Cape Peninsula
University of Technology

PLANNING FOR REGIONAL RESILIENCE IN THE CENTRAL KAROO, WESTERN CAPE, SOUTH AFRICA

by

Elizabet Dimitrova

211006513

Thesis submitted in fulfilment of the requirements for the degree

Master of Technology: Town and Regional Planning

in the Faculty of Informatics and Design

at the Cape Peninsula University of Technology

Supervisor: Dr Masilonyane Mokhele

Cape Town

22 October 2021

DECLARATION

I, declare that the contents of this dissertation/thesis represent my own unaided work and that the dissertation/thesis has not previously been submitted for academic examination towards any qualification. Furthermore, it represents my own opinions and not necessarily those of the Cape Peninsula University of Technology.

Elizabet Dimitrova

Digitally signed by Elizabet Dimitrova
Date: 2022.02.17 09:54:16 +02'00'

Signed **Date** **22 October 2021**

ABSTRACT

Transcending a number of disciplines, the word ‘resilience’ has become pervasive in academia, policy and practice. In urban and regional planning and allied disciplines, resilience has received considerable attention in the context of urban areas, epitomised by the notion of urban resilience. There is however a paucity of resilience-related work in rural areas. The aim of the thesis is therefore to analyse regional resilience planning in the context of rural or peripheral areas of South Africa. The thesis uses the case study of Central Karoo region in the Western Cape province of South Africa to address the following research objectives: one, description of the economic, social and environmental shocks that the Central Karoo region is prone to. Two, analysis of the extent to which the policies guiding spatial planning in the Central Karoo region incorporate regional resilience. Three, description and explanation of factors that influence the level of incorporation of regional resilience in the planning policies and development plans relevant to the Central Karoo region. Using the notion of rationality in planning, the thesis is based upon a catholic and integrative theoretical framework, which incorporates elements of rational comprehensive planning theory and communicative planning theory. The study relied on a combination of secondary and primary sources of data. Documents that have a bearing on planning and development were analysed in the computer programme of Atlas.ti; and primary data were collected through interviews with seven key respondents, who were selected through snowball sampling technique. The analysis discovered that development frameworks that have relevance to the Central Karoo region do not adequately incorporate regional resilience. Reasons for this poor acknowledgement of resilience include the inadequate allocation of resources. It is proposed that further research be conducted to among others analyse the implementation of planning documents in so far as regional resilience is concerned.

Keywords: regional resilience; resilience planning; Central Karoo; Laingsburg, Beaufort West; Prince Albert; Western Cape province

ACKNOWLEDGEMENTS

I would like to thank and acknowledge:

- My supervisor, Dr Masilonyane Mokhele, for his incredible guidance, endless patience and motivation throughout this journey.
- Personnel who assisted me in the research from Western Cape provincial government, Central Karoo district municipality, Laingsburg local municipality, Prince Albert local municipality, and Beaufort West local municipality.
- My family who always believed in me and supported me.
- God, for giving me the faith I needed to complete this thesis.

ACRONYMS AND ABBREVIATIONS

CLES	Center for Local Economic Strategies
COGTA	Department of Cooperative Governance and Traditional Affairs
Covid-19	Coronavirus Disease of 2019
CPUT	Cape Peninsula University of Technology
CSIR	Centre for Scientific and Industrial Research
FET	Further Education Training
GDP	Gross Domestic Product
HIV	Human Immunodeficiency Virus
IDP	Integrated Development Plan
LED	Local Economic Development
MS Teams	Microsoft Teams
NDP	National Development Plan
NEMA	National Environmental Management Act
PSDF	Provincial Spatial Development Framework
SA	South Africa
SDF	Spatial Development Framework
SPLUMA	Spatial Planning and Land Use Management Act
Stats SA	Statistics South Africa
UK	United Kingdom
UN	United Nations
UNDESA	United Nations Department of Economic and Social Affairs
UREx SRN	Urban Resilience to Extremes Sustainability Research Network
USA	United States of America

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

CHAPTER 1: INTRODUCTION

This inception chapter, which is categorised into six main sections, sets the scene and introduces the thesis entitled 'Planning for regional resilience in the Central Karoo, Western Cape province, South Africa'. To be read closely with Chapter Two, Section 1.1 provides a brief background and synopsis of the topic of resilience generally, and thereafter touches on the components of regional resilience and spatial economic resilience. Section 1.2 presents the research problem that the thesis addresses, followed by a discussion of the research aim, questions and objectives (in Section 1.3) that the thesis dissects towards addressing the research problem identified. Section 1.4 advances the research design that the thesis is based upon, including a sketch of the research methodology and methods employed in the study. The penultimate part (Section 1.5) highlights the relevance and contribution of the thesis, and also discusses the main limitations of the study conducted. Section 1.6 closes the chapter with an overview of the organisation of the thesis.

1.1 BACKGROUND AND OVERVIEW

Resilience is increasingly becoming pervasive in academic circles, policy discourse and practice across the world (Stead & Tasan-Kok, 2013; Turok, 2014). To reflect the extent of this increasing interest, and drawing on the Web of Science information, Thorén (2014) notes that in 1983, a negligible number of 10 papers were published with the word 'resilience' in their titles. In 1993, the number of publications had increased to around 60; and the number skyrocketed to a staggering 800 back in 2013 (Thorén, 2014). A search that was conducted on the Web of Science database on 08 March 2021 yielded 21 689 publications with 'resilience' in the titles, portraying the pervasiveness and growing popularity of resilience in the contemporary literature.

The literature widely acknowledges that the word 'resilience' is derived from the Latin word *resilire*, which essentially means to spring back, to rebound or to leap back (Modica & Reggiani, 2015). Despite its relatively newly found and rapidly expanding popularity as discussed in this chapter, resilience is by no means a recently coined word. Although there is no consensus in the literature on the origins of resilience, some scholars claim that the use of the word can be traced to the early 1800s wherein in the context of physics, resilience was defined by Webster in 1824 as the potential of a material to revert to its original condition (in

terms of size and shape) following distortion due to a compressive distress (Modica & Reggiani, 2015).

In the highly-acclaimed treatise, Holling (1973) provided a significant contribution to the discourse on resilience by introducing the term to ecology. Building upon the original definition, Holling broadly defined resilience as the way in which a system recovers from a stress or shock (Davoudi, 2012; Modica & Reggiani, 2015). Holling's (1996) interpretation particularly makes a distinction between two primary facets of resilience, namely engineering and ecological resilience as elaborated later in the chapter (also refer to Chapter Two, Section 2.1). Since then, resilience has continued to command massive academic attention and acclaim in a multitude of disciplines (Salizzoni et al., 2020), which include, inter alia, urban and regional planning, ecology, economics, social work, psychology, sociology and engineering.

However, given its non-specificity and open-endedness, resilience has been expounded and comprehended in various ways; hence scholars, readers, commentators, students and critics may be confused and overwhelmed by the wide-ranging definitions, categorisations and uses of resilience (Modica & Reggiani, 2015). This non-specificity and plurality in the way resilience is interpreted and applied is reminiscent of what could be termed vague concept (Thorén, 2014) or fuzzy concept in urban and regional studies (Markusen, 1999).[1] This is arguably in part because the word has been adopted and transplanted from other fields (Eraydin & Tasan-Kok, 2013). Relatedly, although the literature unpacks resilience from various perspectives and angles (refer to Chapter Two), the lack of understanding of its conceptual foundation presents constraints for urban and regional planning, and accordingly results in shortcomings on the formulation of policies, strategies, initiatives as well as schemata for the analysis of resilience (Brunetta et al., 2019).

As alluded to in this section, different scholars, proponents, exponents and commentators regard resilience as different things depending on, for instance, their preference, focus and intent at a particular time or period. As reiterated by Turok (2014), the wide application of

[1] In the widely-cited seminal work, Markusen (1999) argues that a fuzzy concept possesses a number of meanings, and therefore cannot be consistently identified, interpreted and applied by various scholars, readers and stakeholders.

resilience can result in it being diluted to mean almost anything. To some scholars, resilience is an objective (e.g. MacKinnon & Derickson, 2012); others regard it as a paradigm (e.g. Eraydin & Tasan-Kok, 2013a); in some circles, it is referred to as a framework (e.g. Christopherson et al., 2010); in certain instances, it is regarded as a boundary object (e.g. Thorén, 2014); some even use it as a metaphor (e.g. Pendall et al., 2010; Thorén, 2014); others consider it as theory (e.g. van Breda, 2018); and the majority of scholars and commentators merely regard resilience as a concept or term. Although by no means exhaustive, the foregoing snapshot provides a clear reflection of the underlying variety of interpretations and multiplicities of what resilience is or what it could be.

To further highlight the ambiguity and vagueness of resilience, authors in different fields of study or disciplines advance a number of related and unrelated definitions of resilience. It should similarly be noted that the definitions highlighted here are not exhaustive – they are merely meant to further exemplify the diversity in the way resilience is interpreted, understood and accordingly applied (refer to Chapter Two for further discussion).

- Regional resilience tries to unravel why some regions manage to overcome adversity and sustain a high quality of life for communities while other regions fail to resolve short-term or long-term problems towards augmenting the quality of life of the populace (Christopherson et al., 2010).
- Hill et al., (2008) posit that resilience is the ability of a region to recover from shocks that affected its economy.
- In 2000, Adger defined resilience in human geography as the ability of communities to withstand external shocks to their social infrastructure (Adger, 2000). Katz (2004) proposed an extension to the definition of resilience as it relates to geography as ways in which people adapt to evolving circumstances to get by and ‘make do’ through exercising autonomous initiatives.
- South Africa (2013) highlights spatial resilience one of the core planning principles, and advances a definition that revolves around flexibility in spatial plans, policies and land-use management systems to ensure sustainable livelihoods in communities that are most likely to be affected by the ramifications of economic and environmental shocks.

- Engineering resilience is typically defined as the ability of a system to go back to its original state of equilibrium after the occurrence of a shock of stress (Gunderson, 2000).
- Holling (1973) refers to ecological resilience as the persistence of relationships within a system i.e. the ability of a system to absorb change and persist.
- Gunderson (2000) argues that ecological resilience is the ability of a system to move into a new stable condition after withstanding a shock, as opposed to returning to its previous state of equilibrium.
- In the context of physics, Gordon (1978) defines resilience as the ability of a system to store energy and deflect elasticity under a load without breaking or being deformed in the process.
- In psychology, Egeland et. al., (1993) interpret resilience as the capacity for successful adaptation and functioning amid high risk, stress and/ or trauma.

As exemplified by the definitions above, resilience has been adopted by various fields in the social sciences (Modica & Reggiani, 2015) and even the health sciences, wherein recent research and discussions often revolve around resilience as a framework for analysing social systems; specifically from the angle of the recovery of such systems after the occurrence of a disturbance, stress or shock. Notably, of specific interest to the thesis, resilience appears to have a notable relevance in spatial systems, due to the socio-spatial interactivity among stakeholders or social actors and the varied socio-economic phenomena (Östh et al., 2018). In this regard, resilience is arguably a desirable and ideal characteristic of any spatial system (Kakderi & Tasopoulou, 2017).

Upon this background, it should be noted that resilience gained momentum and significantly appeared in urban and regional planning circles particularly in the 1990s (Mileti, 1999 cited in Lu & Stead, 2013). Planning scholars typically consider resilience as the ability of a social system to withstand disturbances and organise or reorganise itself following changes that are driven by disturbances (Walker et al., 2002). The literature on resilience in planning has accordingly placed significant emphasis on preparation and mitigation actions, especially at a local scale (Godschalk, 2003). As noted by Lu and Stead (2013), it could be argued that this particular focus closely coincides with a traditional approach to land-use planning as a means of circumventing or minimising disturbances (for instance, locating development away from environmentally sensitive areas, or in the main, addressing issues of the so-called

compatibility). Over time, the literature on resilience in the context of planning expanded to include mitigation strategies such as reducing greenhouse gas emissions and tackling climate change and global warming, including the ramifications of such occurrences. Moreover, it should be noted that the literature does not only dwell on mitigation efforts but also focuses on adaptation, with the logical acknowledgement and appreciation that mitigation is typically not sufficient to prevent particular disturbances from occurring (Lu & Stead, 2013).

Given the wide spectrum of resilience, urban and regional planning has continued to embrace the concept more over time. One of the more popular references to resilience, in this context, is urban resilience. Researchers have attempted to devise approaches, methods and techniques to measure the resilience of urban systems, and have among others identified the following attributes of urban resilience: redundancy, diversity, efficiency, autonomy, strength, interdependence, adaptability and collaboration (Godschalk, 2003). Other scholars have explored other complimentary concepts, which include social capital, innovation, adaptability, robustness and flexibility (Walker & Salt, 2006; Eraydin & Tasan-Kok, 2013a). In addition, Sousa and Pinho (2009) unpack the so-called spatial dynamics, which include the notion of compactness.

As indicated earlier in the chapter, definitions and interpretations of resilience differ immensely, and the concept largely remains vague and open to various interpretations. Nevertheless, two common dimensions of resilience can often be identified in the literature, namely: one, robustness or strength (i.e. the ability to withstand a shock), and two, rapidity or flexibility of response (i.e. the potential to bounce back). These two dimensions can be enhanced by mitigation and adaptation efforts, as mitigation can assist towards improving the robustness of a system, while adaptation can augment the speed at which the recovery of a system occurs (Stead & Tasan-Kok, 2013).

The United Nations (UN) subsequently developed an approach for disaster risk reduction, which aims to improve or contribute towards the resilience of cities around the world. Various initiatives (such as the UN Disaster Resilience, C40 Cities Climate Leadership Group, International Council for Local Environmental Initiatives, Making Cities Resilient Campaign, and Resilient Cities Network) are intended to assist the stakeholders in cities, towns and urban centres towards incorporating resilience in the planning processes for disaster risk management.

In South Africa, efforts pertaining to resilience have largely been on water resilience, climate change adaptation, and resilience of cities (for instance, Turok, 2014). Recently, the Spatial Planning and Land Use Management Act 16 of 2013 (SPLUMA) (Republic of South Africa, 2013) made specific reference to spatial resilience, which is advanced as one of the five core principles of planning that are intended to guide land-use and forward planning in the country. Although spatial resilience is arguably closely associated with ecological and engineering resilience highlighted above, it specifically refers to the capacity and ability of urban and regional planning policies, regulations and strategies to acknowledge and address the issue of resilience-building (Barnes & Nel, 2017).

Before bringing down the curtain on the background and overview, it should be noted that the notion of regional resilience (and resilience generally) should be understood in contradistinction to a related concept of vulnerability. Vulnerability refers to the degree to which a system is susceptible to harm. However, it could be argued that vulnerability is not necessarily dependent on the probability of the occurrence of a shock (Smit et al., 1999). Against popular belief, vulnerability is in this regard not simply the opposite state to resilience (Seeliger & Turok, 2013 cited in Modica & Reggiani, 2015). Generally, resilience refers to the speed at which a network or system returns to its equilibrium after a shock and to the shocks that are absorbed, while vulnerability refers to the spread of shocks within a network or system (Modica & Reggiani, 2015).

1.2 RESEARCH PROBLEM

The literature widely acknowledges that the world is urbanising at a fast rate, to an extent that at least half of the globe's population is expected to reside in urban areas around 2025 (UN-Habitat, 2010). Notably, round about half of Africa's population is urbanised (Pieterse & Parnell, 2014), and the continent's urban populace is anticipated to swell and increase about three times between 2018 and 2050, with an ultimate total of at least 1.5 billion urban dwellers (UN DESA, 2019). These are telling figures, patterns and trends of urbanisation, particularly in the context of Africa, which is characterised by young population compared to other parts of the world.

Some scholars and commentators are however critical and sceptical about the accuracy of the urbanisation estimates and projections above. They argue that the figures are one-sided and do not consider migration from urban areas to rural areas (for instance, refer to Potts, 2012).

This undoubtedly brings to the fore the importance of the so-called rural areas and regions. It is argued in some circles that if rural areas protect and preserve their environment, they could encourage people residing in urban areas to relocate (or move back) to rural areas and permanently live there (Novotná et al., 2013). Manifesting at various scales and different stages of the migration cycle, this process can be referred to as counterurbanisation (e.g. Mitchell, 2004).

The literature acknowledges that attempts to formulate a single definition of rural or rurality are neither desirable nor feasible, and there is accordingly a call for the definition of rural to be attuned to the duty at hand at a given time (Halfacree, 1993; Ilbery, 1993). Given the task at hand, the thesis adopts an arguably simplistic descriptive approach to understanding rural, which revolves around socio-spatial characteristics. In this light, the prominent features of rural regions include activities related to the primary sector (for instance, agriculture, energy generation and mining activities), whose products are typically consumed or utilised in urban areas. Worldwide, challenges associated with rural regions include low education levels, low income, brain drain, limited employment opportunities, poor health and generally poor allocation of services and basic infrastructure (Norgaard, 2006). From a geographical perspective, rural regions are located on the outskirts of metropolitan areas, with notable spatial characteristics. Usually, the areas are organised in a hierarchical manner, with a clearly visible structure of towns, villages (Nel et al., 2011) and hamlets. For instance, in the case of rural regions in the Western Cape province of South Africa, most of the areas include small towns of around 20 000 and 50 000 permanent inhabitants (Van der Merwe, 2005). It should also be noted that although they are in a strict sense not synonymous, the thesis uses peripheral regions and rural regions interchangeably. Peripheral regions are generally understood as underdeveloped regions in areas that are characterised by economic and social difficulties (van Aswegen & Retief, 2020).

The problems of rural areas highlighted above are epitomised by the theory of urban bias (also refer to Chapter Two, Section 2.2.2). The theory critically discusses the role of governments, elites and other urban classes of the global South (historically and controversially referred to as developing countries) in perpetuating urban-rural disparities through legislation, policies, plans and strategies that influence the skewed distribution of fundamental resources. The relationship between urban bias and processes of urbanisation (mentioned above) are arguably of particular interest to critical planners, especially within a

context of the contribution of urban bias to processes of rural to urban migration. Some scholars argue that indeed rural regional planning has been largely ignored or sidelined by politicians, planners and policy makers; and the conditions of rurality (as opposed to merely focusing on the benefits derived from rural areas) have accordingly been discarded in favour of urban-related matters. This observation notably emerged at a time when rural landscapes have been exposed to increasing multi-faceted threats. The contemporary problems of rural regions not only encompass uneven power relations and development patterns, but also complex problems such as climate change and loss or degradation of biodiversity (Morrison et al., 2015).

The discussion thus far is not surprising or novel because, as argued by Frank and Reiss (2014), going down memory lane into the past of urban and regional planning, the urban orientation is indeed explicit. The literature that advocates for a well-considered rural view to planning has argued that the planning profession typically at best approaches and interprets rural areas as downscaled versions of cities, cities in the making, or experimental backdrop for sectoral matters such as environmental planning. Commentators have argued that this is not suitable or even adequate for rural areas, regardless of their location relative to urban centres, cities and metropolitan regions. Scholars have argued that rural planning has lacked stature in part because the social contract with rural places and people has been unstable and poorly defined and understood. However, as societal needs evolve and rural landscapes change, reasons for taking rural areas seriously are becoming more apparent and urgent. Rural landscapes should thus no longer simply be understood as predominantly agricultural locations because they have become multifunctional, and therefore serve various roles, including production, consumption and preservation functions (Frank & Reiss, 2014).

One of the crucial contemporary planning issues is thus the need to carefully consider the future of rural regions. These areas are principal locations for a range of critical planning issues, which include, among others, climate change, food and energy security and biodiversity and ecosystem considerations. Despite the existence of these important issues, while there has arguably been a resurgence of regional policy and planning at the metropolitan scale, non-metropolitan regional development planning ideas are not given sufficient attention in theory, policy and practice (Hibbard et al., 2015).

Against this backdrop of urbanisation trends, counterurbanisation and signs of urban bias (particularly by urban and regional planners), there is notably a plethora of literature on resilience planning in the context of cities and metropolitan areas. This wide interest is encapsulated in the notion of urban resilience mentioned earlier in the chapter. Reflecting the great extent of this focus, Meerow et al. (2016) provide a comprehensive review of the extensive literature on the topic of urban resilience. As noted by among others Brunetta et al., (2019), the following experiences can further be cited to reflect the bias towards urban resilience at a policy and practical level: working across government departments, the Resilient Cities Network's so-called '100 Resilient Cities' programme aims to calculate urban resilience; the 'Smart Mature Resilience', which is a framework that directs the resources toward well-defined goals, aspires for transparency and democratic approaches to decision-making for city resilience. The 'Urban Resilience to Extremes Sustainability Research Network (UREx SRN)' puts attention on integrating social, ecological and technical systems to devise, analyse and support urban infrastructure decisions in the era of worsening climate change. In South Africa, the focus on the analysis of the resilience of cities and metropolitan municipalities is also apparent (for instance, see Harrison et al., 2014; Turok, 2014).

There is however a relative paucity of literature on resilience within rural regions, the state of affairs that arguably brings to the fore the notion of urban bias in the context of resilience planning. Nonetheless, a few studies that focus on rural or peripheral regions need to be acknowledged (e.g. Van Aswegen & Retief, 2020). All in all, rural or peripheral regions have different conditions from urban areas and are therefore affected differently by economic, environmental, social and other factors. It can therefore be argued that such regions have specific characteristics and even peculiar challenges, which cannot be tackled through generalised regional policy considerations (Van Aswegen & Retief, 2020). In this regard, the nature of regional resilience planning should be different in peripheral or rural areas, and as noted by Fox-Lent and Linkov (2018), the measuring of resilience should be adapted to case specific conditions in order to get contextually-relevant results and recommendations. Furthermore, resilience must in this regard be explored in relation to the uneven spatial development across a range of scales (Smith, 1990 cited in Mackinnon & Derickson, 2012), which once more brings to the fore the notion of urban bias.

The research problem above should be dissected against a backdrop of the assertion that notwithstanding a growing number of studies that investigate how, when and under what conditions urban (and rural) systems, institutions and other components of the environment adapt and develop innovative solutions in response to threats; the consideration of how resilience planning may be integrated into planning is an area that has received little coverage in academic circles (Eraydin & Tasan-Kok, 2013). Pinho et al. (2013) add that regardless of the increasing presence and prevalence of resilience on the planning agenda, evaluation of resilient-based planning is almost absent in the literature, particularly in comparison to assessments pertaining to the related notion of sustainability. The foregoing reflect that although there is indeed a growing interest in policies and strategies intended to foster regional resilience (Wink, 2014), the literature on this topic is still limited (Kakderi & Tasopoulou, 2017).

1.3 RESEARCH AIM, QUESTIONS AND OBJECTIVES

1.3.1 Research aim

The nuanced research problem presented in Section 1.2 above comes down to the lack of focus on resilience planning (as well as the evaluation of resilience planning) in rural and/ or peripheral regions. Towards addressing the research problem and contributing towards filling the void identified, the aim of the thesis is to analyse regional resilience planning in the context of rural or peripheral regions of South Africa, and specifically intends to investigate how the concept has been incorporated in the applicable planning policy and regulatory frameworks. To put the research objectives and questions below in perspective, it should be noted that the thesis is based on the case study of Central Karoo region, in the Western Cape province of South Africa (refer to Section 1.4 below for further discussion of the case study).

As argued by Kakderi and Tasopoulou (2017), the role of policies in the context of resilience can be placed on the basis of precautionary planning towards protecting the region against externally and/ or internally triggered disturbances or shocks; tools and actions for stabilising the region and mitigating the impacts of the crisis; and processes for transformation and reorientation that would aid the region to recover from stresses and shocks. It stands to reason that policies for resilience in the form of preparatory and preventive interventions are far more ideal than reactive treatment strategies aimed at fixing the disorder (Kakderi & Tasopoulou, 2017).

It is hoped that the findings of the thesis would serve as foundation for future empirical research on regional resilience planning in the context of rural or peripheral areas of South Africa and beyond.

1.3.2 Research questions

In order to realise the aim of the research, the thesis will answer the following three research questions:

1. What are the economic, social and environmental shocks that the Central Karoo region is prone to?
2. To what extent is regional resilience incorporated in the policies and plans that have a bearing on planning and development in the Central Karoo region?
3. What are the factors that result in the particular level of incorporation of regional resilience in the planning policies and development plans of the Central Karoo region?

1.3.3 Research objectives

Aligned with the research questions above, the specific research objectives of the thesis are to:

1. Describe the economic, social and environmental shocks that the Central Karoo region is prone to.
2. Analyse the extent to which the policies guiding planning and development in the Central Karoo region incorporate regional resilience.
3. Describe and explain factors that influence the level of incorporation of regional resilience in the planning policies and development plans relevant to the Central Karoo region.

1.4 RESEARCH DESIGN AND A SUMMARY OF METHODOLOGY AND METHODS

The thesis rests upon a qualitative, inductive approach. As opposed to framing hypotheses or assumptions beforehand, the thesis starts with the analysis whose results are used to arrive at particular conclusions and recommendations (Leedy & Ormrod, 2001) pertaining to planning for regional resilience in the rural or peripheral regions of South Africa. Although qualitative, where relevant, the investigations incorporated some quantitative data (such as statistical information) to describe the case study and the phenomenon of planning for regional

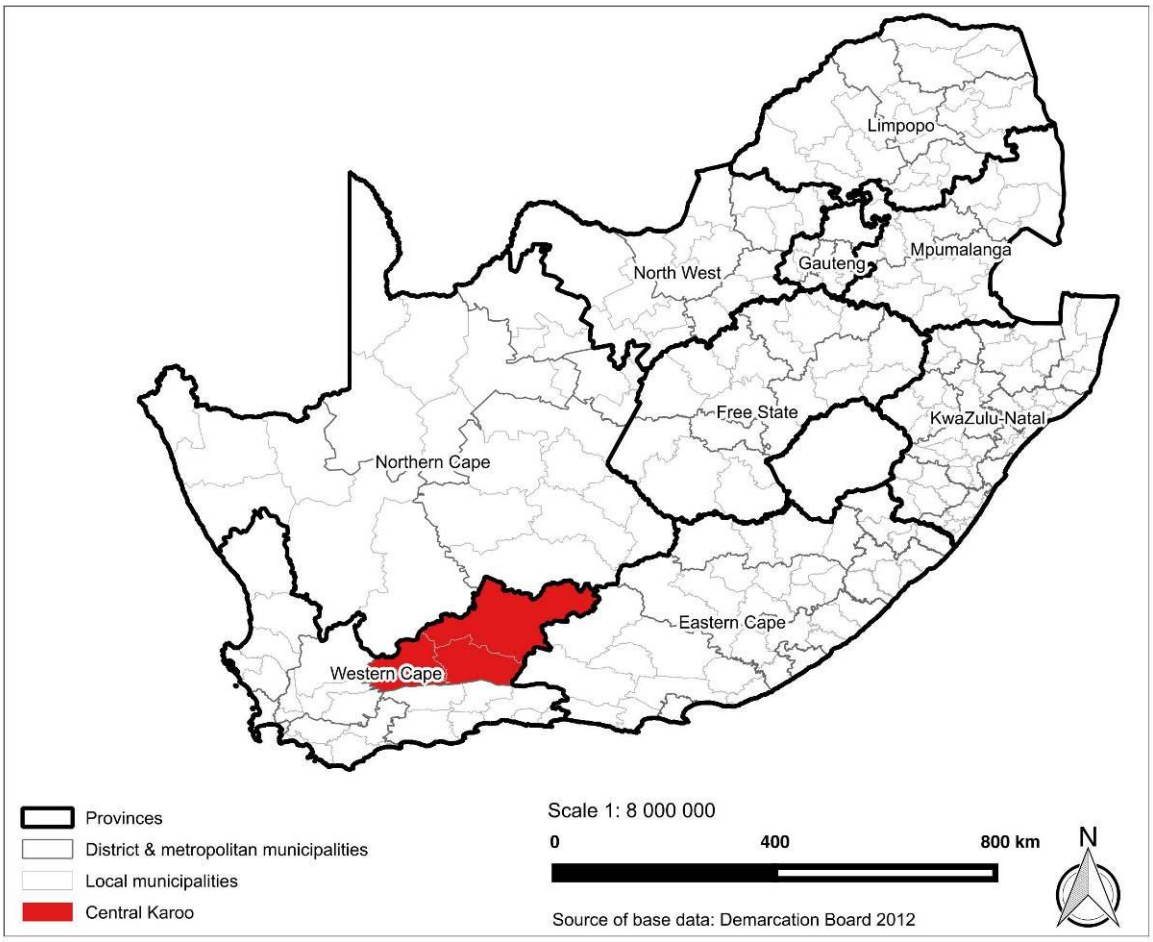
resilience. In this light, the research triangulated various forms of information so as to ensure the validity of the data used, the conclusions drawn as well as the resultant recommendations (Leedy & Ormrod, 2001).

In order to achieve the objectives of the study and ultimately address the research aim, a single case study approach was adopted towards describing and explaining the notion of planning for regional resilience. The case study approach allows the analyses to retain the holistic and meaningful characteristics of real-life events. A case study is an empirical enquiry where the focus is on contemporary phenomenon within its unique context wherein the boundaries between that phenomenon and its context are not clear (Yin, 2014). Furthermore, Leedy and Ormrod (2001) regard a case study to be bound, and its aim is to understand more about a little known or poorly understood situation. In the manner of case study research, the thesis is particularly bounded given that the case selected hereunder provides a good example and context of rurality, which can only be analysed using a specific context-specific 'rural' case study. Indeed, Turok (2014) argues that resilience has to be contextualised in light of the specific and peculiar problems of areas.

The case study inquiry also benefits from theoretical propositions, which guide the data collection and analysis (Yin, 2014). The most important application to the case study approach is to analyse real life events that are too complex to be, for instance, surveyed or experimented. In order to conduct case study research, the researcher should have a good knowledge of the research conducted. In the study, these criterion was met through a detailed literature review conducted (in Chapter Two) before the data could be collected. The literature review was meant to reveal what is known on the topic and accordingly equip the researcher with more knowledge of the problem (Yin, 2014).

Against this backdrop, the research was based on the case study of Central Karoo region in the Western Cape province of South Africa (Figure 1.1).

Figure 1. 1: Locality of Central Karoo



Source: Adapted from Mokhele, 2016

The region was selected as the focus area for this research because it has characteristics of peripheral or rural regions as described earlier in the chapter (Section 1.2). For instance, the Central Karoo region is geographically located far from the Cape Town functional region; and the region primarily depends on agricultural activities (Western Cape Government, 2017). These characteristics show that the Central Karoo is typical of the research problem identified, and thus well suited to the realisation of the research aim.

Central Karoo is arguably an 'administrative region' because its boundaries are aligned with the official municipal boundaries.[2] The region falls under the jurisdiction of Central Karoo

[2] There are various ways of defining a 'region', namely: homogenous region (where particular attributes) are similar across an area; functional region (which is based on the functional linkages between areas); and administrative region, which is based upon political or administrative boundaries. Other researchers consider the

district municipality, which is a Category C municipality in accordance with the Municipal Systems Act No. 32 of 2000 (Republic of South Africa, 2000). The biggest towns in the district municipality, namely Beaufort West, Laingsburg and Prince Albert are the main centres of local municipalities bearing the same names (refer to Chapter Five for further description of the Central Karoo region). Figure 1.2 below depicts the the distribution of main urban areas as well as the (non-urban) rural areas in the Western Cape province.

Figure 1. 2: Urban areas and rural areas of the Western Cape province

Source: Western Cape Government, 2014

1.5 CONTRIBUTION AND LIMITATIONS OF THE STUDY

1.5.1 Contribution

It is widely accepted that the contribution of research can be classified into two closely related aspects, namely: basic research (which intends to contribute towards the development

---

Central Karoo as a functional regional, comprising the following towns: Beaufort West, Laingsburg, Leeu Gamka, Matjiesfontein, Merweville, Murraysburg and Prince Albert (Western Cape Government, n.d).

or extension of theory) and applied research (which intends to inform policy and practice) (Neuman, 2014). The thesis is solely aligned with the applied element of social science research, wherein lessons would be drawn on how regional resilience can be applied in the planning of rural or peripheral regions in South Africa.

It is hoped that future studies would extend the knowledge gained from the thesis by formulating the framework to guide the analysis and implementation of regional resilience in rural regions in South Africa and beyond (refer to Chapter Seven for recommendations on future areas of research).

1.5.2 Limitations

The findings of the research conducted will be discussed in detail in Chapter Five and particularly in Chapter Six. Later in Chapter Seven, the presentation will be concluded with a synthesis of the thesis in order to establish the extent to which the research aim and objectives have been met. There will accordingly be recommendations for further areas of research on the topic of regional resilience.

It is important to point out in this inception chapter that the thesis has a number of limitations. Firstly, the study focuses solely on the level of incorporation of regional resilience in the plans and policies as well as reasons that influence the level of acknowledgement and incorporation uncovered. However, the study does not dwell on the implementation of the subject policies and plans as well as the evaluation of the contribution of those plans towards improving the regional resilience of the case study. Critiques may therefore rightly argue that the thesis provides a partial picture on the regional resilience of the Central Karoo region. It can however be argued that to avoid shooting from the hip, the thesis systematically sets the scene for tackling the elephant in the room i.e. implementation of planning policies and plans is so far as regional resilience is concerned.

Secondly, and relatedly, the thesis does not focus on the analysis of the actual regional resilience of the Central Karoo. It stands to reason that the level of incorporation in the policies and plans does not necessarily provide a picture on the actual regional resilience of the case study.

Thirdly, the thesis focuses on the case study of Central Karoo region, which is essentially aligned with the administrative municipal boundaries (refer to Section 1.4). As argued by, among others, Van Aswegen et al., (2020), the current thinking of (regional) resilience is dominated by a nodal approach i.e. based on resilience being primarily focused on isolated individual cities or regions, therefore, neglecting critical influences of regional (urban) systems and linkages that transcend administrative boundaries.

1.6 ORGANISATION OF THE THESIS

The thesis is organised into seven interrelated chapters. The logic of the thesis is summarised below and graphically depicted in Figure 1.2.

Chapter One systematically introduced the thesis with a background and a general overview of resilience. On the background of the gaps in the existing knowledge, the chapter presented the research problem that forms a heart that the thesis revolves around. The chapter then spelt out the overall aim of the study; after which the research objectives, questions, design, and a summary of methodology and methods employed towards achieving the set aim were presented. The chapter subsequently discussed the contribution of the study as well as its limitations, which could be addressed by further studies as recommended in Chapter Seven (Section 7.3).

Chapter Two reviews literature on the topic of resilience, regional resilience, spatial economic resilience, the (social and economic) dynamics of rural/ peripheral regions, and evaluation of plans in the context of resilience. This is done so as to get an improved understanding of resilience towards addressing the research problem, questions and objectives; and to particularly at least in part inform the analytical framework utilised in the subsequent stages of the thesis.

Chapter Three identifies a theoretical framework that is considered appropriate towards conceptualising and guiding the analysis of regional resilience in rural or peripheral regions. The integrative framework adopted, which is uncommon and somehow controversial, draws upon the rationalities of classic rational comprehensive planning and communicative planning theory. The adopted framework is in association with the lessons drawn from the literature review used to inform the analytical strategy and methods employed in the latter stages of the thesis.

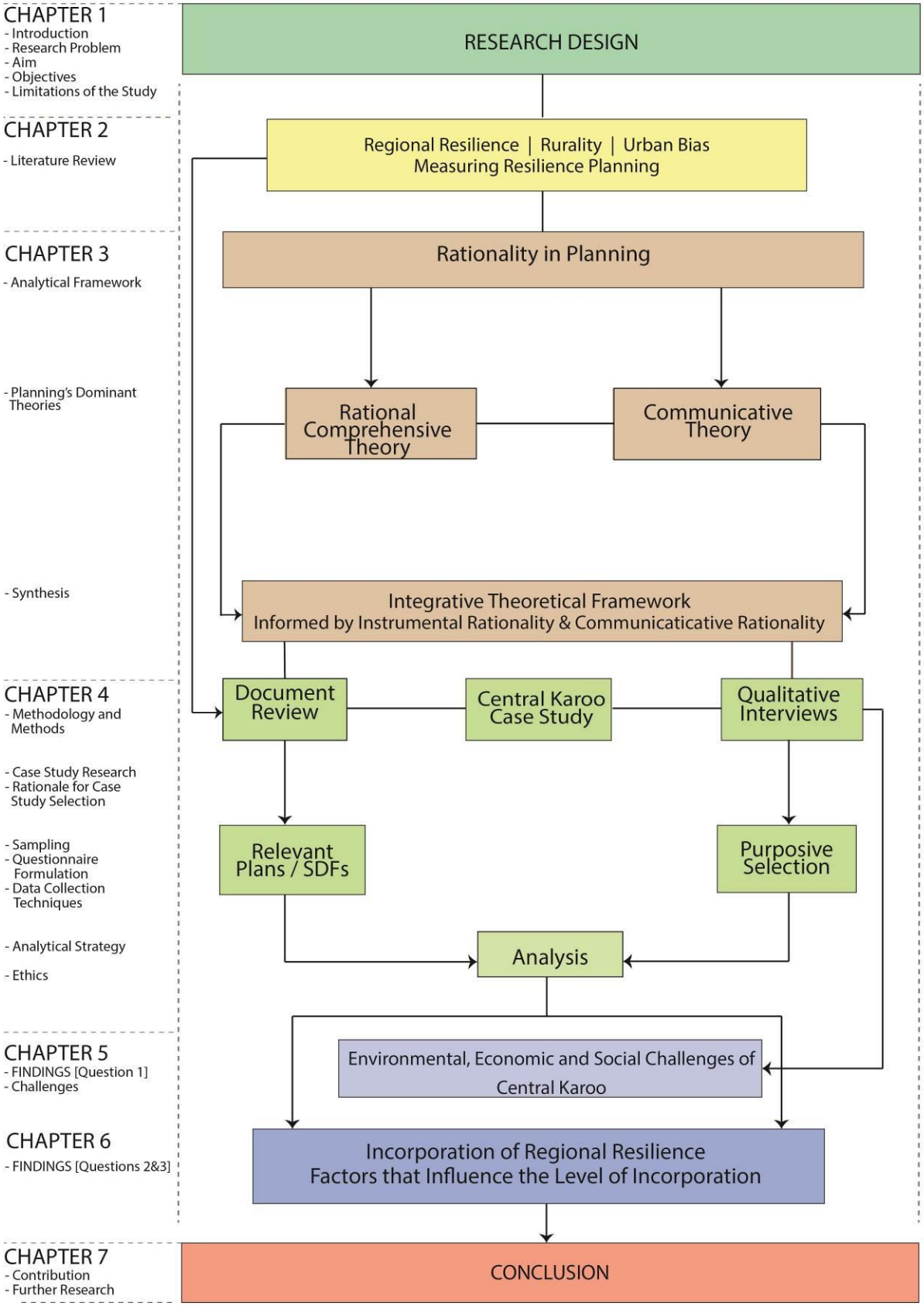
Chapter Four outlines the research approach, methodology and methods used in the study. A case study is adopted as the main research approach, which revolves around the Central Karoo region in the Western Cape province of South Africa. Among others, the chapter describes the types of primary and secondary data collected, the non-probability sampling technique of snowballing sampling employed to identify the respondents, as well as data collection and analysis approaches, methods and techniques utilised towards addressing the aim and objectives of the study.

Chapter Five presents the context of the case study of Central Karoo region, and identifies environmental, economic and social challenges that the region faces or would likely face in future. The challenges identified include the varied ramifications of climate change (mainly frequent drought and increasing temperatures), low educations levels, poverty, and pandemics. This chapter addresses the first research objective.

Chapter Six documents the bulk of findings of the investigations conducted on the Central Karoo region case study, which for ease of reference are organised around the latter two research objectives. The chapter breaks down the findings into the constituent parts of the region, and draws the similarities and differences.

Chapter Seven synthesises the thesis by presenting the potential contribution of the research conducted, and for ease of reference pinpoints and directs readers to sections where the research objectives/ questions are addressed. The chapter accordingly outlines the study's contribution in terms of the applied component of research. The chapter subsequently closes the thesis with recommendations for further research on the topic of regional resilience, and particularly so far as rural or peripheral regions in South Africa are concerned.

Figure 1. 3: Study outline



Source: Adapted from Mokhele, 2016

CHAPTER 2: LITERATURE REVIEW

Following the background and introduction to the thesis in Chapter One, which among others outlined the research problem, overarching aim, questions and objectives of the study; the current chapter reviews the literature on resilience. The purpose of the review is to present the existing knowledge on the subject of resilience relative to rural and/ or peripheral regions, assessment of plans in the context of resilience, and to particularly draw aspects that can in one way or another guide the analysis conducted in the subsequent phases of the study. Lessons from the review (which go in tandem with the theoretical framework discussed in the next chapter) are thus used as foundation for the analytical strategy and methods employed in the study. Against this backdrop, the chapter is structured into four interrelated sections. Section 2.1 sets the scene to the literature review by dissecting the concept of resilience and thereafter discusses the intertwined facets of regional resilience, spatial economic resilience and spatial resilience. Section 2.2 focuses on the notion of rural areas/ rurality, provides an overview of the multiplicity of challenges faced by rural and/ or peripheral regions around the world and specifically in South Africa, and overviews the theory of urban bias. In light of the policy-evaluation orientation of the thesis, Section 2.3 zooms in on the evaluation of plans in the context of resilience planning, and accordingly reviews the methods of analysis employed in resilience-related plan evaluation exercises. Section 2.4 sums up the literature review chapter.

2.1. OVERVIEW OF RESILIENCE

This section overviews the literature on the overarching facets of resilience (i.e. engineering, ecological and evolutionary resilience), regional resilience, spatial economic resilience and spatial resilience.

2.1.1 Engineering, ecological and evolutionary resilience

Traditionally, two main facets or faces of resilience can be discerned in the literature, which are accordingly regarded as holding special significance (Thorén, 2014) in policy and practice. Earlier uses of resilience were predominantly based on the so-called engineering interpretation on the one hand and ecological interpretation on the other (Holling, 1996). As overviewed in Chapter One, Section 1.1, resilience in the engineering sense focuses on the ability of a given system to return to its previous equilibrium after a shock, the effectiveness

of which is measured by the speed at which the system is able to revert to its previous stable condition (Holling, 1996; Carpenter et al., 2005; Boschma, 2015; Vale, 2014).

Having resemblance to the traditional understanding of scholars and practitioners in the disciplines of physics, engineering and control system design, the engineering interpretation of resilience is informed by the presumption and expectation of a global stability, which implies the existence of a single equilibrium (Gunderson, 2000). Based upon the desire for fail-safe situation, this understanding of resilience revolves around the notions of efficiency and predictability (Holling, 1996). The focus of engineering resilience is thus on the toleration of disturbance, avoidance of catastrophe and preservation of accumulated strengths to keep the system running (Turok, 2014).

Against the backdrop of engineering resilience, contemporary literature largely draws on the work of Holling (1973, 1996), whose definition of ecological resilience is associated with the level of disturbance that can be sustained prior to changes to a given system. This is essentially the opposite of engineering resilience, as Holling (1973) argues that an equilibrium-based approach is intrinsically static and does not provide comprehensive insight into the transient behaviour of systems that are not close to the equilibrium. Ecological resilience thus focuses on the ability of a system to absorb changes, persist and adapt accordingly (Adger, 2000; Ahern, 2011; Davoudi, 2012; Holling, 1973) instead of merely returning to the previous state of equilibrium. Holling (1973) also unpacks (ecological) resilience in contradistinction to the notion of stability, wherein stability denotes the ability of a system to return to an equilibrium position following a disturbance. The quicker it reverts, and with minimal fluctuation, the more stable the system is perceived to be (Holling, 1973). It should however be noted that ecological resilience assumes the existence of numerous stability domains, and is thus defined by the enormity of disturbance that can be soaked up by a system before it changes stable states (Gunderson, 2000).

As opposed to focusing on maintaining efficiency in the engineering resilience sense, Holling (1996) argues that ecological resilience is concerned with maintaining the existence of function, and thus revolves around safe-fail considerations. Furthermore, as emphasised by Thorén (2014) building on the ideas of Holling (1973), the notion of resilience in ecology should be analysed in the context of the debate on the stability-diversity consideration, i.e. the understanding that diversity and stability have a positive relationship. The interpretation is

informed by the idea that resilience can capture a dynamic property not just of ecosystems, but of other systems as well, including the ecological, economic and social systems. It should be noted that although (as evident in the foregoing discussion) there is clearly a strong link to, and heavy reliance on, the aforementioned interpretation of Holling, there is wide variation in the way scholars and authors have interpreted and used the notion of ecological resilience (Thorén, 2014).

In the context of urban and regional systems, it stands to reason that a state of equilibrium does not exist and is indeed not feasible or desirable as circumstances can change at any given time due to complex social dynamics at play. This implies that systems neither stand still nor revert to a stable condition following a disturbance (Turok, 2014). It is therefore important to introduce the third facet of resilience, which various authors (for instance, Berkes & Folke, 1998; Carpenter et al., 2005; Scheffer, 2009; Folke, 2010) refer to as evolutionary resilience, adaptive resilience, socio-ecological resilience or bounce-forward. Although external forces can indeed affect a given system (Turok, 2014), this way of thinking about resilience advocates and emphasises that systems themselves may change without disturbances, and therefore resilience cannot be conceived as a return to a previous state of normality (Elimqvist et al., 2014). Resilience in the traditional sense, engineering as a 'bounce back' to a previous state of equilibrium, or even the ecological interpretation of resilience, which also acknowledges that there was previously a steady form, are arguably not sufficient frameworks towards analysing human settlements (Vale, 2014) or urban and regional systems generally.

Despite the nuanced and subtle differences between the facets or faces of resilience above, it can be argued that the different forms are not mutually exclusive. Some scholars therefore argue that the different facets can coexist, suggesting that elements of continuity and change can exist within a single system, accordingly implying that certain functions would persist while other aspects of the system adjust to evolving conditions and circumstances (de Weijer, 2013 cited in Turok, 2014), which could be internally or externally induced.

Coetzee et al., 2016 argue that the interpretation of resilience can be improved by using the lens of complex adaptive systems theory, which would permit the stakeholders to perceive resilience as an open-systems process, which constantly evolves due to, among others, the building and dismantling of parts that make up the resilience profile of a given area. All in

all, systems theory argues that the resilience of a community should be regarded as a system, with interconnections between the different components that constitute overall resilience (Coetzee et al., 2016).

2.1.2 Regional resilience

As expounded on in Chapter One, the thesis analyses regional resilience planning using the case study of Central Karoo, in the Western Cape province of South Africa. It is thus imperative that the literature on 'regional resilience' is overviewed. Arguably similar to resilience generally, one of the reasons for the increasing popularity of the term regional resilience is its vagueness wherein it can mean different things to different people in different areas and times. In the social sciences, in general, regional resilience is particularly popular because of its connection with the notion of regional adaptation. It should however be acknowledged that despite its relatively newly found fame, the notion of regional resilience is an old and enduring question, which tries to unravel why some regions manage to overcome (economic) adversity and maintain a high quality of life for communities while other regions fail to resolve economic problems towards improving the quality of life of communities (Christopherson et al., 2010).

One significant divide and point of contention among researchers, commentators and authors writing about regional resilience can be related to how they analyse and interpret the critical concepts of time and space (Christopherson et al., 2010). Modica and Reggiani (2015) add that the understanding of time and space has important implications on the way (economic) processes that characterise resilience are analysed, interpreted and understood. In the traditional equilibrium approaches, which are typically based on the framework that is static, time is measured in distinct moments (i.e. pre-shock, shock and post-shock). These moments are measured within the geographical confines of a region, which is simply an action 'container' that could bump up against other 'containers' (i.e. neighbouring regions) but is in the main on its own trajectory of development. Some scholars opt for a different, more insightful evolutionary approach to understanding regional change: one that revolves around the understanding that instead of being a neutral container, space is constructed through human action, interaction and the associated social relations. As manifestations of those actions, relationships and interactions, regions are in the constant process of transition (Christopherson et al., 2010; Modica & Reggiani, 2015).

From a regional resilience point of view, some scholars regard the occurrence of resilience as a result of both endogenous or exogenous influences (Pike et al., 2010) and emphasise the return of the system to a single equilibrium or multiple equilibria state after a disturbance. Numerous studies have thus been undertaken, and resilience on a regional level approached from a number of perspectives including but not limited to the concepts of equilibrium-based approaches i.e. 'single equilibrium state' and 'multiple equilibria state'. A third state of 'dynamic non-equilibrium' is also identified wherein a system is understood as being subject to constant change and never gets to a state of content or resilience (Pickett et al., 2004). This relatively new evolutionary approach to regional resilience advocates that there is a constant evolution of a region along a number of growth paths (due to the influence of multiple factors) but that a realisation towards optimal change (during transition phase) according to resilience pathways is the focus as opposed to the previous notion of perfect equilibrium (Grabher & Stark, 1997 cited in van Aswegen & Retief, 2020). The concepts of adaptability and adaptation in a region's ability to withstand shocks are believed to have a significant impact on driving a region onto a new growth path or developing a new path in advance of shocks (van Aswegen & Retief, 2020). It should be emphasised that the aforesaid ways of interpreting regional resilience are aligned with the facets of engineering, ecological and adaptive resilience discussed in Section 2.1.1.

Citing a number of sources, Kakderi and Tasopoulou (2017) note that the literature also unpacks a few principles pertaining to how policies for regional resilience could be crafted or formulated: they have to be flexible, with reduced interdependencies in the manner that the success of one measure is not associated with the success of other measures; they have to be context specific, sensitive to geographical, social, economic and political context but at the same time open and outward looking; and they should also be placed on the basis of ongoing processes, which set long-term objectives for the area. In terms of governance matters, policies should be the outcome of collaborations between communities, institutions and authorities at the regional and local levels, and of vertical synergies with policies at the national level (Kakderi & Tasopoulou, 2017).

Bristow (2010) argues that the stakeholders in charge of formulating regional policy appear to be obsessed with regional competitiveness and as a result regard the concept of resilience through that perspective. This is not ideal since such an approach leads to a narrow and limited view of what regional resilience may have to offer, as a way of comprehending the

factors that influence regional change and in informing the crafting of policy. Furthermore, given that competitiveness is associated with the promotion of economic growth, there is also a tendency to regard resilience in the same manner, and disregard the contribution it can have towards a better comprehension of the determinants of regional sustainability and key interfaces between environmental and economic development (Christopherson et al., 2010). In light of this argument, the thesis focuses on the different facets of regional resilience as opposed to being restricted to economic considerations.

2.1.3 Spatial economic resilience

As noted in Chapter One, Section 1.1, in the light of the socio-spatial interactivity among stakeholders or social actors and the varied socio-economic phenomena, resilience appears to have specific relevancy in spatial systems (Östh et al., 2018). Notwithstanding the limited instances overviewed in Section 2.1.4, instead of focusing specifically on, or referring to spatial resilience per se, the relevant literature to a great degree refers to spatial economic resilience. Towards a better understanding of this notion of resilience, it stands to reason that as a starting point, the field of spatial economics should be briefly defined. Simply put, spatial economics focuses on the interconnections between 'space' and economics, and particularly analyses the spatial pattern and interactions of systems of production, distribution and consumption (or more generally, the activities of humans) in a spatial context, including the management, planning and/ or projection of development (Nijkamp & Ratajczak 2013 cited in Modica & Reggiani, 2015).

In light of the overview above and also the discussion in Section 2.1.2, literature aligned to spatial economic resilience includes the critical definitional complications related to how researchers interpret the fundamental concepts of space and time (Christopherson et al., 2010) wherein two distinct frameworks and positions can be identified. In the absolute interpretation of space, the region (i.e. space) is considered simply as an action container, and time is understood as a defined moment, which could comprise pre-shock, shock, and post-shock stages. In the second and arguably more relational approach, instead of being a neutral container as it were, the region (i.e. space) is understood to be the outcome of complex interactions (human actions) and relationships, and is thus subject to a constant process of change and evolution; and time in this regard is understood as a flow (Modica & Reggiani, 2015).

As discussed earlier in the chapter, equilibrium approaches could be explored using the notion of engineering resilience, while evolutionary approaches could be associated with the interpretation of ecological (or adaptive) resilience. As a result of these differences (which in turn have methodological implications), spatial economic resilience has been expounded in various ways depending on the approach adopted, the focus and purpose of the analysis, the scale or level of analysis, the characteristics of the object analysed, and indeed the nature of the object itself (Modica & Reggiani, 2015).

Furthermore, definition(s) of spatial economic resilience can take various directions depending on considerations such as the type of shock analysed, the analytical context, aims and frameworks employed and the level of analysis. For instance, in relation to shocks, spatial economic resilience could be employed to analyse the capacity and/ or ability of a region to recover from shocks such as natural disasters. The analytical context changes according to the different spatial economic objectives. Although the objectives of the analysis are also multifaceted, it is possible to pinpoint main arenas. As noted by Christopherson et al., (2010) and Dawley et al., (2010), resilience might be analysed to measure the (economic) success of a region or area in terms of the following aspects: adjustment, adaptation, convergence, equilibrium; or according to Martin's (2011) categories of (i) renewal, (ii) reorientation, (iii) recovery or (iv) resistance. These aspects account respectively for the following: (a) the degree of regeneration, (b) the degree of adaptation in response to shock; (c) capacity in terms of speed and degree of recovery from shocks, and (d) the extent of sensitivity to the shock. Another aspect that is highly relevant to the thesis pertains to the selection of 'indicators' of spatial economic resilience and the related 'measurements'. For instance, analysis of resilience pertaining to disasters is typically based upon the use of indices, while studies of recessionary shocks are based mainly on econometric models (Modica & Reggiani, 2015).

2.1.4 Spatial resilience

Related to the foregoing discussion of spatial economic resilience, it is also important to overview the literature that focuses specifically on spatial resilience. It should however be noted that because of the intricate interconnections, it is arguably impossible and not desirable to isolate the 'spatial' from the 'economic'. Although spatial resilience was incorporated into South African planning legislation in 2013 (refer to Republic of South Africa, 2013), it is not clearly defined and understood by interested and affected parties.

According to Barnes and Nel (2017), a large number of urban and regional planners in South African municipalities do not adequately understand what spatial resilience entails, and accordingly how it can be implemented and measured. This is undoubtedly a concern as the concept is embedded within the key planning legislation of the country, which should be used effectively to contribute towards improving the livelihoods of communities.

In the South African context, the notion of spatial resilience essentially relates to the flexibility of plans and development frameworks, yet flexibility is a term that is not well understood. The lack of a clear and focused definition therefore makes it difficult for spatial resilience to be empirically measured. The term flexibility is loosely used in the definition of spatial resilience and it is not clear what it entails. For instance, Barnes and Nel (2017) argue that flexibility in legislation and policy could imply that there is lack of clarity on the interpretation. Also, flexibility could connote that a concept is too vague and cannot be interpreted accordingly and adopted to address particular circumstances. On the one hand, this is seen as problematic, as flexibility in (spatial) plans or frameworks could result in excessive room open for interpretation or misinterpretation; thus, for instance, possibly allowing inappropriate development to take place in the name of flexibility. On the other hand, this vagueness can be interpreted in a positive, more optimistic way. This is when scholars argue that planning can become innovative and come up with new solutions to persisting and evolving problems (Tasan-Kok, 2008) as opposed to being stuck with rigid plans, in the manner of traditional master plans.

2.2 RURAL AREAS AND RURALITY

As argued in Chapter One (Section 1.2), a single definition of rural or rurality does not exit, and it is neither feasible nor advisable to develop an all-embracing definition (Halfacree, 1993). Nonetheless, though simplistic, a descriptive approach (mainly revolving around socio-spatial characteristics) would suffice for the purposes of the thesis. Without being contradictory, it is however emphasised that such definition is limited per the discussion in Chapter One. In this regard, although the term rural is ambiguous, rural spaces or areas are recognisable due to their specific characteristics, which are different from the so-called urban areas (Ashley & Maxwell, 2002). Rural regions are often located on the outskirts of metropolitan areas or urban regions, and have a spatial economic character that includes sparse settlement patterns, predominant agricultural activities, and centrally located economic

base at one dominant town centre. These regions include small rural towns, villages and small settlements (Western Cape Government, 2019).

Some scholars argue that sustainable development principles, which are linked to regional planning and (regional) resilience, have not been adapted well to the conditions of rural areas (Hudson, 2010). One of the major concerns is that rural regions experience uneven investment, potentially because of a number of reasons. These include being locked out of growth processes and not having influence or powerful representatives in decision-making processes or simply being stuck with institutional structures, which are at a risk of becoming redundant or irrelevant in time (Hudson, 2007).

As noted with the statement of research problem in Chapter One (Section 1.2), the urban and regional planning discipline surprisingly does not put the deserved attention on the peculiar circumstances, challenges, prospects and potential of rural regions, notwithstanding the magnitude of critical planning issues that exist in such areas (Morrison et at., 2015).

Despite the reiterated insufficient interest in rural areas, Ashley and Maxwell (2002) suggest that rural spaces will evolve over time, influenced by the following key considerations:

- Initial stable population rates, which later change as migration occurs and some young adults move out.
- Improved telecommunications infrastructure and services in rural areas.
- Improved skills base of rural communities and better health care provision.
- Agriculture will be largely commercialised and the primary source of employment for the residents of rural areas will be in the secondary economic sectors.
- Agriculture will reap technological benefits but to the detriment of communities who will suffer increased disparities.
- Contributions of agriculture to the economy and export will both be at around 10% and the sector will become the primary focus of the allocation of government investment (Ashley & Maxwell, 2002).

Some of these considerations can be observed in rural areas and depending on the specific location, the challenges experienced in rural areas are generally linked to insufficient investment, limited employment opportunities, low income, low education levels, poor

allocation of services and basic infrastructure, and population loss (Norgaard, 2006). Further to this, roles and responsibilities within regional planning and development realm are sometimes not well defined in so far as rural areas are concerned. Fox-Lent and Linkov (2018) point out that in some instances, lower levels of government may expect the state or national government to take on certain responsibilities pertaining to regional development, where the state also expects local government to be pro-active and ensure that planning is facilitated. Furthermore, there is still a need to establish stronger links for improved livelihoods between policy and implementation in rural areas (Ellis & Biggs, 2001).

Several authors unpack the changing way in which rural development around the world has been approached in the recent past (Tomaney et el., 2010). One of the main driving forces of this change is globalisation (Drabenstott, 2006; Rogerson, 2010a) and the effect it has on regional development.

Ellis and Biggs (2001) outline the following themes in rural development, from the 1950s to the 2000s:

- 1950s: attention was given to the concept of community development, which was worked into rural development strategies. This particularly had an impact on the way the agricultural sector was understood.
- 1960s: technological changes and advancements began to influence the economy and development. The need for transformation at all levels of society was identified, and authors point to the commencement of the green revolution, highlighting the importance of sustainable farming and the conservation of the natural environment.
- 1970s: urban bias decreased investment and resource allocation in agriculture (Bezemer & Headey, 2007). The term urban bias was popularised in the late 1970s by authors including Michael Lipton (1977) in his treatise entitled ‘Why Poor People Stay Poor: A Study of Urban Bias in World Development’. The work advanced arguments and evidence on ways urban bias contributed to poverty in rural areas (refer to Section 2.2.2 of this chapter for a discussion of the theory of urban bias).
- 1980s: trade and market liberalisation resulted in multi-sectoral approaches, and the idea of sustainable livelihoods was developed as a guiding principle of rural development (Chambers & Conway, 1992). The term poverty alleviation was introduced in the so-called developed world.
- 1990s: terminology progressed as experiences in rural development unfolded and the newly accepted development interpretation focused on poverty reduction.

- 2000s: subsequent to further informative experiences, poverty eradication became the focus of this decade.

The ideas or themes above are not only closely linked to each other, but also transition into subsequent decades, and develop over time as they gain momentum and strength (Ellis & Biggs, 2001).

Authors like Bachtler and Yuill (2001) consider the United Kingdom as one of the most significant contributors to regional planning policy, and certainly the first to make leaps into its application. Before the Second World War, Britain and the Scandinavian part of Europe incentivised manufacturing factories to locate on the outskirts of metropolitan regions. After the war, the strategy of regional development was to take up economic strain from the more active urban regions and in the process cater for economic opportunities in the rural areas (Rogerson, 2010a).

Regional growth and development strategy were largely top-down and controlled by government. During the same period, regional development in the United States of America (USA) was centred around attracting investment for the manufacturing sector into depressed regions (Drabenstott, 2006; Rogerson, 2010a). The government took precedent from Western Europe, and grants were focused on spatial equity and providing equitable standard of living, basic infrastructure and economic opportunities. Rogerson (2010a) lists four main focus areas in regional development for that period, namely: infrastructure investment with a big focus on rural areas; moving of state-owned industry to the so-called problem areas; control of industry located in affluent regions; and fiscal incentives.

Bachtler and Yuil (2001) and Tomaney et al. (2010) refer to the complete change in the vision and focus of regional development and rural investment during the 1970s and 1980s. The drive through Western Europe and the USA was around the privatisation of markets and liberalisation, so much so that academics began to speak about the ‘death of regional policy’ (Rogerson, 2009). Governments in Western Europe started putting most of their efforts into economic development and the rise of new regionalism began in the USA (Drabenstott, 2006). The most significant changes that came about through new regionalism were bottom-up initiatives as opposed to the top-down practices of the past (Rogerson, 2009). With the rise of globalisation, regions were forced to find new ways of keeping their economies and

entrepreneurship began to take the centre stage in Western Europe and the USA, with a lot of focus on small to medium enterprises as opposed to large manufacturing industries (Bachtler et al., 2003; Tomaney et al., 2010).

Bachtler and Yuill (2001) refer to 'modern paradigm' for regional development post the 1980s, which is directly linked to regional competitiveness. Drabenstott (2006) elaborates on existing markets evolving and constantly looking for innovative ways to remain competitive. The interest on learning and innovation starts to increase and local or indigenous values become more needed. New approaches are identified including: the involvement of a variety of government sectors in policy making, including inter alia, tourism and hospitality industry, agriculture, human resources, and business development; focus on all regions as opposed to only problematic ones; involvement of various stakeholders, such as local businesses and communities; the designated areas for investment are both areas experiencing problems, as well as areas presenting opportunities; in Western Europe particularly, grants were used as the main tool to support regional development; successful regional programmes are developed to support the grant system (Rogerson, 2009; Bachtler & Yuill, 2001).

2.2.1 Rural development in South Africa

Against the backdrop of the trends of rural development broadly, given that the case study that the thesis unpacks is located in the Western Cape province of South Africa, it is imperative to highlight the country's and the province's position on regional and/ or rural development. Directly post the dawn of democracy in 1994, initiatives focusing on the funding and driving of regional development in South Africa were inconsistent and in a way fragmented (Rogerson, 2010b).

A short historic timeframe illustrating regional growth investment can be summarised as follows:

- Apartheid period: regional growth and investment strategies were strongly incentivised as a means of supporting spatial strategies for apartheid planning and its underlying ideology. The period between 1979 and 1981, often referred to as the world's most abundant programme of incentives for regional development (Rogerson, 1994), was the biggest push by the government to decentralise industrial development across the country.

- Late apartheid period: there was initiation of large development grants, which encouraged manufacturers to move away from cities and relocate to rural areas/ regions. This was closely analysed by various authors (for instance, Dewar, Todes, & Watson, 1986; Wellings & Black, 1986; Wellings & Black, 1987; Rogerson, 1988), who concluded that this was arguably the first solid attempt at regional development in South Africa. Despite the various critiques of this incentive system, Driver and Platzky (1992) as well as Platzky (1995) pointed out that there had been long-term successes associated with the strategy, especially for rural regions. This was also supported by Hart & Todes (1997) cited in Rogerson (2010b).
- Post 1994: for a period of 10 to 15 years, South African government decreased focus on incentivising regional development. This could be attributed to many new strategies for development, and the notion to avoid and disassociate with strategies that in any way supported or aligned with apartheid spatial planning (Harrison et al., 2008; Nel & Rogerson, 2009).
- The National spatial development perspective (2003) pointed out issues of development in rural areas as well as their spatial significance (Rogerson, 2010b).
- In 2006, a more focused approach to addressing development in rural regions was addressed by the Department of Trade and Industry in the draft regional industrial development strategy. The strategy was a way of responding to the need for government to support industrial development in impoverished areas and to introduce a regional industrial development fund (South Africa , 2006).
- Department of Cooperative Governance and Traditional Affairs (COGTA), during 2009, recommended that incentives for regional and local economic development be assessed (Rogerson, 2010a).
- Post 2009, the South African government has clearly expressed a commitment to long-term spatial planning and coordination. This is referred to within the New Growth Path plan which deals with redressing imbalances in development and economic opportunities within rural areas (South Africa, 2010; Turok, 2010; Rogerson, 2010b).

It is argued that the development and adoption of a strategy for rural regions is important as it would not only drive rural development and redress the past imbalances, but would also determine settlement patterns based on appropriate economic drivers (Rogerson, 2010b).

In the Western Cape province, the Western Cape Government (2019) proposed a strategy for rural regions within the province in the work entitled 'Western Cape Land Use Planning Guidelines for Rural Areas'. The document outlines the main rural areas within the province and points to an overall vision as well as specific strategies for realising the vision in different rural contexts in the province (Western Cape Government, 2019). The strategy strives to meet sustainable development of rural areas, conservation of biodiversity, functionality of ecosystems, protection of productive agricultural land, and protect the heritage and culture in rural areas (Western Cape Government, 2019). Through setting out a vision for development of rural regions, spatial planning principles can be put forward to meet this vision.

2.2.2 Urban bias

The contemporary challenges faced by rural areas alluded to in the preceding sections can be described and explained through the lens of the theory of urban bias. Some scholars and commentators are of the view that the so-called urban bias (as defined below) is largely to blame for the failure of development to be meaningful and of benefit to the rural poor wherein the allocation of resources within the urban areas and within the rural areas as well as between them, indicate urban preference rather than fairness, justness or efficiency (Lipton, 1977).

The notion of urban bias is particularly interested in the role of government, politicians and other influential role players in perpetuating socio-economic disparities between urban areas and rural areas. The main proponent and arguably one of the founding fathers of the theory is Lipton (1977), who regarded urban bias as an outcome of urban-rural relations that is epitomised by, inter alia, lack of proper roads in rural areas while urban areas get good quality roads, minute agricultural research while urban industry is heavily subsidised. Furthermore, Lipton highlighted the bias against rural research wherein the higher education system produces relatively few people who are able and willing to conduct research or indeed conduct any work, which is relevant to rural circumstances and needs. A call is thus made for researchers in private sector, non-governmental sector and different spheres of government to increase the proportion and quality of their efforts towards conducting research that is likely to improve the conditions of the rural people (Lipton, 1977).

In light of the overview above, it could also be argued that the 'urban' exploits the 'rural' (Dewar et al., 1984). In sum, the theory of urban bias argues that: (a) the development process is biased against rural areas; and (b) such bias is embedded in the political and economic structures, which are dominated by groups that reside in urban areas (Varshney, 1993). The theory can therefore be used to explain, though not necessarily wholly, the challenges of rural and/ or peripheral regions. Lipton (1977) acknowledges and argues that the intention is not to overstate the case for urban bias, because such a reduction is not the only thing necessary. However, a concerted shift of focus and resources to rural areas, towards improving the livelihood of the rural (poor) communities, is arguably the overriding task of development efforts (Lipton, 1977).

2.3. EVALUATION OF PLANS/ MEASURING RESILIENCE PLANNING

It is widely acknowledged that (spatial) planning should be based on an integrated approach, where various levels of governance have shared and agreed-upon responsibilities, aimed at a broader goal (Eggenberger & Partidário, 2000) of improving the livelihoods and conditions of communities and society. In order for planning to have the desired impact, various future-oriented plans, frameworks, strategies and instruments are put in place across the world. Spatial plans or development frameworks at different scales and levels of governance, including provincial, district and local (or derivatives depending on context), form part of these instruments and tools.

In its very nature, (spatial) planning deals with cross-border and regional issues. Here, the encounter with administrative and political boundaries is unavoidable and poses a challenge to spatial plans, more specifically the integration of various levels of spatial plans, e.g. national, provincial and local (Allmendinger & Haughton, 2009). For instance, in the South African context, the National Development Plan 2030 places critical importance on integration. Responsibility is allocated to each municipality and province, to ensure that the principle of integration is embraced and adopted in the plans. The measuring of integration is however not explicitly defined, and the concept thus becomes difficult to implement in practice (du Plessis, 2014). Du Plessis (2014) further argues that spatial plans do not typically provide the required level of detail for decision-making and effective implementation of the plans developed. Evidence is also provided that vertical integration of plans, at various levels of governance, is sometimes unclear at the highest level although links are supposed to exist between provincial spatial development frameworks (SDFs) and district and local SDFs. It is

thus imperative to have a comprehensive and multi-dimensional evaluation of plans to, among others, ensure the anticipated integration.

Republic of South Africa (2013) provides requirements for the preparation of SDFs in South Africa. In 2014, the South African Department of Rural Development and Land Reform set out the draft SDF guideline document, so as to inform the development of provincial, regional and municipal SDFs as well as precinct plans. The intention of the document is to ensure that the principles of SPLUMA are integrated into all levels of SDFs towards achieving the set spatial outcomes and goals. The overarching framework adopted for the said guidelines incorporates three key themes towards achieving integration, namely biophysical, socio-economic and built-environment. The guidelines also provide a framework for the evaluation of SDFs, which is critically important in addressing the limitations of some SDFs in the country (South Africa, 2014).

Machakaire et al. (2020) emphasise that it is widely accepted in the literature that evaluation is an important aspect of urban and regional planning albeit differences emerge on what evaluation should entail or should focus on. It stands to reason that the outcome of evaluation exercises can be useful towards improving decision-making, improving the plan preparation processes, augmenting the implementation of plans, and determining the efficacy of plans, among others (Guyadeen & Seasons, 2016, 2018). Two related and non-mutually exclusive forms of evaluation can typically be discerned in the literature. On the hand, evaluation efforts focus on the quality of plans, plan implementation and the anticipated outcome of plans. On the other hand, evaluation is concerned with the underlying planning processes and practices (Guyadeen & Seasons, 2018).

Spatial planning is considered a continuous process, thus necessitating the evaluation, monitoring and review of spatial plans at different stages of the planning process. As indicated above, although it is a challenging task due to the highly complex nature of development planning, evaluation of plans is essential in ensuring continuous effectiveness of planning (Segura & Belen, 2017). Despite many commentators and authors agreeing that there is no single method that measures the effectiveness of plans, the thesis focuses specifically on resilience thinking in spatial plans and the associated policy positions. The research objectives stated in Chapter One necessitate that the discussion transcends the two facets of plan evaluation mentioned above, namely the content (quality) of plans as well as

the underlying processes that may result in particular quality so long as the incorporation of regional resilience is concerned.

Before resilience measuring was seen as a viable option, one of the traditional practices was to conduct risk analysis. Fox-Lent and Linkov (2018) critique traditional risk assessments in terms of their applicability to contemporary circumstances and contexts, and argue that such analysis, while able to yield a good risk value, may lead to false sense of certainty. This makes the process of risk management challenging because of the following reasons: firstly, it is a costly process when applied to complex systems; secondly, the nature of threats is constantly evolving and there are new disaster-related threats emerging, which compound traditional threats; thirdly, since risk management is capital investment based, it can be unpopular due to the fact that it is a preventative measure, and threats may not even occur. It can therefore be argued that the need for (regional) resilience is not well addressed through traditional risk assessment approaches.

Linkov et al. (2013) present a basic matrix for capturing system capacity during a threat or disaster. The authors used a network-centric approach, developed by the United States Military Command and Control Research Program, which breaks a subject system down into a number of measurable domains. There are four domains measured in this regard, namely physical, information, cognitive and social. The four stages, which the domains are measured against are: preparation, absorption, recovery and adaptation. The ultimate goal of using this matrix is to identify critical areas of poor performance, thus initiating further investigations and improvement.

Multitudes of variables, which can range from one to 29, are typically used in the analysis of spatial economic resilience (Modica & Reggiani, 2015). Nonetheless, notwithstanding the wide range, the variables used in the literature can be grouped into five main categories. One, socio-economic attributes and financial position of the individuals, and the overall spatial economic systems (such as economic diversification and density of business). Two, institutional capacity of the spatial economic system, particularly with reference to the political system and the availability and/ or quality of public facilities. Three, infrastructure, which improves efficiencies of the economic system. Four, good community capacity, which could be a strength that allows a given area or region to cooperate and cope with a

disturbance. Five, innovation, technology and natural environment could prevent or reduce the impact of a disturbance or disaster (Modica & Reggiani, 2015).

Elsewhere in the literature, in the analysis of the resilience of South African cities, Turok's (2014) insightful analysis revolved around three main dimensions of change, namely economic progress, reshaping the built environment, and responsive governance. The author employed these dimensions as measures of resilience-building over time.

Pinho et al. (2013) presented a well-considered methodology for evaluating the so-called 'resilience thinking' in planning. The methodology draws both on work from the socio-environmental systems and from the field of planning evaluation referred to earlier in this section of the chapter. Instead of focusing on particular phases of the planning process, the methodology notably considers planning process in its totality, focusing on planning documents at preparation and implementation stages, and on their impact on the subject communities and/ or society at large. The methodology comprises seven stages, namely: identification of key issues; selection of relevant planning documents; identification of resilience-related policies and measures; determination and formulation of evaluation questions; selection of the dimensions of resilience and the associated indicators; and synthesis and critical assessment of the evaluation outcome. These stages of resilience thinking evaluation are overviewed below and integrated with the relevant supporting literature where possible.

Identification of key issues: the first stage of the methodology focuses on the identification of the principal issues to be taken into consideration, and the identification of the alterations that have occurred in the study area. The study area could be a neighbourhood, city, metropolitan area or rural/ peripheral region in the context of the thesis. These issues shall subsequently be the key aspects to be addressed and systematically dissected in the assessment exercise (Pinho et al., 2013).

Selection of applicable planning documents; and identification of resilience-related policies and measures: the second stage of the assessment process includes the identification and selection of the main planning documents focusing on the key issues identified in the first stage and, particularly, the identification of the fundamental concerns expressed in the planning documents. The policies and measures considered in the planning document

(selected in stage two) correlate with the third stage. These policies and measures are indeed the main object of the investigation (Pinho et al., 2013).

Selection of appropriate resilience attributes: the fourth stage of the evaluation process encompasses the selection of the policies and measures that can be evaluated under the framework of the resilience concept. Policies and measures are chosen according to this concept, identifying how the objectives and the proposed actions have potential to contribute to a more resilient area (Pinho et al., 2013) or specifically more resilient rural or peripheral region in the context of the thesis.

Formulation of evaluation questions: the fifth stage correlates with the identification of the resilience attributes that are most appropriate to the specific case under consideration, and to the preparation of the assessment questions. The perspective of the analysis of the resilience concept can be strengthened through the consideration of the most relevant attributes towards realising sustainable policies. The reasoning for the selection of these attributes considers that:

- The attribute must show a positive quality or connotation (‘the more the better’).
- The attribute should depict a dynamic perspective, so that gains and losses can be easily pinpointed.
- The attribute should be able to equally apply across the four selected dimensions of resilience: economic, social, environmental and governance, which are arguably close to Turok’s dimensions of economic progress, reshaping the built environment and responsive governance.
- The attribute should be defined so that duplications are avoided as much as possible. However, the interdependencies between the attributes is acknowledged and it is accepted that it might be impossible to completely isolate them.

The selected attributes can have different levels of importance. For each case study, a number of attributes are to be considered through an assessment of identified planning documents (policies, programmes, plans, strategies and/ or projects). Arguably transcending the different facets of resilience (refer to Section 2.1.1), these attributes include recovery, connectivity, capital building, adaptability, robustness, flexibility and transformability. Each of these attributes should relate to an assessment question, with the intention being to expound on how that particular attribute would be considered. The corresponding considerations (which

are arguably close to the principles on the formulation of policies for regional resilience in Section 2.1.2 of the chapter) are:

- Recovery: Are the policies, programmes, plans and projects advancing capacity in the area towards respond to and recover from disturbance?
- Connectivity: Are the policies, programmes, plans and projects promoting an interrelated territory, in which nodes of the network are effectively connected? This includes relationships between people, as well as the physical dimension (Tasan-Kok et al, 2013).
- Capital building: Are the policies, programmes, plans and projects under analysis contributing to the build-up of capital (stock), reinforcing in this way the stability and cohesion of the territory? Capital building includes formal and informal processes of decision making and improved social interaction, thus creating a more equitable society (Tasan-Kok et al, 2013).
- Adaptability: Are the policies, programmes, plans and projects promoting the adaptability of the territory and its capacity to adjust to change in a reactive way? Importance is placed on adaptive governance systems, which can deal with shocks in an efficient manner.
- Robustness: Are the policies, programmes, plans and projects increasing the robustness of the territory to unforeseen shocks and disturbances?
- Flexibility: Are the policies, programmes, plans and projects augmenting the adptability of the territory and its capacity to react to change in a proactive manner? The adaptability of policies changes when there is lack of flexibility and high levels of bureaucracy (Gunderson, 1999).
- Transformability: Are the policies, programmes, plans and projects contributing to the transformability of the territory and its ability to innovate and create a new system should the previous become no longer viable. Tasan-Kok et al., (2013) point out that the ability to learn is anticipated to create innovation and improve vulnerability and resilience (Pinho et al., 2013; also see Kakderi & Tasopoulou, 2017).

Selection of the dimensions of resilience and corresponding indicators: the sixth stage of the evaluation approach includes the choosing of the relevant dimensions of resilience and the measurement of the corresponding indicators in both the formulation and implementation

phases of the planning documents. An assessment of the crafting of the planning documents should provide an indication of the internal cohesion of the plan, as well as its consistency and coordination with other instruments. The evaluation of the implementation of the planning documents should be able to focus on the transformability of the territory and on planning practice, meaning that whenever possible, both the conformance and performance of policies should be evaluated. The methodology identified four fundamental dimensions: economic (considering both macro and micro components), social (including cultural components), environmental (the natural and built environment) and governance (public and private). An assessment of these dimensions and components involves the use of different indicators at different scales – national, regional and local. The indicators should be easily measurable and available, quantitative and qualitative, reduced in number and carefully selected to ensure good representation (Pinho et al., 2013).

Synthesis and assessment of the evaluation results: the final stage of the assessment process is meant to provide a critical assessment of the applicability and usefulness of the resilience concept to the case study under analysis with the help of indicators. The framework of evaluation should provide good measurements for determining whether the resilience concept is practical in comprehending the policies, and supplying guidance towards addressing economic, social and environmental changes to promote sustainability (Pinho et al., 2013).

Stead and Tasan-Kok (2013) assert that some scholars and researchers employ discourse analysis to analyse legislative and policy documents at different levels of government or governance towards gaining insight on how the concept of resilience is interpreted and adopted in planning (refer to how the lessons are adopted in Chapter Four of the thesis). Notably, although a few policy documents can be identified that refer explicitly to the concept of resilience, more of the documents typically focus on climate change, adaptation or mitigation without necessarily explicitly making reference to the word resilience. Systematic assessment of resilient thinking in planning should thus be on the agenda of urban and regional planning debates (Eraydin & Tasan-Kok, 2013).

Application of the method above to context specific studies (which is rural or peripheral areas in the context of the thesis) could ultimately inform the theoretical and conceptual improvement of resilience (Pinho et al., 2013).

2.4. SUMMARY

The chapter reviewed the literature on resilience generally (including its underlying facets), and thereafter focused on regional resilience, spatial economic resilience, spatial resilience, rurality and the multifaceted challenges of rural and/ or peripheral regions, including the notion of urban bias. The chapter described how the concept of resilience was borrowed from other disciplines and incorporated into urban and regional planning, and how it has evolved to address complex systems that encompass the economy, social considerations and natural environment. It was particularly noted that the different facets of resilience (i.e. engineering, ecological and adaptive resilience) are not mutually exclusive, and particular elements could be combined towards a thorough analysis of regional resilience. In light of the focus of the thesis, the discussion had to specifically focus on the notion of regional resilience, and the challenges experienced by rural or peripheral regions across the world and in the global South (particularly in South Africa). The review culminated in the discussion of various ways of measuring resilience planning, specifically in the context of urban and regional planning. Some elements of the approaches discussed in the chapter would be employed towards addressing the research aim, questions and objectives presented in Chapter One of the thesis. Against the backdrop of existing knowledge (as reflected by the foregoing literature review), the next chapter unpacks the integrative theoretical framework adopted towards informing the data collection and analysis in the later stages of the thesis.

CHAPTER 3: THEORETICAL FRAMEWORK

The previous chapter reviewed literature on the notion of resilience generally, regional resilience, spatial economic resilience, the meaning of rural or rurality (including urban bias) as well as methods for assessing resilience planning, framed within the umbrella of planning evaluation. Building upon the foregoing literature review, the current chapter unpacks the theoretical framework, which will be used to in part guide the analysis in the subsequent stages of the study. It should be noted from the onset that contrary to the traditional view of theory being law or indeed a misconception that theory is a phenomenon that is abstract, the thesis is based upon the premise of theory as a framework that provides guidance towards conceptualising a phenomenon being analysed (Mokhele, 2016), which in the context of the thesis is planning for regional resilience in rural and peripheral areas of South Africa. The chapter is categorised into three main sections. To put the discussion into perspective, Section 3.1 provides a brief overview of the dominant theories of urban and regional planning, namely rational comprehensive planning theory and communicative planning theory. To avoid selecting the appropriate theoretical framework willy-nilly, Section 3.2 discusses the notion of rationality in planning. In Section 3.3, rationality is used to decide upon a suitable guiding theoretical framework. The last part of the chapter (Section 3.4) summarises the discussion.

3.1 OVERVIEW OF PLANNING THEORY

In the widely acknowledged treatise, Faludi (1973) advanced a framework for urban and regional planning theory, which revolved around the contradistinction between procedural and substantive elements of theory. These elements are also known as theory of planning and theory in planning respectively. The aforementioned seminal work continues to be the first port of call for lessons of planning theory wherein it is emphasised that well-considered planning should accommodate the aspects of process (i.e. procedures) as well as content of plans.

Other prominent scholars have over the years extended debates on the typologies of planning theory. For instance, Yiftachel (1989) developed an approach that focuses on three typical elements of planning theory: first, the analytical component, which focuses on the question ‘what is planning?’; second, the urban form component, which unpacks elements that

constitute a good plan; and third, procedural concerns, which unravel elements of what could be regarded a good planning process.

In another classification, Friedman (2003) cited in Alexander (2003) argues that there are essentially three kinds or sets of planning theory. The first set pertains to theories for use in planning; these are about the subjects or objects of the planning undertaking, often borrowed from related fields and specific sub-specialisation in planning, which include land-use planning, transportation, environmental planning, and so on. The second set relates to the (normative) theory of planning, i.e. in its generic sense, which is common to all areas of specialisation in planning. The third set is associated with critical theory about planning, i.e. theory that is based on empirical study or experience of practice (Friedman, 2003 cited in Alexander, 2003).

Against this backdrop, it is imperative to overview what are arguably urban and regional planning's most dominant theories, namely the rational comprehensive planning theory and communicative planning theory. Rational comprehensive planning, known in some circles as synoptic planning, comprises four typical processual aspects: one, goal-setting; two, identification of alternatives; three, evaluation of means against ends; and four, implementation of decisions taken. The process involving the aforesaid components is not necessarily sequential, and each stage permits a number of iterations, feedback loops, and the requisite elaboration of underlying sub-processes. Rational comprehensive planning typically approaches problems from a systems viewpoint. Despite the critique, and its capacity for methodological improvement and elaboration, the main advantage of rational comprehensive planning is its simplicity. The proponents assert that the fundamental matters addressed by the theory (e.g. ends, means, trade-offs and decision-making) are arguably part of all planning processes. Alternative schools of thought on planning can criticise the (methodological) shortcomings of the synoptic approach, challenge the way it was applied historically or be against its underlying logic, yet the practical tasks it encompasses could be acknowledged and addressed in some form by even the most unrelenting critics. For this reason, there is a sustained tension between rational comprehensive planning and other planning theories wherein neither side of the debate do not openly feel comfortable with the opposite side, yet they cannot do without each other. Each theoretical lens indeed helps to define, refine and improve the other by reflecting on its own limitations (Hudson et al., 1979).

On this background, it is important to note that planners inclined towards rational comprehensive planning theory were of the view that urban and regional planning was a science, as opposed to the earlier views of planning as art, which was dominated by the so-called architects cum planners. Two elements of this rational comprehensive science can be discerned. On the one hand, the analysis of systems encompass systematic empirical (and thus scientific) analysis of linkages and interrelationships between activities at different locations in space. On the other hand, the conception of planning as a process of rational comprehensive decision-making was also typically equated with being scientific (Taylor, 1999).

Around the 1970s and 1980s, there was emergence of a tradition of planning theory that emphasised the role of urban and regional planners as one of identifying, communicating, mediating and negotiating between various interest groups involved in, or affected by development. In this way, the planner was regarded as a person who acts to assist other people's (i.e. community's) assessment of planning issues, as opposed to someone who is specially qualified to analyse the issues himself or herself. An earlier version of this theoretical lens of urban and regional planning, and of the planner's role, was advocacy view of planning in the 1960s. The later and more popular version of this theoretical orientation is the communicative planning theory (Taylor, 1999).

Communicative planning theory, which is in some circles referred to as collaborative planning, is based on the philosophical approaches of American pragmatism, developed by John Dewey and Richard Porty, and the theory of communicative rationality by Jurgen Habermas (Fainstein, 2000). As mentioned by Huxley & Yiftachel (2003), significant contributions to this theory were made in the 1970s and 1980s and importantly by John Forester's (1989) *Planning in the face of Power,* and subsequently *Critical Theory, Public Policy, and Planning Practice: Towards a Critical Pragmatism* (1993). Other scholars who have significantly contributed to this theory over the years include, among others, Judith Innes, Jean Hillier, Patsy Healey, Charles Hoch and Seymour Mandelbaum.

Communicative theory states that the planner has a function to listen to people and foster consent amongst different viewpoints. Their role is not the traditionally thought technocrat (i.e. in the manner of rational comprehensive planning) but rather an experiential learner, who provides information while remaining sensitive to various viewpoints (Fainstein, 2000). This

approach has become widespread amongst politicians with its appealing nature of collaboration amongst different groups (Healey, 2000).

3.2 PLANNING THEORY AND RATIONALITY

Given that planning paradigms and/ or theories are intrinsically based on different forms of rationality (Alexander, 2000), some scholars aptly argue that one of the critical aspects to be considered when determining a possible framework for integrating resilience into urban and regional planning is rationality (for instance, see Eraydin, 2013). This implies that a careful discussion of rationality is required to avoid selecting the study's guiding theoretical framework uninformed, possibly discard particular useful frameworks and in the process throw the baby out with the bath water.

Alexander (2000) notes that, historically, the word 'rationality' was erroneously regarded as a definite no-no in urban and regional planning wherein 'rational planning' was typically narrowly associated with, among others, empiricism and technocracy. The misinterpretations and confusion mainly arise from the conflation of 'rational planning' with 'rational comprehensive planning' discussed in the preceding section. Alexander (2000) states that this stereotype on rationality and planning is inaccurate, and to clear the confusion, he dissects and expounds on the accurate meaning of rational planning.

Various forms of rationality show that planning has to in principle be rational wherein rationality is simply another word for reason. Rationality is valued in its relation to accountability, which is the basis for the connection between rationality and planning. Rationality provides grounds for acting on particular decisions. As such, rational planning denotes planning that can provide reasons to justify a particular course of action or actions taken in a planning process i.e. it accounts for the proposed course of action. To argue that planning does not have to be rational is indeed to say that planners can contribute to the development and adoption of policies, frameworks and strategies of future action without explaining, either to themselves or to others, why that particular action is preferable to doing something else. Contrary to the multitudes of critiques, the communicative aspect of planning does not contradict the aspect of rationality – it is rather intrinsic to planning processes that are rational (Alexander, 2000).

Alexander (2006) advances a classification of rationality associated with different planning paradigms as follows: one, instrumental rationality, which corresponds with the logic of selecting the best means towards realising a set goal; two, substantive rationality, which is concerned with the goals themselves, deciding and selecting between objectives and assigning priorities accordingly; three, bounded rationality, which provides a context to decision making; four, strategic rationality, which promotes the interdependence of decision makers and other stakeholders; and five, communicative rationality, which shifts the focus from decision making to requisite interactions in a social setting (Alexander, 2006).

3.3 INTEGRATIVE THEORETICAL FRAMEWORK

The theoretical position of the thesis largely bears resemblance to is the so-called resilience planning paradigm (see Eraydin, 2013), which can be well understood in contradistinction to the dominant planning theories of rational comprehensive planning and communicative planning overviewed in Section 3.1 above. It should be noted that, as Taylor (1999) asserts, some planning scholars and authors are of the view that planning theory has over time fragmented into a plurality of numerous and incompatible theoretical lenses, positions or paradigms. However, although there have over time been significant shifts in planning theory, thought and practice, there have also been significant continuities. Indeed, the shifts in urban planning thought over time can be regarded as developmental rather than as ruptures between incompatible theories of planning (Taylor, 1999). This is the main reason some scholars advocate for what could be referred to as theoretical tolerance or theoretical promiscuity towards learning from different viewpoints and camps, and in the process establish a broader and better informed planning imagination (see Sandercock, 2004).

Goldstein (2009) explores connections between communicative planning and resilience planning. As a point of departure, the author argues that urban and regional planners have over time been interested in resilience because of the increasing number of disasters and threats across the globe. Resilience thus arguably has a natural and logical appeal to planners, given the planners' longstanding focus on dealing with surprises, such as those from the occurrence of natural disasters. It is further asserted that resilience thinkers share an interest in collaborative deliberation with communicative planners. Communicative planners' interest in resilience is an expression of the broadening of the planners concerns beyond dispute resolution, as well as the appreciation of socio-ecological relationships, as opposed to

regarding ecology as just a set of issues that require acknowledgement and balancing (Goldstein, 2009) in planning processes.

Eraydin (2013) argues that resilience planning should define means but not ends, and accordingly have flexibility that would enable urban and regional systems not only to adapt to expected and unexpected disturbances but to reap benefits from such disturbances. It is therefore argued that instrumental rationality, which is the foundation for rational comprehensive planning or communicative rationality, which informs communicative planning based on socially constructed values and social interactions, do not on their own offer a sufficient basis or framework for resilience planning. Similarly, the bounded rationality and strategic rationality that are mainly focused on planning as frame setting are not able to serve the needs of resilience planning, which aims not to provide means for clear ends, but instead focuses on means for undefined ends towards ensuring that the disruption and loss from unexpected events, stresses and shocks is minimised (Eraydin, 2013) and even absorbed.

Against this backdrop, it stands to reason that urban planning based upon resilience thinking has to be based on an integrative framework that combines rational comprehensive planning and communicative planning; wherein rational comprehensive planning is based upon instrumental rationality and communicative planning is informed by communicative rationality. Different from the two dominant planning theories and the associated planning practice, resilience planning that employs integrative rationality necessitates not only actors as individuals but also individuals in interactive groups, in addition to interdisciplinary teams with particular skills and knowledge, to be involved within the various stages of planning processes (Eraydin, 2013).

Eraydin (2013) continues that within the ambit of the integrative framework, the concern of resilience planning should not be merely about problem solving in the manner of the classical (rational comprehensive) planning, or merely striving for collective decision making in the manner of communicative planning. Resilience planning should rather define ‘no-regret situations’ under uncertain conditions, in which the outcomes of the specific models that links structures and processes in urban and regional systems can be used as informants in decision-making processes. In such a framework, the identification and analysis of critical issues using different methods, and problem solving defined under the instrumental rationality could act

as input when defining problem areas in collective decision-making processes. In this regard, the aim of resilience planning is not to define the most effective actions to achieve goals within a comprehensive framework but rather to define priorities that ensure a no-regret situation, and create a system that is not only adaptive to changes (influenced by internal and external factors) but also to major expected and unexpected disturbances and/ or shocks. Such a system has to define the impact of disturbances or changes by integrating the ecosystem functions and socio-economic dynamics of urban and regional systems. This is arguably at the very core of the resilience approach to urban and regional planning. All in all, it can be argued that the resilience planning paradigm presented in this section calls for a reconsideration of the substance of planning within a well-considered process. Bringing back substance and context based upon the vulnerabilities and adaptive capacities of areas, as the key goal of planning, is an important feature of resilience planning (Eraydin, 2013).

The integrative framework above is notably against the scepticism of some researchers and commentators (see Goldstein, 2009) that although the fields of resilience and (communicative) planning converge on common ground, their capacity to complement one another is challenged by differences in the way that they define, analyse and all in all understand resilience.

3.4 SUMMARY

The chapter discussed the theoretical framework to provide guidance towards conceptualising regional resilience in the rural areas of South Africa, and accordingly used to at least in part inform the analysis in the subsequent phases of the study. The discussion employed the notion of 'rationality in planning' as a yardstick to determine the appropriateness of theories. The chapter subsequently adopted a catholic theoretical framework, which is based upon the elements of urban and regional planning's two dominant theories or paradigms, namely rational comprehensive planning theory and communicative planning theory. Epitomising theoretical tolerance and openness (Sandercock, 2004), the integrative framework rests upon instrumental rationality of comprehensive planning theory and communicative rationality of collaborative planning theory. The chapter argued that resilience planning should not be merely about problem solving in the manner of the classical rational comprehensive planning approaches or just striving for collective decision making in the manner of communicative planning. Rather, resilience planning has to define 'no-regret situations' under uncertain conditions, in which the outcomes of specific models that link structures and processes in

urban and regional systems can be used as informants in decision-making processes. All in all, resilience is not the result of conventional top-down processes but is rather the effect of a proactive vision of socio-political and community systems to implement collective and individual actions, fostering self-adapting, innovation, learning capacity and the evolution of the system (Brunetta et al., 2019). The framework adopted in the chapter unpacks the ecological, social and economic aspects of regional systems. Building upon this integrative resilience theoretical framework, the next chapter presents the research methodology and methods adopted in the study towards answering the research questions and addressing the problem and the overarching research aim.

CHAPTER 4: RESEARCH METHODOLOGY AND METHODS

The preceding chapter presented the theoretical position adopted towards answering the research questions and addressing the research problem and aim. Informed by the fundamental notion of rationality in planning, the chapter adopted an unfamiliar and somehow controversial synergism of rational comprehensive planning and communicative planning as a theoretical framework appropriate to guide the analysis of regional resilience planning. The current chapter links that theoretical orientation with the rest of the study by presenting the research methodology and methods employed in the study. The chapter is structured into six closely related sections. Section 4.1 provides an overview of the research setting, including the rationale for focusing on the case study of Central Karoo region, which is located in the Western Cape province of South Africa. Section 4.2 outlines the research methods, including the sampling technique used to identify the respondents/ key informants, as well as data collection techniques employed in the study. Section 4.3 presents the strategy that was devised to inform the analysis of the primary and secondary data collected. Section 4.4 discusses the matters of reliability and validity. The penultimate part (Section 4.5) highlights the ethical issues taken into consideration in the study. Section 4.6 closes the chapter with a summary.

4.1 RESEARCH SETTING

4.1.1 Case study approach

The thesis was based upon a case study approach, which is defined as an empirical enquiry where the focus is on contemporary phenomenon within its unique context wherein the boundaries between a phenomenon and its context are not clear (Yin, 2014). Leedy and Ormrod (2001) regard a case study approach to be bound. As highlighted in Chapter One, Section 1.4, the thesis is arguably bounded because the case study selected provided a good example of a rural region in South Africa, which can only be analysed through a specific context-specific area. The case study approach was thus appropriate for the research because it enabled the researcher to improve the understanding of rural regions in South Africa, and specifically to analyse the incorporation of regional resilience in the plans that have a bearing on planning and development.

Neuman (2014) adds that the advantages of using case studies include linking abstract ideas and concepts to real-life situations, with a potential to ultimately contribute towards the development of theory through in-depth analysis of cases or situations. Other strengths or benefits of the case study approach include the following:

- Case studies provide a platform for further research and theory development or extension.
- Case study can explain how various factors or influences within a social setting affect one another.
- Linking of processes and complex situations over specified parameters, i.e. time and space can be achieved through case study research.
- Linking of theory to real-life experiences and identifying elements of theory, which could be adjusted.
- Incorporation of a number of perspectives on a given phenomenon makes the case study holistic (Neuman, 2014).

Against the backdrop of the benefits above, the study was based upon a single case study of Central Karoo region, which is located in the Western Cape province of South Africa (refer to Figure 1.1 in Chapter One). The research focused on one case, allowing more time and effort to be spent gathering data on the case and establishing a deeper understanding of regional resilience. It should however be noted at this juncture that Leedy and Ormrod (2010) point out that the weakness of the single case study approach is that conclusions arrived at cannot be generalised to other (similar) cases.

4.1.2 Rationale for case study selection

Central Karoo region was selected as a focus area because of its appropriateness towards addressing the research problem, objectives and aim of the study (refer to Chapter One, sections 1.2 and 1.3) due to the following three main reasons, which are discussed further in Chapter Five:

- Firstly, Central Karoo is deemed to be a rural region by the Provincial Government of Western Cape (Western Cape Government, 2017) and its geographical location is on the periphery of the province, geographically far from the Cape metropolitan area and the broader functional region. The land occupied by Central Karoo is generally of rural nature, with some having conservation, agricultural and mining value. The

region is notably the largest in the province in terms of land area albeit it has the lowest population (refer to Chapter Five). While largely rural, the region appears to have well established connections between the towns and settlements, providing easy access and an important logistical connection between Johannesburg, Bloemfontein, Cape Town and the Eastern Cape province.

- Secondly, the climate of the Central Karoo region is dry and the area is subjected to frequent and persistent drought. The ocurance of the drought has worsened over the last decade, and is now seen as a major threat to the economy and the livelihoods of the people of the region. Some authors argue that the drought, which affected the Western Cape province over the last five years, is the worst in the last century, and the conditions are experienced more severely by the Central Karoo, which has already been declared a disaster area (Botai et al., 2017).
- Thirdly, Central Karoo has large deposits of shale gas. Exploration rights are currently with the state and the prospect of granting such rights to large corporations to mine the shale gas is a constant debate due to potential harmful consequences to the natural environment. More specifically, the process used to mine the shale gas (i.e. hydraulic fracturing) may result in large amounts of polluted water being inadvertently stored and subsequently affecting animals, plants (Lee et al., 2019) and humans. This argument shows that while shale gas may present numerous economic opportunities and benefits to the region, it may in turn pose serious risks to the natural environment.

Given the characteristics of the region above, the Central Karoo was deemed suitable to address the research problem and aim presented in Chapter One. It should be noted that while there may be suitable focus areas elsewhere in the country, the study was limited to the Western Cape province of South Africa due to the limited duration (required for the completion of a master's thesis) and funds available to conduct the study. It is hoped that in future, the work would be extended to other regions in South Africa and beyond (refer to Chapter Seven on the potential areas for further research).

4.2. RESEARCH METHODS

Based upon the overarching research design presented in Chapter One (which posited that the study was qualitative in nature), this section outlines the techniques employed to collect and analyse the data. The study used multiple sources of information, which is a technique that is considered suitable for a case study approach (Yin, 2014). The main types of data used in the

study were secondary information (in the form of planning documents) and primary information (derived from the interviews conducted with key informants). These fundamental forms of data are discussed in the sections below.

4.2.1 Secondary information

The study utilised secondary sources of information towards answering the research questions. The main sources used in this regard were spatial or development plans that have direct or indirect influence on planning and development in the Central Karoo region. These included plans at various spheres of governance, as well as spatial development frameworks (SDFs) in the region (Table 4.1).

Table 4.1: Plans that influence planning and development in Central Karoo

Document	**Reference**
National Spatial Development Perspective, 2006	Republic of South Africa (2006)
Draft National Spatial Development Plan, 2019	Department of Rural Development and Land Reform (2018)
Western Cape Provincial SDF, 2014	Western Cape Government (2014)
Central Karoo District Municipal SDF, 2019	Western Cape Government (2019b)
Laingsburg SDF, 2012	Laingsburg Municipality (2012)
Prince Albert SDF, 2014	Prince Albert Municipality (2014)
Beaufort West SDF, 2013	Beaufort West Municipality (2013)

Source: Author

4.2.2 Interviews

To supplement, validate and in certain instances make sense of the secondary information, the research used primary sources of data, which were in the form of qualitative interviews. The interview questions were formulated with the focus on bridging the gap between literature on regional resilience in rural areas, and the existing development strategies for the Central Karoo region. The key informants/ stakeholders interviewed were in one way or another involved in socio economic development and spatial planning in the Central Karoo region, and particularly in the drafting and/ or implementation of the provincial, district and local documents analysed in the study.

The interviews were guided by a semi-structured questionnaire, which entailed a combination of questions, namely closed-ended, open ended as well as Likert scale (Annexure A). Open-ended (also known as unstructured or free response) questions pose a question to which respondents can provide any answer, while for closed-ended (also known as structured or fixed) questions, respondents are given responses to choose from. Finally, Likert scales are typically used to capture whether the respondents agree or disagree, approve or disapprove and so on (Neuman, 2001). In the study, the Likert scale was particularly useful for discerning the respondents understanding of regional resilience and their views on whether resilience was adequately incorporated in the policy documents and development frameworks analysed.

4.2.2.1 Sampling

The aim of the qualitative interviews was to gain an in-depth understanding towards answering the research questions. Thus, the sample size was expected to be smaller than would be the case in quantitative research (Dworkin, 2012) and particularly not expected to be statistically representative. In this regard, the research used non-probability sampling to select the participants. Due to the nature of the case study and the aim of the research, snowball sampling technique was employed to identify the interview participants. Based on the analogy of a snowball, snowballing sampling begins with a few people and spreads out on the basis of links provided by the initial respondents. The participants are thus in a way connected and not selected randomly (Neuman, 2001).

Nonetheless, it should be emphasised that the participants selected through snowballing technique may not necessarily be working together or working for the same organisations, but had contributed towards the formulation of the various SDFs within the region and/ or knowledgeable of the challenges in the region. The researcher attempted to address all levels of government applicable to the Central Karoo region as well as the non-governmental organisation (NGO) sector to provide the perspective of the communities. The individuals selected were thus in the employ of the provincial government, Central Karoo district municipality, the constituent local municipalities and the NGO active in the region (Table 4.2). All in all, the respondents were deemed suitable to provide first-hand information on the subject matter i.e. challenges experienced and factors that influence planning for regional resilience in the Central Karoo region.

Table 4. 2: Respondents

Number	Organisation	Reason for selection	Date of Interview
Respondent 1	Provincial Government Western Cape: Department of Environmental Affairs and Development Planning	Research and compilation of the Central Karoo District SDF	19 July 2021
Respondent 2	Central Karoo district municipality	Familiarity and involvement with the compilation of the Central Karoo SDF	26 July 2021
Respondent 3	Laingsburg local municipality	Implementation of the local SDF	19 July 2021
Respondent 4	Prince Albert local municipality	Familiarity and involvement with the compilation of the local SDF	26 July 2021
Respondent 5	Beaufort West local municipality	Implementation of the local SDF	26 July 2021
Respondent 6	Beaufort West local municipality	Familiarity and involvement with the compilation of the local SDF	19 July 2021
Respondent 7	Rural Support Network	Knowledge of social and economic issues in the region	07 October 2021

Source: Author

4.2.2.2 Data collection technique

In order to collect data from the individuals identified in the preceding section, the researcher evaluated various methods of data collection. The first and arguably traditional method is face-to-face interviews, which allow for longer interviews and provide a good level of response to the questions posed. A second method, which involves sending out the questions to the respondents, is advantageous in that it is relatively affordable. However, this method may not yield a good response rate and the respondents may leave out certain questions, which would contribute to possible gaps in the data collected. Lastly, telephonic interviews have similar advantages to face-to-face interviews, although the interview duration is expected to be relatively shorter. This method is particularly affordable and efficient in terms of time saving (Neuman, 2014). The telephone interview method was thus selected as the

preferred method. In addition to the aforementioned advantages, another factor was the state of National Disaster due to Covid-19 pandemic, which posed a health risk for people meeting in person. It was thus deemed reasonable to conduct interviews telephonically/ virtually.

The interviews were conducted by means of Microsoft Teams online platform, where initial arrangements with each interviewee were made via email. The interviews were personally conducted by the researcher.

As discussed above, the interview process was semi-structured where the total time for a single interview was between 20 and 30 minutes. The interviews were conducted between 19 July 2021,26 July 2021 as well as on 07 October 2021. The researcher started by giving an overview of the study, before the formal interview commenced. This was done to grant the respondents the opportunity to understand the topic and research questions, and provide the most honest and up to date answers. The researcher captured the responses on Microsoft Exel spreadsheet during the interview process. It was generally decided not to record the interviews as some respondents would potentially be uncomfortable. Furthermore, the respondents typically give particular (normally conservative) answers when the discussion is being recorded.

4.3 ANALYTICAL STRATEGY

Two forms of analysis were considered in the study.

- The first aspect focused on: (i) identifying the multi-faceted challenges or shocks that the Central Karoo region is prone to; and (ii) deciphering the concept of regional resilience in the documents that have a bearing on planning and development in the region.
- The second aspect of the analysis (focusing on information from the interviews) was based upon thematic analysis wherein patterns in the data collected were identified.

The analytical strategy for analysing the incorporation of resilience in the subject documents hinged on the environmental, social and economic problems of the region as identified and discussed at length in Chapter Five. Per the lessons of the literature and the integrative theoretical framework, the logic was that the acknowledgement and response to these context-specific problems would arguably be representative of regional resilience. The response would be identified by the normative stands taken towards addressing or

circumventing the environmental, social and economic problems in the Central Karoo region. This would represent priorities in the manner of the integrative theoretical framework covered in Chapter Three.

On this background, the logic of the analytical strategy was to identify 'problem-related' themes as well as the opposite/ ideal situation or 'normative-related' phrases and words (Table 4.3), which point towards possible solutions (or in part preparedness for potential problems and shocks) identified by each plan/ SDF. As alluded to here, the incorporation of these words and phrases, at least in part, provide insight into the level of awareness and acknowledgement of regional resilience reflected in the SDFs analysed.

Table 4. 3: Analytical strategy

Central Karoo current and potential problems (environmental, economic and social)	**Normative position towards addressing the problems**
1. 2. 3. 4. etc	1. 2. 3. 4. etc

Source: Author

4.3.1 Content analysis of policy documents

Content analysis starts with a research question, followed by the determination of the units of analysis. In this regard, the units of analysis in the study were plans/ spatial development frameworks. As noted by Prior (2011), the analysis of policy statements can typically be approached in two ways. On the one hand, the simplest way is to count the number of times a particular word or words appears in the subject document. Such concordance can often reflect what is considered significant in a subject document and it can also serve to highlight what is absent or not considered important in any given document. On the other hand, the relatively advanced investigations move beyond the words that are present or absent in a document, and enumerate concepts and themes that emerge from the document analysed (Prior, 2011). The study accordingly employed content analysis to establish an overall picture of the focus of the documents, and to particularly determine whether the spatial development frameworks

incorporated regional resilience. Neuman (2014) however states that it is important to note that the outcome of content analysis cannot reveal what the underlying intention of the creator of the text was.

The analysis was conducted using version 9 of the computer program of Atlas.ti. There are various software packages that can be used in qualitative research, including Atlas.ti, MxQDA and NVivo (Richards, 2009). Atlas.ti was chosen because CPUT had a licence to the software. Although it is ideal to compare and choose one package afterwards, Richards (2009) acknowledges that the availability of a software in an institution may preempt the choice.

4.3.2 Analysis of the interviews data

Richards (2009) notes that some research designs combine the gathering of documents with the later use of more unobtrusive methods. In this regard, the important consideration is to access the documents before conducting interviews so as to approach the interview informed, and not potentially waste the participants' time asking questions whose answers are available (Richards, 2009) in the documents. In some instances, the interpretation of the respondents would however be different from the analysis conducted. The data collected through the interviews were analysed through the use of Atlas.ti software (Version 9) to generate word clouds.

4.4 RELIABILITY

The range of questions was employed towards ensuring reliability of data collected from the interviews of key informants. This was with specific reference to internal consistency, which pertains to whether the data collected are plausible, and whether the different pieces fit together (Neuman, 2001). For instance, if the key informant’s understanding of the concept of resilience was poor, he/ she was not expected to claim that the concept is addressed thoroughly in the applicable spatial development frameworks (refer to Annexure A). No contradictions were identified, arguably reflecting some level of internal consistency in the research conducted.

Furthermore, the primary data from the interviews were compared with the content analysis towards establishing external consistency, which is the second component of reliability. As noted by Neuman (2014), external consistency is achieved by cross-checking different

sources of data. It should also be noted that the interviews intended to derive the respondents views on challeges of the region, which was used to cross-check the findings from secondary sources of information.

4.5 ETHICAL MATTERS

The Ethics Committee of Cape Peninsula University of Technology's (CPUT's) Faculty of Informatics and Design approved the study and issued the requisite ethical clearance (Annexure B) prior to the final approval of the research proposal. This implies that ethics clearance was sought and granted before the interviews could be conducted. Informed by trends at universities and research institutions around the globe, this is a standard practice at CPUT.

The main ethical considerations for the research were twofold. Firstly, there had to be honest reporting of information and findings by the researcher. It is important to note that the researcher is a professional urban and regional planner, who vouched to acknowledge all sources used in the compilation of the thesis and give credit to authors, organisations and individuals who contributed to the study. Similarly, the information had to be presented without bias notwithstanding the researcher's/ planner's potential contrary views and opinion on the subject of regional resilience in rural or peripheral areas.

The second consideration was, as described by among others Leedy and Ormrod (2010), the right to privacy. The researcher introduced the respondents to the research and obtained their voluntary consent to participate. However, given that the interviews were conducted virtually and the respondents could not sign consent forms, consent was obtained verbally over the MS Teams platform prior to the commencement of the interviews. The respondents were explicitly informed beforehand that should they consent to the interview, they still had the option to withdraw at any stage of their interview or choose not to answer certain questions for whatever reason.

4.6 SUMMARY

The chapter presented the research methodology and methods adopted in the study. The research approach employed revolved around a single case study, which was analysed through a combination of secondary and primary sources of information. Based on specific

characteristics that were useful towards addressing the research problem and objectives of the study presented in Chapter One, the Central Karoo region, which is located in the Western Cape province of South Africa, was selected as a suitable case study. The chapter outlined how data were collected from secondary sources i.e. documents that have a bearing on planning and development in the Central Karoo region; as well as primary data from the interviews conducted with the key informants who are knowledgeable of the socio-economic challenges as well as planning and development in the region. These participants, who were selected through the non-probability sampling technique of snowballing, were particularly well-placed to give insight and reflect on the incorporation of resilience in the policy documents, against their personal understanding of the concept. The data were analysed through the use of content analysis and the computer programme of Atlas.ti. The primary data, collected through semi-structured interviews, were also analysed using Atlas.ti so as to ensure continuity of the analysis and presentation of results. Building upon the foregoing research methodology and methods, the next chapter introduces the case study of Central Karoo region, and systematically presents the environmental, economic and social challenges that the region faces and/ or would potentially face in future.

CHAPTER 5: RESEARCH CONTEXT AND THE CHALLENGES OF CENTRAL KAROO REGION

The previous chapter presented the research methodology and methods employed in the study, which involved the collection of various forms of primary and secondary data towards addressing the research problem, aim and objectives of the study. Before presenting the bulk of the research findings in Chapter Six, this chapter introduces the case study of Central Karoo region, and particularly identifies the environmental, economic and social challenges that the region is prone to. As argued in the preceding chapter, the study's analytical strategy hinged on the triad set of challenges in the region, hence the need for the current chapter. The chapter is categorised into five main sections. So as to put the discussion in perspective, Section 5.1 presents an overview of the spheres of government in South Africa. Section 5.2 provides a broad overview of the case study, in terms of the geographical setting within the broader Western Cape province, physical extent, population size and the constituent administrative areas (i.e. municipalities). Section 5.3 presents the environmental, economic and social challenges of the constituent municipalities of Prince Albert, Laingsburg and Beaufort West. Building upon the foregoing problems at the level of local municipalities, Section 5.4 synthesises the multifaceted problems that the Central Karoo region faces. The synthesis is presented through text and graphically through the use of word clouds. Section 5.5 summarises the chapter.

5.1 SPHERES OF GOVERNMENT IN SOUTH AFRICA

Given that discussions in the current and subsequent chapters largely refer to the words 'province' and 'municipality', it is necessary to provide a snapshot of the spheres of government in South Africa, so as to put the subsequent discussion in perspective. South African government comprises the national, provincial and local spheres. Beneath the national level, the constitution (Republic of South Africa, 1996) classifies the country into nine provinces, viz. Eastern Cape, Free State, Gauteng, KwaZulu-Natal, Limpopo, Mpumalanga, Northern Cape, North West and Western Cape (Figure 1.1 in Chapter One). As noted in Chapter Four, the case study that the thesis focused on is situated in the Western Cape province.

The local sphere of government consists of municipalities of three distinct but related types, namely metropolitan, district and local municipalities. Eight metropolitan municipalities in

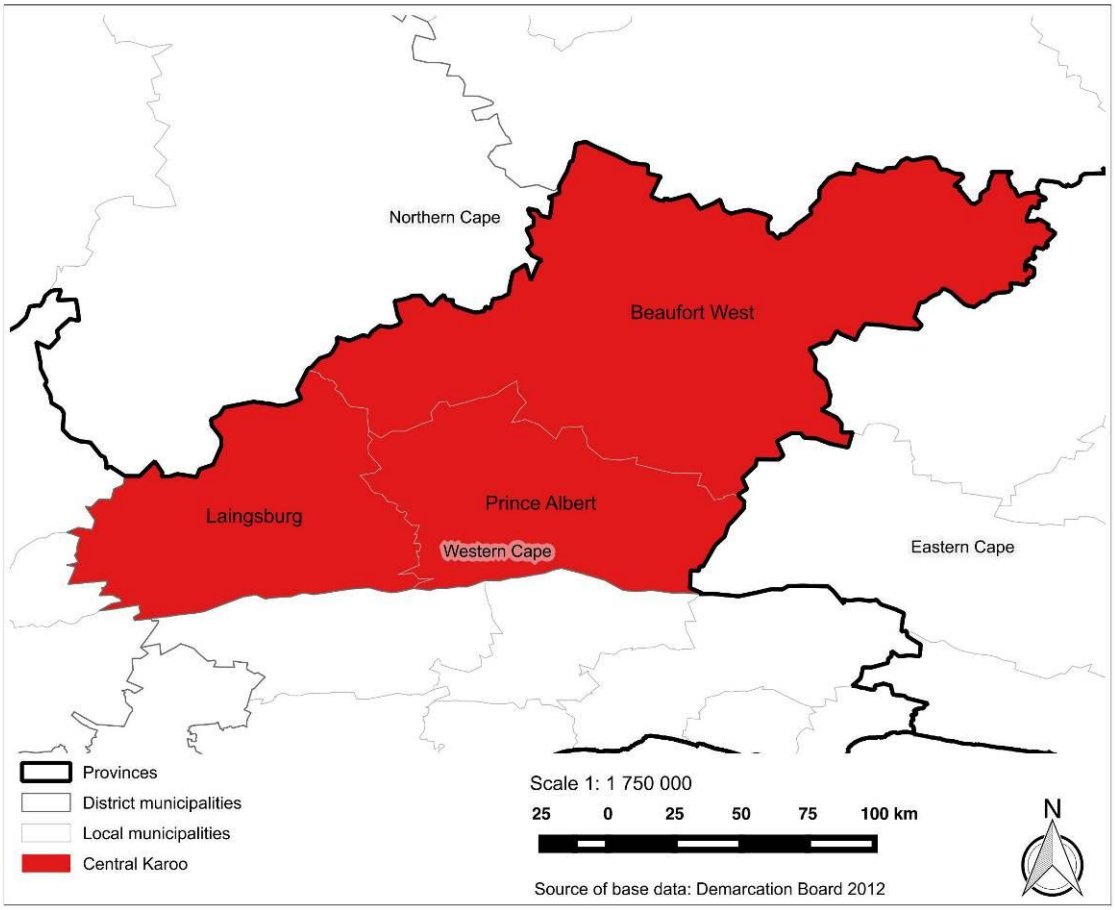
South Africa administer areas that accommodate the country's largest cities or urban areas. The rest of the country is under the jurisdiction of district municipalities, with each district municipality categorised into smaller local municipalities.

5.2 OVERVIEW OF THE CENTRAL KAROO REGION

The Central Karoo is an administratively defined district municipality, which is situated on the eastern most part of the Western Cape province. The region is bordered by the Northern Cape and Eastern Cape provinces to the north and east respectively (Figure 5.1). The total extent of the region is 38 854km², which constitutes approximately 28% of the total land area of the Western Cape province (Central Karoo district municipality, 2017).

The Central Karoo district municipality is a Category C municipality in accordance with the Municipal Systems Act 32 of 2000. The three biggest towns in the district, namely Beaufort West, Laingsburg and Prince Albert are the main centres of local municipalities bearing the same names (Figure 5.1), and are classified as category B municipalities by the aforementioned Act. The positioning of the towns and urban centres in the district creates an evenly spread and proportional agricultural service centres, which are located far from one another. Major towns within each local municipality are located centrally to that municipality but quite far from each other, with distances of between 160km and 200km. This shows that although the three local municipal areas have access to a centre of higher order, the travel distances are extensive.

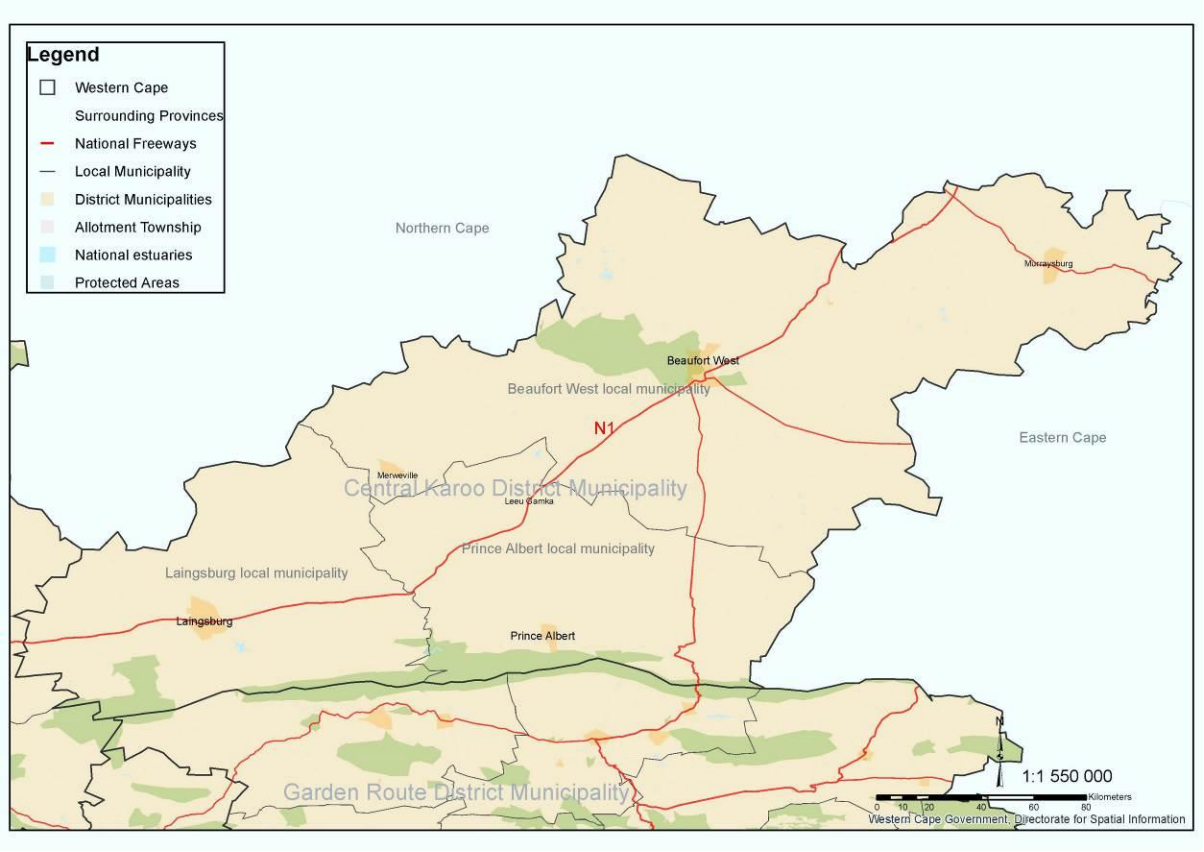
Figure 5. 1: Central Karoo region relative to the surrounding provinces



Source: Adapted from Mokhele, 2016

The total population of the Central Karoo district municipality is 74 763 people (which equates to two people per square kilometre) and is the least populated district in the Western Cape province. The projected growth between 2020 and 2024 is 0.2%. The majority of the population is clustered in the main towns of Beaufort West, Prince Albert, and Laingsburg, which are also the three local municipalities that provide service town functions to the region (Western Cape Government, 2020). The population of the region is clustered in these towns as follows: Laingsburg (5 667), Prince Albert (44 160) and Beaufort West (49 586). Beaufort West, the largest and most well-located municipality of the three, is strategically placed on the N1 freeway between Cape Town and Johannesburg (Figure 5.2), and is also part of the primary rail route between the two metropolitan areas.

Figure 5. 2: National connectivity of the Central Karoo region



Source: Western Cape Government, 2021

The Central Karoo is predominantly a sheep-farming area, with well-established abattoir facilities that cater for the slaughtering of the livestock and the requisite packaging of the meat. Currently, animals are slaughtered in the region and the meat delivered across the province and beyond, with however no further processing activities (of skins, for instance) occurring in the area (Western Cape Government, n.d).

As noted by Western Cape Government (n.d), the large geographical extent of the region and the resultant long distances between towns in the Central Karoo contribute to its lack of economic potential. Towns in the region are thus categorised as areas with low to very low growth potential, with Beaufort West the only town with a medium potential. There is also a general decline in agriculture and agro-processing activities in the region; the growth in game farms is also regarded as a threat to traditional farming practices, and there is particularly a strong need for improved water collection and storage (Western Cape Government, n.d.).

The Central Karoo region is currently facing two major challenges, that of the persistent and worsening drought, and the potential ramifications of the proposed hydraulic fracturing (fraking) of shale gas in the region. These directly and indirectly affect the social aspects, the economy and the natural environment. Therefore, these challenges are highlighted below as they relate to the entire region. In addition to these challenges, the national state of disaster, which was declared in 2020 due to the Covid-19 pandemic, brought serious risks to the economy of the region and indeed the country as a whole (Department of co-operative governance and traditional affairs South Africa, 2020).

5.2.1 Fraking

In 2015, the Centre for Scientific and Industrial Research (CSIR) was commissioned to conduct a scientific assessment on the potential shale gas development in the Karoo. Since there has never been any production of shale gas in South Africa, various scenarios were described as hypothetical. The said study describes four scenarios and the associated benefits and risks of each to the natural environment, economy and social aspects. The scenarios are described as follows:

- Reference case where no shale gas-related activities take place.
- Exploration only scenario where production does not take place.
- Small gas scenario where 5 million cubic feet (Tcf) of gas are extracted.
- Big gas scenario where 20 Tcf is developed (Scholes et al., 2016).

The natural environment of the Central Karoo is characterised by sensitive and unique ecosystems. The impact of fraking is associated with fragmented landscapes due to the construction of new infrastructure needed to support the process. The sensitive environment would face possible damage and unforeseen impacts into the future, which likely need to be monitored and mitigation processes put in place at a regional scale to ensure that the rehabilitation of the affected ecosystems takes place (Scholes, et al., 2016). Furthermore, the use of water, either fresh or salt water, and storage of the contaminated water are strictly regulated by the applicable legislation in South Africa. The storage of this waste water on the surface is currently not permitted (Republic of South Africa, 1998). The Municipal manager for Prince Albert, who is also the Operational manager for corporate and community services, expressed a specific concern relating to the possible damage to underground water aquifers of high significance, should fracking be allowed to commence. In this instance, the cumulative

negative impacts to the region would be devastating and no clear disaster risk management strategy has been outlined for now (Respondent No. 4).

In the Central Karoo, agriculture is currently the main driver of the economy that provides the majority of the jobs for the region. Fraking poses a potential risk of polluting water resources, especially surface and ground aquifers, which are one of the main sources of water for the region's farming activities and human consumption. Furthermore, Scholes et al. (2016) point out that the fragmentation of the landscape that would be caused by fraking-related infrastructure would pose a further risk to agricultural enterprises. However, the local economic development, which will be driven by the shale gas exploration, would stimulate the agricultural production.

Another risk to the economy is related to the tourism industry. The increased noise and traffic pollution, for the period of the shale gas exploration and production activities, may have a negative impact on tourism. Currently, the management of tourism in the region is fragmented between the various municipalities and this situation is seen as ineffective. Further to that, the director for engineering services at the Beaufort West municipality pointed out that the Central Karoo seems to have very few and far in-between tourist attractions. The lack of investment from government and large business in the tourism industry makes it difficult for small businesses to prosper and attract people to their towns and villages. Without agriculture and tourism, there is almost no economic opportunities for locals (Respondent No. 5). Addressing this issue at a regional level can be made possible through strategic interventions, supported by various levies on the gas production set aside to offset the negative impacts on tourism (Schreiner & Snyman-Vand der Walt, 2018).

It should also be acknowledged that shale gas development would bring about positive economic changes, like the creation of jobs in the region. Since some of the scenarios stretch over long periods of time, the benefits of creating such jobs are considerably high for the region. Further to job creation, the shale gas will contribute to the renewable energy sector of the country (Wait & Rossouw, 2014). However, if the development of the industry takes off to the highest possible development scenario, this may pose risk to other economic sectors of the region. The industry may compete with other sectors of the economy and easily become the dominant one, thus reducing the potential investment in other sectors (Schreiner & Snyman-Vand der Walt, 2018).

The social fabric of the region will potentially be significantly impacted upon by shale gas development. The small towns, villages, and rural or agricultural settlements are likely to experience in-migration directly linked to the industry. This would increase the pressure on existing social services and facilities and will necessitate investment into basic infrastructure and housing. The region will also experience increased truck traffic, higher need for law enforcement, and challenges related to governance. The newly created jobs will increase the competition for local resources and it is not guaranteed that local labour will get preference (Scholes, et al., 2016).

The health status of the region is notably below the national average. Scholes et al. (2016) note that this is due to poverty, inadequate basic infrastructure and poor health infrastructure. This can be improved through investment from shale gas exploration and production, guided by policy at a a regional scale. It would be necessary to monitor the effects of fraking on human health, especially of the communities residing in the immediate vicinity of the wells (Wait & Rossouw, 2014).

Fraking will have a negative effect on the sense of place of the region as well as the aesthetic, visual, and scenic routes and heritage resources. Although some of these impacts can be reduced or managed, some are irreversible. The public engagement process is key in informing the management of these effects, however, at a regional scale, and particularly due to the complexity of the shale gas development activities, the process is highly complex (Scholes et al., 2016).

The impacts on spatial and infrastructure planning are influenced by the points described above. In particular, the following should be noted:

- Based on the development scenario accepted, the growth of towns and villages will vary, thus by creating an increased demand for services and infrastructure investment.
- It is necessary to improve the quality of road infrastructure to support the high volume of trucks. South Africa does not have the sufficient infrastructure to support the exploration and production of shale gas, therefore a large investment into supplying the infrastructure is required to be planned at a regional scale (Wait & Rossouw, 2014).
- Regulatory tools and land-use management will become increasingly difficult with the rapid growth of towns and villages. The local municipalities are under-resourced at

present and potential increases in land development applications will place even more pressure on them. Integrated approach to spatial planning in the region may be necessary (Schreiner & Snyman-Vand der Walt, 2018).

5.2.2 Drought

Although the Western Cape Climate Change Response Framework (Western Cape Government, 2016) does not provide a clear view of the future climatic conditions of the Western Cape, it is expected that the Central Karoo region will become hotter and drier, with a higher chance of vegetation loss and fires. The Central Karoo's main focus is currently agriculture, and climate change being a certain, there are major threats to the production of crops and livestock in the region. The Central Karoo has been experiencing a prolonged period of drought. This makes the harvesting of water resources highly important. The region has key aquifers and ground water, which are currently supplying the majority of the water needs for the region, including agricultural and household/ domestic use (Western Cape Government, 2019b). The ground water aquifers are therefore the main source of water in the region as rainfall is too low to rely on. The dams in the district are currently at very low levels and are not fulfilling their intended water supply purpose.

The Central Karoo was declared an agricultural drought disaster area due to worsening drought conditions over the last decade. Drought poses a serious risk that would lead to sustainable livelihoods and directly impact the natural environment, the economy and society (Botai et al., 2017). The region is characterised as all year-round rainfall area, which has been receiving significantly decreased rain. The region is also experiencing other conditions related to climate change, namely increased temperature and stronger winds (Central Karoo district, 2017), which are contributing to an even more harsh drought conditions.

The main concern with drought is that the quality of useable water is decreased and this has a direct negative impact on agriculture. Currently, agriculture is the main source of work opportunities in the Central Karoo. The region is also a large contributor to South Africa's food security status, which is however threatened by the persistent drought conditions (Botai et al., 2017). The manager for strategic services at the Central Karoo district municipality emphasised the availability of water as the key environmental challenge for the region (Respondent No. 2).

A disaster risk assessment was conducted by the Western Cape provincial government at the end of 2019, to find out if the drought conditions in the Western Cape have improved with the recent presence of rain. The assessment however reports back that the Central Karoo region has experienced insignificant amounts of rainfall and is still critically dry. The criteria used in the assessment defines critically dry as a condition where the majority of the plants are black and dry and only few still show signs of life. The region has therefore been identified as needing drought-relief assistance in order to sustain livestock farming (Western Cape Government, 2019b).

The Central Karoo district municipality has accordingly developed a drought recovery action plan, which is aimed at addressing the areas of highest need, through strategic and targeted investment. However, the only place, which is described in the plan is Prince Albert local municipality (Central Karoo district, 2019). The lack of resources and capacity remains a big challenge for the region. A senior planning official working in Beaufort West municipality identified the dire lack of resources available for environmental management and implementation strategy, and argued that this is resulting in the ineffective and unsustainable planning of new development, which would result in negative long-term impact on the natural environment. The need for the prolonged drought to be addressed in a more practical manner, with interventions that can be implemented on local level as well as regional level should be prioritised (Respondent No. 6).

5.2.3 Covid-19 pandemic

The South African government declared a national state of disaster on 15 March 2020 due to the outbreak of the Covid-19 pandemic. The state imposed the initial 21-day strict lockdown on the entire country on 27 March 2020, followed by a progressive easing of restrictions over the next months. The direct and long-term economic and social impacts of this are profound (Arndt et al., 2020).

The South African economy was already in a technical recession prior to Covid-19 state of disaster, and had already experienced prolonged job losses in various industries (Statistics South Africa, 2020). The sectors of the economy, which experienced a shut-down, including construction, manufacturing, tourism, and hospitality are likely to have a direct impact on further job loss and in turn poverty increase. It is projected that, overall, the South African economy will likely not recover until end of 2024. Government revenue will also decrease,

resulting is less allocation to infrastructure investment across the state (United Nations, 2020).

The sectors, which were deemed essential during the lockdown experienced and continue to experience pressure on their services. These sectors include health, agriculture and food sector, financial sector and telecommunication sector. In the case of the Central Karoo, particularly the health services sector is not well resourced and may face pressure and not be able to cope with the demand of the pandemic, including the usual day-to-day functions and services offered. The indirect impacts of the pandemic to workers in these sectors are significant and have a long-term effect to the provision of services (United Nations, 2020).

In a survey conducted by Statistics South Africa (2020), it was discovered that a high percentage of families are not comfortable and do not deem the return to school safe. The main concerns centre around the safety of the children from the Covid-19 virus, and the potential threat of the virus being brought home by the children. Unfortunately, Statistics South Africa note that this is not representative of the general population of South Africa due to the method of data collection used under the lockdown circumstances. It can however be said that the majority of learners experienced a severe interruption in their studies, which would have a lasting negative impact.

Further to the above, all recreational activities were completely banned and are re-opening in a progressive manner and with caution. The impact on society is considered to be negative and long lasting. The lack of recreational activities is contributing to general physical health and mental well-being decline. The crime rates are also progressively increased as poverty increases and job loss is becoming more severe (Arndr et al., 2020).

5.3 CHALLENGES OF LOCAL MUNICIPALITIES IN THE CENTRAL KAROO REGION

5.3.1 Prince Albert local municipality

Prince Albert is one of the three main towns in the Central Karoo district and is a local municipal (Category B) in terms of The Municipal Systems Act 32 of 2000. Prince Albert shares administrative borders with the following local municipalities:

- Laingsburg local municipality (Central Karoo district)
- Beaufort West local municipality (Central Karoo district)
- Oudtshoorn local municipality (Eden district)
- Kannaland local municipality (Eden district)
- Baviaans local municipality (Eastern Cape province)

Although the research was primarily focused on the Central Karoo district and the local municipalities within the district, it is acknowledged that each of these adjoining municipalities may have a level of influence over Prince Albert local municipality.

The entire municipal area is intersected by various national roads, including the N1 and N12. Some of the larger towns can be accessed via the national railway, while the smaller or rural settlements gain access through regional roads, which are usually gravel (Department of Rural Development and Land Reform, 2014). The most recent SDF for Prince Albert, outlines the classification of the towns in the area as follows:

- Prince Albert is the main local town and a known tourism hub
- Leeu Gamka is the agricultural service centre in the area
- The following are considered rural settlements: Klaarstroom, Prince Albert Road, Kruidfontein, Dwyka, Kommandokraal and Seekoigat.

Prince Albert is widely known for its tourism attractions and rich history. The SDF of the area recognises the importance of protecting the heritage and the natural environment of the area, and identifies this as a top priority amongst its strategies.

5.3.1.1 Natural environment

The SDF identifies the loss of biodiversity and heritage resources as one of the main challenges of the area. It is recommended that more focus is put on the protection of critical

biodiversity resources and ecological corridors, water resources and agricultural resources. The area has set out guidelines, supported by the National Environmental Management Act (Act No 107 of 1998) principles, outlining how development efforts should appreciate and respond to the natural environment.

It has been identified that the growth of informal settlements, in part due to in-migration over the last few years, is posing a risk to sensitive environments and must be addressed in a holistic manner by adequately addressing the housing needs of the citizens, while retaining the integrity of the natural systems. In 2017, the Central Karoo district set out a project plan which speaks to addressing environmental health issues associated with informal settlements. Prince Albert was found to have the highest number of informal dwellings amongst the region, located mainly in Klaarstroom. Although the number is not incredibly high (around 31 households), the demand for housing in the area is addressed very slowly, creating a backlog (Central Karoo district municipality, 2017).

5.3.1.2 Economy

The economy of Prince Albert is reliant on the primary sectors of agriculture and mining as well as some service industry related to tourism. There is currently an improving rate of employment, however, the potential of fraking in the area may pose a risk to secondary sectors of the economy, especially travel and tourism. It is projected that with exploration rights granted, the region would see growth in employment in the short to medium term, while the activities are going on. Long term impacts pose threats to other sectors and will result in decreased opportunities in such, in the event that the natural environment is left in a deteriorated state as described above in Section 5.2.1. The labour force in the area is majority low skilled and reliant on the primary sector of the economy for employment.

Due to the harsh drought, especially around 2016 and 2017, the agricultural sector had only recorded 2.8% average annual growth. Projections estimated that this would improve with drought conditions easing, however, the Covid-19 pandemic has caused huge interruptions in the economy, which will have lasting effects, still to be seen (Prince Albert municipality, 2020). The shutting down of key sectors of the economy also poses a great risk of job losses and increased poverty.

The socio-economic profile of Prince Albert, points to the need to invest in basic services, telecommunications, as well as optimisation of the transport infrastructure, including roads. These investments will improve the quality of living of the local communities and boost the potential for local economic growth in the region. The investment amount received by the region is largely influenced by the study on the growth potential of towns in the Western Cape province (Donaldson et al., 2014).

5.3.1.3 Social aspects

As noted earlier, the area is experiencing a shortage of housing opportunities. The population of Prince Albert is growing substantially faster than the rest of the region, and will require around 625 new houses by 2030 (Central Karoo district municipality, 2019). This poses a challenge to the local municipality, which is not only receiving minimal funding but is also under-capacitated. The municipal manager of Prince Albert stressed the increasing amount of people moving into the town from the surrounding villages, and facing the possibility of having to live in informal settlements due to the lack of affordable housing (Respondent No. 4).

In the event that housing opportunities are not provided, the growth of informal settlements will become even higher. This will lead to further degradation of the natural environment and the creation of social ills, driven by inequality and poverty, and inadequate living conditions. The current poverty levels are recorded at 65.26% of people living in poverty, or surviving on less than R602.02 per month (Prince Albert municipality, 2014). The figures are based on Statistics South Africa 2011 and need to be updated in order to ascertain if the situation has improved over the last decade.

Furthermore, a problem of poor civic culture exists in Prince Albert with apparent a racial and language divide, which stifles the establishment of partnerships and results in a lack of civic culture of community spirit and cohesion in the municipality (Western Cape Government, n.d).

5.3.2 Laingsburg local municipality

Laingsburg is one of the three main towns in the Central Karoo district municipality. It is the smallest local municipality in the region and the province – it measures a total extent of

8 781.44km² and is very sparsely populated with only around one person per square km (Laingsburg municipality, 2017).

The only two settlements in the area are Laingsburg, being the bigger one, and Matjiesfontein, which is a historic settlement. The remainder of the landscape is rural with agricultural activities taking place over the majority of the landscape. The area has a number of natural features including mountains and rivers, as well as environmentally sensitive areas. The main connections running through the area are the national railway and the N1 freeway stretching from Johannesburg to Cape Town.

Laingsburg municipality borders the following local municipal areas, with their corresponding district municipalities indicated in brackets:

- Beaufort West local municipality (Central Karoo district)
- Prince Albert local municipality (Central Karoo district)
- Kannaland local municipality (Eden district)
- Langeberg local municipality (Cape Winelands district)
- Breede Valley local municipality (Cape Winelands district)
- Witzenberg local municipality (Cape Winelands district)
- Karoo Hoogland local municipality (Namakwa district: Northern Cape province)

The Laingsburg municipality is known for agricultural activities and a sparse population. The settlements have low investment priority due to the low population figures, and innovative strategies are required to promote and guide targeted development. The Central Karoo District SDF has identified Laingsburg as a primary investment node and Matjiesfontein as a secondary investment node. This is due to their location along the N1 freeway, which is one of the most important logistical routes of the country (Western Cape Government, 2019).
In terms of town hierarchy in the area, Laingsburg is categorised as a major town with 7 205 inhabitants, Matjiesfontein a secondary town with a population of 623 people, and some rural settlements, very sparsely populated and usually gaining access through gravel roads. Laingsburg is bounded by geographical and man-made features, i.e. hills, rivers and railway line. Notably, the N1 presents a major safety risk for pedestrians and in terms of pollution from the noise and emissions of vehicles and trucks. Matjiesfontein is not well connected between the north and south areas of the railway line. There is a tourism node which needs input and intervention for investment and development (Laingsburg municipality, 2017).

5.3.2.1 Natural environment

The main problem identified by the SDF, in terms of the biophysical environment, is the deterioration of arable land, and introduction of sustainable water use for all industries. The area relies heavily on agriculture for employment and if the sector is negatively affected by poorly managed practices and the lack of fresh water resources, both the economy and social aspects will be adversely affected (Laingsburg municipality, 2017).

Climate change, particularly the effect it has on winds and changing rainfall patterns, has a negative impact on the water resources of the area. The area generally has low rainfall, especially during summer and the continuous drought over the entire Karoo over the last decade poses a great threat to the natural environment and people. An integrated development plan (IDP) water sector input report, which was compiled in 2016, reflects on the water shortages and the increased demand for fresh water through industry and household usage, and recommends that the municipality adopt a conservative approach in mitigation and adaptation to climate change, as it relates to water resources (Western Cape Government, 2012). The district municipal manager stressed the fact that the majority of strategic recommendations for the area are not explored in detail and their practicality is overlooked to the context of the area. This has resulted in poor implementation of the strategy (Respondent No. 2).

Currently, the main water resource of Laingsburg municipality is groundwater, both for human consumption and agricultural purposes. Besides climate change, the management of groundwater resources is vitally important for Laingsburg, in ensuring the sustainable and continued supply of fresh water. The boreholes and wells used for the main supply of the municipal water are constantly monitored but pressure is increasing and groundwater levels are decreasing, posing a severe risk to the economy and society (Harding et al., 2017). Provincial chief town and regional planner for the area pointed out that issues related to water scarcity need to be addressed by a number of sectors and role players, including various levels of government, which is currently problematic in that resource allocation is poor and plans are often outdated (Respondent No. 1).

5.3.2.2 Economy

Laingsburg municipality is the lowest contributor to the regional economy of the Central Karoo. The economy of Laingsburg is largely based on agriculture and tourism. A large portion of the economically active population rely on these sectors and are under skilled due

to low levels of education in the area. It has been identified that there is a need to diversify the economy and provide more opportunities for work (Laingsburg municipality, 2017). The unemployment rate in the area is notably higher than the national average (Department of Rural Development and Land Reform, 2015).

The settlement patterns of the municipality are based on the location of the urbanised areas, and around 80% of the entire population reside in the bigger towns. The majority of the tourism related economic opportunities are based in these towns (Laingsburg, Matjiesfontein and Vleiland) but need to be optimised and the workforce behind them upskilled. Unfortunately, the nationwide lockdown due to Covid-19 had a negative impact on these sectors of the economy and the majority of jobs are not likely to recover, with the regional economy declining even quicker than before (United Nations, 2020).

5.3.2.3 Social aspects

The funding the municipality receives from National Treasury is seen as inadequate in addressing the developmental challenges that have a direct influence over the social dynamics of the area. The main social problems in the area arise from low levels of education, which lead to under skilled population and low potential for employment in sector requiring skilled labour force. Since Laingsburg municipality is the smallest in the Western Cape, it is unlikely that the growth potential of any of the towns will be high, hence the low investment in the area. This will result in people moving for better opportunities and service provision, thus abandoning infrastructure and contributing to the increased poverty and lack of opportunities in the area (Western Cape Government, 2017).

The majority of the municipal area rely on the town of Laingsburg for most of their educational needs. There is a particular problem in the case of secondary schools and higher education for the area as there are no dedicated secondary schools and no further education training (FET) institutions in the municipal area. The available data, on the community survey, is contradictory to the information provided by the SDF, in that the SDF states that the majority of the population had no secondary education (Laingsburg municipality, 2017). The towns in the area rely on schools located in the surrounding municipalities. The district municipal manager for the area pointed out that many children are forced to stop attending school due to reasons including travel distance, inability to pay fees, and lack of programmes to support schooling (Respondent No. 2).

The result of low education levels and in some instances no education, is that the majority of the population rely on employment in agriculture and service industries requiring low skilled labour force. This has a direct negative effect on the earning potential of individuals and thus contributes to increased poverty levels in the area (Department of Rural Development and Land Reform, 2015).

5.3.3 Beaufort West local municipality

Beaufort West local municipality is a Category B municipality, located in the Central Karoo district and comprises of the settlements of Beaufort West, Merweville, Nelspoort and Murraysburg. It is the largest local municipality in the district and Beaufort West is the biggest town in the Central Karoo region and one of the three strongest retail centres in the broader Karoo (Western Cape Government, 2019b). The location of Beaufort West is strategically placed along the N1 freeway between Johannesburg, Bloemfontein and Cape Town. Beaufort West is centrally located in the Central Karoo, equidistant between the Western Cape, Northern Cape and Eastern Cape (Western Cape Government, 2019b).

The area has experienced a population growth from 2001 (37 000 people) to 2011 (49 000 people) (Statistics South Africa, 2011). The municipality is located adjacent to the following municipalities:

- Laingsburg Local Municipality (Central Karoo district)
- Prince Albert Local Municipality (Central Karoo district)
- Karoo Hoogland Local Municipality (Northern Cape province)
- Ubuntu Local Municipality (Northern Cape province)
- Camdeboo Local Municipality (Eastern Cape province)
- Baviaans Local Municipality (Eastern Cape province)

5.3.3.1. Natural environment

Beaufort West local municipality will be affected almost in its entirety by the proposed shale gas exploration. The engagement processes on the matter must ensure that sensitive environments are protected from degradation and suitable economic benefits realised by the community and the region. The impacts, if proper rehabilitation is not put in place, could be devastating to the natural environment and the tourism sector (Beaufort West municipality, 2008). According to the director of engineering services in the local municipality, environmental management implementation plans are lacking in clarity. There are very

limited resources, at local level, assigned to environmental management, thus the need for support from higher levels of government is crucial (Respondent No. 5).

Another potential damage is the contamination of groundwater reserves. The area is highly reliant on this resource and the need for water has increased due to drought and more agricultural practice. In the event that the groundwater is contaminated, the natural environment, social and economic sectors will suffer greatly, since the region is experiencing a persisting drought. It stands to reason that since the water resources of the area are scarce, they must be protected at all cost from contamination and depletion.

5.3.3.2. Economy

While the greatest contributor to the regional economy, Beaufort West local municipality has been experiencing a stagnating economy. The location of Beaufort West is highly strategic as it is seen as a service link between Johannesburg, Bloemfontein and Cape Town, through the N1 freeway. There are many advantages to this, like local economic development on key routes, which are not fully realised and investment opportunities are missed for the area (Beaufort West municipality, 2008). The local communities have identified a high rate of unemployment and the lack of cohesive strategy, linking various sectors of the economy with each other and potential investment. This lack of coordination has increased the levels of poverty, which are higher than the national rate (Central Karoo district municipality, 2017).

The primary sector has been experiencing a decline due to prolonged drought conditions emphasised throughout the chapter. The conditions resulting from climate change effects are exacerbating the drought situation, as there are temperature and wind increases, which contribute to higher need for scarce water resources (Beaufort West municipality, 2008). This has a direct impact on agriculture activities in the region. The crop production would ultimately decrease due to increased air temperatures and the resultant loss of arable land. There is a high potential for wild fires, which will be very damaging to local agricultural activities.

The overall loss of water resources will result in further crop loss in the area. In addition, the sector has been losing jobs even more during the Covid-19 pandemic, and the long-term effects on the economy of the region, like in the rest of the country, are still to be seen (United Nations, 2020). Director of engineering services in Beaufort West local municipality

highlighted that investment in the tourism sector is almost nonexistent. The tourism amenities in the area, if enhanced, can be used to provide more opportunities and jobs. However, at the current level, these amenities are lacking in attractiveness for either government or private sector to invest in. The local municipality are so under resourced, that they cannot, on their own, provide effective local economic development strategies including tourism interventions (Respondent No. 5).

5.3.3.3. Social aspects

Even though Beaufort West is the biggest town in the Central Karoo, and the local municipal area is home to the highest amount of people, the degree of social challenges occurring is on the rise. The local communities in Beaufort West and Nelspoort have identified a lack of health facilitates, particularly health facilities (clinics) supplying HIV-related services. In addition to that, all three larger towns in the municipality (i.e. Beaufort West, Nelspoort and Merweville) experience an increase in vandalism occurrences and criminal activity, resulting in safety concerns, especially for community members trying to access public/ community facilities (Beaufort West municipality, 2008).

Beaufort West municipality has not increased the number of schools in the area. This is seen as a potential problem in the future, especially as the number of learners increases. The need to meet the educational and up-skilling needs of the area are therefore critical. The social benefit of a diversified economy contributes towards the bridging of the income inequality gap currently persisting over the region (Western Cape Government, 2018). All in all, the lack of social infrastructure is a major issue in the area. There are however no clear municipal infrastructure plans, with implementation strategies. The compilation of such strategies would require a lot of assistance from higher levels of government, which is also often problematic and unavailable (Respondent No. 6).

5.4 A SYNTHESIS OF THE CHALLENGES

This section synthesises the discussion covered in the previous discussion to identify the cross-cutting environmental, economic and social problems that characterise the Central Karoo region as a whole or challenges that the region is prone to. The synthesis includes word clouds created from the responses of the key informants on the key challenges experienced in the region.

5.4.1 Natural environment

The Central Karoo region, as a whole, does not have a well-established and clear biodiversity plan. The resulting challenges of this is that the natural environment is deteriorating and sensitive natural resources are in the process lost. To exacerbate the problem, potential shale gas extraction will pose a great risk to the natural systems in the region i.e. if not managed well and if mitigation and rehabilitation measures are not put in place prior to commencement of the exploration activities.

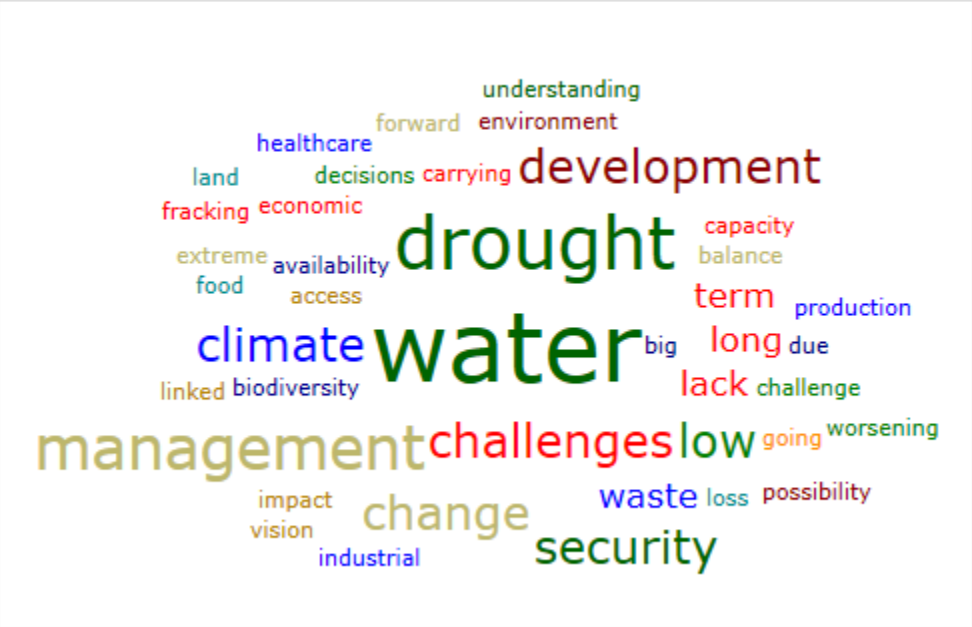
The Central Karoo as a whole has been experiencing a long period of drought and heavily relies on underground aquifers. The water resources are further threatened by poor use of such, and the lack of a holistic management strategy for the region makes the situation worse. This poses a great risk to agriculture, which is the key economic driver for the region. Household water supply is also under threat and the infrastructure required to supply water to the households is very expensive, mainly due to the great distances between settlements in the area. This makes it more difficult for local municipalities and the district municipality to provide the basic services.

Valuable and vulnerable water resources are further threatened by the projected mining and extraction of shale gas in the region. While this is a valuable economic activity, there is a threat to the ground water aquifers which may be polluted as a direct result of shale gas extraction through hydraulic fracturing. At present, Western Cape provincial government is in support of the granting of exploration rights in the region, but not production rights (Central Karoo district municipality, 2017).

Representatives from all three local municipalities in Central Karoo district municipality, as well as Western Cape Provincial government, explicitly pointed out the need for an updated, integrated environmental management plan. It is crucial to focus on implementation and address this at all levels, especially local municipal levels. It is also important to provide the local municipalities with the required training and up-skilling, to assist in interpreting this plan and implementing it effectively as the current understanding of environmental management is not sufficient (Respondent No. 2).

The respondents' feedback on the overarching environmental challenges in the Central Karoo region is portrayed in Figure 5.3 below.

Figure 5. 3: Respondents' feedback on environmental challenges in the region



Source: Atlas.ti analysis

5.4.2. Economy

The economy of the region is stagnating, especially with the advent of Covid-19 pandemic. The main economic sector in the region, agriculture, is arguably stable for now although experiencing a slow decline, as food supply to the region and the country is vital. However, many jobs have been lost and continue to be cut, as a direct result of the pandemic.

The region is very sparsely populated and opportunities and potential for economic growth are low. Thus, investment into the region is not sufficient to address the local economic development needs and advance the tourism and service sectors to their potential towards diversifying the economy. Provincial government Western Cape chief planner for the region stressed that many of the challenges associated with both the economy and social aspects unfortunately cannot be sufficiently addressed within the SDFs and need interventions within the respected strategies applicable to the issues (Respondent No. 1).

Various municipal officials from local municipalities as well as the district municipality, are of the opinion that local economic development albeit somewhat present, is not sufficiently addressed and is vitally important for the economies of the small towns and villages (Respondent No. 2). The understanding of LED makes it very difficult to attract and motivate

investment from private and public sector, leaving the local economy vulnerable and poorly managed.

Figure 5.4 graphically displays the repondents' feedback on the main economic challenges in the Central Karoo region.

Figure 5. 4: Respondents' feedback on economic challenges in the region

Source: Atlas.ti analysis

5.4.3. Social aspects

Education, health, and gross domestic product (GDP) per capita levels are low in the Central Karoo region. These contribute to deteriorating quality of life and unsustainable livelihoods of the poor in the region. It appears that as a result of this, crime and violence are increasing and short-term solutions to these problems are becoming more critical. Teenage pregnancy has come up in all the interviews conducted with the officials, as one of the top social issues which has been increasing over the last decade, and contributing to young females dropping out of school.

The socio-economic dynamics might become vulnerable due to interest and investment being placed elsewhere, like mining and economic activity, thus further declining the social profile

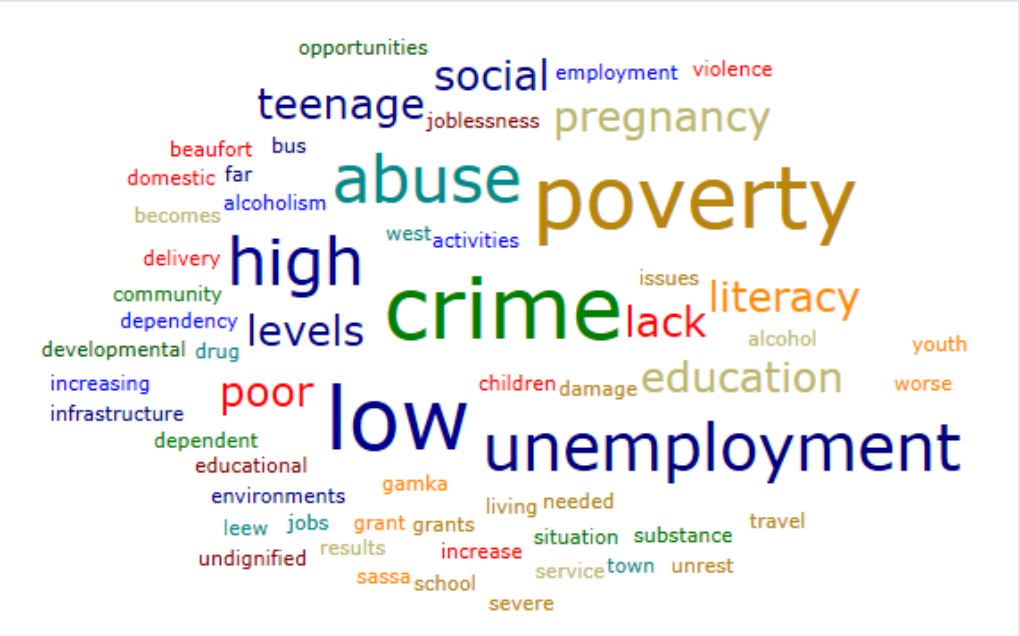
of the region, including lowering education levels, increased crime and violence, higher unemployment and poverty rates, and deteriorating Gini coefficient.

Education levels are a particular concern for the region as a whole. In many instances, towns and settlements record insufficient provision of schools and reliance of neighbouring areas' schools. The number of people educated at various levels, decreases as the levels go up, which is normally the case but poses particular problems for the region because the population is already low-skilled. Up-skilling is required to provide people with the necessary tools and knowledge towards improving rates of poverty and diversifying the economy. This in itself will contribute to better overall social indicators, including less violence and crime in the region.

Furthermore, in the study conducted by Western Cape Government (n.d.), it was established that various areas of the Central Karoo region are characterised by a poor civic culture wherein there is a severe mistrust between different actors and interested and affected stakeholders.

The respondents' feedback on the overarching social challenges in the Central Karoo region is displayed in Figure 5.5.

Figure 5. 5: Respondents' feedback on social challenges in the region



Source: Atlas.ti analysis

5.5 SUMMARY

In preparation of the presentation of the bulk of findings in Chapter Six, this chapter introduced the case study of Central Karoo region, and identified the main environmental, social and economic challenges that are experienced in the region or the challenges that might be faced by the region in future. The discussion in the chapter is prefaced with a snapshot of the spheres of government in South Africa, namely national, provincial and local (municipal) sphere. The administrative region, which is aligned with the boundaries of Central Karoo district municipality, comprises three local municipalities, namely Beaufort West, Laingsburg and Prince Albert. The main challenges experienced in the region include prolonged drought and the associated threats to water resources; potentially negative effects of the proposed shale gas development; the impact of Covid-19 pandemic on the economy, which includes the loss of jobs; unemployment; low education levels and majority of work force being low skilled or unskilled. On this background, the next chapter employs the identified challenges as point of reference in the presentation of findings of the analysis conducted on the incorporation of regional resilience in the plans and frameworks that have a bearing on planning and development in the Central Karoo region.

CHAPTER 6: INCORPORATION OF REGIONAL RESILIENCE IN THE POLICIES AND PLANS

The preceding chapter introduced the case study of Central Karoo region in the Western Cape province of South Africa. That chapter culminated in the identification and delineation of environmental, economic and social problems that exist in the region and/ or problems that can potentially affect the region. Against that backdrop, the current chapter presents the research findings from the qualitative analysis conducted on the incorporation of regional resilience in the policies and plans that have a bearing on planning and development in the Central Karoo region. Aligned with the second and third research questions of the thesis as spelt out in Chapter One and highlighted below for ease of reference, the chapter is organised into three interrelated sections. Section 6.1 presents the findings on the extent to which regional resilience is incorporated in the relevant policies and plans (Research Question Two). Section 6.2 focuses on the findings pertaining to factors that influence the level of incorporation of regional resilience established in the foregoing section (Research Question Three). The final part (Section 6.3) summarises the chapter.

6.1 REGIONAL RESILIENCE IN THE POLICIES AND PLANS

As discussed at length in Chapter Four of the thesis, it was established that for the study to adequately answer the research questions, it was essential to analyse spatial development frameworks (at different spheres of governance) that have direct or indirect influence on planning and development in the Central Karoo region. The most logical sequence was to commence the analysis with policies and plans at the national level, followed by the Western Cape provincial SDF and then the Central Karoo district municipality's SDF. Once the documents at the three higher levels were analysed, the three local municipal SDFs (i.e. of the municipalities that are constituent of the Central Karoo region) were put under the microscope. Informed by this elementary logic, which essentially revolved around the hierarchy of SDFs and/ or plans in South Africa, the following documents were analysed towards achieving the research objectives, answering the questions and realising the overarching aim of the study:

a) National development plan
b) National spatial development perspective
c) Western Cape provincial SDF
d) Central Karoo district municipal SDF
e) Laingsburg local municipal SDF
f) Prince Albert local municipal SDF
g) Beaufort West local municipal SDF

At the outset of the study, a decision had to be made on the appropriate qualitative data analysis software to be employed towards analysing the documents (policies, plans and frameworks) mentioned above. After careful consideration, it was decided that the data analysis software of Atlas.ti (Version 9) would be utilised in the study. As noted in Chapter Four (Section 4.3.1), this software preference was largely informed by the fact that, at the time of the study, CPUT had an existing Atlas.ti subscription/ licence as opposed to other prominent and equally acclaimed qualitative analysis software, such as, inter alia, Nvivo and Provalis. Notably, some scholars herald Nvivo and Atlas.ti as the most popular qualitative data analysis software (Lewis, 2004). The aforesaid existing CPUT subscription implied that Atlas.ti would be readily available for use in the study without any licencing hurdles.

The software of Atlas.ti works with codes (in the form of words or phrases), which have to be pre-identified by the researcher. In this regard, the analysis codes outlined below were identified beforehand and applied in the analysis of all the subject documents to ensure consistency and fair determination of similarities and differences so far as regional resilience was concerned. In addition to the pre-determined codes, an overall picture, which highlighted the most common themes contained in each subject policy, plan and/ or SDF, was extracted from the documents analysed. As discussed in Chapter Four, the output of the analysis was specifically displayed in the form of word clouds, which were afterwards summarised and evaluated in a tabular form discussed below.

The themes used for the coding were selected on the basis of the environmental, social and economic problems identified and discussed at length in Chapter Five. The logic was that the acknowledgement and response to these context-specific problems would arguably be representative of regional resilience planning. The response would be identified by the normative stands taken towards addressing or circumventing the environmental, social and

economic problems in the Central Karoo region. On this background, Table 6.1 lists the themes identified as 'problem-related' as well as the opposite/ ideal situation or 'normative-related' phrases and words, which point towards possible solutions (or preparation for potential problems and shocks) identified by each plan/ SDF. As alluded to above, the incorporation of these words and phrases, at least in part, provide insight into the level of awareness and acknowledgement of regional resilience reflected in the SDFs. Each section of the SDF evaluation therefore concludes with a summary of how the two sets of themes are represented in the documents analysed, and accordingly used to ascertain the level of acknowledgement of regional resilience in the subject documents.

Table 6. 1: Problems and normative position

Central Karoo (potential) problems	**Normative position towards addressing the problems**
Hydraulic fracturing Fraking Shale gas	Rehabilitation Mitigation
Drought Disaster	Water management Disaster management Water use regulation
Biodiversity loss	Conservation Protection Environmental education
Low education level Education Lack of schools	Schools Colleges Adult education
High unemployment rate Unemployment	Subsidy Skills
Housing shortage Informal settlements	Suitable land Residential development Density Basic services
Stagnating economy Economy	Employment opportunities Market diversity Business Economic growth
Low investment potential	Capital investment Subsidies

Source: Author

The outcome of the qualitative analysis conducted in Atlas.ti is presented in a twofold manner in the subsequent sections of the chapter. To provide an overall picture on the focus of the documents, the most common themes contained in each document are set out, followed by the presentation and discussion of the 'problem-related' themes and 'normative-relative'

themes contained in the subject documents, which are subsequently synthesised to ascertain the level of incorporation of regional resilience in the documents. Each of the policy document/ SDF at four levels of governance (i.e. national, provincial, district and local) are presented in separate sections hereunder.

In order to do the establish a logical rating for the synthesis, the following approach was used: Firstly, with regard to the word clouds, it was noted that the most dominant words included the name of the document, for example 'Central Karoo spatial development framework'. These words were accordingly omitted from the subsequent rating as it was deemed they were used to refer either to the document or the geographical area. Through the use of Atlas.ti, the exact number of times a problem theme or normative theme mentioned within the document was identified. This number was compared to the appearance of the theme in the overall word cloud and how its relevance was displayed graphically.

Secondly, in order to compare the relationship between the problem themes and normative themes, the number of times each word appeared in a document was compared to each other. In this way, if a normative theme appeared more often than its corresponding problem theme, it was assumed that the problem had been sufficiently acknowledged in the document. Where the problem appeared more than its corresponding normative theme, the normative theme may need to be expanded on further in order to ensure that the problem is adequately addressed.

Drawing upon the logic of Mokhele and Geyer (2021), the following rating categories were adopted:

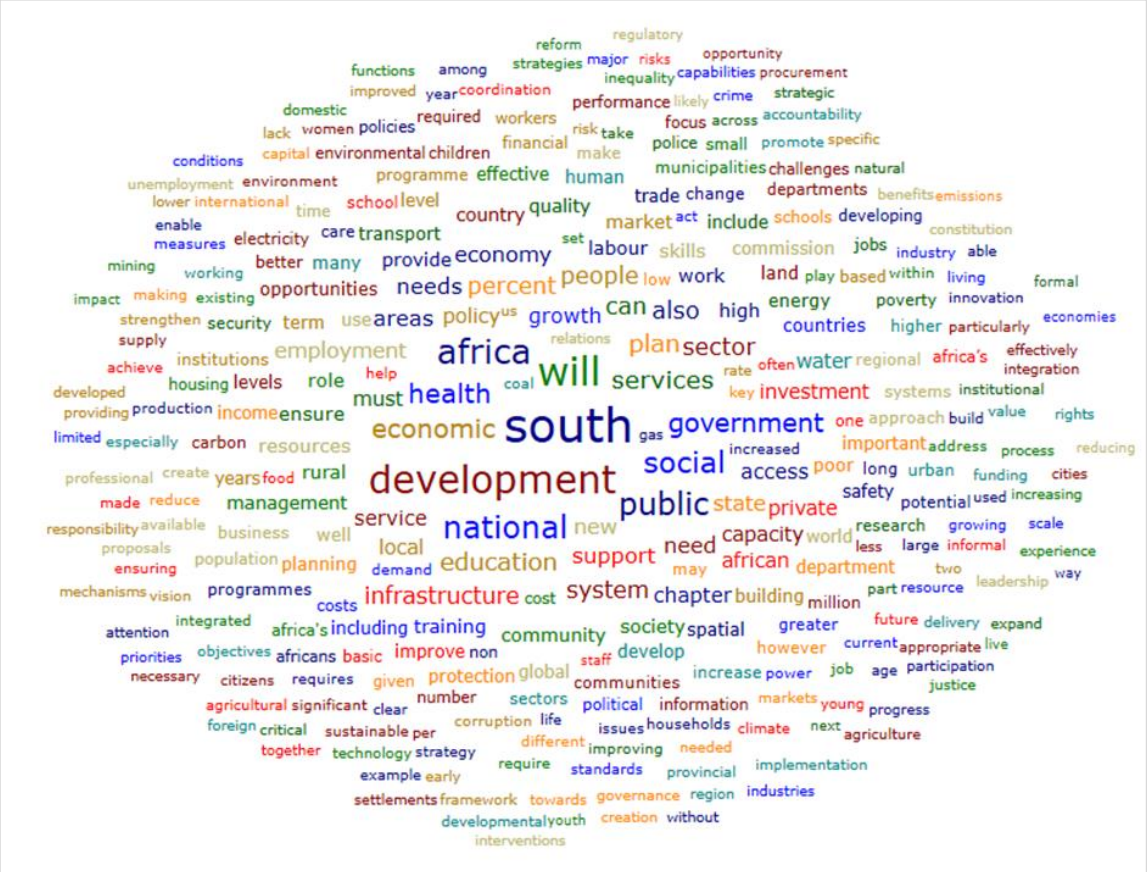
- Poor: The theme is not prominent in the word cloud. The number of times it appears in the document is low.
- Fair: The theme is either prominent in the word cloud or the number of times it appears throughout the document addresses its corresponding theme, but not both.
- Good: The theme is illustrated prominently in the word cloud and the number of times it appears in the document sufficiently addresses its corresponding theme.

6.1.1 National sphere of governance

Due to the hierarchy and high-level status of the national spatial development perspective and the national development plan, the analysis of these documents did not delve into the identification of specific Central Karoo problems and normative positions as part of the coding process. This stance was taken because the problems are largely context-specific and to an extent peculiar to the case study i.e. Central Karoo region. At the national level, only the most common themes contained in the documents were identified and discussed relative to the focus of the study so as to set the scene for the SDFs at lower levels i.e. provincial, district and local spheres of governance.

Figure 6.1 depicts an overall picture from the analysis conducted on the National Development Plan, which is a document that maps the country's development path and meant to inform development and planning policies, plans and strategies at lower levels of governance.

Figure 6. 1: National Development Plan

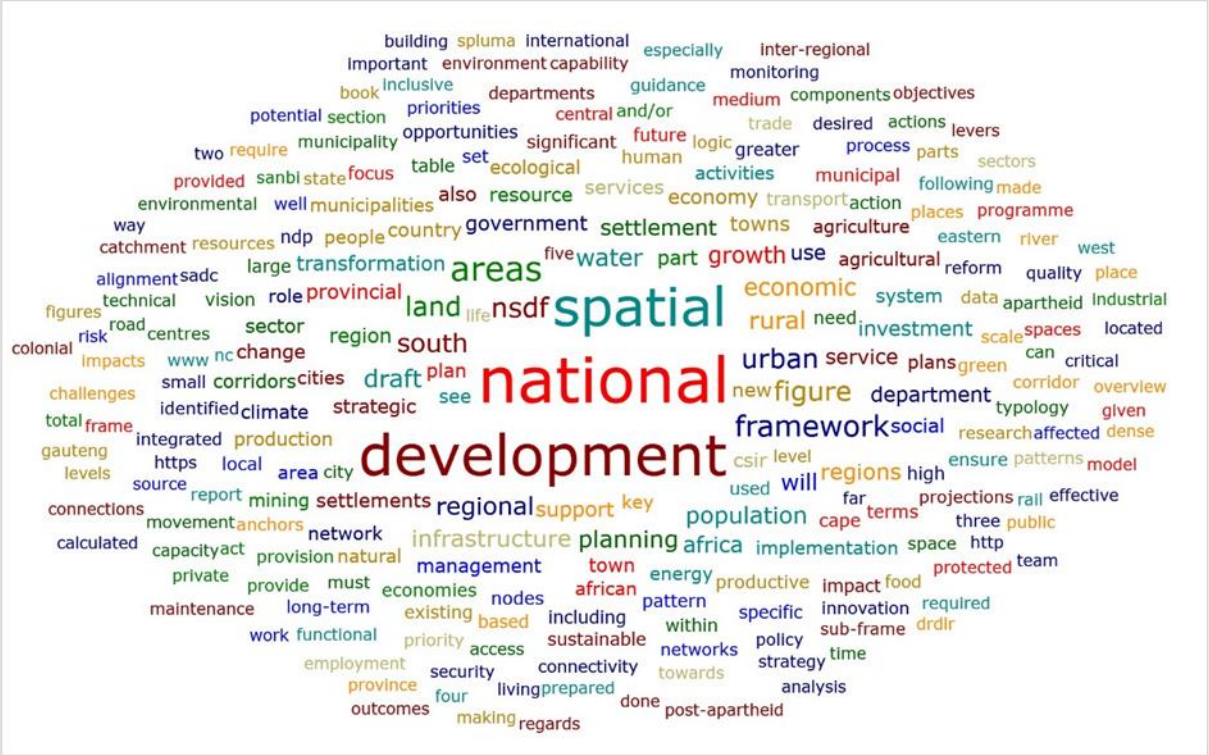


Source: Atlas.ti analysis

The themes that have a dominant presence in the national development plan include development, public, health and economic.

The second national-level document analysed in the study is the national spatial development perspective. Figure 6.2 below provides a pictorial presentation of the most common themes contained in the national spatial development perspective. As alluded to earlier (and similar to the national development plan), this document provides overarching guidance, and sets the scene for the strategic focus of lower level and more detailed, context-specific policies and plans in line with the planning and developmental direction and aspirations of the country.

Figure 6. 2: National Spatial Development Perspective



Source: Atlas.ti analysis

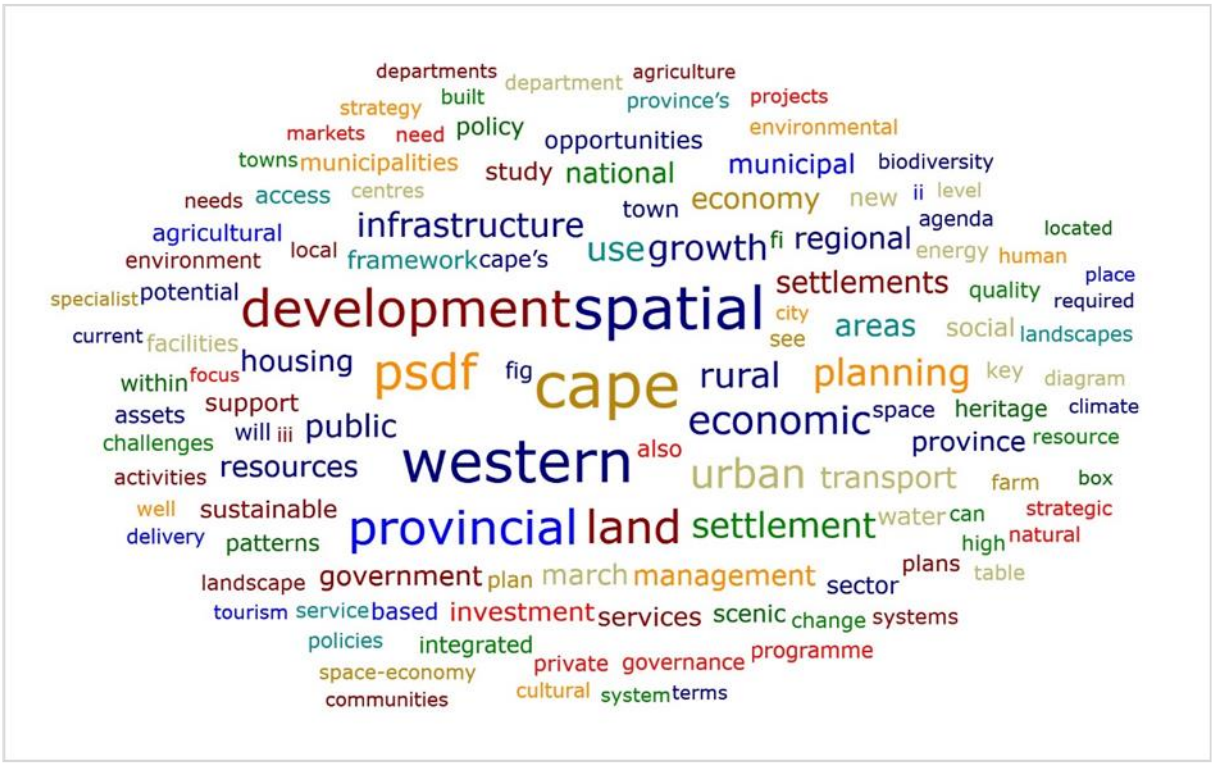
The themes appearing the most in the national spatial development perspective document include the following: spatial, development, urban, land, economic growth, framework, regional and rural. ‘National’ is understandably one of the prominent words in the light of the position of the document i.e. national level. In order to allow for a wide variety of strategies to be developed at lower levels, the document has to reflect high level themes that are broad enough and allow for interpretation and application at the detailed level. The aim at this level is to prompt and guide government entities, relevant stakeholders and other interested and

affected parties towards formulating detailed policies, plans and context-specific analysis and proposals at the lower spheres of governance in the country.

6.1.2 Provincial sphere of governance

The overall picture of the Western Cape provincial SDF (PSDF) reflects significant similarities with the national spatial development perspective and the national development plan. The top themes in the Western Cape PSDF encompass the following: spatial, development, land, economic, growth, urban, rural and infrastructure (Figure 6.3). These are the themes that are carried down from the national level and applied specifically to the context of the Western Cape province. Notably, the issue of land has a prominent presence at the provincial sphere as opposed to the national level. As was the case with 'national' in the foregoing discussion of the national development plan and the national spatial development perspective, 'Cape' and 'provincial' were found to feature prominently in the Western Cape PSDF. Given the focus of the study, which is on the rural region of Central Karoo, it is important to emphasise that the term 'rural' features prominently in the Western Cape PSDF, reflecting some acknowledgement of rural areas or rurality in the province.

Figure 6. 3: Western Cape Provincial SDF overall picture



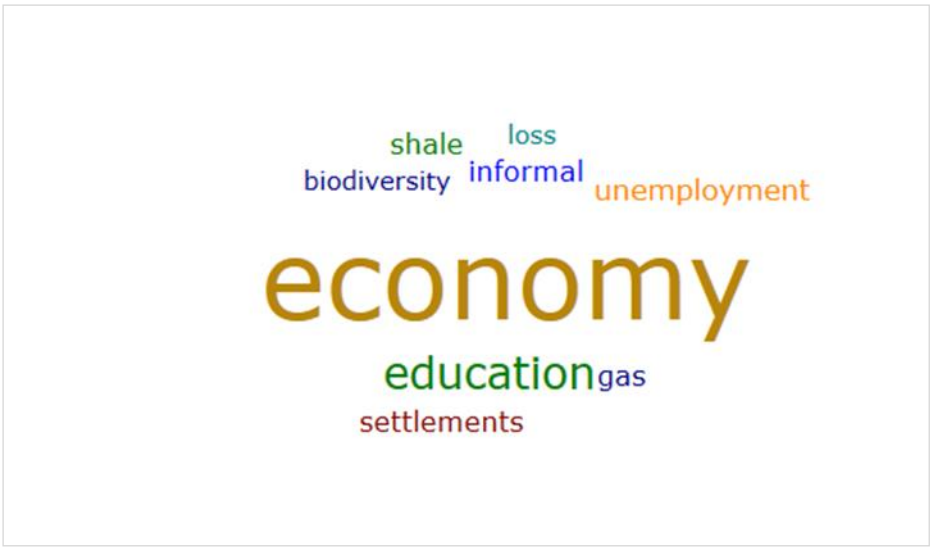
Source: Atlas.ti analysis

The nature of the Western Cape provincial SDF, while focused specifically on the province, remains broad enough to allow the various municipalities (districts, metropolitan and local) within the province, to formulate their own SDFs and the associated plans, strategies and programmes. Due to the diversity and large geographical extent of the Western Cape province, though there are similarities, the districts and regions have different environmental, social and economic conditions. There are also a variety of problems experienced by each region albeit there might be common problems across particular areas. It therefore stands to reason that normative position and spatial development direction should be considered based on an appropriately assessed context and specifically applicable to particular regions or districts in the province.

6.1.2.1. Problem themes

The most significant 'problem-related' themes identified in the Western Cape PSDF relate to increase in informal settlements, declining levels of education, rising unemployment and natural environment degradation in the province (Figure 6.4). It is important to highlight that the prominence of these themes in a provincial-level document indicate that they are not necessarily peculiar to the Central Karoo region. The themes here also reflect the importance placed by the national spatial development perspective and national development plan on economic growth, urban and rural contexts, as well as spatial development.

Figure 6. 4: Challenges in the Western Cape PSDF



Source: Atlas.ti analysis

The increasing number of informal settlements across the province in part means that there are high levels of migration between rural and urban areas (including inter provincial movements), high levels of unemployment, increasing poverty and declining economy. The housing backlogs within urban areas are growing rapidly and people often have no other solution than to reside in the so-called informal settlements. Notably, Western Cape province currently has the second highest number of informal settlements in the country (Statistics South Africa, 2020).

The declining levels of education and the rising unemployment are particularly concerning as the economy of the Western Cape province is considered to be generally growing as development occurs especially in the bigger urban areas. This decline may point to poor allocation of resources in the education sector and less importance being put on facility development and associated programmes for learners and educators. The declining level of education would ultimately result in increase in unemployment and lead to a vicious cycle of poverty.

Through further coding and modeling of the environmental protection issues, the results generated point to biodiversity loss and the matters of hydraulic fracturing in the province. The provincial SDF places great importance on the environmental problems associated to shale gas extraction and how this would negatively impact the Western Cape. There are many subsequent problems which would snowball from these impacts, including contamination of ground water reserves that would worsen the drought that the province has experienced in recent times; biodiversity loss, which has a negative impact on tourism, heritage resources and ecosystems; subsequent jobs and opportunities for small business will be lost and the tourism sector will be impacted on negatively.

Ultimately many people and businesses would potentially relocate from the areas impacted on by hydraulic fracturing, as a result of degraded economy and job loss. This will amount to increased pressure for service delivery on cities and urban areas that will absorb the new residents from affected areas.

6.1.2.2. Normative-related themes

The modelling of the solution- or normative-related themes contained in the Western Cape PSDF resulted in the picture depicted in Figure 6.5 below.

Figure 6. 5: Western Cape PSDF normative themes

Source: Atlas.ti analysis

The findings reflect a focus on investment and economic growth, largely through the enabling of business opportunities, employment creation, skills enhancement, and provision of related infrastructure. These interventions range from immediate impact, where skill enhancement is concerned, to longer term investments with the provision of infrastructure to support economic drivers, for example telecommunications infrastructure.

The province maintains its Constitutional mandate to uphold developmental state and focus on the provision of services, social infrastructure (like schools and other community facilities) and basic infrastructure, while looking to increase population densities at key locations. Due to the increasing number of informal settlements, coupled with unstable economy, the provision of basic service infrastructure is at the forefront of developmental focus of the province. Ensuring the access to basic infrastructure and supportive infrastructure, like transport, enables people to focus on education and skills and creation of economic opportunities.

The Western Cape PSDF also has a large focus on conservation, protection, and rehabilitation, which feeds into large portions of the Western Cape's economy through tourism. Within both rural and urban areas, conservation of valuable species and protection of

biodiversity and heritage is very important and enforced through various legislation and policies. This focus is against the backdrop of tourism being one of the drivers of the economy of the province, including the Central Karoo region that is the focus of the thesis.

Table 6.2 synthesises the foregoing discussion of the Western Cape PSDF. The synthesis reflects that although the normative proposals in the document are relevant to the Central Karoo, the performance regarding the problems is largely poor. It can therefore be argued that the PSDF does not adequately incorporate regional regional resilience in so far as Central Karoo is concerned.

Table 6. 2: Summary of the Western Cape SDF problem and normative themes

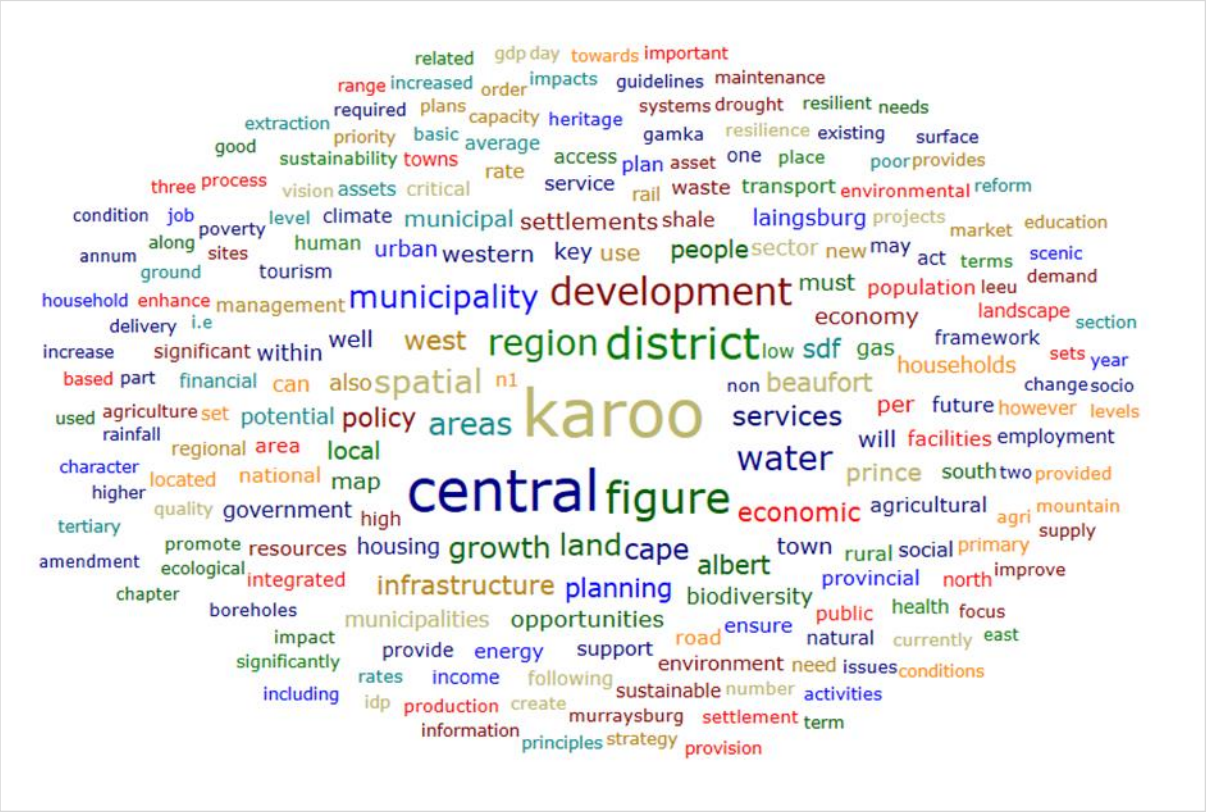
Central Karoo problems	**Normative position towards addressing the problems**	**Problems noted in the Western Cape PSDF**	**Normative position in the Western Cape PSDF**
Hydraulic fracturing Fraking Shale gas	Rehabilitation Mitigation	Poor	Fair
Drought Disaster	Water management Disaster management Water use regulation	Poor	Poor
Biodiversity loss	Conservation Protection Environmental education	Poor	Good
Low education level Education Lack of schools	Schools Collages Adult education	Good	Poor
High unemployment rate Unemployment	Subsidy Skills	Poor	Good
Housing shortage Informal settlements	Suitable land Residential development Density Basic services	Poor	Good
Stagnating economy Economy	Employment opportunities Market diversity Business Economic growth	Good	Good
Low investment potential	Capital investment Subsidies	Poor	Good

Source: Author's analysis

6.1.3 District sphere of governance

The Central Karoo district municipal SDF is expected to delve deeper into more context-specific and detailed analysis applicable to the case study of Central Karoo region. As reflected in Figure 6.6 below, the overall focus of this framework revolves around the themes of economic growth, land development and redistribution, education and employment, shale gas and disaster management.

Figure 6. 6: Central Karoo municipal SDF overall picture



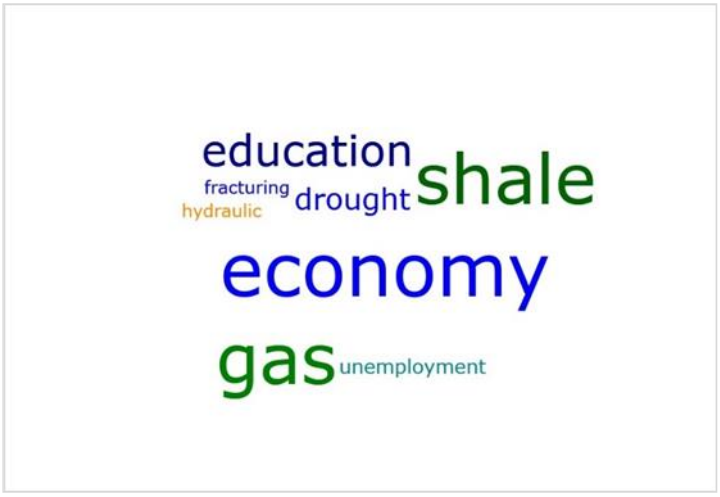
Source: Atlas.ti analysis

Lack of capacity and resources continues to be an issue for the Central Karoo district as a whole and continuous efforts are made by the Western Cape provincial government to facilitate the development of effective SDFs and associated implementation plans. There is however a need for further investment into the region, which would strengthen the economy through, among others, educational and employment support initiatives and programmes.

6.1.3.1. Problem themes

Figure 6.7 represents the modelling of the problematic themes pertaining to the Central Karoo. The aspect that is mostly considered in the district-level SDF is the issue of the economy, which is not surprising because the economy has impact on various facets of a given area. The economy is followed by concerns pertaining to shale and gas. Education is another aspect that is eminent in the SDF. Surprisingly, drought is not top of the agenda of the challenges that the Central Karoo region is experiencing or prone to.

Figure 6. 7: Central Karoo SDF problem themes



Source: Atlas.ti analysis

Due to the low population of Central Karoo region, the number of educational institutions remains low. The main provision of schools, tertiary institutions, and other adult educational facilities is within the three main towns of the district, namely Laingsburg, Prince Albert and Beaufort West. However, due to the large distances between the towns and rural areas in the region, travelling is cumbersome and poses serious risks to education provision, possibly contributing towards declining education sector.

One of the direct results of declining education is the increased unemployment and high poverty rates in the Central Karoo region. This is further exacerbated by the low levels of investment in programmes and stretegies for promoting the growth and development of small and informal businesses. The prospect of skills development and job opportunities rises through the possibility of hydraulic fracturing and shale gas extraction. However, this in itself has ramifications and poses serious environmental and socio economic risks for the region.

As discussed at lenghth in Chapter Four, hydraulic fracturing may contaminate ground water reserves and pollute the natural environment. This in turn means that the drought would be worsened and the residents of the region would suffer the consequences of an already bad disaster. Further to that, the jobs created through this initiative may not be beneficial to the locals, especially in the long term. This would possibly leave people unemployed after a short period of time. The ramifications will have a domino effect on, among others, the economy of the region and the dire housing shortage, as well as rural to urban migration and the subsequent increase of informal settlements.

As the region is naturally extremely dry, and receives very low rainfall throughout the year, drought is undoubtedly one of the most serious problems experienced in the region. The human population, animals as well as the natural environment are severely impacted by this. A need for innovative solutions and disaster risk management initiatives is thus very pertinent in the region.

6.1.3.2. Normative themes

Figure 6.8 below is the reflection of results of the coding of the solution (normative) related themes contained in the Central Karoo district municipal SDF.

Figure 6. 8: Central Karoo normative themes

Source: Atlas.ti analysis

The Central Karoo district SDF reflects clear linkages between the normative/ solution driven aspects as reflected in Figure 6.8 above. The most prominent theme is identified to be ‘land’, which is among others essential towards addressing the challenges of housing shortage and informal settlements identified in the discussion of problem-related themes. Land-related strategies are valuable, especially when looking at the context of Central Karoo region, which

is geographically big (though some areas are not necessarily habitable). These strategies include land restitution processes, land development strategy, and land optimisation strategy in the case of open spaces and underutilised land. Within the context of spatial development frameworks, land is arguably at the forefront, and one of the most important elements of development.

The positive elements outlined above also deal with the low education and employment levels through incorporating interventions at various levels and for different sectors of the economy and the population. Specific reference is also made to colleges, which seek to address the lack of variety of tertiary education options in the region and to improve skills in the adult population. Further to improving education as means towards strengthening the economy, there are also key themes of 'business', 'opportunities' and 'capital'. These themes have a direct link up to the Western Cape PSDF, the national spatial development perspective and the national development plan.

Similar to the provincial-level SDF, biodiversity is another dominant topic at the level of district municipality. The specific indicators in this regard include rehabilitation, mitigation and conservation of the biodiversity. The district has taken a firm stance towards protecting the natural and heritage assets and the associated benefits. Further to that, it is to be noted that water is a major theme as well as disaster and management. It may be difficult for the district municipality to resolve the drought in the region. However, managing water resources and ensuring that disaster risk management strategy is in place for worsening conditions, should be a priority in the region. This issue is considered at both provincial and district levels. The SDFs at these two levels set the scene for water conservation and disaster risk management associated with such. As discussed later, the local municipal areas have accordingly adopted the strategy.

Table 6.3 synthesises the foregoing discussion of the Central Karoo district SDF. The synthesis reflects that although the normative proposals in the document are largely fair and good, the performance regarding the problems is largely poor. It can therefore be argued that the Central Karoo district SDF does not adequately incorporate regional regional resilience.

Table 6. 3: Summary of the Central Karoo SDF problem and normative themes

Central Karoo problems	**Normative position towards addressing the problems**	**Problems noted in the Central Karoo SDF**	**Normative position in the Central Karoo SDF**
Hydraulic fracturing Fraking Shale gas	Rehabilitation Mitigation	Good	Poor
Drought Disaster	Water management Disaster management Water use regulation	Poor	Poor
Biodiversity loss	Conservation Protection Environmental education	Poor	Fair
Low education level Education Lack of schools	Schools Collages Adult education	Fair	Poor
High unemployment rate Unemployment	Subsidy Skills	Poor	Good
Housing shortage Informal settlements	Suitable land Residential development Density Basic services	Poor	Good
Stagnating economy Economy	Employment opportunities Market diversity Business Economic growth	Good	Good
Low investment potential	Capital investment Subsidies	Poor	Good

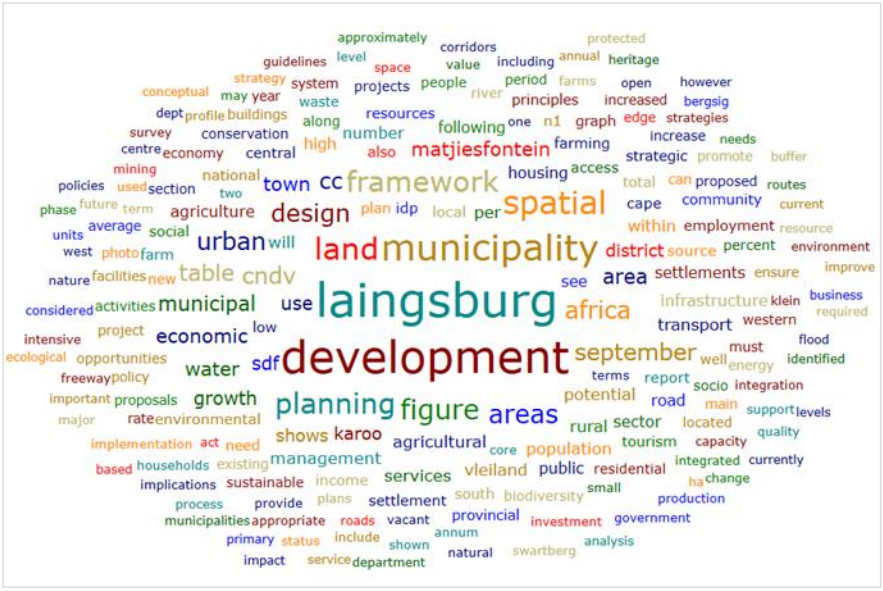
Source: Author's analysis

6.1.4 Local sphere of governance

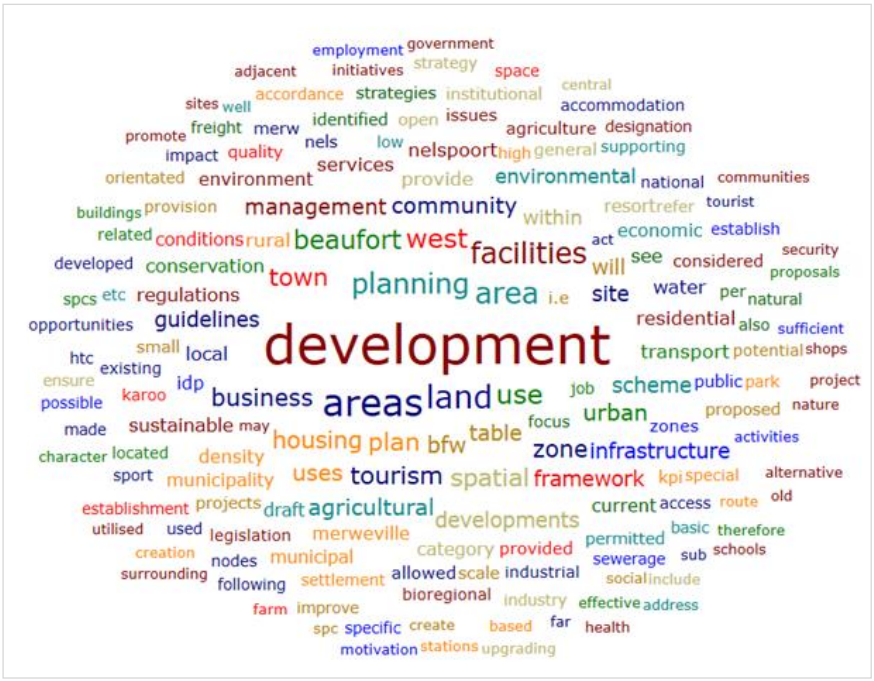
The following sub-sections deal with the findings of analysis conducted on the three local municipal SDFs, namely Beaufort West, Laingsburg and Prince Albert. These sub-sections reflect on the problem and solution themes at a local level. The overall SDF themes are depicted in Figure 6.9.

Figure 6. 9: Overall picture of the local municipal SDFs

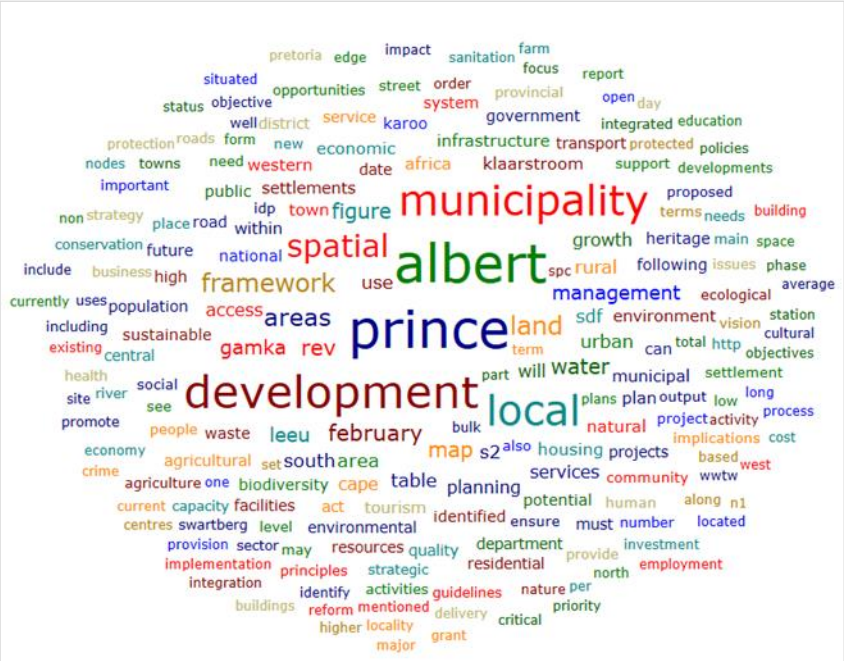
a) Laingsburg local SDF



b) Beaufort West local SDF



c) Prince Albert local SDF



Source: Atlas.ti analysis

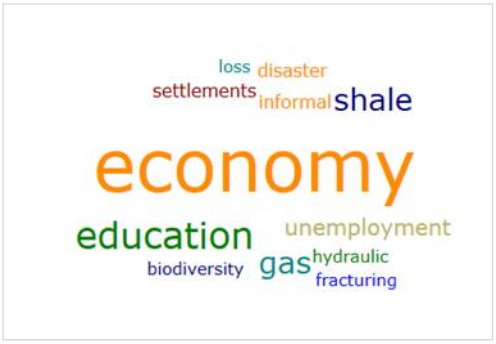
The nature of the problems experienced within these local municipal areas is almost identical and similarly the solutions set out by the SDFs are mostly the same. Therefore, they have been presented as one section later in the section and distinction is made only in instances where a specific problem is only applicable to one local municipal area.

6.1.4.1. Problem themes

The emerging problems within the three local municipalities are the same, and their importance or relevance is also very similar. Figure 6.10 Below is representative of the prominence of the challenges that are experienced in the municipalities.

Figure 6. 10: Problem themes in the local municipal SDFs

a) Laingsburg local SDF



b) Beaufort West local SDF

c) Prince Albert local SDF

Source: Atlas.ti analysis

A clearly prominent problem is economy related, which is a reflection that the municipal SDFs acknowledge the challenges in the respective areas. Unemployment and education are also at the forefront, which can both be related back to the stagnant or declining economy. This is also due to the low investment into the area as it is sparsely populated and reliant on very few sectors with heavy reliance on agriculture and tourism.

The stagnant economy and rural-urban migration and in all three main towns (Laingsburg, Prince Albert, and Beaufort West) has put immense pressure on the provision of basic services, housing and social infrastructure. The settlement patterns of these towns show an increased number of informal settlements, which are problematic from locational perspective, negative ecological consequences, and may subsequently in part give rise to crime.

Themes related to shale gas are very prominent within the problems modelling. It is noted that 'hydraulic fracturing', loss of biodiversity' and 'shale gas' all come up within this section. There have been a number of studies conducted in the area, which would be affected in the event of exploration rights being granted. Some of these studies point to very lucrative economic benefits for the country and the development of portions of the region, mainly in Beaufort West. However, provincial, district, and local municipal level SDFs all place a particularly high emphasis on the negative impacts which will be experienced as a result of this activity. It is also unclear if the revenue generated will be to the benefit of the district at all. At present, the SDFs cautiously speak to this issue and recommend measures of conservation and rehabilitation in all three local municipalities.

The municipal manager of Prince Albert local municipality expressed caution and worry towards the impact that fracking will have on the natural environment and water provision of the region. The municipal manager specifically pointed to the need to have disaster management plans, which are continuously updated and well resourced, should fracking be allowed to commence. The negative impacts this activity will have on tourism, which is one of the key economic drivers in the region, are also not clearly understood or outlined within strategy. This is a shortfall and should be looked at into more detail, to provide clarity on the way forward for this industry, should fracking commence in the future (Respondent No. 4).

6.1.4.2. Normative-related themes

Figure 6.11 below illustrates the themes related to solutions set forward by the three local municipal SDFs.

Figure 6. 11: Normative themes in the local municipal SDFs

a) Laingsburg local SDF

b) Beaufort West local SDF

c) Prince Albert local SDF

Source: Atlas.ti analysis

The biggest focus for the SDFs is evidently employment and conservation. The strategies for employment are supported by enhancement of skills and education, which is also supported by the provision of more schools. Prince Albert municipal manager specifically noted that there is a dire need for more secondary schools within accessible range for learners in the municipality. Currently, many young people drop out of school as they are unable to travellong distance to access schools. There is therefore a need to include a strategy to provide learners with transport (Respondent No. 4). The provision of education and skills enhancement for adults will have a direct and long-term benefit to the improvement and growth of the economies. Further to that, a focus is put into the enablement of business opportunities for small and informal sectors. This is a good strategy to not only ensure a growing economy, but to alleviate poverty, improve living conditions for many people who currently reside in informal settlements, and minimise rural-urban migration.

Residential development and the provision of basic services are vitally important strategies within the SDFs. Since there is a housing shortage within all three local municipal areas (Laingsburg, Prince Albert, and Beaufort West), as well as resource shortage within the municipalities, a clear strategy around the provision of housing opportunities must be defined. The identification of possible solutions to this crisis point to a developmental local government focus and the fulfillment of the constitutional obligations to its residents. Senior planner at Beaufort West local municipality highlighted the need to allocate more resources into the provision of effective spatial planning strategy and ensure that it is understood and

implemented. This is crucial in ensuring housing provision and sustainable livelihoods are adequately addressed (Respondent No. 6).

The conservation theme is highly linked to rehabilitation, mitigation and management of ecosystems and valuable biodiversity resources. This is linked to the possible outcome of hydraulic fracturing, which although will mostly impact Beaufort West will also have a high impact for both Laingsburg and Prince Albert as the polluted ground water aquifers will worsen the drought and the loss of biodiversity negatively impact the natural environment and economy. It is therefore considered that this is a valuable focus of the three local municipalities and the strict measures applied pertaining to hydraulic fracturing.

6.1.5 Synthesis of the incorporation of regional resilience in local SDFs

Tables 6.4, 6.5 and 6.6 reflect that the local municipal SDFs in the main performs poorly in terms of identifying regional-resilience related problem in the area. Although the normative position is largely good or fair, it can be argued that the local SDFs do not adequately incorporate regional resilience.

Table 6. 4: Summary of the Beaufort West SDF's problem and normative themes

Central Karoo problems	**Normative position towards addressing the problems**	**Problems noted in the Beaufort West SDF**	**Normative position in the Beaufort West SDF**
Hydraulic fracturing Fraking Shale gas	Rehabilitation Mitigation	Poor	Fair
Drought Disaster	Water management Disaster management Water use regulation	Poor	Poor
Biodiversity loss	Conservation Protection Environmental education	Poor	Good
Low education level Education Lack of schools	Schools Collages Adult education	Good	Poor
High unemployment rate Unemployment	Subsidy Skills	Fair	Good
Housing shortage Informal settlements	Suitable land Residential development Density Basic services	Poor	Good
Stagnating economy Economy	Employment opportunities Market diversity Business Economic growth	Good	Good
Low investment potential	Capital investment Subsidies	Poor	Good

Source: Author's analysis

Table 6. 5: Summary of the Laingsburg SDF's problem and normative themes

Central Karoo problems	**Normative position towards addressing the problems**	**Problems noted in the Laingsburg SDF**	**Normative position in the Laingsburg SDF**
Hydraulic fracturing Fraking Shale gas	Rehabilitation Mitigation	Good	Poor
Drought Disaster	Water management Disaster management Water use regulation	Poor	Poor
Biodiversity loss	Conservation Protection Environmental education	Poor	Good
Low education level Education Lack of schools	Schools Collages Adult education	Good	Fair
High unemployment rate Unemployment	Subsidy Skills	Poor	Poor
Housing shortage Informal settlements	Suitable land Residential development Density Basic services	Poor	Poor
Stagnating economy Economy	Employment opportunities Market diversity Business Economic growth	Good	Good
Low investment potential	Capital investment Subsidies	Poor	Poor

Source: Author's analysis

Table 6. 6: Summary of the Prince Albert SDF's problem and normative themes

Central Karoo problems	**Normative position towards addressing the problems**	**Problems noted in the Prince Albert SDF**	**Normative position in the Prince Albert SDF**
Hydraulic fracturing Fraking Shale gas	Rehabilitation Mitigation	Poor	Poor
Drought Disaster	Water management Disaster management Water use regulation	Fair	Poor
Biodiversity loss	Conservation Protection Environmental education	Poor	Good
Low education level Education Lack of schools	Schools Collages Adult education	Good	Fair
High unemployment rate Unemployment	Subsidy Skills	Fair	Good
Housing shortage Informal settlements	Suitable land Residential development Density Basic services	Poor	Good
Stagnating economy Economy	Employment opportunities Market diversity Business Economic growth	Good	Good
Low investment potential	Capital investment Subsidies	Poor	Good

Source: Author's analysis

6.2 FACTORS THAT INFLUENCE THE LEVEL OF INCORPORATION OF REGIONAL RESILIENCE IN THE PLANS

Relying on the feedback of the respondents, this section presents findings on the reasons for the level of incorporation of regional resilience in the Central Karoo district SDF and SDFs of the three constituent local municipalities of Beaufort West, Laingsburg and Prince Albert. The section focuses specifically on the aforementioned three because the documents have direct applicability and relevance to planning and development in the region. Although there are instances where the SDFs perform well in terms of problem and normative themes, Section 6.1 concluded that the Central Karoo district SDF and the three local SDFs do not adequately incorporate regional resilience.

It is noteworthy that only one of the respondents stated that both the Central Karoo SDF as well as the three local SDFs addressed resilience adequately. The rest of the respondents stated that they do not think the either the Central Karoo SDF or the local SDFs address resilience adequately. Further to that, all the six respondents (i.e. those in the employ of government) were of the view that the environmental, social, and economic challenges were not adequately addressed in the local SDFs. One participant stated that they thought that some of the challenges were addressed through the Central Karoo SDF. Prince Albert and Beaufort West have recently embarked on a process to review their SDFs, which have had little change over the last decade and have largely remained the same, due to lack of resources (Respondent No. 2). This will most likely improve the performance of the SDFs pertaining to regional resilience.

6.2.1 Environment

The lack of resources and capacity was highlighted as a main reason why the environmental challenges of the region and local municipalities are not adequately addressed. The director for engineering services at Beaufort West municipality spoke about the lack of assistance from other spheres of government in mitigating the drought. It is not clear if such assistance would have resolved the problem quicker, however, the area would have benefited from the additional resources in mitigating the effects of the drought (Respondent No. 5). The lack of resource allocation was also mentioned by municipal managers across the region, who pointed out that the local municipalities are understaffed and heavily constrained. In addition, provincial government chief regional planner for Central Karoo stressed that for problems

like water scarcity, there is a requirement for a number of sectors to respond and participate. The respondent argued that this is not a purely (spatial) planning issue and thus cannot be adequately addressed within the SDF for the region (Respondent No. 1). A lack of understanding of the role of local municipalities in environmental management was stressed by the manager for strategic services at the Central Karoo district municipality. This further limits the effectiveness of environmental strategies at higher levels of government and how they are adapted to local conditions (Respondent No. 2).

Along the lines of resources, a particularly stressed point was the lack of funding. The majority of the officials interviewed pointed out that the lack of a clear, implementation focus of the environmental management plan is one of the key reasons the environmental challenges are not given enough attention and resources. There is a dire need for more focused environmental management planning to ensure a regional strategy, which provides local implementation initiatives. Senior planner at Beaufort West municipality asserted that budgets are not made available or they are very limited for the purpose of developing sector plans to effectively address environmental management. The implementation component is especially key and often overlooked, thus leaving officials with poor understanding on how to action a plan (Respondent No. 6).

6.2.2 Social

Social challenges can be looked at through many lenses and addressed through many strategies. The provincial government chief town and regional planner for Central Karoo stressed that the SDFs cannot alone address the social challenges of any region, rural or urban. Many social challenges do not require spatial intervention and are likely linked to economic challenges. These issues need to be looked at through more than one perspective and solutions proposed at various levels of government and in many sectors (Respondent No. 1). Although there are policies which are aimed at addressing some of the social challenges, like substance abuse, crime, and violence, the lack of active programmes remains one of the main issues in terms of resolving the challenges (Respondent No. 2).

Beaufort West officials pointed out that with social issues (like with the economic and environmental problems), the lack of proper allocation of skills and resources is a continuing limitation. This impacts the Central Karoo as a region, and looking into the local municipal levels, the resources become even scarcer. This sentiment was also shared by the municipal

managers of Laingsburg and Prince Albert. There is a lack of social programmes that stem from lack of resource allocation. These programmes can provide key interventions to address social problems but require a large amount of skilled workforce, like teachers, librarians, psychologists, adult educators. These programmes need to be factored into long term development plans and strategies in order to support population growth and migration, and mitigate existing societal issues.

6.2.3. Economic

Beaufort West director of engineering services stressed that economic challenges in the region are not well addressed, mainly because of lack of resources and investment from other spheres of government (Respondent No. 5). This is also evident by the answers provided by the provincial chief planner for the Central Karoo region, who pointed to the lack of resource allocation as well as a general acceptance of status quo of the current economic situation, which highly influences officials to give poor attention to the economic problems. The acceptance of a situation as the norm discourages officials to introduce new strategy and focus into resolving the existing problems in the economy. This is inclusive of accepting that no investment will be made into the area because of its rural character and generally low economic value (Respondent No. 1). Similarly, the municipal manager of Prince Albert stated that lack of resources is a key challenge in addressing economic challenges effectively. Local municipalities resources are too stretched into basic service provision to be able to provide for skill enhancement which will contribute towards resolving economic problems (Respondent No. 4).

Senior planner in the region reflects on the main reasons for the poorly addressed economic challenges being that the area has no proper LED initiatives, lack goals and focus on strategy into economic development, and there are no economic drivers. The respondents described the local economies of towns and villages to be on the verge of collapsing with very few small businesses being sustained. This points to the lack of planning and support provided by public sector and government, including upskilling, funding, as well as other development and investment opportunities. In turn, private investment is not pulled into the region as there is lack of small businesses to invest in. It is vitally important that local government prioritise LED and come up with more solutions into attracting investment into the small businesses in the region (Respondent No. 6). The same concern was expressed by the Central Karoo district

municipality manager of strategic services, who noted that local municipalities do not understand LED and support that is required to address this (Respondent No. 2).

6.3 SUMMARY

Towards addressing the second and third research questions of the thesis, the chapter presented the bulk of research findings pertaining to two intertwined aspects. Aligned with the second research question, the presentation dealt with the level of incorporation or acknowledgement of regional resilience in the policies and/ or plans (at different levels of governance) that have a bearing on planning and development in the case study of Central Karoo region. It was discovered that the policy documents at different levels of governance in part acknowledge the environmental, social and economic problems that exist (or problems that can potentially exist) in the Central Karoo region. This state of affairs is not surprising because the sources in which the problems were identified (in Chapter Four) most likely indirectly or directly relied on the information contained in the respective SDFs. A similar scenario would be applicable with regard to the challenges mentioned by the key informants, as some of them were instrumental in the compilation of the subject SDFs at the district and local levels. In this regard, the most insightful part of the analysis was on whether the policy documents acknowledged the normative positions, which were regarded essential towards addressing the multifaceted challenges in the Central Karoo region. It was discovered that the normative positions focused on economic growth and boosting of the economy were dominating the SDFs as opposed to normative positions related to social and environmental problems. As such, because a balance is required between the identification of problems and the normative positions, notwithstanding good performance here and there, it was concluded that the District SDF and local SDFs do not adequately incorporate regional resilience. Finally, aligned with the third research question, the chapter presented findings pertaining to factors that influence the level of incorporation of regional resilience uncovered. It was discovered that resource constraints was largely the reason for the poor level of incorporation of regional resilience. The next chapter concludes the thesis and recommends areas for future research on the topic of resilience in rural or peripheral areas.

CHAPTER 7: SYNTHESIS OF THE FINDINGS AND CONTRIBUTION TOWARDS PRACTICE

The previous chapter represented a culmination of the interrelated research findings on the analysis of the incorporation of regional resilience in the policies and plans that have a bearing on planning and development in the rural region of Central Karoo, in the Western Cape province of South Africa. Against the backdrop of the findings, this final chapter synthesises and concludes the research conducted. The chapter is categorised into three main sections. Following these introductory remarks, Section 7.1 presents elementary ideas on the potential contribution of the study towards planning for regional resilience in the rural and peripheral areas of South Africa. Section 7.2 outlines the extent to which the thesis answered the underlying triad of research questions and addressed the research problem. Amid the limitations of the study presented in Chapter One (Section 1.5.2), Section 7.3 recommends areas for future research on the topic of regional resilience in rural and peripheral areas.

7.1 CONTRIBUTION TO PRACTICE

As noted in Chapter One, Section 1.5.1, as opposed to vying to extend theory, the thesis specifically intended to provide elementary contribution in terms of applied research. In this light, the potential contribution of the thesis towards (regional planning) practice is in terms of two closely related aspects, namely: one, evaluating the level of regional resilience in planning documents; and two, planning for regional resilience in rural and peripheral regions of South Africa. The contribution below is informed by both the findings of the thesis and the literature reviewed on the topic of regional resilience particularly in so far as rural and peripheral areas are concerned.

7.1.1 Evaluating regional resilience in planning documents

- Evaluation should straddle different spheres of government as opposed to focusing solely on the subject case study.
- Evaluation should assess how various concepts within planning contribute to building a higher level of regional resilience instead of basing the assessment on a single definition of resilience.

- Evaluation should not only consider the documents alone, but the level of implementation that follow. This would reflect on the practical effectiveness of the documents.

7.1.2 Planning for regional resilience

- There should be clear identification of key environmental, economic and social issues/ challenges. Representative of regional resilience, the issues have to be specific to the case study under consideration.
- The identified challenges should be matched with a thorough discussion of how they could be resolved. Alignment between the problems and potential solutions should be carefully considered.
- The terms of reference for the compilation of SDFs should be explicit and include guidelines on planning for regional resilience. This clarity should be present at plans across different spheres of governance.
- The implementation of the plans should be considered and clearly outlined within the plan to ensure regional resilience does not remain abstract. The outline should include clear timelines, programmes and budget.
- Evaluation of regional resilience with specific indicators must be included. The evaluation will reflect on the success of the implementation and indicate where changes should be made to problematic or difficult to implement concepts.

7.2 CONCLUSIONS

7.2.1 Research aim

The overarching aim of the thesis was to at least in part contribute towards a framework for guiding the planning for regional resilience in rural and peripheral areas. The anticipated elementary contribution is presented in Section 7.1.2 above.

7.2.2 Research objectives and questions

Three objectives were set towards achieving the research aim. For ease of reference, indication is provided below of main sections where the objectives were addressed in the thesis. The synopsis below should be closely read with Figure 1.3: outline of the study presented in Section 1.6 of Chapter One.

a) The first objective of the study was to establish the environmental, social and economic challenges and shocks that the Central Karoo region is prone to. The objective was adequately addressed in Chapter Five.

b) The second objective of the study was to analyse the extent to which the policies guiding spatial planning in the Central Karoo region incorporate regional resilience. This objective was comprehensively attended to in Section 6.1 of Chapter Six.

c) The third objective was to describe and explain factors that influence the level of incorporation of regional resilience in the integrated development plans and spatial planning policies of the Central Karoo region. This objective was thoroughly addressed in Section 6.2 of Chapter Six.

The foregoing summary is testament to the fact that the thesis systematically and thoroughly addressed the research objectives, answered the research questions, and accordingly realised the overarching research aim set.

7.3 AREAS FOR FURTHER RESEARCH

Although a multitude of studies exist on the notion of evaluation in planning generally, it can be argued that more research is required on the topic of evaluation specifically pertaining to planning for regional resilience. The thesis is only a stepping stone towards improved understanding of regional resilience, which can be extended and improved upon by future studies.

The following further areas of research are necessary with a view to improving the contribution to practice:

- The method used in the thesis could be improved upon, and be used to analyse the planning for regional resilience in rural and peripheral areas in South Africa and beyond, with contexts and challenges different from the Central Karoo.

- Empirical research be conducted on the analysis of regional resilience of rural and peripheral regions, which would go beyond the content of policies and plans. Research should thus be conducted on the implementation of resilience-related considerations included in the applicable policies and plans.
- Focus on peripheral or rural regions that are not limited to the administrative municipal boundaries. In this regard, future research could potentially explore functional regions that incorporate a number of rural/ peripheral areas.

REFERENCES

Adger, W.N. 2000. Social and ecological resilience: are they related?. *Progress in Human Geography,* 24: 347-364.

Ahern, J.F. 2011. From fail-safe to safe-to-fail: sustainability and resilience in the new urban world. University of Massachusetts. *Landscape Architecture and Regional Planning,* Spring.

Alexander, R. 2000. Rationality Revisited: Planning Paradigms in a Post-Postmodernist Perspective. *Journal of Planning Education and Research,* 19 (3): 242- 256.

Alexander, E.R. 2006. Evolution and Status: Where is Planning-Evaluation Today and How Did It Get Here?. Alexander, E.R (ed.). *Evaluation in Planning Evolution and Prospects.* USA: Ashgate Publishinmg Limited

Allmendinger, P. & Haughton, G. 2009. Soft spaces, fuzzy boundaries, and metagovernance: the new spatial planning in Thames Gateway. *Environment and Planning A.* 41: 617-633.

Arndt, C., Davies, R., Gabriel, S., Harris, L., Makrelov, K., Modise, B., Robinson, S., Simbanegavi, W., van Seventer, D. & Anderson, L. 2020. *Impact of Covid-19 on the South African economy: An initial analysis.* Working paper. SA-TIED.

Ashley, C. & Maxwell, S. 2002. Rethinking Rural Development. *Development Policy Review.* 19(4): 395-425.

Bachtler, J. & Yuill, D. 2001. *Policies and strategies for regional development: A shift in paradigm?* Glasgow: University of Strathclyde, European Policies Research Centre, Regional and Industrial Policy Paper No.46.

Bachtler, J., Wishlade, F. & Yuill, D. 2003. *Regional policies after 2006: Complementary or conflict?* Glasgow: University of Strathclyde, European Policies Research Centre. Research Paper No. 51.

Barnes, A. & Nel, V. 2017. Putting Spatial Resilience into Practice. *Urban Forum.* 28: 219-232.

Beaufort West Municipality. 2008. *Review of Spatial Development Framework*. Government Publication.

Beaufort West Municipality. 2013. *Beaufort West Municipal Spatial Development Framework*. Government Publication.

Berkes, F. & Folke, C. (Eds.), 1998. *Linking Social and Ecological Systems: Management Practices and Social Mechanisms for Building Resilience*. Cambridge: Cambridge University Press.

Bezemer, D. & Headey, D. 2008. Agriculture, Development, and Urban Bias. *World Development*, 36 (8): 1342-1364.

Boschma, R. 2015. Towards an evolutionary perspective on regional resilience. *Regional Studies*, 49(5): 733-751.

Botai, C. M., Botai, J. O., de Wit, J. P., Ncongwane, K. P., & Adeola, A. M. 2017. Drought Characteristics over the Western Cape Province, South Africa. *Water*, 9 (11): 876.

Bristow, G. 2010. Resilient regions: re- 'place'ing regional competitiveness. *Development Economics,* 3 (1): 153-167.

Bristow, N. & Kennedy, C.A. 2013. Urban Metabolism and the Energy Stored Cities. *Industrial Ecology*, 15 (5): 656-667.

Brunetta, G., Ceravolo, R., Barbieri, C.A., Borghini, A., de Carlo, F., Mela, A., Beltramo, S,, Longhi, A., De Lucia, G., Ferraris, S., Pezzoli, A,, Quagliolo, C., Salata, S. & Voghera, A. 2019. Territorial resilience: Toward a proactive meaning for spatial planning. S*ustainability*. 11, 2286; Doi: 10.3390/su11082286 [01 June 2020].

Carpenter, S.R., Westley, F. & Turner, G. 2005. Surrogates for resilience of social-ecological systems. *Ecosystems*, 8(8): 941–944.

Central Karoo district municipality. 2017. *Project Proposal: Health & hygiene training & education programme for informal settlements in the Central Karoo district*. Municipal Health department: Government Publication.

Chambers, R. & Conway, R. 1992. *Sustainable Rural Livelihoods: Practical Concepts for the 21st Century*. Discussion Paper 296. Brighton: Institute of Development Studies, University of Sussex.

Christopherson, S., Michie, J. & Tyler, P. 2010. Regional resilience: theoretical and empirical perspectives. *Cambridge Journal of Regions, Economy and Society,* 3: 3-10.

Coetzee, C., Van Niekerk, D. & Raju, E. 2016. Disaster resilience and complex adaptive systems theory: Finding common grounds for risk reduction. *Disaster Prevention and Management,* 25(2): 196-211.

Davoudi, S. 2012. *Resilience: A bridging concept or a dead end? Interface. Planning Theory and Practice,* 13(2): 299-333.

Dawley, S., Pike, A. & Tomaney, J. 2010. Towards the resilient region: Policy activism and peripheral region development. *Spatial Economics Research Centre.* Discussion paper 53.

Department of co-operative governance and traditional affairs (South Africa). 2020. Disaster management Act, 2002 (Act No. 57 of 2002): Declaration of national state of disaster.(Notice 313). *Government Gazette,* 43096, 15 March.

Department of Rural Development and Land Reform. 2014. *Guidelines for the Development of Provincial, Regional and Municipal Spatial Development Frameworks and Precinct Plans*. Government Publication: South Africa.

Department of Rural Development and Land Reform. 2015. *Rural development plan for the Central Karoo District municipality in the Western Cape province: Volume 1 Status Quo report*. South Africa: Government Publication.

Department of Rural Development and Land Reform. 2018. *National Spatial Development Framework Draft.* Government Publication

Dewar, D., Todes, A. & Watson, V. 1986. Industrial decentralization policy in South Africa: Rhetoric and practice. *Urban Studies,* 23(5): 363- 376.

Donaldson, R., Benn, J., Campbell, M. & de Jager, A. 2014. Reshaping urban space through studentification in two South African urban centres. *Urban Izziv,* 25: S176- S188.

Drabenstott, M. 2006. Rethinking federal policy for regional economic development. *Economic Review- Federal Reserve Bank of Kansas City,* 91 (1): 115-139.

Driver, M. & Platzky, L. 1992. *Regional development: An overview of South African policy.* Cape Town: Development Action Group.

Du Plessis, D.J. 2014. A Critical Reflection on Urban Spatial Planning Practices and Outcomes in Post-Apartheid South Africa. *Urban Forum,* 25: 69-88.

Dworkin, S. 2012. Sample size policy for qualitative studies using in-depth interviews. *Archives of Sexual Behavior,* 41: 1319- 1320.

Egeland, B., Carlson, E.A. & Sroufe, L. A. 1993. Resilience as Process. *Development and Psychopathology,* 5 (4): 517-528.

Eggenberger, M. & Rosário Partidário, M. 2000. Development of a framework to assist the integration of environmental, social and economic issues in spatial planning. *Impact Assessment and Project Appraisal,* 18: 201-207.

Ellis, F. & Biggs, S. 2001. Evolving Themes in Rural Development 1950s-2000s. *Development Policy Review,* 19(4): 437-448.

Elmqvist, T. 2014. Urban resilience thinking. *Solutions*, 5(5), 26-30.

Elmqvist, T., Barnett, G. & Wilkerson, C. 2014. Exploring urban sustainability and resilience. In Pearson, L.J., Newton, P.W. & Roberts, P (Eds.), *Resilient and sustainable cities, a future*: 19-28.

Eraydin, A. 2013. "Resilience thinking" for planning. In Eraydin, A. & Tasan-Kok, T. (eds). *Resilience thinking in urban planning,* 17-37.

Eraydin, A. & Tasan-Kok, T. 2013. The evaluation of findings and future of resilience thinking in practice. In Eraydin, A. & Tasan-Kok, T. (eds). *Resilience thinking in urban planning*. 229 – 239.

Fainstein, S.S. 2000. New Directions in Planning Theory. *Urban Affairs Review.* 35(4): 451-478.

Folke, C. 2006. Resilience: The emergence of a perspective for social-ecological systems analyses. *Global Environmental Change,* 16: 253-267.

Faludi, A. 1973. *A reader in planning theory*. New York: Pergamon Press.

Foster, K.A. 2007. Snapping back: what makes regions resilient?. *National Civic Review*, 184: 27–29.

Fox-Lent, C. & Linkov, I. 2018. Resilience Matrix for Comprehensive Urban Resilience Planning. *Resilience- Oriented Urban Planning.* Lecture Notes in Energy 65. Springer.

Frank, K.I. & Reiss, S.A. 2014. The rural planning perspective at an opportune time. *Journal of Planning Literature,* 29 (4): 386-402.

Friedman, K. 2003. Theory Construction in Design Research: Criteria, Approaches, and Methods. *Design Studies,* 24 (6): 507- 522.

Gaillard, J. C. 2010. Vulnerability, capacity and resilience: Perspectives from climate and development policy. *International Development,* 22 (2): 218-232.

Godschalk, D. R. 2003. Urban Hazard Mitigation: Creating Resilient Cities. *Natural Hazards Review,* 4 (3). https://ascelibrary.org/doi/abs/10.1061/(ASCE)1527-6988(2003)4:3(136) [20 January 2021].

Goldstein, B.E. 2009. Resilience to Surprises through Communicative Planning. *Ecology and Society*, 14 (2). http://www.ecologyandsociety.org/vol14/iss2/art33/ [20 June 2020].

Gordon, J.E. 1978. *Structures*. Harmondsworth, United Kingdom: Penguin Books.

Gunderson, L. 1999. Resilience, flexibility and adaptive management–antidotes for Spurious certitude? *Conservation Ecology*, 3(1): 7. http://www.consecol.org/vol3/iss1/art7/ [20 June 2020].

Gunderson, L.H. 2000. Ecological Resilience – In Theory and Application. *Annual Review of Ecology and Systematics*, 31: 425-439.

Guyadeen, D. & Seasons, M. 2016. Plan evaluation: challenges and directions for future research. *Planning Practice & Research*, 31 (2): 215-228.

Guyadeen, D. & Seasons, M. 2018. Evaluation theory and practice: comparing program evaluation and evaluation in planning. *Journal of Planning Education and Research*, 38 (1): 98-110.

Halfacree, K.H. 1993. Locality and social representation: space, discourse and alternative definitions of the rural. *Journal of Rural Studies*, 9 (1): 23-27.

Harding, G., Courtney, C. & Russo, V. 2017. When geography matters. A location-adjusted blue water footprint of commercial beef in South Africa. *Journal of Cleaner Production,* 151: 494-508.

Harrison, P., Bobbins, K., Culwick, C., Humby, T., La Mantia, C., Todes, A. & Weakley, D. 2014. *Urban Resilience Thinking for Municipalities*. Gauteng: University of the Witwatersrand.

Harrison, P., Todes, A. & Watson, V. 2008. *Planning and transformation: Learning from the post-apartheid experience.* Abingdon: Routledge.

Hart, G. & Todes, A. 1997. Industrial decentralization revisited. *Transformation,* 32: 31-53.

Healey, P. 2000. Planning Theory and Urban and Regional Dynamics: A Comment on Yiftachel and Huxley. *International Journal of Urban and Regional Research,* 24 (4). https://onlinelibrary.wiley.com/doi/abs/10.1111/1468-2427.00288 [15 June 2020].

Hibbard, M., Senkyr, L. & Webb, M. 2015. Multifunctional rural regional development: Evidence from the John Day Watershed in Oregon. *Journal of Planning Education and Research*, 35(1): 51-62.

Hill, E.W., Wial, H. & Wolman, H. 2008. Exploring Regional Economic Resilience. Paper presented at the annual meeting of the Urban Affairs Association, University of California, June 2008.

Holling, C.S. 1973. Resilience and stability of ecological systems. *Annual Review of Ecology and Systematics*, 4: 1-23.

Holling, C.S. 1996. *Engineering resilience versus ecological resilience*. In Schulze, P. (Ed.) Engineering within ecological constraints. Washington, DC: National Academy of Sciences.

Hudson, B.M., Galloway, T.D. & Kaufman, J.L. 1979. Comparison of current planning theories: counterparts and contradictions. *Journal of the American Planning Association*, 45 (4): 387-398.

Hudson, R. 2007. Regions and regional uneven development forever? Some reflective comments upon theory and practice. *Regional Studies,* 41: 1149-1160.

Hudson, R. 2010. Resilient regions in an uncertain world: wishful thinking or a practical reality?. *Cambridge Journal of Regions, Economy and Society*, 3: 11-25.

Huxley, M. & Yuftachel, O. 2000. New Paradigm or Old Myopia? Unsettling the Communicative turn in Planning Theory. *Journal of Planning Education and Research*, 19: 101-110.

Ilbery, B. 1993. Dimensions of rural change. In Ilbery, B. (ed.) *The geography of rural change*. P1-10. Essex: Longman.

Katz, C. 2004. *Growing up Global: Economic Restructuring and Children's Everyday Lives.* Minneapolis, MN: University of Minnesota press.

Kakderi, C. & Tasopoulou, A. 2017. Regional economic resilience: The role of national and regional policies. *European Planning Studies*, 25 (8): 1435–1453.

Laingsburg Municipality. 2012. Laingsburg municipal spatial development framework.

Laingsburg municipality. 2017. Laingsburg Municipal Spatial Development Framework: Draft Final Report. Laingsburg. Government Publication.

Lee, K., Lim, J., Yoon, D. & Jung, H. 2019. Prediction of Shale-Gas Production at Duvernay Formation Using Deep-Learning Algorithm. *SPE Journal*, 24 (6): 2423-2437.

Leedy, P. & Ormrod, J. 2010. *Practical research: Planning and design*. 7th ed. New Jersey: SAGE Publications.

Lewis, R, B. 2004. Nvivo 2.0 and ATLAS.ti 5.0: A comparative review of two popular qualitative data-analysis programs. *Field Methods*, 16 (4): 439-469.

Linkov, I., Daniel, A.E., Matthew, E.B., Derek, C., Matteo, C., Julia, H.A., Stephen, E. F. & Thomas, P.S. 2013. Measurable resilience for actionable policy. *Environmental Science & Technology*, 47: 101108 – 10110.

Lipton, M. 1977. *Why poor people stay poor: a study of urban bias in world development.* Canberra: Australian National University Press.

Lu, P. & Stead, D. 2013. Understanding the notion of resilience in spatial planning: A case study of Rotterdam, The Netherlands. *Cities*, 200-212.

Machakaire, D., Tapela, N. & Mokhele, M. 2020. Using geographic information system to analyse the divergence of urban development from spatial plans in Harare, Zimbabwe. *South African Journal of Geomatics*, 9 (2): 219- 235.

MacKinnon, D. & Derickson, K. 2012. From resilience to resourcefulness: A critique of resilience policy and activism. *Progress in Human Geography*, 3 7(2): 253-270.

Markusen, A. 1999. Fuzzy concepts, scanty evidence, policy distance: The case for rigor and policy relevance in critical regional studies. *Regional Studies*, 33: 869-884.

Martin, R. 2011. Regional economic resilience, hysteresis and recessionary shocks. *Journal of Economic Geography*, 12: 1-32.

Meerow, S., Newell, J.P. & Stults, M. 2016. Defining urban resilience: A review. *Landscape and Urban Planning*, 147: 38-49.

Mitchell, C.J.A. 2004. Making sense of counter urbanization. *Journal of Rural Studies*, 20: 15-34.

Modica, M. & Reggiani, A. 2015. Spatial economic resilience: overview and perspectives. *Networks and Spatial Economics*, 15: 211-233.

Mokhele, M. 2016. Spatial economic attributes of airport- centric developments in Cape Town and Johannesburg. PhD thesis. Stellenbosch: Stellenbosch University.

Mokhele, M. & Geyer, H.S. 2021. A theoretical foundation for investigating the spatial economic attributes of airport-centric developments. *Bulletin of Geography. Socio-economic Series*, 54(54): 23-33. DOI: http://doi.org/10.2478/bog-2021-0030

Morrison, T.H, Lane, M.B. & Hibbard, M. 2015. Planning, governance and rural futures in Australia and the USA: revisiting the case for rural regional planning. *Journal of Environmental Planning and Management*, 58(9): 1601-1616.

Nel, E. & Rogerson, C. 2009. Re-thinking spatial inequalities in South Africa: Lessons from international experience. *Urban Forum*, 20(2): 141-153.

Nel, E., Taylor, B., Hill, T. & Atkinson, D. 2011. Demographic and Economic Changes in Small Towns in South Africa's Karoo: Looking from the Inside Out. *Urban Forum*, 22: 395-410.

Neuman, W.L. 2001. *Social Research Methods: Qualitative and Quantitative Approaches.* USA: Pearson Custom Library.

Neuman, W.L. 2014. *Social Research Methods: Qualitative and Quantitative Approaches*. Harlow: Pearson Education Limited.

Norgaard, K.M. 2006. "We don't really want to know": Environmental justice and socially organized denial of global warming in Norway. *Organization & Environment*, 19: 347-370.

Novotná, M., Preis, J., Kopp, J. & Bartoš, M. 2013. Changes in migration to rural regions in the Czech Republic: position and perspectives. *Moravian Geographical Reports*, 21(3): 37-54. DOI: 10.2478/mgr-2013-0015 [01 June 2020].

Östh, J., Dolciotti, M., Reggiani, A. & Nijkamp, P. 2018. Social capital, resilience and accessibility in urban systems: a study on Sweden. *Networks and Spatial Economics*, 18: 313-336.

Pendall, R., Foster, K.A. & Cowell, M. 2010. Resilience and regions: building understanding of the metaphor. *Cambridge Journal of Regions, Economy and Society*, 3: 71-84.

Pike, A., Dawley, S. & Tomaney, J. 2010. Resilience, adaptation and adaptability. Cambridge Journal of Regions, *Economy and Society*, 3 (1): 59-70.

Pikett, S.T.A., Cadenasso, M.L. & Grove, J.M. 2004. Resilient Cities: meaning, models, and metaphor for integrating the ecological, socio-economic and planning realms. *Landscape and Urban Planning*, 69: 369-384.

Pinho, P., Oliveira, V. & Martins, A. 2013. Evaluating resilience in planning. In Eraydin, A. & Tasan-Kok, T. (eds). *Resilience thinking in urban planning.* 131-144.

Platzky, L. 1995. The development impact of South Africa's industrial location policies. Unpublished PhD thesis. The Hague: Institute of Social Sciences.

Potts, D. 2012. *Whatever happened to Africa's rapid urbanisation*. Africa Research Institute. https://www.africaportal.org/publications/whatever-happened-to-africas-rapid-urbanisation/ [20 January 2020].

Prince Albert Municipality. 2014. Spatial development framework report. Cape Town: Department of Rural Development and Land Reform.

Prince Albert Municipality. 2020. *Integrated Development Plan: Draft Review 20/21.* Prince Albert: Government Publication.

Prior, L. 2011. Using documents in social research. In Silverman, D. (Ed.) *Qualitative research. Issues of theory, method and practice*, 93-110. London: Sage.

Republic of South Africa. 1996. *Constitution of the Republic of South Africa Act, 108 of 1996*. Pretoria: Government Printer.

Republic of South Africa. 1998. National Environmental Management Act, 1998 (ActNo.107 of 1998)(Notice 401). *Government Gazette*, 19519, 27 November.

Republic of South Africa. 2000. *Municipal Systems Act, No. 32 of 2000*. Pretoria: Government Printer.

Republic of South Africa. 2006. *National Spatial Development Perspective.* Government Publication.

Resilient Cities Network. 2018. *100 Resilient Cities*. https://www.100resilientcities.org/about-us/ [30 August 2018].

Richards, L. 2009. *Handling qualitative data: A practical guide*. Second Edition. London: Sage.

Rogerson, C. 1988. Regional development policy in South Africa. *Regional Development Dialogue,* 9(Special Issue): 228-255.

Rogerson, C. 2009. The turn to 'new regionalism': South African reflections. *Urban Forum,* 20 (2): 111-140.

Rogerson, C. 2010a. *Re-thinking the role of regional development funds in South Africa: Reflections on international experience*. University of Johannesburg.

Rogerson, C. 2010b. Local economic development in South Africa: key strategic challenges. *Development Southern Africa,* 27(4): 481-495.

Rogerson, W. 1994. Economic Incentives and the Defense Procurement Process. *Journal of Economic Perspectives,* 8(4): 65-90.

Salizzoni, E., Pérez-Campaña, R., Alcalde-Rodríguez, F. & Talavera-Garcia, R. 2020. Local Planning Practice towards Resilience: Insights from the Adaptive Co-Management and Design of a Mediterranean Wetland. *Sustainability* 12(7): 2900 https://doi.org/10.3390/su12072900 [01 June 2021].

Sandercock, L. 2004. 'Deep difference': can talk resolve conflicting rationalities? Draft for presentation at ACSP, Portland, October 2004, planning theory track.

Scheffer, M. S. 2009. *Critical Transitions in Nature and Society*. New Jersey: Princeton University Press.

Scholes, B., Lochner, P., Schreiner, G., Snyman-Vand der Walt, L. & de Jager, M. (eds.). 2016. *Shale Gas Development in the Central Karoo: A Scientific assessment of the Opportunities and Risks: Summary for Policy-makers*. Stellenbosch: CSIR.

Schreiner, G., & Snyman-Vand der Walt, L. 2018. Risk modelling of shale gas development scenarios in the Central Karoo. *Sustainable Development Planning,* 13 (2): 294-306.

Seeliger, L. & Turok, I. 2013. Towards sustainable cities: extending resilience with insights from vulnerability and transition theory. *Sustainability,* 5: 2108–2128.

Segura, S. & Belen, P. 2017. Monitoring and Evaluation Framework for Spatial Plans: A Spanish Case Study. *Sustainability.* 9: np

Smit, B., Burton, I., Klein, R.J.T. & Street, R. 1999. The science of adaptation: a framework for assessment. *Mitigation and Adaptation Strategies for Global Change,* 4 (3-4): 199-213.

Sousa, S. & Pinho, P. 2009. Growth versus Shrinkage. *Proceedings of the CITTA 2nd Annual Coference on Planning Research Planning in Times of Uncertainty, University of Oporto, 2009.* Oporto.

South Africa Department of Trade and Industry. 2006. *South Africa's new regional industrial development strategy*. Pretoria: Department of Trade and Industry.

South Africa. 2010. *The new growth path: The framework*. Pretoria: Department of Economic Development.

South Africa. 2011. Guidelines for the Development of Spatial Development Frameworks. Pretoria: Department Rural Development and Land Reform.

South Africa. 2013. *Spatial Planning and Land Use Management Act 16 of 2013*. South Africa. Government Print.

Statistics South Africa. 2020. *Social impact of COVID-19 (Wave 3): Mobility, Migration, and Education in South Africa*. Statistics SA: Pretoria.

Stead, D. & Tasan-Kok. 2013. Urban Resilience, Climate Change and Land-Use Planning in Rotterdam. In Eraydin, A. & Tasan-Kok, T. (eds). *Resilience thinking in urban planning*. 211-228.

Tasan-Kok, T. 2008. Changing Interpretations of 'Flexibility' in the Planning Literature: From Opportunism to Creativity?. *International Planning Studies,* 13(3), 183-195.

Tasan-Kok, T., Stead, D. & Lu, P. 2013. Conceptual Overview of Resilience: History and Context. In Eraydin, A. & Tasan-Kok, T. (eds). *Resilience thinking in urban planning*. 39-52.

Taylor, N. 1999. Anglo-American town planning theory since 1945: three significant developments but no paradigm shifts. *Planning Perspectives,* 14 (4): 327-345.

Thoren, H. 2014. Resilience as a unifying concept. *International Studies in the Philosophy of Science,* 28(3): 303-324.

Tomaney, J., Pike, A. & Rodriguez-Pose, A. 2010. Local and regional development in times of crisis. *Environment and Planning A,* 42: 771- 779.

Turok, I. 2010. Towards a developmental state? Provincial economic policy in South Africa. *Development South Africa,* 27(4): 497-515.

Turok, I. 2014. The resilience of South African cities a decade after local democracy. *Environment and Planning A*, 46(4), 749-769.

United Nations Department of Economic and Social Affairs. 2018. *Population Dynamics*. https://population.un.org/wpp/ [20 January 2020].

United Nations. 2020. *Covid-19 in South Africa: Socio- Economic Impact Assessment*. United Nations Development Programme: South Africa.

Vale, L. 2014. The politics of resilient cities: whose resilience and whose city?. *Building Research & Innovation*, 42 (2): 191-201.

Van Aswegen, M. & Retief, F.P. 2020. The role of economic sectoral structure as a policy mechanism towards more resilient peripheral regions: the case of South Africa. *GeoJournal*. https://doi.org/10.1007/s10708-020-10233-0 [20 May 2021].

Van Breda, A. 2018. A critical review of resilience theory and its relevance for social work. *Social Work (Stellenbosch Online),* 54 (1). http://www.scielo.org.za/scielo.php?script=sci_arttext&pid=S0037-80542018000100002 [20 July 2021].

Van der Merwe, I., Ferreira, S. & Zietsman, L. 2005. An investment strategy for effective town development in the Western Cape, South Africa. *Urban Forum*, 16(4): 385-416.

Van Aswegen, M., Drewes, J.E. & Van der Linde, E. 2020. Regional resilience: An urban systems approach. *Urban and Transit Planning, Advances in Science, Technology & Innovation,* 121-132.

Varshney, A. 1993. Introduction: Urban Bias in perspective. *The Journal of Development Studies,* 29 (4): 3-22.

Wait, R. & Rossouw, R. 2014. A comparative assessment of the economic benefits from shale gas extraction in the Karoo, South Africa. *Southern African Business Review.* 18 (2): 1-34.

Walker, B., Carpenter, S., Andries, J., Abel, N., Cumming, G., Janssen, M., Lebel, L., Norberg, J., Peterson, G.D. & Pritchard, R. 2002. Resilience Management in Social-ecological Systems: a Working Hypothesis for a Participatory Approach. *Conservation Ecology,* 6 (1): 14.

Walker, B. & Salt, D. 2006. *Resilience thinking: sustaining people and ecosystems in a changing world*. Washington DC: Island Press.

Wellings, P. & Black, A. 1986. Industrial decentralization under apartheid: The relocation of industry to the South African periphery. *World Development,* 14(1): 1-38.

Wellings, P. & Black, A. 1987. Industrial decentralization under apartheid: An empirical assessment. In: Tomlinson, R. & Addleson, M. (eds.). *Regional restructuring under apartheid: Urban and regional policies in contemporary South Africa.* Johannesburg: Ravan.

Western Cape Government. 2012. Water resilience- a partnership. Cape Town. Government Publication.

Western Cape Government. 2014. Western Cape Provincial Spatial Development Framework. Cape Town. Government Publication.

Western Cape Government. 2016. Western Cape Climate Change Response Framework and Implementations Plan for the Agricultural Sector. Cape Town. Government Publication.

Western Cape Government. 2017. *Central Karoo District Municipality: Socio-Economic Profile.* Government Publication.

Western Cape Government. 2018. *Socio Economic Profile: Laingsburg municipality*. Government Publication.

Western Cape Government. 2019a. *Western Cape Land Use Planning Guidelines: Rural Areas*. Government Publication.

Western Cape Government. 2019b. *Central Karoo District Spatial Development Framework (Draft).* Government Publication.

Western Cape government. 2019c. Central Karoo spatial development framework.

Western Cape Government. 2020. *Socio- economic profile Central Karoo District*. Cape Town: Government Publication.

Western Cape Government. 2021. PSDF/Basemap, ArcGIS dataset, Directorate for Spatial Information, https://gis.elsenburg.com/arcgis/rest/services/PSDF/Basemap/MapServer [01 September 2021].

Western Cape Government. n.d. *Qualitative phase: unlocking latent potential and recommendations for appropriate interventions for regional development*. A research study undertaken for the Department of Environmental Affairs and Development Planning of the Western Cape provincial government. By Stellenbosch University and CSIR.

Wink, R. 2014. Regional Economic Resilience: Policy Experiences and Issues in Europe. *Raumforschung und Raumordnung*, 72 (2): 83–84.

Yiftachel, O. 1989. Towards a New Typology of Urban Planning Theories. *Environment and Planning*, 16 (1): 23-39.

Yin, R. 2014. *Case Study Research: Design and Methods*. 5th ed. USA: SAGE Publications, Inc.

Annexure A: Questionnaire

QUESTIONNAIRE

Date: _____
Time: _____
Name: _____
Surname: _____
Position: _____

01 How long have you been employed by the current organisation? — Provide years ☐

02 How long have you been in your current position? — Provide years ☐

03 What is your level of understanding of the concept of (spatial) resilience?
- a. Good ☐
- b. Average ☐
- c. Poor ☐

04 Is (spatial) resilience well catered for in the Central Karoo District SDF?
- a. Yes ☐
- b. No ☐
- c. Don't know ☐

05 Is (spatial) resilience well catered for in the Local SDF(s)?
- a. Yes ☐
- b. No ☐
- c. Don't know ☐

06 What influences the poor incorporation of resilience in the SDFs
If answered 04b or 05b
_____

07 In your view, what are the main environmental challenges experienced in the area?
_____

08 Are those environmental challenges adequately addressed in the Central Karoo District SDF?
- a. Yes ☐
- b. No ☐

09 Are those environmental challenges adequately addressed in the Local SDF(s)?
- a. Yes ☐
- b. No ☐

10 What influences the poor attention to environmental challenges?
If answered 08b or 09b
_____

11 In your view, what are the social challenges experienced in the area?
List the challenges
_____

12 Are those social challenges adequately addressed in the Central Karoo District SDF?
- a. Yes ☐
- b. No ☐

13 Are those social challenges adequately addressed in the Local SDF(s)?
- a. Yes ☐
- b. No ☐

14 What influences the poor attention to social challenges?
If answered 13b or 14b
_____

15 In your view, what are the economic challenges experienced in the area?
List the challenges
_____

16 Are those economic challenges adequately addressed in the Central Karoo District SDF?
- a. Yes ☐
- b. No ☐

17 Are those economic challenges adequately addressed in the Local SDF(s)?
- a. Yes ☐
- b. No ☐

18 What influences the poor attention to economic challenges?
If answered 17b or 17b
_____

Annexure B: Ethics Clearance Certificate

Cape Peninsula University of Technology

P.O. Box 652 • Cape Town 8000 South Africa •Tel: +27 21 469 1012 • Fax +27 21 469 1002
80 Roeland Street, Vredehoek, Cape Town 8001

Office of the Research Ethics Committee	**Faculty of Informatics and Design**

03 June 2020

Ethics approval is hereby granted to MS ELIZABET DIMITROVA, student number 211006513, for research activities related to the MTech: Town and Regional Planning at the Faculty of Informatics and Design, Cape Peninsula University of Technology (CPUT).

Title of thesis:	Spatial resilience of the central Karoo region, Western Cape, South Africa

Comments

Data collection permission is required from the relevant institution and research activities are restricted to those detailed in the research proposal.

Signed: Faculty Research Ethics Committee	**03 June 2020** **Date**