty gap.                                              | They found that the most commonly used indicator of poverty is the head count measure, and they found that 45.7 per cent of individuals live in poverty.                                         |

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## Appendix A

**Table A1: 2001 Rankings for all of the local municipalities**

| Municipality                                             | Ranking | Local Fragility Index |
|----------------------------------------------------------|---------|-----------------------|
| Breede Valley Local Municipality                         | 1       | 9.6                   |
| Kruger National Park District Management Area            | 2       | 9.27                  |
| Hantam Local Municipality (including Namaqualand DMA)    | 3       | 8.57                  |
| St Lucia Park District Management Area                   | 4       | 6.94                  |
| Rustenburg Local Municipality                            | 5       | 6.39                  |
| Saldanha Bay Local Municipality                          | 6       | 5.61                  |
| uMhlathuze Local Municipality                            | 7       | 5.36                  |
| Sol Plaatjie Local Municipality                          | 8       | 5.25                  |
| Thabazimbi Local Municipality                            | 9       | 4.18                  |
| Thaba Chweu Local Municipality                           | 10      | 4.11                  |
| Benede District Management Area                          | 11      | 4.01                  |
| Kalahari District Management Area                        | 12      | 3.41                  |
| Kgatelopele Local Municipality (Dan-Lime)                | 13      | 2.79                  |
| Cederberg Local Municipality                             | 14      | 2.68                  |
| Kareeberg Local Municipality                             | 15      | 2.53                  |
| Richtersveld Local Municipality                          | 16      | 2.48                  |
| Tsantsabane Local Municipality                           | 17      | 2.4                   |
| Karoo Hoogland Local Municipality (Frasuwil)             | 18      | 2.36                  |
| Mier Local Municipality                                  | 19      | 2.2                   |
| Metsimaholo Local Municipality                           | 20      | 2.09                  |
| Oudtshoorn Local Municipality (including South Cape DMA) | 21      | 1.98                  |
| Breede River/Winelands Local Municipality                | 22      | 1.93                  |
| Knysna Local Municipality                                | 23      | 1.91                  |
| Bitou Local Municipality (Plettenberg Bay)               | 24      | 1.88                  |
| Local Municipality of Madibeng                           | 25      | 1.88                  |
| Thembelihle Local Municipality                           | 26      | 1.87                  |
| Gamagara Local Municipality                              | 27      | 1.82                  |
| Letsemeng Local Municipality                             | 28      | 1.81                  |
| Lowveld District Management Area                         | 29      | 1.73                  |
| Steve Tshwete Local Municipality (Middelburg)            | 30      | 1.7                   |
| Matzikama Local Municipality                             | 31      | 1.59                  |
| Drakenstein Local Municipality                           | 32      | 1.56                  |
| Emalahleni Local Municipality (Mpumalanga)               | 33      | 1.54                  |
| Ba-Phalaborwa Local Municipality                         | 34      | 1.53                  |
| Prince Albert Local Municipality                         | 35      | 1.51                  |
| Siyathemba Local Municipality (including Bo Karoo DMA)   | 36      | 1.49                  |
| Nama Khoi Local Municipality                             | 37      | 1.47                  |

|                                                                |    |      |
|----------------------------------------------------------------|----|------|
| Cape Agulhas Local Municipality (including Overberg DMA)       | 38 | 1.41 |
| Kou-Kamma Local Municipality                                   | 39 | 1.41 |
| City of Tshwane Metropolitan Municipality                      | 40 | 1.39 |
| West Coast District Management Area                            | 41 | 1.38 |
| Witzenberg Local Municipality                                  | 42 | 1.35 |
| Khai-Ma Local Municipality                                     | 43 | 1.35 |
| Theewaterskloof Local Municipality                             | 44 | 1.31 |
| Mossel Bay Local Municipality                                  | 45 | 1.21 |
| Buffalo City Local Municipality                                | 46 | 1.21 |
| Lesedi Local Municipality                                      | 47 | 1.21 |
| Stellenbosch Local Municipality                                | 48 | 1.2  |
| Nelson Mandela Bay Metropolitan Municipality                   | 49 | 1.19 |
| Tokologo Local Municipality                                    | 50 | 1.16 |
| Sunday's River Valley Local Municipality                       | 51 | 1.14 |
| Kgetlengrivier Local Municipality                              | 52 | 1.09 |
| Bergvriër Local Municipality                                   | 53 | 1.08 |
| Kannaland Local Municipality                                   | 54 | 1.08 |
| Nokeng tsa Taemane Local Municipality                          | 55 | 1.08 |
| Breede River District Management Area                          | 56 | 1.07 |
| Midvaal Local Municipality                                     | 57 | 1.07 |
| Swartland Local Municipality                                   | 58 | 1.06 |
| Tswelopele Local Municipality                                  | 59 | 0.97 |
| Govan Mbeki Local Municipality (Highveld)                      | 60 | 0.95 |
| Merafong City Local Municipality                               | 61 | 0.91 |
| Kamiesberg Local Municipality                                  | 62 | 0.88 |
| Ga-Segonyana Local Municipality                                | 63 | 0.87 |
| Westonaria Local Municipality                                  | 64 | 0.85 |
| Swellendam Local Municipality                                  | 65 | 0.75 |
| Gariep Local Municipality (Eastern Cape)                       | 66 | 0.74 |
| Ubuntu Local Municipality                                      | 67 | 0.71 |
| Khara Hais Local Municipality                                  | 68 | 0.69 |
| Laingsburg Local Municipality                                  | 69 | 0.63 |
| Kopanong Local Municipality                                    | 70 | 0.62 |
| Renosterberg Local Municipality                                | 71 | 0.61 |
| Lekwa Local Municipality (Standerton)                          | 72 | 0.61 |
| Musina Local Municipality                                      | 73 | 0.6  |
| Beaufort West Local Municipality (including Central Karoo DMA) | 74 | 0.59 |
| IKai! Garib Local Municipality                                 | 75 | 0.59 |
| Emthanjeni Local Municipality                                  | 76 | 0.58 |
| Hessequa Local Municipality (Langeberg)                        | 77 | 0.4  |
| George Local Municipality                                      | 78 | 0.34 |
| City of Matlosana (Klerksdorp)                                 | 79 | 0.34 |
| Matjhabeng Local Municipality                                  | 80 | 0.33 |

|                                                             |     |       |
|-------------------------------------------------------------|-----|-------|
| Overstrand Local Municipality                               | 81  | 0.32  |
| Delmas Local Municipality                                   | 82  | 0.32  |
| Masilonyana Local Municipality                              | 83  | 0.31  |
| City of Johannesburg Metropolitan Municipality              | 84  | 0.3   |
| !Kheis Local Municipality                                   | 85  | 0.3   |
| Kouga Local Municipality                                    | 86  | 0.27  |
| Msukaligwa Local Municipality                               | 87  | 0.24  |
| Tlokwe Local Municipality (Potchefstroom)                   | 88  | 0.17  |
| Greater Kokstad Local Municipality                          | 89  | 0.16  |
| Kungwini Local Municipality                                 | 90  | 0.15  |
| Ekurhuleni Metropolitan Municipality                        | 91  | 0.13  |
| Blue Crane Route Local Municipality                         | 92  | 0.11  |
| Emadlangeni Local Municipality (Utrecht)                    | 93  | 0.11  |
| Ventersdorp Local Municipality                              | 94  | 0.11  |
| Camdeboo Local Municipality                                 | 95  | 0.1   |
| Baviaans Local Municipality                                 | 96  | 0.09  |
| Dikgatlong Local Municipality (including Diamondfields DMA) | 97  | 0.08  |
| Moqhaka Local Municipality                                  | 98  | 0.07  |
| Tswaing Local Municipality                                  | 99  | 0.03  |
| Emakhazeni Local Municipality (Highlands)                   | 100 | 0.02  |
| Magareng Local Municipality                                 | 101 | 0     |
| uMngeni Local Municipality                                  | 102 | -0.04 |
| Siyancuma Local Municipality                                | 103 | -0.07 |
| Naledi Local Municipality                                   | 104 | -0.07 |
| Ikwezi Local Municipality                                   | 105 | -0.09 |
| Mogale City Local Municipality (including Sterkfontein DMA) | 106 | -0.09 |
| Nxuba Local Municipality                                    | 107 | -0.1  |
| Inxuba Yethemba Local Municipality                          | 108 | -0.11 |
| Lephalale Local Municipality                                | 109 | -0.11 |
| Randfontein Local Municipality                              | 110 | -0.14 |
| Aberdeen Plain District Management Area                     | 111 | -0.15 |
| Lekwa-Teemane Local Municipality                            | 112 | -0.17 |
| Umjindi Local Municipality                                  | 113 | -0.19 |
| Umsobomvu Local Municipality                                | 114 | -0.21 |
| Nala Local Municipality                                     | 115 | -0.24 |
| uMshwathi Local Municipality                                | 116 | -0.29 |
| Bela-Bela Local Municipality                                | 117 | -0.31 |
| Dipaleseng Local Municipality                               | 118 | -0.32 |
| Mbombela Local Municipality                                 | 119 | -0.33 |
| Tsolwana Local Municipality                                 | 120 | -0.39 |
| Endumeni Local Municipality                                 | 121 | -0.39 |
| Mbonambi Local Municipality                                 | 122 | -0.39 |
| Mookgopong Local Municipality                               | 123 | -0.45 |



|                                                    |            |              |
|----------------------------------------------------|------------|--------------|
| Makana Local Municipality                          | 124        | -0.47        |
| <b>Maquassi Hills Local Municipality</b>           | <b>125</b> | <b>-0.47</b> |
| Dihlabeng Local Municipality                       | 126        | -0.48        |
| <b>Abaqulusi Local Municipality</b>                | <b>127</b> | <b>-0.48</b> |
| Ditsobotla Local Municipality (Lichtenburg)        | 128        | -0.48        |
| <b>Mkhondo Local Municipality</b>                  | <b>129</b> | <b>-0.52</b> |
| Mangaung Local Municipality                        | 130        | -0.54        |
| <b>uPhongolo Local Municipality</b>                | <b>131</b> | <b>-0.56</b> |
| Mamusa Local Municipality (Schweizer-Reneke)       | 132        | -0.56        |
| <b>Ndlambe Local Municipality</b>                  | <b>133</b> | <b>-0.58</b> |
| Umhlabuyalingana Local Municipality                | 134        | -0.58        |
| <b>Ngwathe Local Municipality</b>                  | <b>135</b> | <b>-0.64</b> |
| Umtshezi Local Municipality                        | 136        | -0.65        |
| <b>Pixley Ka Seme Local Municipality</b>           | <b>137</b> | <b>-0.66</b> |
| Mantsopa Local Municipality                        | 138        | -0.67        |
| <b>Dannhauser Local Municipality</b>               | <b>139</b> | <b>-0.68</b> |
| Maletswai Local Municipality                       | 140        | -0.7         |
| <b>Amahlati Local Municipality</b>                 | <b>141</b> | <b>-0.71</b> |
| Naledi Local Municipality (Free State)             | 142        | -0.72        |
| <b>Okhahlamba Local Municipality</b>               | <b>143</b> | <b>-0.72</b> |
| Moses Kotane Local Municipality                    | 144        | -0.74        |
| <b>Mohokare Local Municipality</b>                 | <b>145</b> | <b>-0.76</b> |
| Modimolle Local Municipality                       | 146        | -0.76        |
| <b>City of Cape Town Metropolitan Municipality</b> | <b>147</b> | <b>-0.77</b> |
| Greater Tubatse Local Municipality                 | 148        | -0.77        |
| <b>Setsoto Local Municipality</b>                  | <b>149</b> | <b>-0.79</b> |
| Mafube Local Municipality                          | 150        | -0.79        |
| <b>Mooi Mpofana Local Municipality</b>             | <b>151</b> | <b>-0.8</b>  |
| Molopo Local Municipality                          | 152        | -0.81        |
| <b>Newcastle Local Municipality</b>                | <b>153</b> | <b>-0.84</b> |
| Phokwane Local Municipality                        | 154        | -0.85        |
| <b>The Msunduzi Local Municipality</b>             | <b>155</b> | <b>-0.87</b> |
| Richmond Local Municipality                        | 156        | -0.87        |
| <b>Mtubatuba Local Municipality</b>                | <b>157</b> | <b>-0.89</b> |
| Mandeni Local Municipality (Endondakusuka)         | 158        | -0.92        |
| <b>Nketoana Local Municipality</b>                 | <b>159</b> | <b>-0.93</b> |
| Maluti a Phofung Local Municipality                | 160        | -0.93        |
| <b>Greater Tzaneen Local Municipality</b>          | <b>161</b> | <b>-0.93</b> |
| Kwa Sani Local Municipality                        | 162        | -1           |
| <b>Inkwanca Local Municipality</b>                 | <b>163</b> | <b>-1.02</b> |
| Phumelela Local Municipality                       | 164        | -1.02        |
| <b>Albert Luthuli Local Municipality</b>           | <b>165</b> | <b>-1.03</b> |
| Ramotshere Moiloa Local Municipality (Zeerust)     | 166        | -1.08        |

|                                             |     |       |
|---------------------------------------------|-----|-------|
| Umvoti Local Municipality                   | 167 | -1.12 |
| Mkhambathini Local Municipality             | 168 | -1.15 |
| Nkonkobe Local Municipality                 | 169 | -1.18 |
| Ingwe Local Municipality                    | 170 | -1.19 |
| Nkomazi Local Municipality                  | 171 | -1.2  |
| KwaDukuza Local Municipality                | 172 | -1.21 |
| Mthonjaneni Local Municipality              | 173 | -1.23 |
| Mogalakwena Local Municipality              | 174 | -1.23 |
| Makhado Local Municipality                  | 175 | -1.26 |
| Elias Motsoaledi Local Municipality         | 176 | -1.27 |
| Lukhanji Local Municipality                 | 177 | -1.28 |
| Ernambithi-Ladysmith Local Municipality     | 178 | -1.28 |
| Maruleng Local Municipality                 | 179 | -1.29 |
| Ntambanana Local Municipality               | 180 | -1.32 |
| eDumbe Local Municipality                   | 181 | -1.36 |
| Jozini Local Municipality                   | 182 | -1.38 |
| Ubuhlebezwe Local Municipality              | 183 | -1.39 |
| uMlalazi Local Municipality                 | 184 | -1.42 |
| Blouberg Local Municipality                 | 185 | -1.45 |
| Hlabisa Local Municipality                  | 186 | -1.46 |
| Polokwane Local Municipality                | 187 | -1.48 |
| Mafikeng Local Municipality                 | 188 | -1.5  |
| eThekweni Metropolitan Municipality         | 189 | -1.56 |
| Emfuleni Local Municipality                 | 190 | -1.57 |
| Moshaweng Local Municipality                | 191 | -1.57 |
| Molemole Local Municipality                 | 192 | -1.59 |
| Greater Taung Local Municipality            | 193 | -1.6  |
| Port St Johns Local Municipality            | 194 | -1.64 |
| uMuziwabantu Local Municipality             | 195 | -1.64 |
| Hibiscus Coast Local Municipality           | 196 | -1.64 |
| Ezingoleni Local Municipality (Izingolweni) | 197 | -1.65 |
| Matatiele Local Municipality                | 198 | -1.77 |
| Kagisano Local Municipality                 | 199 | -1.79 |
| Ndwedwe Local Municipality                  | 200 | -1.86 |
| Maphumulo Local Municipality                | 201 | -1.86 |
| Ratlou Local Municipality (Setla-Kgobi)     | 202 | -1.86 |
| Ulundi Local Municipality                   | 203 | -1.87 |
| Vulamehlo Local Municipality                | 204 | -1.88 |
| Greater Letaba Local Municipality           | 205 | -1.88 |
| Great Kei Local Municipality                | 206 | -1.89 |
| Umdoni Local Municipality                   | 207 | -1.98 |
| Qaukeni Local Municipality (Ingquza Hill)   | 208 | -2.05 |
| Lepelle-Nkumpi Local Municipality           | 209 | -2.08 |

|                                           |     |       |
|-------------------------------------------|-----|-------|
| Sakhisizwe Local Municipality             | 210 | -2.09 |
| Nquthu Local Municipality                 | 211 | -2.1  |
| Umzumbe Local Municipality (Khiphinkunzi) | 212 | -2.12 |
| Emalahleni Local Municipality             | 213 | -2.16 |
| Mnquma Local Municipality                 | 214 | -2.17 |
| Umzimkhulu Local Municipality (Umzimkulu) | 215 | -2.19 |
| Mbhashe Local Municipality                | 216 | -2.24 |
| Senqu Local Municipality                  | 217 | -2.27 |
| Nyandeni Local Municipality               | 218 | -2.29 |
| King Sabata Dalindyebo Local Municipality | 219 | -2.3  |
| Intsika Yethu Local Municipality          | 220 | -2.43 |
| Imbabazane Local Municipality             | 221 | -2.45 |
| Nkandla Local Municipality                | 222 | -2.56 |
| Aganang Local Municipality                | 223 | -2.64 |
| Mutale Local Municipality                 | 224 | -2.67 |
| Msinga Local Municipality                 | 225 | -2.69 |
| Elundini Local Municipality               | 226 | -2.75 |
| Bushbuckridge Local Municipality          | 227 | -2.83 |
| Engcobo Local Municipality                | 228 | -2.9  |
| Ntabankulu Local Municipality             | 229 | -3.02 |
| Umzimvubu Local Municipality              | 230 | -3.05 |
| Mhlontlo Local Municipality               | 231 | -3.2  |
| Thulamela Local Municipality              | 232 | -3.3  |
| Mbizana Local Municipality                | 233 | -3.81 |

**Table A2: 2007 Rankings for all of the local municipalities**

| Municipality                                                | Ranking | Local Fragility Index |
|-------------------------------------------------------------|---------|-----------------------|
| City of Johannesburg Metropolitan Municipality              | 1       | 7.55                  |
| Breedee Valley Local Municipality                           | 2       | 6.35                  |
| City of Tshwane Metropolitan Municipality                   | 3       | 5.72                  |
| City of Cape Town Metropolitan Municipality                 | 4       | 5.64                  |
| Ekurhuleni Metropolitan Municipality                        | 5       | 5.44                  |
| Sol Plaatjie Local Municipality                             | 6       | 5.41                  |
| Saldanha Bay Local Municipality                             | 7       | 5.08                  |
| Stellenbosch Local Municipality                             | 8       | 4.94                  |
| Drakenstein Local Municipality                              | 9       | 4.91                  |
| uMhlathuze Local Municipality                               | 10      | 4.78                  |
| Bitou Local Municipality (Plettenberg Bay)                  | 11      | 4.67                  |
| Overstrand Local Municipality                               | 12      | 4.6                   |
| Thaba Chweu Local Municipality                              | 13      | 4.47                  |
| Midvaal Local Municipality                                  | 14      | 4.43                  |
| eThekweni Metropolitan Municipality                         | 15      | 4.34                  |
| Nelson Mandela Bay Metropolitan Municipality                | 16      | 4.25                  |
| Knysna Local Municipality                                   | 17      | 4.12                  |
| St Lucia Park District Management Area                      | 18      | 4.02                  |
| Buffalo City Local Municipality                             | 19      | 3.85                  |
| Rustenburg Local Municipality                               | 20      | 3.77                  |
| Kruger National Park District Management Area               | 21      | 3.76                  |
| Nokeng tsa Taemane Local Municipality                       | 22      | 3.64                  |
| The Msunduzi Local Municipality                             | 23      | 3.3                   |
| Tlokwe Local Municipality (Potchefstroom)                   | 24      | 3.12                  |
| Metsimaholo Local Municipality                              | 25      | 2.94                  |
| Lesedi Local Municipality                                   | 26      | 2.87                  |
| George Local Municipality                                   | 27      | 2.71                  |
| Sunday's River Valley Local Municipality                    | 28      | 2.7                   |
| Mossel Bay Local Municipality                               | 29      | 2.69                  |
| Kalahari District Management Area                           | 30      | 2.64                  |
| Randfontein Local Municipality                              | 31      | 2.64                  |
| Lowveld District Management Area                            | 32      | 2.63                  |
| Maletswai Local Municipality                                | 33      | 2.5                   |
| Mogale City Local Municipality (including Sterkfontein DMA) | 34      | 2.48                  |
| Makana Local Municipality                                   | 35      | 2.43                  |
| Govan Mbeki Local Municipality (Highveld)                   | 36      | 2.41                  |
| Emthanjeni Local Municipality                               | 37      | 2.4                   |
| Thabazimbi Local Municipality                               | 38      | 2.23                  |
| Kouga Local Municipality                                    | 39      | 2.19                  |
| Hantam Local Municipality (including Namaqualand DMA)       | 40      | 2.18                  |
| Emfuleni Local Municipality                                 | 41      | 2.09                  |



|                                                          |    |      |
|----------------------------------------------------------|----|------|
| Emalahleni Local Municipality (Mpumalanga)               | 42 | 2.08 |
| Cape Agulhas Local Municipality (including Overberg DMA) | 43 | 2.07 |
| Richtersveld Local Municipality                          | 44 | 2.06 |
| Swellendam Local Municipality                            | 45 | 1.98 |
| Theewaterskloof Local Municipality                       | 46 | 1.96 |
| Mangaung Local Municipality                              | 47 | 1.95 |
| Hibiscus Coast Local Municipality                        | 48 | 1.93 |
| Ndlambe Local Municipality                               | 49 | 1.9  |
| Khara Hais Local Municipality                            | 50 | 1.88 |
| Steve Tshwete Local Municipality (Middelburg)            | 51 | 1.85 |
| Westonaria Local Municipality                            | 52 | 1.79 |
| Matjhabeng Local Municipality                            | 53 | 1.75 |
| Kungwini Local Municipality                              | 54 | 1.73 |
| Kou-Kamma Local Municipality                             | 55 | 1.72 |
| Oudtshoorn Local Municipality (including South Cape DMA) | 56 | 1.68 |
| Umdoni Local Municipality                                | 57 | 1.64 |
| uMngeni Local Municipality                               | 58 | 1.6  |
| Umjindi Local Municipality                               | 59 | 1.57 |
| Emakhazeni Local Municipality (Highlands)                | 60 | 1.47 |
| Bela-Bela Local Municipality                             | 61 | 1.44 |
| Witzenberg Local Municipality                            | 62 | 1.43 |
| Beaufort West Local Municipality                         | 63 | 1.42 |
| KwaDukuza Local Municipality                             | 64 | 1.41 |
| Mookgopong Local Municipality                            | 65 | 1.33 |
| Swartland Local Municipality                             | 66 | 1.31 |
| Dihlabeng Local Municipality                             | 67 | 1.29 |
| Camdeboo Local Municipality                              | 68 | 1.23 |
| Modimolle Local Municipality                             | 69 | 1.23 |
| West Coast District Management Area                      | 70 | 1.18 |
| Msukaligwa Local Municipality                            | 71 | 1.16 |
| Cederberg Local Municipality                             | 72 | 1.13 |
| City of Matlosana (Klerksdorp)                           | 73 | 1.11 |
| Delmas Local Municipality                                | 74 | 1.04 |
| Musina Local Municipality                                | 75 | 1.04 |
| Local Municipality of Madibeng                           | 76 | 1.02 |
| Breede River District Management Area                    | 77 | 0.94 |
| Renosterberg Local Municipality                          | 78 | 0.88 |
| Matzikama Local Municipality                             | 79 | 0.86 |
| Endumeni Local Municipality                              | 80 | 0.85 |
| Greater Kokstad Local Municipality                       | 81 | 0.82 |
| Breede River/Winelands Local Municipality                | 82 | 0.77 |
| Port St Johns Local Municipality                         | 83 | 0.76 |
| Emnambithi-Ladysmith Local Municipality                  | 84 | 0.69 |

|                                                        |     |      |
|--------------------------------------------------------|-----|------|
| Merafong City Local Municipality                       | 85  | 0.69 |
| Karoo Hoogland Local Municipality (Frasuwil)           | 86  | 0.66 |
| Naledi Local Municipality                              | 87  | 0.65 |
| Kwa Sani Local Municipality                            | 88  | 0.63 |
| Thembelihle Local Municipality                         | 89  | 0.61 |
| Umtshezi Local Municipality                            | 90  | 0.61 |
| Lekwa Local Municipality (Standerton)                  | 91  | 0.61 |
| Gamagara Local Municipality                            | 92  | 0.6  |
| !Kheis Local Municipality                              | 93  | 0.58 |
| Bergvriervier Local Municipality                       | 94  | 0.57 |
| Kamiesberg Local Municipality                          | 95  | 0.53 |
| Kareeberg Local Municipality                           | 96  | 0.53 |
| Letsemeng Local Municipality                           | 97  | 0.52 |
| Great Kei Local Municipality                           | 98  | 0.47 |
| Mtubatuba Local Municipality                           | 99  | 0.47 |
| Mkhondo Local Municipality                             | 100 | 0.46 |
| Amahlati Local Municipality                            | 101 | 0.45 |
| Lukhanji Local Municipality                            | 102 | 0.45 |
| Mandeni Local Municipality (Endondakusuka)             | 103 | 0.45 |
| Benede District Management Area                        | 104 | 0.4  |
| Mbizana Local Municipality                             | 105 | 0.38 |
| Lekwa-Teemane Local Municipality                       | 106 | 0.37 |
| Umsobomvu Local Municipality                           | 107 | 0.34 |
| Inxuba Yethemba Local Municipality                     | 108 | 0.33 |
| Nkandla Local Municipality                             | 109 | 0.33 |
| Siyathemba Local Municipality (including Bo Karoo DMA) | 110 | 0.32 |
| Vulamehlo Local Municipality                           | 111 | 0.32 |
| Mnquma Local Municipality                              | 112 | 0.31 |
| uMlalazi Local Municipality                            | 113 | 0.31 |
| Mbombela Local Municipality                            | 114 | 0.31 |
| Setso Local Municipality                               | 115 | 0.3  |
| Siyancuma Local Municipality                           | 116 | 0.29 |
| Kgatelopele Local Municipality (Dan-Lime)              | 117 | 0.28 |
| Magareng Local Municipality                            | 118 | 0.27 |
| Thulamela Local Municipality                           | 119 | 0.26 |
| Sakhisizwe Local Municipality                          | 120 | 0.22 |
| Ntambanana Local Municipality                          | 121 | 0.21 |
| !Kai! Garib Local Municipality                         | 122 | 0.2  |
| Newcastle Local Municipality                           | 123 | 0.14 |
| Mbonambi Local Municipality                            | 124 | 0.14 |
| King Sabata Dalindyebo Local Municipality              | 125 | 0.11 |
| Dipaleseng Local Municipality                          | 126 | 0.11 |
| Moqhaka Local Municipality                             | 127 | 0.06 |

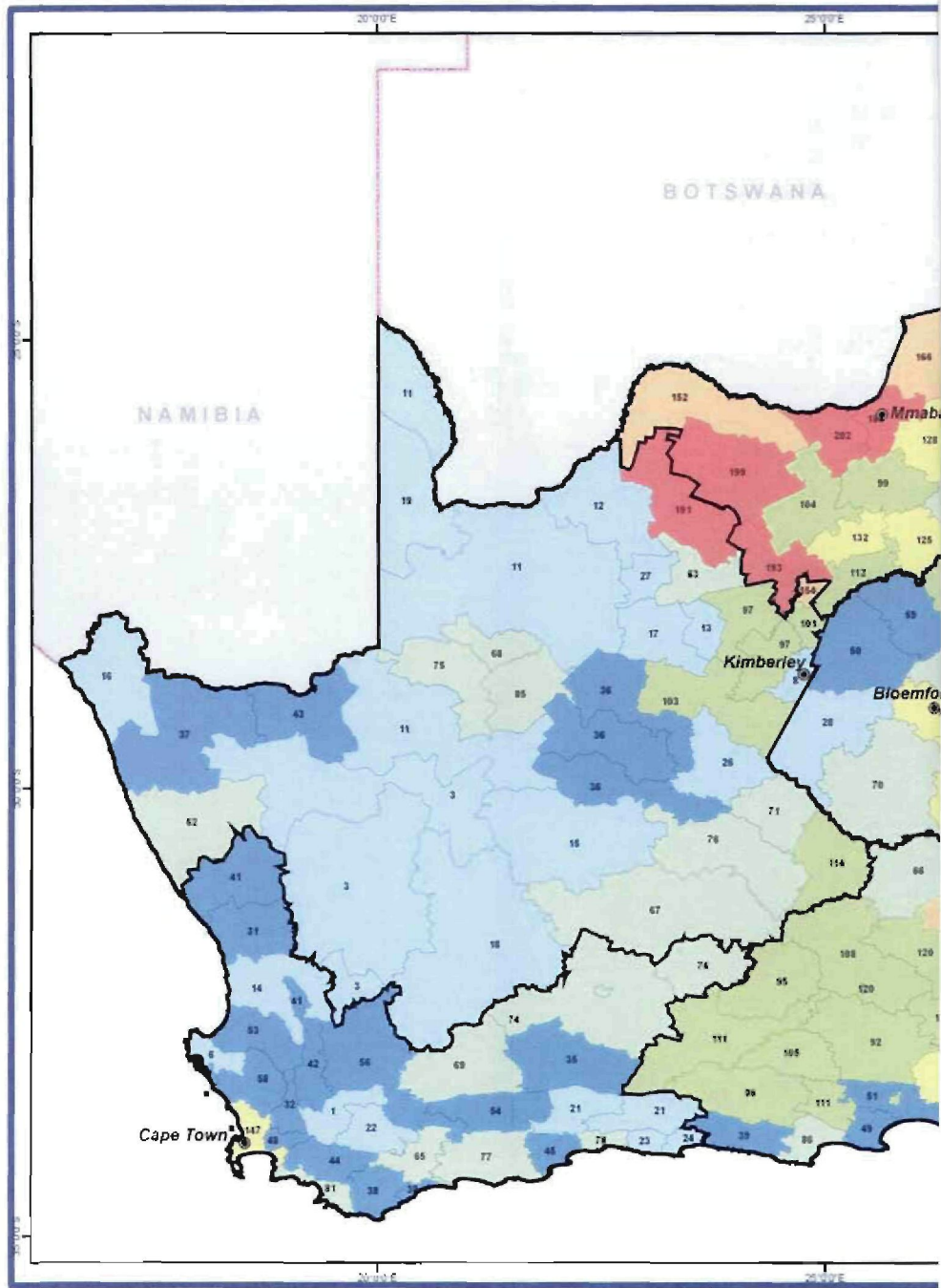
|                                                             |     |       |
|-------------------------------------------------------------|-----|-------|
| Greater Tzaneen Local Municipality                          | 128 | 0.06  |
| Umvoti Local Municipality                                   | 129 | 0.03  |
| Umzimkhulu Local Municipality (Umzimkulu)                   | 130 | 0.03  |
| Mhlontlo Local Municipality                                 | 131 | 0.02  |
| Mbhashe Local Municipality                                  | 132 | 0.01  |
| Kgetlengrivier Local Municipality                           | 133 | -0.01 |
| Ubuhlebezwe Local Municipality                              | 134 | -0.03 |
| Nama Khoi Local Municipality                                | 135 | -0.04 |
| Richmond Local Municipality                                 | 136 | -0.06 |
| Pixley Ka Seme Local Municipality                           | 137 | -0.06 |
| Ngwathe Local Municipality                                  | 138 | -0.07 |
| Hessequa Local Municipality (Langeberg)                     | 139 | -0.08 |
| Phokwane Local Municipality                                 | 140 | -0.09 |
| Gaukeni Local Municipality (Ingquza Hill)                   | 141 | -0.11 |
| Mohokare Local Municipality                                 | 142 | -0.13 |
| Masilonyana Local Municipality                              | 143 | -0.15 |
| Tsantsabane Local Municipality                              | 144 | -0.17 |
| Gariep Local Municipality (Eastern Cape)                    | 145 | -0.17 |
| Umzimvubu Local Municipality                                | 146 | -0.17 |
| Mantsopa Local Municipality                                 | 147 | -0.19 |
| Engcobo Local Municipality                                  | 148 | -0.2  |
| Kopanong Local Municipality                                 | 149 | -0.21 |
| Maluti a Phofung Local Municipality                         | 150 | -0.21 |
| Mooi Mpofana Local Municipality                             | 151 | -0.21 |
| Dikgatlong Local Municipality (including Diamondfields DMA) | 152 | -0.22 |
| Prince Albert Local Municipality                            | 153 | -0.24 |
| Blue Crane Route Local Municipality                         | 154 | -0.24 |
| Nyandeni Local Municipality                                 | 155 | -0.28 |
| Ingwe Local Municipality                                    | 156 | -0.31 |
| Khai-Ma Local Municipality                                  | 157 | -0.32 |
| Laingsburg Local Municipality                               | 158 | -0.38 |
| Ba-Phalaborwa Local Municipality                            | 159 | -0.38 |
| Mkhambathini Local Municipality                             | 160 | -0.41 |
| Elundini Local Municipality                                 | 161 | -0.42 |
| Ubuntu Local Municipality                                   | 162 | -0.43 |
| Naledi Local Municipality (Free State)                      | 163 | -0.46 |
| Nala Local Municipality                                     | 164 | -0.46 |
| Aberdeen Plain District Management Area                     | 165 | -0.47 |
| uMuziwabantu Local Municipality                             | 166 | -0.5  |
| Nxuba Local Municipality                                    | 167 | -0.52 |
| Emadlangeni Local Municipality (Utrecht)                    | 168 | -0.52 |
| Mthonjaneni Local Municipality                              | 169 | -0.52 |
| Baviaans Local Municipality                                 | 170 | -0.55 |

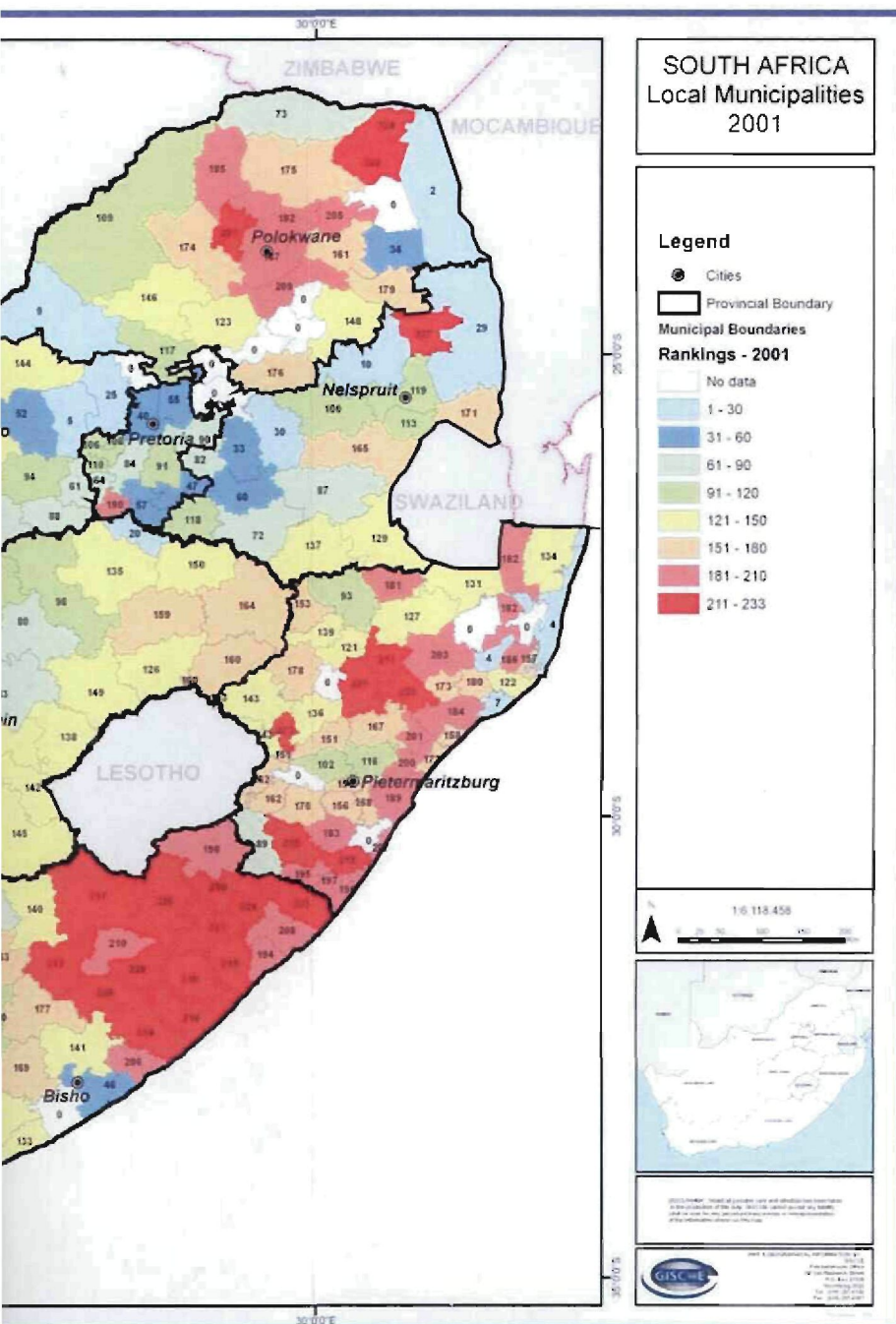
|                                                |     |       |
|------------------------------------------------|-----|-------|
| Polokwane Local Municipality                   | 171 | -0.58 |
| Mutale Local Municipality                      | 172 | -0.65 |
| Mataiele Local Municipality                    | 173 | -0.65 |
| Ikwezi Local Municipality                      | 174 | -0.68 |
| Ntabankulu Local Municipality                  | 175 | -0.68 |
| uMshwathi Local Municipality                   | 176 | -0.68 |
| Abaqulusi Local Municipality                   | 177 | -0.68 |
| Maquassi Hills Local Municipality              | 178 | -0.69 |
| Kannaland Local Municipality                   | 179 | -0.72 |
| Ditsobotla Local Municipality (Lichtenburg)    | 180 | -0.72 |
| Ndwedwe Local Municipality                     | 181 | -0.73 |
| Nkonkobe Local Municipality                    | 182 | -0.76 |
| Mamusa Local Municipality (Schweizer-Reneke)   | 183 | -0.77 |
| Mafube Local Municipality                      | 184 | -0.85 |
| Imbabazane Local Municipality                  | 185 | -0.85 |
| Umhlabuyalingana Local Municipality            | 186 | -0.85 |
| Okhahlamba Local Municipality                  | 187 | -0.86 |
| Mafikeng Local Municipality                    | 188 | -0.87 |
| Nketoana Local Municipality                    | 189 | -0.9  |
| Intsika Yethu Local Municipality               | 190 | -0.91 |
| Albert Luthuli Local Municipality              | 191 | -0.92 |
| Makhado Local Municipality                     | 192 | -0.95 |
| Phumelela Local Municipality                   | 193 | -0.96 |
| Ezingoleni Local Municipality (Izingolweni)    | 194 | -0.96 |
| Msinga Local Municipality                      | 195 | -0.96 |
| Jozini Local Municipality                      | 196 | -0.99 |
| Umzumbe Local Municipality (Khiphinkunzi)      | 197 | -1.01 |
| Ventersdorp Local Municipality                 | 198 | -1.01 |
| Tswelopele Local Municipality                  | 199 | -1.1  |
| eDumbe Local Municipality                      | 200 | -1.14 |
| Mier Local Municipality                        | 201 | -1.18 |
| Maphumulo Local Municipality                   | 202 | -1.21 |
| Emalahleni Local Municipality                  | 203 | -1.27 |
| Ufundi Local Municipality                      | 204 | -1.38 |
| Senqu Local Municipality                       | 205 | -1.39 |
| Nquthu Local Municipality                      | 206 | -1.4  |
| Tokologo Local Municipality                    | 207 | -1.45 |
| Ga-Segonyana Local Municipality                | 208 | -1.48 |
| Ramotshere Moiloa Local Municipality (Zeerust) | 209 | -1.5  |
| Inkwanca Local Municipality                    | 210 | -1.51 |
| Lephalale Local Municipality                   | 211 | -1.63 |
| Hlabisa Local Municipality                     | 212 | -1.64 |
| Nkomazi Local Municipality                     | 213 | -1.73 |

|                                         |     |       |
|-----------------------------------------|-----|-------|
| Greater Letaba Local Municipality       | 214 | -1.74 |
| Mogalakwena Local Municipality          | 215 | -1.8  |
| Maruleng Local Municipality             | 216 | -1.84 |
| uPhongolo Local Municipality            | 217 | -1.87 |
| Molopo Local Municipality               | 218 | -1.92 |
| Bushbuckridge Local Municipality        | 219 | -2.07 |
| Tsolwana Local Municipality             | 220 | -2.18 |
| Molemole Local Municipality             | 221 | -2.19 |
| Dannhauser Local Municipality           | 222 | -2.3  |
| Lepelle-Nkumpi Local Municipality       | 223 | -2.35 |
| Elias Motsoaledi Local Municipality     | 224 | -2.35 |
| Greater Tubatse Local Municipality      | 225 | -2.41 |
| Blouberg Local Municipality             | 226 | -2.46 |
| Tswaing Local Municipality              | 227 | -2.65 |
| Greater Taung Local Municipality        | 228 | -2.9  |
| Moses Kotane Local Municipality         | 229 | -2.95 |
| Moshaweng Local Municipality            | 230 | -3.16 |
| Aganang Local Municipality              | 231 | -3.46 |
| Ratlou Local Municipality (Setla-Kgobi) | 232 | -3.84 |
| Kagisano Local Municipality             | 233 | -4.04 |

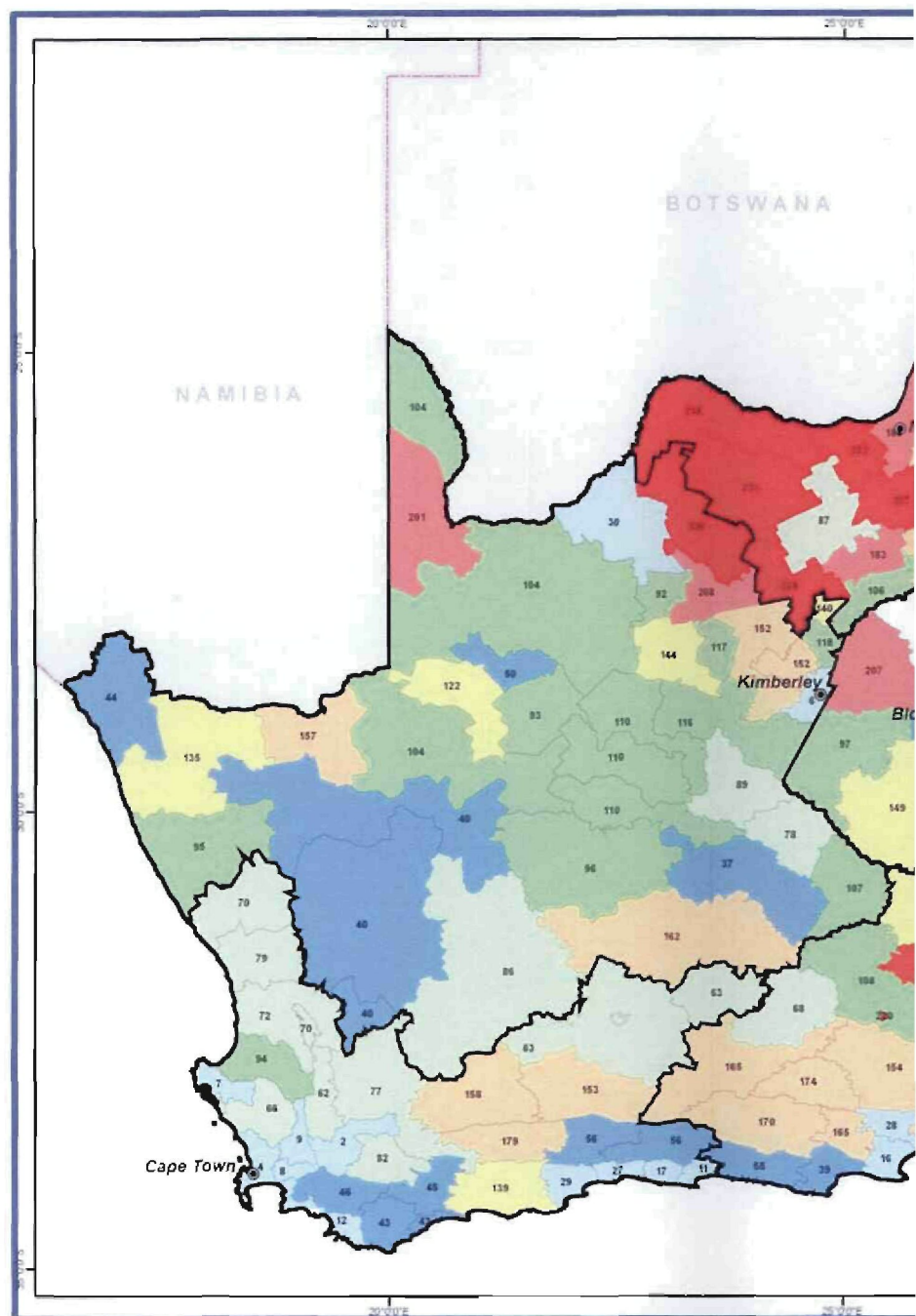


Figure 1: Map of rankings in 2001

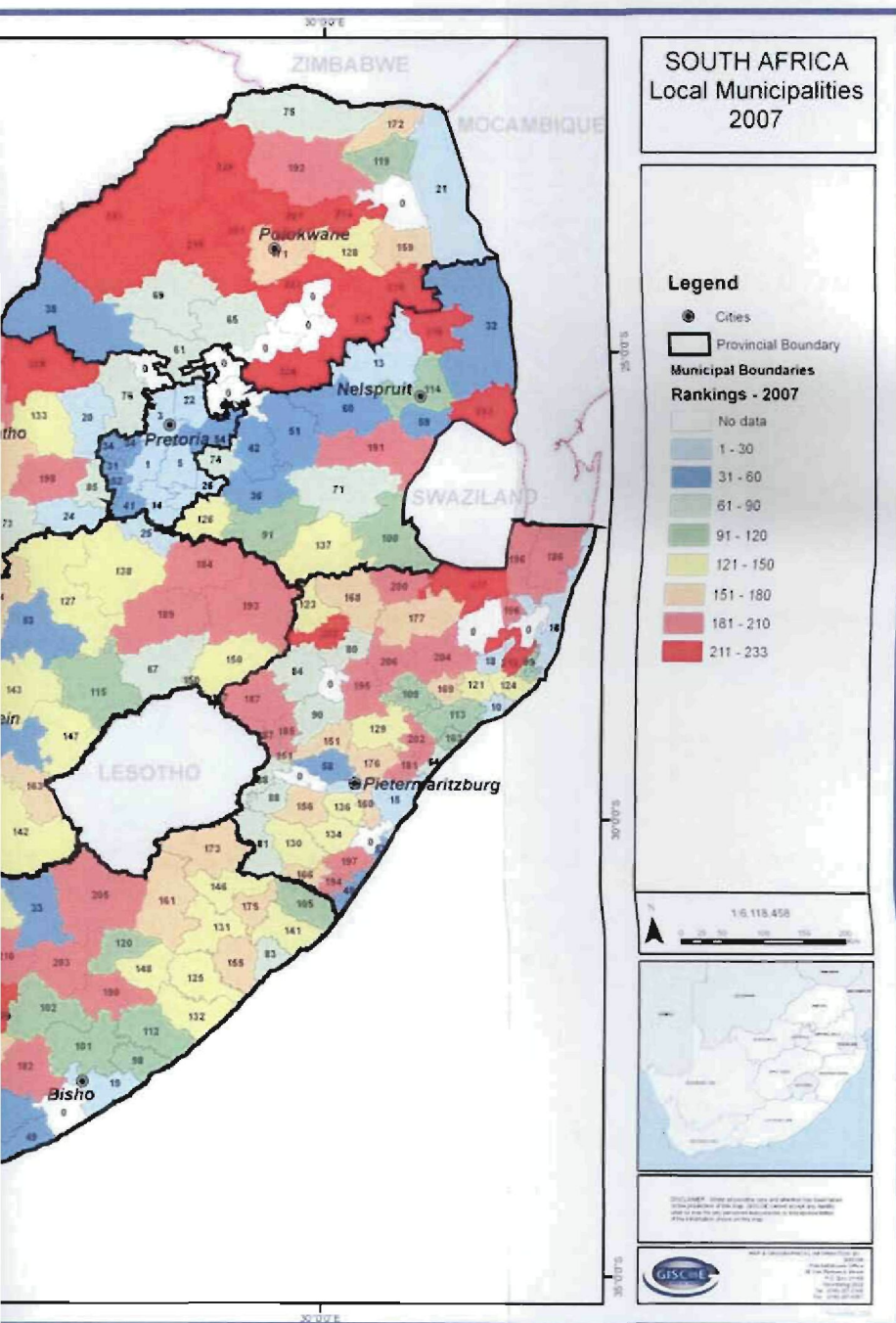




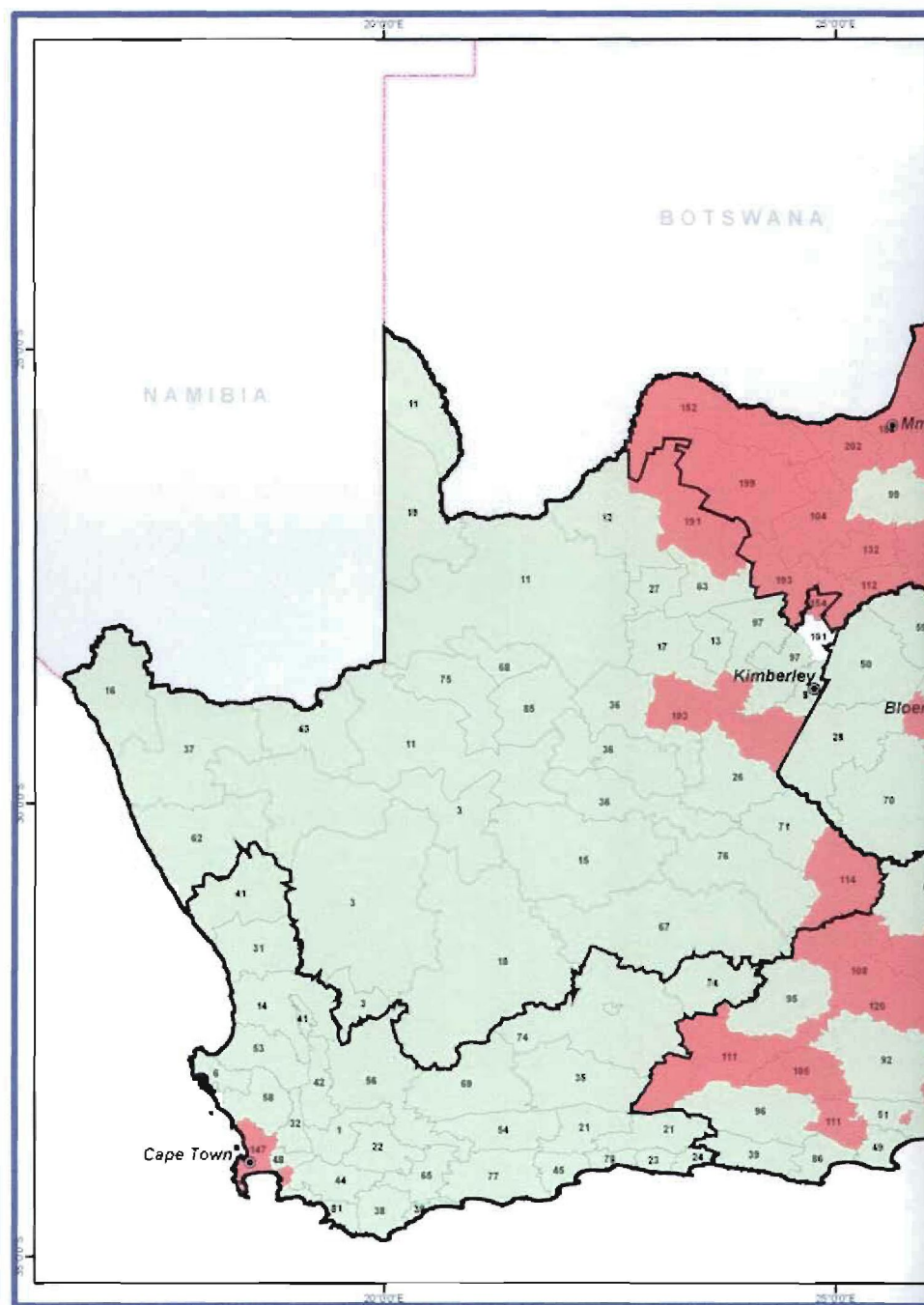
**Figure 2: Map of rankings in 2007**

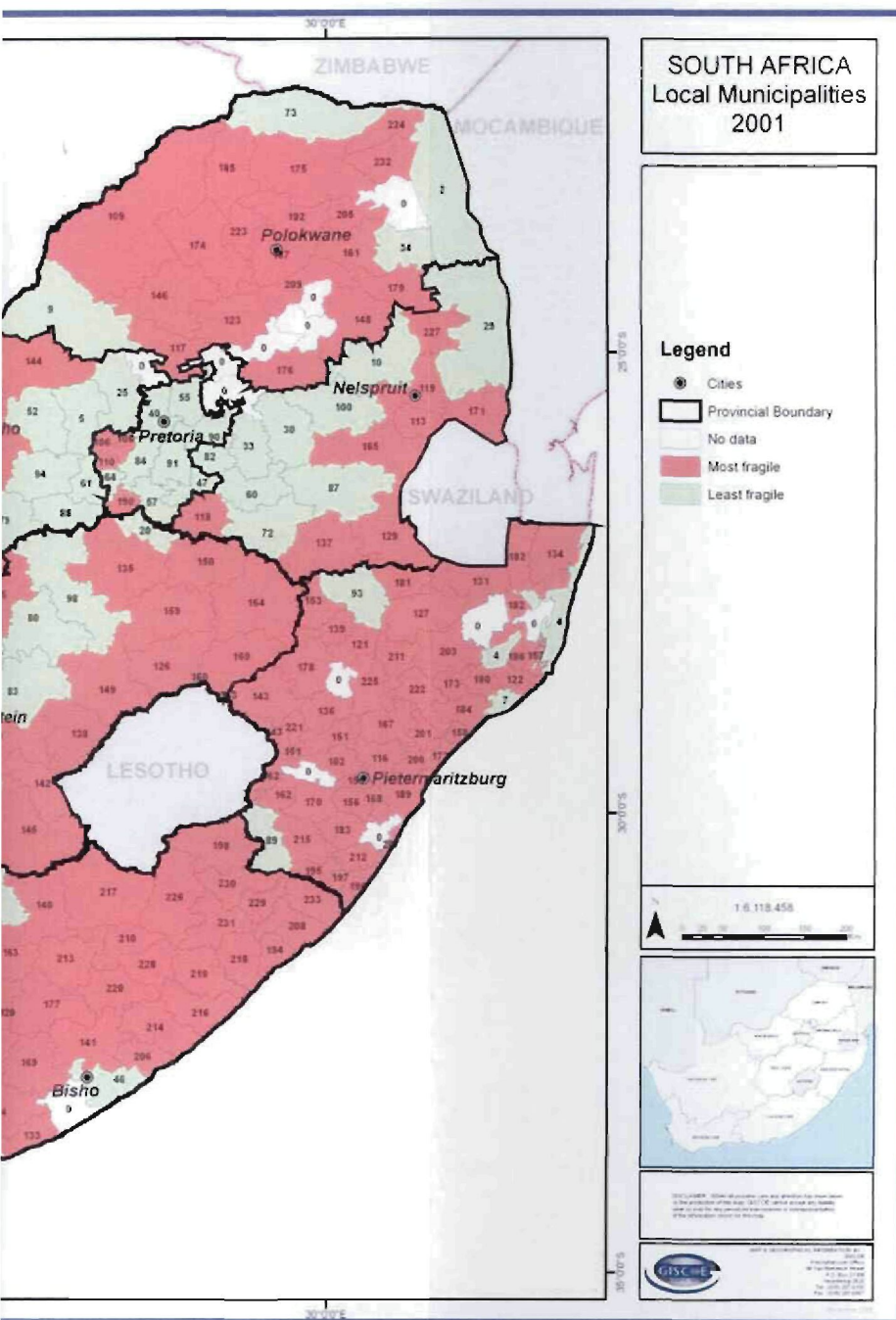




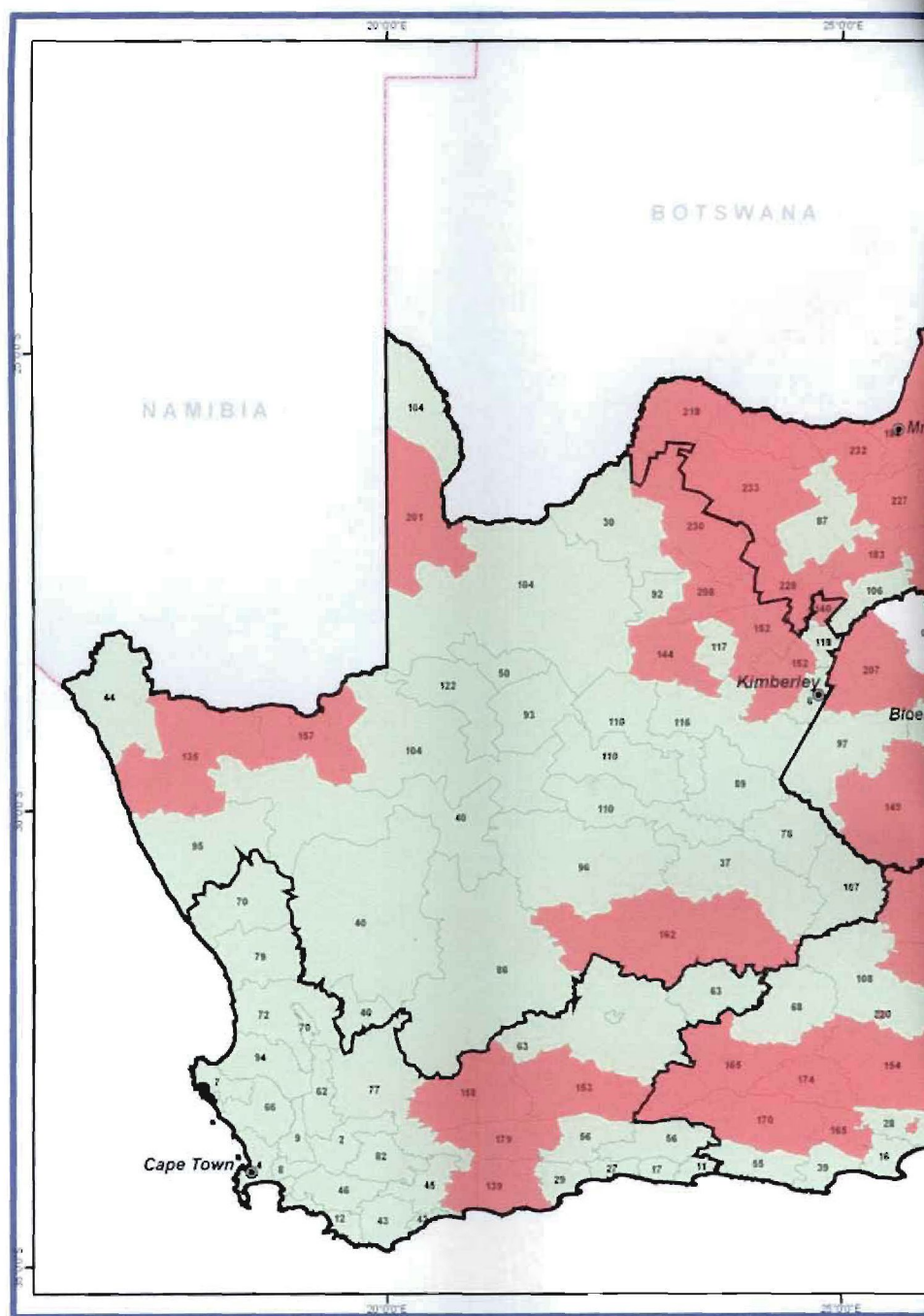


**Figure 3: Map of most and least fragile municipalities in 2001**

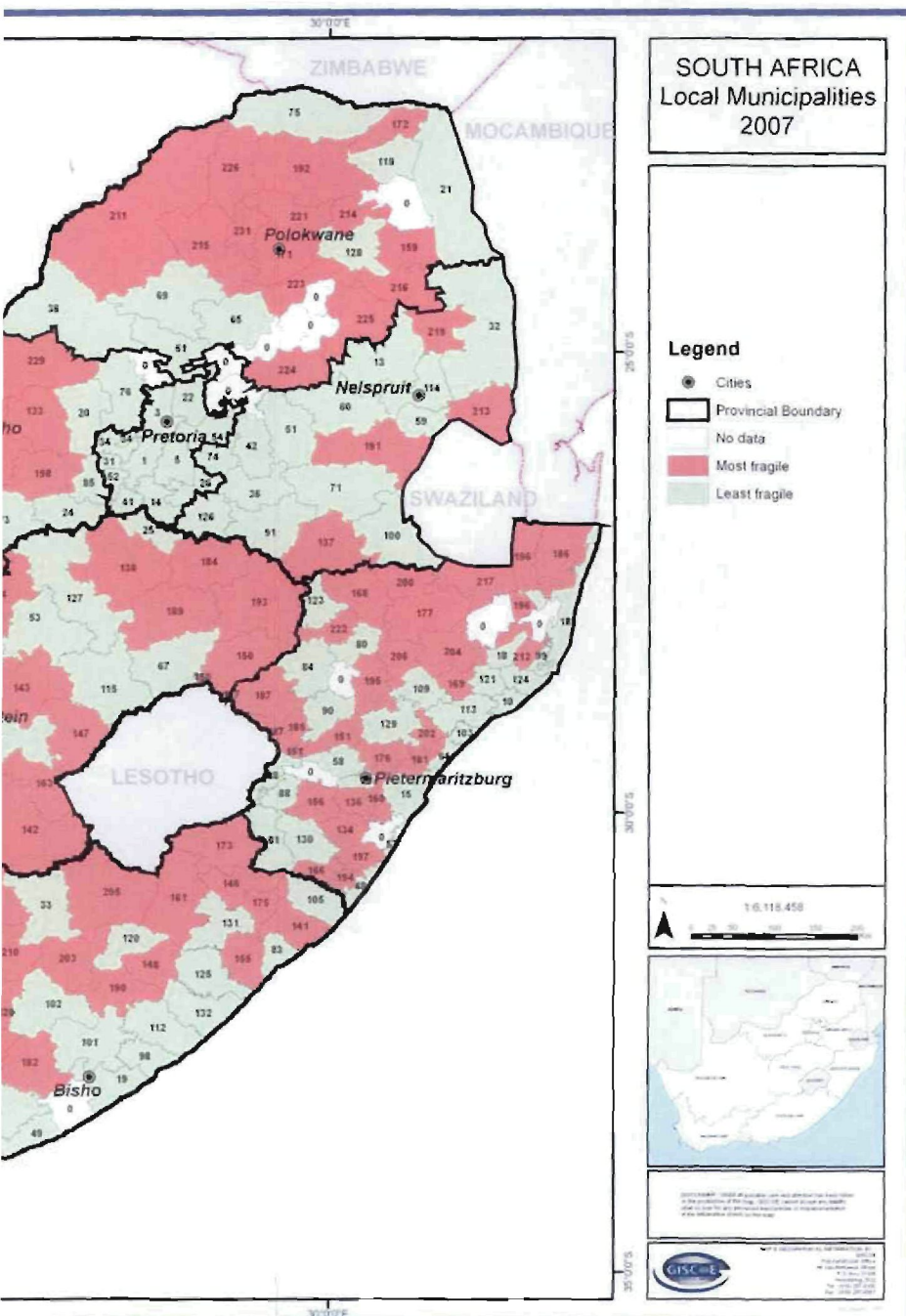




**Figure 4: Map of most and least fragile municipalities in 2007**







## APENDIX C

**Table C1: Principle component analysis output 2001 (communalities)**

| Communalities                                                                  |         |            |
|--------------------------------------------------------------------------------|---------|------------|
|                                                                                | Initial | Extraction |
| GDP per capita (constant 2000 prices)                                          | 1       | 0.63       |
| Population density (nr of people per km2)                                      | 1       | 0.539      |
| Urbanisation rate (% of people in urban areas)                                 | 1       | 0.723      |
| Proportion of primary production (agriculture and mining as % of regional GVA) | 1       | 0.814      |
| Exports (as % of GDP)                                                          | 1       | 0.806      |
| Trade (exports + imports as % of GDP)                                          | 1       | 0.761      |
| Human Development Index                                                        | 1       | 0.888      |
| Poverty (% of people in poverty)                                               | 1       | 0.811      |
| Unemployment rate (% according to expanded definition)                         | 1       | 0.639      |
| Average annual rainfall (mm)                                                   | 1       | 0.485      |
| Degraded land (% of total area)                                                | 1       | 0.468      |
| Total land cover km2 (forests, water bodies and wetlands)                      | 1       | 0.69       |
| Overall crime index                                                            | 1       | 0.787      |
| Property crime index                                                           | 1       | 0.744      |
| % households with piped water inside dwelling                                  | 1       | 0.831      |
| % households that use electricity for cooking                                  | 1       | 0.905      |
| % households that use electricity for heating                                  | 1       | 0.881      |
| % households that use electricity for lighting                                 | 1       | 0.71       |
| % households with flush toilet                                                 | 1       | 0.885      |
| % households living in brick structures                                        | 1       | 0.589      |

**Table C2: Principle component analysis output 2001 (Total variance explained)**

| Component | Initial Eigenvalues |               |              | Extraction Sums of Squared Loadings |               |              | Rotation Sums of Squared Loadings |               |              |
|-----------|---------------------|---------------|--------------|-------------------------------------|---------------|--------------|-----------------------------------|---------------|--------------|
|           | Total               | % of Variance | Cumulative % | Total                               | % of Variance | Cumulative % | Total                             | % of Variance | Cumulative % |
| 1         | 9.944               | 49.722        | 49.722       | 9.944                               | 49.722        | 49.722       | 9.209                             | 46.045        | 46.045       |
| 2         | 2.08                | 10.4          | 60.122       | 2.08                                | 10.4          | 60.122       | 2.411                             | 12.057        | 58.102       |
| 3         | 1.481               | 7.403         | 67.526       | 1.481                               | 7.403         | 67.526       | 1.72                              | 8.601         | 66.703       |
| 4         | 1.08                | 5.401         | 72.927       | 1.08                                | 5.401         | 72.927       | 1.245                             | 6.224         | 72.927       |
| 5         | 0.97                | 4.849         | 77.776       |                                     |               |              |                                   |               |              |
| 6         | 0.842               | 4.212         | 81.989       |                                     |               |              |                                   |               |              |
| 7         | 0.636               | 3.18          | 85.169       |                                     |               |              |                                   |               |              |
| 8         | 0.582               | 2.909         | 88.078       |                                     |               |              |                                   |               |              |
| 9         | 0.497               | 2.485         | 90.563       |                                     |               |              |                                   |               |              |
| 10        | 0.394               | 1.971         | 92.533       |                                     |               |              |                                   |               |              |
| 11        | 0.349               | 1.747         | 94.281       |                                     |               |              |                                   |               |              |
| 12        | 0.228               | 1.139         | 95.419       |                                     |               |              |                                   |               |              |
| 13        | 0.223               | 1.114         | 96.534       |                                     |               |              |                                   |               |              |
| 14        | 0.21                | 1.05          | 97.583       |                                     |               |              |                                   |               |              |
| 15        | 0.14                | 0.698         | 98.281       |                                     |               |              |                                   |               |              |
| 16        | 0.127               | 0.633         | 98.915       |                                     |               |              |                                   |               |              |
| 17        | 0.083               | 0.413         | 99.328       |                                     |               |              |                                   |               |              |
| 18        | 0.072               | 0.36          | 99.688       |                                     |               |              |                                   |               |              |
| 19        | 0.053               | 0.264         | 99.952       |                                     |               |              |                                   |               |              |
| 20        | 0.01                | 0.048         | 100          |                                     |               |              |                                   |               |              |

**Table C3: Principle component analysis output 2001 (component)**

|                                                                                | Component |       |        |       |
|--------------------------------------------------------------------------------|-----------|-------|--------|-------|
|                                                                                | 1         | 2     | 3      | 4     |
| % households that use electricity for cooking                                  | 0.945     |       |        |       |
| % households with flush toilet                                                 | 0.938     |       |        |       |
| Human Development Index                                                        | 0.928     |       |        |       |
| % households that use electricity for heating                                  | 0.924     |       |        |       |
| % households with piped water inside dwelling                                  | 0.904     |       |        |       |
| Poverty (% of people in poverty)                                               | -0.893    |       |        |       |
| Urbanisation rate (% of people in urban areas)                                 | 0.834     |       |        |       |
| % households that use electricity for lighting                                 | 0.832     |       |        |       |
| Property crime index                                                           | 0.83      |       |        |       |
| Overall crime index                                                            | 0.79      |       |        |       |
| Unemployment rate (% according to expanded definition)                         | -0.754    |       |        |       |
| % households living in brick structures                                        | 0.633     |       |        |       |
| Degraded land (% of total area)                                                | -0.607    |       |        |       |
| Exports (as % of GDP)                                                          | 0.409     | 0.687 |        |       |
| Trade (exports + imports as % of GDP)                                          |           | 0.667 |        |       |
| Population density (nr of people per km2)                                      |           | 0.65  |        |       |
| Average annual rainfall (mm)                                                   | -0.455    | 0.486 |        |       |
| Proportion of primary production (agriculture and mining as % of regional GVA) |           |       | -0.796 |       |
| GDP per capita (constant 2000 prices)                                          | 0.467     |       | -0.624 |       |
| Total land cover km2 (forests, water bodies and wetlands)                      |           |       |        | 0.763 |



**Table C4: Principle component analysis output 2001 (rotated)**

|                                                                                | Component |       |       |       |
|--------------------------------------------------------------------------------|-----------|-------|-------|-------|
|                                                                                | 1         | 2     | 3     | 4     |
| % households that use electricity for cooking                                  | 0.902     |       |       |       |
| % households with flush toilet                                                 | 0.902     |       |       |       |
| % households with piped water inside dwelling                                  | 0.896     |       |       |       |
| Human Development Index                                                        | 0.887     |       |       |       |
| % households that use electricity for heating                                  | 0.865     |       |       |       |
| Urbanisation rate (% of people in urban areas)                                 | 0.844     |       |       |       |
| Poverty (% of people in poverty)                                               | -0.834    |       |       |       |
| % households that use electricity for lighting                                 | 0.834     |       |       |       |
| Property crime index                                                           | 0.83      |       |       |       |
| Overall crime index                                                            | 0.817     |       |       |       |
| Unemployment rate (% , according to expanded definition)                       | -0.734    |       |       |       |
|                                                                                |           |       |       |       |
| % households living in brick structures                                        | 0.7       |       |       |       |
| Degraded land (% of total area)                                                | -0.591    |       |       |       |
| Average annual rainfall (mm)                                                   | -0.485    |       |       |       |
| Exports (as % of GDP)                                                          |           | 0.877 |       |       |
| Trade (exports + imports as % of GDP)                                          |           | 0.85  |       |       |
| Population density (nr of people per km2)                                      |           | 0.476 |       |       |
| Proportion of primary production (agriculture and mining as % of regional GVA) |           |       | 0.896 |       |
| GDP per capita (constant 2000 prices)                                          |           |       | 0.615 |       |
| Total land cover km2 (forests, water bodies and wetlands)                      |           |       |       | 0.825 |

**Table C5: Principle component analysis output 2007 (communalities)**

| Communalities                                                                  |         |            |
|--------------------------------------------------------------------------------|---------|------------|
|                                                                                | Initial | Extraction |
| GDP per capita (constant 2000 prices)                                          | 1       | 0.645      |
| Population density (nr of people per km2)                                      | 1       | 0.601      |
| Urbanisation rate (% of people in urban areas)                                 | 1       | 0.74       |
| Proportion of primary production (agriculture and mining as % of regional GVA) | 1       | 0.848      |
| Exports (as % of GDP)                                                          | 1       | 0.802      |
| Trade (exports + imports as % of GDP)                                          | 1       | 0.811      |
| Human Development Index                                                        | 1       | 0.863      |
| Poverty (% of people in poverty)                                               | 1       | 0.811      |
| Unemployment rate (% according to expanded definition)                         | 1       | 0.587      |
| Average annual rainfall (mm)                                                   | 1       | 0.648      |
| Degraded land (% of total area)                                                | 1       | 0.497      |
| Total land cover km2 (forests, water bodies and wetlands)                      | 1       | 0.626      |
| Overall crime index                                                            | 1       | 0.789      |
| Property crime index                                                           | 1       | 0.825      |
| % households with piped water inside dwelling                                  | 1       | 0.876      |
| % households that use electricity for cooking                                  | 1       | 0.886      |
| % households that use electricity for heating                                  | 1       | 0.835      |
| % households that use electricity for lighting                                 | 1       | 0.728      |
| % households with flush toilet                                                 | 1       | 0.849      |
| % households living in brick structures                                        | 1       | 0.662      |

**Table C6: Principle component analysis output 2007 (Total variance explained)**

| Component | Initial Eigenvalues |               |              | Extraction Sums of Squared Loadings |               |              | Rotation Sums of Squared Loadings |               |              |
|-----------|---------------------|---------------|--------------|-------------------------------------|---------------|--------------|-----------------------------------|---------------|--------------|
|           | Total               | % of Variance | Cumulative % | Total                               | % of Variance | Cumulative % | Total                             | % of Variance | Cumulative % |
| 1         | 8.257               | 41.287        | 41.287       | 8.257                               | 41.287        | 41.287       | 7.269                             | 36.344        | 36.344       |
| 2         | 1.983               | 9.916         | 51.204       | 1.983                               | 9.916         | 51.204       | 2.079                             | 10.393        | 46.737       |
| 3         | 1.798               | 8.99          | 60.194       | 1.798                               | 8.99          | 60.194       | 1.902                             | 9.511         | 56.248       |
| 4         | 1.668               | 8.339         | 68.533       | 1.668                               | 8.339         | 68.533       | 1.86                              | 9.3           | 65.548       |
| 5         | 1.223               | 6.115         | 74.648       | 1.223                               | 6.115         | 74.648       | 1.82                              | 9.1           | 74.648       |
| 6         | 0.925               | 4.623         | 79.271       |                                     |               |              |                                   |               |              |
| 7         | 0.742               | 3.711         | 82.982       |                                     |               |              |                                   |               |              |
| 8         | 0.668               | 3.342         | 86.323       |                                     |               |              |                                   |               |              |
| 9         | 0.548               | 2.741         | 89.064       |                                     |               |              |                                   |               |              |
| 10        | 0.423               | 2.116         | 91.18        |                                     |               |              |                                   |               |              |
| 11        | 0.362               | 1.812         | 92.993       |                                     |               |              |                                   |               |              |
| 12        | 0.334               | 1.668         | 94.66        |                                     |               |              |                                   |               |              |
| 13        | 0.277               | 1.385         | 96.045       |                                     |               |              |                                   |               |              |
| 14        | 0.225               | 1.125         | 97.171       |                                     |               |              |                                   |               |              |
| 15        | 0.197               | 0.987         | 98.157       |                                     |               |              |                                   |               |              |
| 16        | 0.117               | 0.583         | 98.74        |                                     |               |              |                                   |               |              |
| 17        | 0.099               | 0.497         | 99.237       |                                     |               |              |                                   |               |              |
| 18        | 0.062               | 0.308         | 99.545       |                                     |               |              |                                   |               |              |
| 19        | 0.054               | 0.27          | 99.815       |                                     |               |              |                                   |               |              |
| 20        | 0.037               | 0.185         | 100          |                                     |               |              |                                   |               |              |

**Table C7: Principle component analysis output 2007 (component)**

|                                                                                | Component |       |        |        |       |
|--------------------------------------------------------------------------------|-----------|-------|--------|--------|-------|
|                                                                                | 1         | 2     | 3      | 4      | 5     |
| % households with piped water inside dwelling                                  | 0.911     |       |        |        |       |
| % households with flush toilet                                                 | 0.905     |       |        |        |       |
| % households that use electricity for cooking                                  | 0.899     |       |        |        |       |
| Human Development Index                                                        | 0.897     |       |        |        |       |
| Poverty (% of people in poverty)                                               | -0.89     |       |        |        |       |
| % households that use electricity for heating                                  | 0.869     |       |        |        |       |
| Urbanisation rate (% of people in urban areas)                                 | 0.814     |       |        |        |       |
| % households that use electricity for lighting                                 | 0.691     |       |        |        |       |
| Property crime index                                                           | 0.673     |       | 0.47   |        |       |
| Unemployment rate (% according to expanded definition)                         | -0.66     |       |        |        |       |
| Degraded land (% of total area)                                                | -0.487    |       |        |        |       |
| Population density (nr of people per km2)                                      |           | 0.668 |        |        |       |
| Proportion of primary production (agriculture and mining as % of regional GVA) |           | -0.66 |        | -0.609 |       |
| Average annual rainfall (mm)                                                   | -0.41     | 0.525 |        |        |       |
| Total land cover km2 (forests, water bodies and wetlands)                      |           |       | 0.617  |        | 0.486 |
| Overall crime index                                                            | 0.573     |       | 0.586  |        |       |
| % households living in brick structures                                        |           |       |        | 0.713  |       |
| GDP per capita (constant 2000 prices)                                          | 0.53      |       |        | -0.588 |       |
| Trade (exports + imports as % of GDP)                                          |           | 0.416 | -0.428 |        | 0.559 |
| Exports (as % of GDP)                                                          |           | 0.445 | -0.461 |        | 0.487 |

**Table C8: Principle component analysis output 2007 (rotated)**

|                                                                                | Component |        |       |       |        |
|--------------------------------------------------------------------------------|-----------|--------|-------|-------|--------|
|                                                                                | 1         | 2      | 3     | 4     | 5      |
| % households that use electricity for cooking                                  | 0.924     |        |       |       |        |
| % households with piped water inside dwelling                                  | 0.916     |        |       |       |        |
| % households that use electricity for heating                                  | 0.879     |        |       |       |        |
| % households with flush toilet                                                 | 0.874     |        |       |       |        |
| Poverty (% of people in poverty)                                               | -0.832    |        |       |       |        |
| % households that use electricity for lighting                                 | 0.815     |        |       |       |        |
| Human Development Index                                                        | 0.802     |        |       |       |        |
| Urbanisation rate (% of people in urban areas)                                 | 0.763     |        |       |       |        |
| Unemployment rate (% , according to expanded definition)                       | -0.619    |        |       |       |        |
| % households living in brick structures                                        |           | -0.805 |       |       |        |
| GDP per capita (constant 2000 prices)                                          |           | 0.708  |       |       |        |
| Overall crime index                                                            | 0.436     |        | 0.761 |       |        |
| Total land cover km2 (forests, water bodies and wetlands)                      |           |        | 0.742 |       |        |
| Property crime index                                                           | 0.5       |        | 0.569 |       | 0.424  |
| Degraded land (% of total area)                                                |           |        |       |       |        |
| Trade (exports + imports as % of GDP)                                          |           |        |       | 0.883 |        |
| Exports (as % of GDP)                                                          |           |        |       | 0.871 |        |
| Proportion of primary production (agriculture and mining as % of regional GVA) |           | 0.444  |       |       | -0.794 |
| Population density (nr of people per km2)                                      |           |        |       |       | 0.634  |
| Average annual rainfall (mm)                                                   | -0.494    |        |       |       | 0.56   |