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Community perceptions about climate change in iLembe district municipality

by

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DECLARATION

I, **Nokukhanya Thobeka Zondi**, declare that:

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DEDICATION

This thesis is dedicated to:

Philani Zondi, Sithelesihle Zondi &

Simangele Radebe

I, Nokukhanya Thobeka dedicate this work and give thanks to my mother (Simangele Radebe), new born son (Sithelesihle Zondi) and husband Philani Zondi as we entered parenthood and making sense of the various challenges we faced and in providing encouragement to each other in times when it seemed impossible to continue.

This thesis is also dedicated to my entire family at large, the Radebes & the Zondis. I truly appreciate the words of encouragement and the push to make this thesis possible. I am tremendously appreciative of the support you all gave me.

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ABSTRACT

The country has experienced significant climatic shocks over recent years. Water is the primary medium through which the impact of climate change is going to be felt in South Africa. As one of the world's top CO_2 emitters, this reflects a political commitment to ensuring that the country transitions to a low-carbon economy. Successfully navigating this transition will require a nuanced understanding of public opinion and behaviour, in order for policy processes to take account of individual preferences, concerns, and lived realities.

This study used political ecology, and the stakeholder engagement theory into understanding and examine the phenomenon of climate change and considered the link between governance. This was highlighted in order to reveal the missing mechanisms of governance that would help public organizations and other stakeholders to take on joint responsibility for the impacts of climate change. The study also focused on the relationship between beliefs about climate change, concerns about climate change as well as personal norms and efficacy beliefs. An investigation into the Ilembe District has been provided and served as a departure point from which to critically examine the governance around water management and climate change attitudes in Noodsburg, Ilembe district municipality. The study employed a qualitative research design. New data on this topic was collected via focus groups which consisted of South Africans 18 years and older living in ward 6 Noodsburg. Face-to-face semi-structured interviews were conducted with ILembe District municipality officials in the environmental and planning units.

The study provides insights into the understanding of Noodsburg community members' attitudes toward climate change. The findings revealed that the community members in Noodsburg identified a range of expected adverse effects over the coming decades, particularly water shortages and drought, food shortages, and higher temperatures. These findings have relevance to climate change communication in the country, and matter for ongoing policy interventions that are striving to minimise the human development consequences of climate change. The study concludes with a discussion of the implications of these findings and recommendations for crafting effective climate change frameworks and policy interventions in South Africa in the coming years.

Key words: Climate Change, political ecology, public opinion, governance

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS AND ACRONYMS

BP	:	British Petroleum
CAM	:	Comparative Analysis Method
CDWs	:	Community Development Workers
CO2	:	Carbon Dioxide
COGTA	:	Cooperative Governance and Traditional Affairs
CRC	:	Citizen Report Card
DGDP	:	District Growth and Development Plan
DPLG	:	The Department of Provincial and Local Government
DPPF	:	District Public Participation Forum
DWEA	:	Department of Water and Environmental Affairs
FGDs	:	Focus Group Discussions
GHG	:	Greenhouse Gas
IDASA	:	Institution for democracy in South Africa
IDP	:	Integrated Development Plan
IPCC	:	Intergovernmental Panel on Climate Change
IWA	:	International Water Association
KZN	:	KwaZulu-Natal
KSIA	:	King Shaka International Airport
LHWP	:	Lesotho Highlands Water Project
NDP	:	National Development Plan
NEMA	:	National Environmental Management Act, No. 107 of 1998
NGO	:	Non-Governmental Organisation
NWA	:	National Water Act
OECD	:	Organisation for Economic Co-operation and Development
PPPSC	:	Provincial Public Participation Steering Committee
SADC	:	Southern African Development Community
SAWS	:	South African Weather Service
SDF	:	Sustainable Development Framework
SDG	:	Sustainable Development Goals
SWOT	:	Strengths, Weaknesses, Opportunities and Threats
TA	:	Traditional Authorities

UN	:	United Nations
UNEP	:	United Nations Environment Programme
UNFCCC	:	United Nations Framework Convention on Climate Change
WC	:	Water Conservation
WDM	:	Water Demand Management
WSDP	:	Water Services Development Plan
WWF	:	World Wide Fund For Nature

CHAPTER ONE

INTRODUCTION AND OVERVIEW OF THE STUDY

1.1 Introduction

Climate change is expected to significantly impact South Africa, with resulting consequences for people, the economy, and ecosystems. Water is the primary medium through which the impact of climate change will be felt in South Africa. Climate change refers to long-term changes in the climate experienced in a particular region. Climate change in South Africa will result in the following; changing rainfall patterns, the intensity of storms and the extremes of droughts and floods, increasing evaporation, changes in soil moisture and runoff, and thus water availability; changing water quality conditions (including the temperature of aquatic systems) and lastly increasing climate variability.

The Natural Water Resource Strategy (2013) stated uncertainty in the projected water climate change impact. It is said to be one of the biggest challenges facing water managers today. The water managers now need to understand how uncertainty impacts the decisions made by management. The strategy also proposes that water managers should make decisions that will be appropriate to a whole list of possible scenarios. The strategy mentions a vital tool such as adaptive management whereby water resource systems are monitored, and management actions are made concerning the measure changes on the ground. The strategy proposes that there is a critical need to build the capacity of water sector institutions to be able to function at high levels should uncertainty prevail. That improved collaboration is needed between all agencies to address the challenge that climate change is bringing. Climate Change happens naturally throughout extended periods.

In this study, the term climate change means rapid climate change, which is being experienced due to human activities and the amplified production of greenhouse gases. The study argues that an essential municipal service delivery such as water is imperative for realising human rights in South Africa and enhancing the quality of life for the local citizenry. Despite the current complexities in service delivery, municipalities must align their developmental plans with the new legislation of local government to make informed and

considered decisions. This study aims to critically examine the participatory processes around water management and climate change attitudes in Noodsburg, Ilembe district.

1.2 Background of the Study

The study takes place in Noodsburg in the iLembe district municipality. The municipality is located on the east coast of KwaZulu-Natal (KZN). It houses four local municipalities: KwaDukuza in the east, Ndwedwe and Maphumulo in the west, and Mandeni in the North. It is the smallest of KZN's ten District municipalities. It was named after the great king of the Zulu nation, King Shaka, who lived in the area. The majority of areas in this district municipality are predominantly tribal authority areas, characterized mainly by subsistence farming. The harsh landscape conditions complicate the delivery of infrastructures, such as roads, water, sanitation, and electricity. Residents are mostly poor, and official census documentation reflects that 96 percent of the population is from a previously disadvantaged background. It is also characterized by acute poverty.

Water has become very important and its crucial to start using it wisely. It has been noted that 40 percent of people from around the world are affected by water scarcity. Climate change scientists have projected this percentage to rise due to climate change. It has been stated that by 2050 one in four people will be affected by the repeated water shortages if we don't change our ways (Gumbi and Rangongo, 2018). South Africa is facing a huge challenge of not having capacity within the local government level to effectively manage water resources.

The integrated Development Plan (IDP) Document of iLembe District Municipality (2020:14) states that the District has been proactive in developing Enterprise iLembe, a broad-based institution to facilitate local economic development in response to its challenges of high rates of unemployment and correspondingly high levels of poverty. The development challenges and critical issues that need to be addressed in the iLembe context revolve around the fact that the communities residing in the rural areas are more severely affected by poverty and service backlogs than the urban community. The IDP document of iLembe District Municipality (2020:18) states the following infrastructural characteristics, issues, and challenges impact the future development of the iLembe District:

- The provision of the necessary infrastructure is hampered by the topographic constraints, low densities, and low affordability levels, particularly in rural and traditional areas.
- Service infrastructure in iLembe's urban areas needs upgrading and maintenance.

- Rural areas are severely affected by a lack of essential services and continued service delivery backlogs.
- Bulk water supply is a significant constraint that affects the entire District and needs attention.
- 18.66% of the population still do not have access to clean water and obtain water from rivers and streams. This poses a health risk with further implications regarding the provision of social services.
- The main urban areas have proper waterborne sanitation systems, but rural areas rely on pit latrines or no system. This places tremendous strain on the environment and poses a health risk.
- Refuse removal is limited to urban areas. Dumping of refuse has become a significant problem, particularly in denser rural settlements. This poses serious environmental problems and risks. Efforts are needed to increase people's awareness of the advantages of proper waste management practices.
- Lack of funding for bulk infrastructure remains a significant hindrance to the municipality's ability to execute its legislative obligations to citizens.

The IDP document of iLembe District Municipality (2020:189) also states due to financial challenges, that the Municipality has been battling with developing a Climate Change Response Strategy for the district, though acknowledging the climate change impacts in the region. Most noticeably, the 2007 storms and the recent drought experiences. In the financial year 2017-18, the District has been identified as one of the Municipalities to be funded by the Department of Environmental Affairs through the Local Government Climate Change Support Programme.

The intention of the programme, is to strengthen local government capacity for adapting to climate change impacts. According to Moseer (2016), there is a need for in-depth research when focusing on climate change that will examine inconsistencies in beliefs, actions, and values, for instance, how people feel about climate change or changing the choices that concern their lifestyle. In addition, to learn how they deal with climate change uncertainty. The research seeks to showcase participation in dialogues of administration governance and the environment dealing with scarce natural resources.

Figure 1.1: Topographical map showing iLembe District Municipality and its local municipalities

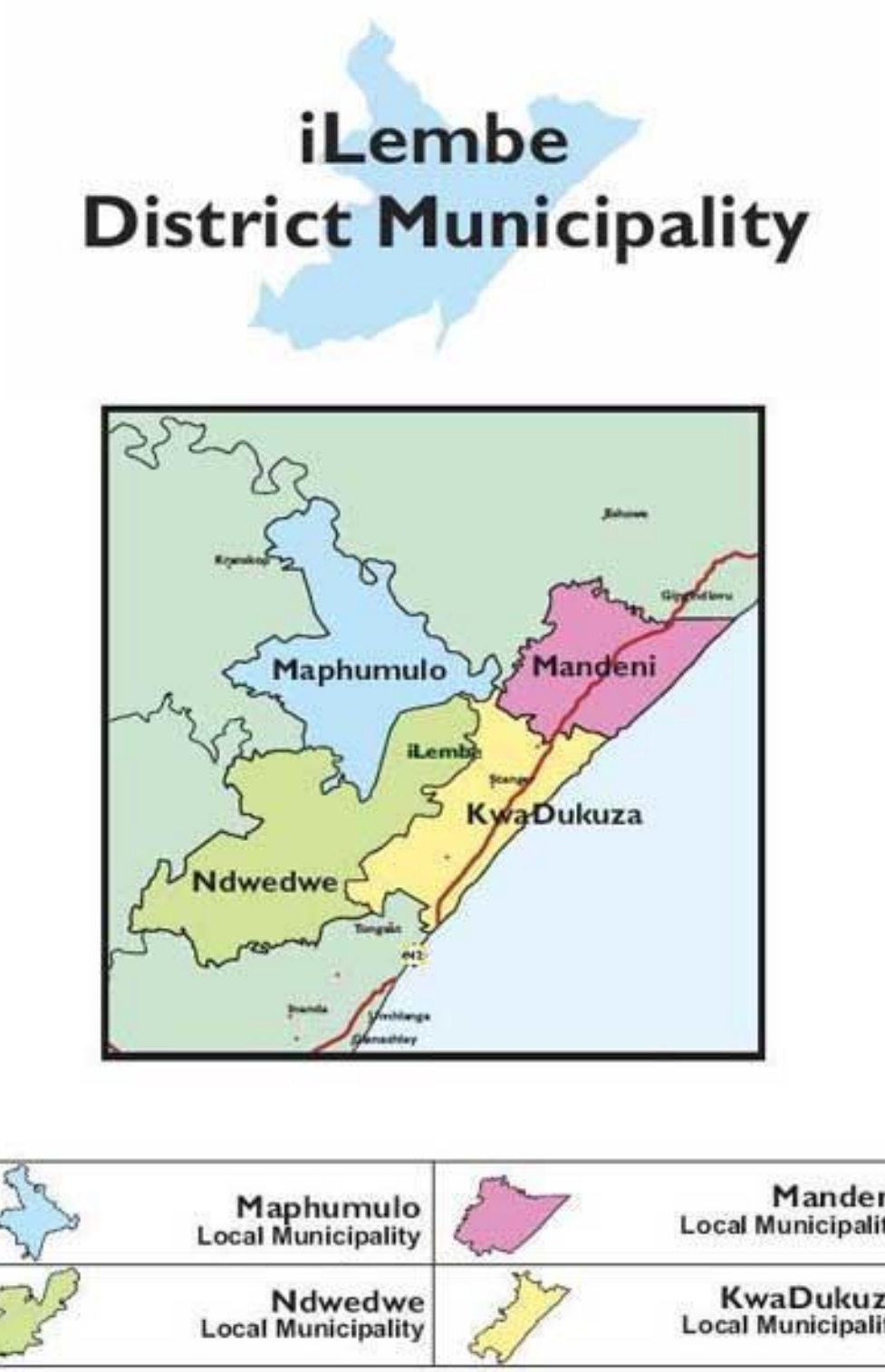


Figure 0-1 (Source www.gov.za: accessed on 9 June 2020).

The study deals with the participatory dynamics involved in water resource management. According to King and Reddell (2015), information gathered during such processes ensures that administrative decisions are made from an informed perspective. The National Environmental Management Act (1998) states that the main umbrella objective of making environmental decisions lies in promoting sustainable development that needs the incorporation of social, economic, and environmental factors in the planning and execution and the assessment of decisions made.

The IDP of iLembe Districts (2020:245) states that the strategic mission of Community Services is to enable political office bearers to fulfil their constitutional functions and electoral mandate by effectively planning and overall coordination and monitoring the public participation process through activities of Public hearings and public meetings. The document also stipulates that the main challenges not adequately recognized in the iLembe district are communication and public participation. The document states that the alignment of activities such as public participation for local municipalities to come together with the district municipality to undertake public participation; and that minority groups are not participating.

Public participation is not fully synchronized and is not cost-effective within the District Family and there is a need for committees to upscale input to the IDP and Budget. Public participation is an essential mechanism for making sure that decisions dealing with the environment are premised on sustainable development. Smith (1983) describes public participation as a collection of procedures made to consult, involve, and inform the public. To permit those that are affected by a decision to have a contribution to that decision. Therefore, public participation plays a crucial role in giving the people affected by administrative action an opportunity to take part and make representations.

This study intends to highlight that while part of the problem at the local government level can be attributed to poor service delivery, the problem is also perpetuated by a lack of proper public participation structures and active engagement between citizens and local authorities. The government have not done all they could to execute their duties more transparently; this is evident by the increased numbers of public protests directed at local government functioning (Burger, 2009:3). Citizens have not seized full opportunities to use their democratic right to provide critical inputs in managing local government affairs in their areas. With this background, the policy provisions call for a developmental culture among local

government administrations to be encouraged and for local authorities to be streamlined in a way that guarantees the participation of civil society in decision making processes.

Bernstein (1994:62), points out that if the government wishes to uphold its promises of a people-driven government and people-centred development, it should prioritize policy development and a legislative environment in which communities and organs of civil society participate and effectively cement partnerships with NGOs in the planning and implementation of development initiatives. Public participation can be used as a tool for creating environmental priorities, understanding the potential risks, and making sure that sustainability imperatives are given due cognizance in decision-making processes.

Thus, public participation is an essential environmental decision-making tool linking the citizen to environmental governance and provides the means to exercise environmental governance. Skidmore et al. (2006:21) argue that the government has made a significant investment in community participation. He contends that it builds more reliable networks between people who live in the same neighbourhood. However, there is a gap in understanding whether community dynamics and relationships can facilitate good governance and enhance service delivery.

1.3 The legislative framework governing public participation and local government

The study is established within the following legislative framework, which emphasizes the roles of public participation and good governance in the acceleration of local democracy and enhanced service delivery.

1.3.1 Constitution of the Republic of South Africa (1996)

Section 152 (1) of the Republic of South Africa Constitution encourages municipalities to involve communities and community organizations in local governance. According to section 195 (e), "people's needs must be responded to, and the public must be encouraged to participate in policy-making processes of their communities." This emphasizes the value that can be added by local communities in defining the urgent needs of their communities. The adoption of the Constitution of the Republic of South Africa in 1996 (hereafter stated as 'the 1996 constitution') encapsulates a new era in the South African local government transition process. According to section 40 (1) of the 1996 Constitution, "the government constitutes the national, provincial and local spheres, which are distinctive, interdependent and interrelated." Among these spheres, the local government is the closest to the citizenry and is mandated to champion people's needs.

1.3.2 Local Government Municipal Structures Act (1998)

The Local Government Municipal Structures Act states (1998) that municipal executives must annually report on the involvement of local communities in influencing policy decision processes of their communities. This is facilitated by the ward committee structure of the municipality. The rationale for the existence of this structure is to enhance participatory development through the mobilisation of the community members.

1.3.3 Local Government municipal systems Act (32 of 2000)

Section 57 of the Local Government Municipal Systems Act (2000) requires the municipality to develop a culture of comprehensive municipal governance that balances formal representative government with a system of participatory governance.

1.4 Theoretical Underpinnings

The theoretical underpinnings of this study will draw on political ecology and stakeholder engagement theory. This study will also focus on the beliefs about climate change and concerns about climate change. According to Perreault, Bridge, and McCarthy (2015), political ecology has no natural monopoly on studying nature-society relations. Its defining commitments have developed not in a vacuum but in conversation with and reaction to other areas of inquiry. Political ecology occupies but one patch of a broad field populated, in the main, by other social science disciplines. From environmental anthropology, environmental sociology, ecological economics, and environmental economics, among others, are, like political ecology, dedicated to understanding societies' relations with the non-human world: through the knowledge these disciplines create, they seek to inform and give shape to environmental futures.

The general intellectual terrain that political ecology occupies also includes explicitly interdisciplinary fields like sustainability science and political ecology has developed alongside these areas of inquiry and in generative tension with them, finding intellectual allies while also actively "positioning for difference" to highlight what political ecology puts at stake as a distinctive mode of knowledge production. There is, for example, a long-standing and productive conversation with ecological economics centred on the dissipative character of agricultural and industrial systems in energetic terms and its implications for uneven development (Perreault et al., 2015).

Stakeholder engagement theory is essential for sustaining a positive relationship between an organization and its stakeholders (Luoma-aho, 2015). Ostrom (2010) proposes that to

successfully address climate change in the long run, encouraging simultaneous actions at multiple scales is an important strategy to address this problem as substantial changes in the day-to-day activities of individuals, families, firms, communities, and governments at multiple levels, especially in the more developed world, is required.

1.5 Aims and objectives of the study

The study's main aim is to critically examine the governance of water management and climate change attitudes in Noodsburg, Ilembe district municipality.

The objectives of the study are:

- To critically examine critical factors that affect water-related communication and decision making within Noodsburg;
- To assess governance legislative and policy framework that use models for public participation;
- To examine the institutional mechanisms or water service provision strategies put in place by iLembe district municipality that deal with climate change impacts;
- To understand the role of community stakeholders in dealing with climate change impacts such as water shortages; and
- To examine the attitudes and perceptions held by the community in Noodsburg towards climate change and its impact.

1.6 Research Questions Addressed by the study

The following vital exploratory questions present the flow of the inquiry into governance, participation, and climate change impacts, such as water issues aligned to the objectives of the study:

- What are the factors that affect water-related communication and decision processes within the iLembe District?
- What are the governance arrangements that use models for inclusive participation in iLembe District Municipality?
- What are the institutional mechanisms or water service provision strategies put in place by the iLembe District?

- What is the role of the community stakeholders in dealing with climate change impacts such as water shortages?
- What are the attitudes and perceptions held by the community in Noodsburg towards climate change and its impact**?**

1.7 Significance and Rationale of the Study

One of the most critical issues facing the world today is the global impact of climate change on society, the environment, and the economy. The reason for the study is that South Africa is experiencing a severe drought with demand exceeding supply. South Africa is a water-scarce country with increasing pressure on its water resources. Urgent interventions are needed to protect water security within this rapidly developing country. Given South Africa's increasing demand for water, the need for water is clear. This study seeks to create awareness about water conservation as a means of addressing this crisis. There is scope for further examination on the topic of water conservation. South Africa is a chronically water-stressed country with between 500 m3 and 1000 m3 of water available per year (Ashton, 2002).

Surface water is heavily committed for use, water is imported from neighbouring countries, and the limited groundwater resources do not offer much reprieve (Scholes, 2001). As a result, water availability is predicted to be the single most significant and most urgent development constraint facing South Africa. The need for water is highlighted because water scarcity in developing countries is closely linked to the prevalence of poverty, hunger, and disease (Falkenmark, 1994; Ashton and Haasbroek, 2002).

The increasing scarcity of water has made it a highly tradable commodity. It follows that ecosystem services that affect water supply will also become valuable and ultimately tradable. In South Africa, the provision of water is highly dependent on the conservation of catchment areas (watersheds), riparian zones, and wetlands. Pollitt (2011:6-7) argues that the governance capacity to solve water scarcity problems is not sufficient due to the existing fragmentation of responsibilities in this field, and the attractiveness of a short-sighted and selfish strategy "pass on the problem to another region, organization or sector."

As Pollitt (2011:7) argues, what seems to be missing is a governance mechanism that helps public organizations and interest groups take on joint responsibility for the problem of water scarcity, supply, and flooding, knowing that it is a long-term problem. An integrated approach to water problems is needed. In contrast, the governance system in which the approach has to be applied is highly fragmented and probably will be fragmented in the

coming decades (Pollitt, 2011:7). Water services refer to water supply and sanitation services and include regional water schemes, local water schemes, rudimentary water schemes, on-site sanitation, and the collection and treatment of wastewater (Thabethe, 2011).

The study hopes to provide collaborative research approaches to strengthen collaborative governance processes because by strengthening a collaborative research approach with local government, the researcher could support government and citizens to improve urban governance and their overall well-being. The researcher hopes to create or forging the following:

- New and improved relationships between city officials and community leaders;
- It is providing a space for interaction between residents and community leaders; and
- Developing local understandings and knowledge on how local government and community structures operate and could be used.

1.8 Research Methodology

The study employed a qualitative research design. Qualitative research means exploring and understand the meaning of social or human problems. This research process involves emerging questions and procedures, and data is typically collected in the respondents setting. The study takes on the constructivism perspective and has used a case study as a strategy of inquiry; one of the features of a case study research is its flexibility. Adjustments may be made during the data collection method process by deciding to use additional data sources (Gray, 2014). In the case of this study, the researcher intends to provide more insight into problems related to environmental issues such as climate change and the lack of public participation in local government matters.

More recently, a mixed-method approach has been increasing used, which utilizes both qualitative and quantitative approaches. The most distinctive difference between the two methods is that the former uses numbers, graphs, and tables. In contrast, the latter is strictly limited to explanations and is not graphed, as it deals with the nature of things through investigative questions. In mixed methods, these are combined. According to Creswell (2014), "mixed method research is relatively new in the social and human sciences as a distinct research approach, it involves the collection of both qualitative (open-ended) and quantitative (close-ended) data in response to research questions or hypothesis" (Gray, 2014:217).

1.9 Techniques of Data Collection

The following methods below are used in the study for data collection.

1.9.1 Research Sampling

Since the study does not target any particular race to collect its data, it uses non-probability sampling, which is purposive because sometimes it is appropriate to select the knowledge of the population, its elements, and the nature of the research aims (Babbie & Mouton, 2001). Qualitative research usually works with purposive non-probability samples because it seeks to obtain insights into particular practices that exist in a specific location, context, and time (Gray, 2014). The sampling population for this study is the iLembe District Municipality. The participants include members of the general public, councillors, ward committee members, and traditional authority members. The researcher conducted five focus groups, which consisted of three community members in each group at ward 6, Noodsburg iLembe municipality.

1.9.2 Data Collection Methods

The researcher developed and used an interview protocol to ask questions and record answers during a qualitative telephonic interview. The interview protocol has included the following components, a heading, and instructions that the interviewer will follow to use the standard procedure from one interview to another. It has also included spaces between the questions to record responses and a final thank you statement to acknowledge the time the interviewee spent during the interview (Creswell, 2013).

1.9.3 Secondary Data sources

Secondary data include books, journal articles to discuss the study's conceptual and theoretical framework. Substantial work has been done to develop a theoretical framework drawn from an extensive review of literature relating to political ecology, environmental justice, and water management. Other sources of information include national, provincial, and municipal government legislation and policy documents on service delivery, national, provincial, and municipal governments' workshops and public gatherings on critical issues relating to the provision of water services.

1.9.4 Primary Data Sources

There are many different primary data types, such as observations, interviews, documents, and audio-visual material. According to Travers (2009), interviewing, as a qualitative methodology, can be traced back to the turn of the nineteenth century, when it was commonly

used in anthropology and sociology. Primary data was gathered through the administering of semi-structured interviews with the municipal officials.

1.10 Chapter Outline

1.10.1 Chapter One: Introducing the study

This chapter outlines the latitude of the study; it presents the background, research approach, theoretical underpinning, aims, objectives, and motivation for the study. The Natural Water Resource Strategy (2013) stated uncertainty in the projected water climate-change impact. The study draws on the international and national dilemma of climate change impacts and its effect on communities. The aims, objectives of the study are defined. The research approach and methodology employed for the study are outlined.

1.10.2 Chapter Two: Theoretical Concepts and Literature Review

This Chapter provides a theoretical and conceptual perspective in two sections. The first part is about political ecology, and the second part is about the stakeholder engagement theory process with particular reference to iLembe District Municipality. It also presents a holistic perspective.

1.10.3 Chapter Three: Climate Change and Water Governance in South Africa

This chapter deals with climate change and water governance in South Africa. The chapter gives an overview of water security and issues that include South Africans' ability to cope with water scarcity through water infrastructure projects like large dams and extensive irrigation projects. In this section, the researcher will consider climate change and how it could impact water security.

1.10.4 Chapter Four: Context of ILembe District Municipality

This chapter deals with the contextualisation of the iLembe District Municipality and the public participation processes concerning service delivery issues in South Africa. The areas covered are the legislative framework and perspectives at different levels.

1.10.5 Chapter Five: Research Design and Methodology

Chapter Four presents the research design and methodology employed for the study. It details the data collection methodology utilised, together with the challenges and limitations faced during the investigation. A description of the socio-political and geographical location of the selected study area is offered.

A case-study design has been selected to study sanitation governance, which allows the researcher to present an in-depth account of governance processes leading to contextual analysis. The case-study design facilitates detailed engagement with the objectives of the study. This method also allows for accentuating a small number of cases, an openness to multiple sources of data (multi-method approach) and flexible design features that permit the researcher to adapt and make changes to the study where and when necessary (Babbie & Mouton, 2002: 279).

This study is predominantly a qualitative assessment complementing the findings. This enabled the assessment of interactions and relationships between institutions and various stakeholders involved. The qualitative analysis presents the nuanced lived experiences of communities. This chapter provides the methodology applied in the study, the research design, and the sampling procedures used. Data collection strategies and techniques are also explored in this chapter

1.10.6 Chapter Six: Data Description and analysis

This chapter investigates the real-life experiences and challenges communities in the study area. It also briefly explores the impact of climate change. This chapter focuses on the following, namely: the socio-demographic profile of community participants, the community's attitudes towards environmental issues such as climate change, community participation in environmental issues, responsibility for addressing climate change.

1.10.7 Chapter Seven: Findings and Discussion: The Governance of Water

This Chapter investigates the importance of water governance, and the challenges faced. The literature section has covered in detail that water governance acknowledges that water plays a crucial part in poverty alleviation and the country's economic development and stresses the importance of the responsible use of water resources. The chapter is structured thematically to align to the objectives of the study, which are "To assess governance legislative and policy framework that use models for public participation and "To examine the institutional mechanisms or water service provision strategies put in place by iLembe district municipality that deal with climate change impacts".

1.10.8 Chapter Eight: Conclusion and Recommendations

The final chapter of the research consists of a summary of the main findings of this study, by merging different sections of the study in order to show how the aim and objects of the study were realized. It begins with a concise re-examination and synthesis of the principal findings

emanating from the qualitative analysis presented in chapters six and seven . The aim is to identify and locate significance of the current study findings by placing them within the context of existing pool of knowledge. This chapter includes an attempt to provide valuable suggestions and recommendations based on the findings of the study.

1.11 Conclusion

This chapter introduced the key concepts to be explored in the study. The overview and objectives of the study are discussed, as well as the methodology that is used to achieve these objectives. The primary objective of the study is to gain more detailed knowledge and insight on public participation and service delivery systems at iLembe District Municipality. Specifically, it seeks to develop an understanding of how the municipality and other role-players, such as municipal functionaries and other stakeholders, attempt to involve the public in management, monitoring, and implementation of policies for efficient and effective overall service delivery.

CHAPTER TWO

CONCEPTUAL FRAMEWORK

2.1 Introduction

"The signs of potential disaster are unmissable, for example, the fact that the last five years have been the hottest on record, and have seen extreme weather events and associated disasters, from hurricanes to drought to floods to wildfires. Ice caps are melting at a rapid rate, sea levels are rising, and oceans are acidifying, threatening all marine life. There is no time and no reason to delay. We have the tools, and we have the science, we have the resources. Let us show we also have the political will that people demand from us. To do anything less will be a betrayal of our entire human family and all the generations to come"

Secretary-General António Guterres, 02 December 2019. Opening remarks of the COP25 UN climate conference in Madrid (UN News Centre, 2019).

The purpose of this chapter is to present the conceptual and theoretical framework for this study. This chapter will have two sections; the first section will focus on political ecology. Political ecology is one of the frameworks used to analyse water issues (Derman and Ferguson, 2000). The second section will focus on the stakeholder engagement theory. Stakeholder engagement is essential for sustaining a positive relationship between an organization and its stakeholders (Luoma-aho, 2015). Ostrom (2010) proposes that to successfully address climate change, in the long run, encouraging simultaneous actions at multiple scales is an important strategy to address this problem as substantial changes in the day-to-day activities of individuals, families, firms, communities, and governments at multiple levels, especially in the more developed world is required.

In this chapter, the emergence of the political ecology framework is discussed concerning the shifts in social science paradigms. The first part presents the genealogy of political ecology. The main aim is to provide the reader with the poststructuralist political ecology background as a theory that informs this study. Political ecology has a history that starting from the 1960s. Political ecology theory has transformed from structuralist to poststructuralist. This chapter presents a critique of the structuralist political ecology approach as a framework that analyses the human-environment interactions at a household level. Mbeleko (2014) states, the development of post-structural political ecology does not deny basic political ecology, which is heavily influenced by structuralist Marxism but gives the actor more agency and voice.

This chapter will discuss post-structuralist political ecology as the theoretical framework adopted by this study, then shifts to present the recent literature which theorizes the link between social systems and the environment. It should be appreciated that political ecology theorists relatively understudy the relationship between social systems and the environment. The chapter argues that the post-structural political ecology framework is appropriate for analyzing the experiences of rural people and their response to water scarcity.

2.2 Political Ecology

This chapter presents the theoretical framework for the research and draws on the literature from political ecology. This study utilizes the political ecology approach because it questions the conceptual linkages between society and natural resources. Political ecology inhabits but one place of a broad field populated, in the main, by other social science disciplines. Environmental anthropology, environmental sociology, ecological economics, and environmental economics, among others, are, like political ecology, dedicated to understanding society's relations with the non-human world: and through the knowledge these disciplines create, they also seek to inform and give shape to environmental futures.

The general intellectual terrain that political ecology occupies also includes explicitly interdisciplinary fields like sustainability science and more applied work such as hazards research, rural development, climate change mitigation, and urban environmental planning. Political ecology has developed alongside these areas of inquiry and in generative tension with them, finding intellectual allies while also actively "positioning for difference" in order to highlight what political ecology puts at stake as a distinctive mode of knowledge production. There is, for example, a long-standing and productive conversation with ecological economics centred on the dissipative character of agricultural and industrial systems in energetic terms and its implications for uneven development (Perreault et al., 2015).

The arrival of political ecology as a critical framework happened during the 1960s. The anthropologist Eric Wolf is credited for formalizing the theory when he first coined the term political ecology in 1972 (Walker, 2005; Biersack, 2006). According to Blaikie (2008), most of the work that occurred during this period did not include political ecology. The analysis done took the form of the philosophy of political ecology. The term political ecology was made more famous by various authors in their work, such as Brookfield (1987) and Blaikie (1987), Bassett (1988), Bryant (1992), Escobar (1996), Neumann (1992) during the 1980s.

Subsequently, this approach has gained much recognition amongst scholars and academics examining or linking human society and the natural environment. Forsyth (2003) found that political ecology has gradually been taken up by more social scholars rather than ecologists and other natural scientists. Political ecology is a framework that is used when studying human-environmental relations. According to Vayda and Walters (1999), political ecology developed because of the shortcomings of existing scholarship that utilized positivist theories of adaptation, organic analogies, and behavioralism to analyze local-scale human-environment interactions. The authors added that these theories were developed to address the impact of the rapid expansion of capitalism, neo-colonialism, and decolonization on the environment and the resultant environmental degradation in the 1960s and 1970s. Greenberg and Park (1994: 1), for instance, define political ecology as providing a synthesis of "political economy, with its insistence on the need to link the distribution of power with productive activity and ecological analysis, with its broader vision of bioenvironmental relationships". Robbins (2004: 12) defines political ecology as "empirical, research-based explorations to explain linkages in the condition and change of social/environmental systems, with explicit consideration of relations of power" According to Bryant (1998: 79), "…political ecology examines the political dynamics surrounding material and discursive struggles over the environment in the third world. The role of unequal power relations in constituting a politicized environment is a central theme".

According to Derman and Ferguson (2003), the main central concern of political ecology is understanding the relationship between social and environmental change. Political ecology draws on insights from a variety of environmentally related disciplines in the social and environmental sciences. Power plays a key role in definitions of political ecology. The outcomes of environmental change are often felt unevenly by different social groups. They explained why and how this unevenness is generated links political ecology to political economy and makes conflict and contestation over resources central to most analyses. Derman and Ferguson (2003) assert that power is a central focus of the political in political ecology. Increasingly, a concern with power relations extends beyond the local level and decentres and problematizes unidimensional treatments of the state, donor groups, nongovernmental organizations, and their related discourses. Empirical studies within this field tend to provide detailed presentations of various uses of power, involving corporate and conservation interventions influencing access to land and natural resources. In contrast to earlier approaches, which assumed that ecological systems tended toward equilibrium,

political ecology recognizes that resource utilization patterns may be ecologically degrading while being socially profitable or functional, at least in the short term, for some actors.

What also led to the development of political ecology was the critique of the Malthusian theory. According to Robbins et al. (2010), Malthus had foreseen a case whereby the resource use would grow and keep increasing while the population would also increase at a geometric rate. Adger et al. (2001) and Guthman (2011) states that Malthus had concluded that the increasing population and the consumption are related and linked to the depletion of resources, which will, in turn, create a global crisis. Although Malthusian thinking or concepts were only limited to food production, on the other hand, neo-Malthusian academics took up the notions and expanded them to include environmental problems (Robbins et al., 2010).

According to Robinson et al. (2010: 52), the argument made by neo-Malthusians on the issue of environmental degradation, argues that "… neo-Malthusian discourses have blamed individual food producers at the point of production for environmental degradation, due to their lack of knowledge or negligence." It was only then that political ecology gained much attraction and was used in the 1970s partly due to its criticism of neo-Malthusian solutions to the environmental crisis. The first political ecologists to criticize neo-Malthusian scholars were Bryant (1997), Buchanan (1973), Darben (1975), Lowe and Worboys (1978) and Wisner, et al. (1982) for neglecting political economy questions in their research. According to Bryant (2001), the theory of Malthus diverted attention away from the real crisis of the uneven economic development and the depletion of resources from the south to the north that had left communities in the developing world highly vulnerable devastations like drought and floods.

Political ecologists challenged the Malthusian ideas of population and resource interaction by explaining resource depletion as a product of the global political economy (Bryant, 2001; Adger et al., 2001; Munro, 2009). Political ecologists consider the complicated dialectical relationship that exists among the environment, society, and structure (Kalipeni and Oppong, 1998). Political ecologists argued that the cause of resource depletion is global capitalism and exploitation by the politically and economically powerful, rather than population growth or ignorant social actors. Thus, the arguments made by neo-Malthusians in the 1960s created fertile ground for an alternative theory that did not assume a linear relationship between nature and society (Walker, 2005).

According to Derman and Ferguson (2000), one of the strengths of political ecology is its focus on the mutual constitution of social and environmental change. One of the ways of approaching the study at hand is to focus on the relationship between people and their environment as a starting point and observations of environmental change. The central goal and dimension of political ecology, in theory, is to develop different modes of analysis that incorporate and relate to social and ecological variables. Another dimension of political ecology is first to understand that environmental change results are often felt unevenly, and how this unevenness is generated links to political ecology. This means that contestation over natural resources and conflicts remains central to most analyses. This involves struggles at discursive levels, including local knowledge, environment, sustainability, biodiversity (Derman and Ferguson, 2000).

There are different theoretical perspectives on power that have dominated this field. There are combinations of influences, two of them being actor-oriented and neo-Marxist approaches used from the 1980s. The focus has been on processes involving actors behind these interventions, as well as the outcomes for different social groups. Over the last two decades, in political ecology there has been a move in power perspectives towards poststructuralist thinking about "discursive power", inspired by Foucault. Today, the three approaches (actor-oriented, neo-Marxist and Foucauldian) and their combinations form a synergy of power perspectives that provide a set of rich and nuanced insights into how power is manifested in environmental conflicts and governance.

There is an actor-oriented perspective that states power is seen as being exercised by actors, in contrast to views in which power is perceived as a force that may pass through people without consciousness or accountability. The Norwegian sociology professor, Fredrik Engelstad (1999), defines a strong power concept as a combination of intentionality, relationality and causality. This implies that actors are seen to exercise power in a strong sense through actions to achieve particular intentions (intentionality), that the actions take place between two or more actors (relationality), and that the actions produce an intended result (causality). Outcomes are usually negotiated results of processes where different actors have exercised power, rather than the total fulfilment of the will of only one actor. In actor-oriented power perspectives, power is connected to agency, but this does not imply that structures are irrelevant (Dowding 2008).

Instead, the exercise of power by actors is seen as constrained as well as enabled by various types of structures. Max Weber provided classic contributions to an actor-oriented theory of power. He defines power as the ability of individuals to realize their will, despite resistance from others (Weber 1964: 152). Robert Dahl (1957) gives an example of actor-oriented power theory in which actor A exercises power over actor B, when A can get B to do something that B would not otherwise do. An extreme version of this is when people are forced to do something that they are totally against. Two of the three power dimensions presented by Steven Lukes (2005) constitute actor-oriented power.

The "one dimensional view" addresses behavior leading to decision-making in overt conflicts; the "two dimensional view" also includes successful behavior in order to control political agendas, thereby sometimes avoiding the situation that some issues are made subject to debate and decision making. We find that actor-oriented power theories provide conceptual distinctions which give useful theoretical elements to apply in political ecology studies as elsewhere. On the one hand there are actors who, in different ways, exercise or try to exercise power. On the other hand, actors are met by various forces of resistance and opposition. One of these forces consists of restrictions to the fulfilment of their own intentions by more powerful actors who directly oppose them. Actors may also encounter structural limitations from institutions that are the result of intended actions to stop these kinds of intentions.

Norman Long (1992, 2001) has provided seminal contributions to actor-oriented perspectives in development studies. He argues that social structures are important, but that actors usually have several options and their agency is seldom totally constrained by structures (Long 1992, 2001). This fits into a larger body of sociological literature that conceptualizes actor structure relations (e.g. Giddens 1984, Bourdieu 1977, 1989). In many contributions to political ecology, scholars highlight what we term "power resources." These are means, or various types of capital, that different actors have available and may use in order to realize their intentions, particularly when they are able to convert one form of capital into another (Bourdieu 1986).

Capital forms may, for instance, be related to social relationships or economic structures and consist of class positions in addition to related capital such as land, companies and finances. They also entail discursive power resources in terms of abilities to create, legitimize and disseminate perspectives on topics and specific cases in influential ways. Power resources may be political or symbolic and consist of means to influence policy-making and

governance. These power resources are possessed and activated by actors, but at the same time they have structural aspects. In political ecology, scholars have emphasized the exercise of power by two types of actors in particular—those who carry out environmental interventions and those who resist them—with the authors generally supporting the latter, especially when interventions lead to disempowerment of local communities or degradation of their environments.

The former often consist of companies, government agencies or nongovernmental organizations (Bergius et al. 2018; Brockington 2002; Büscher and Ramutsindela 2016; Igoe and Croucher 2007; Neumann 1998). The latter may be peasants, fishers, or pastoralists, who exercise counterpower through different types of resistance, adaptation or pragmatic engagement (Cavanagh and Benjaminsen 2015; Gingembre 2015; Hall et al. 2015; Holmes 2007; Mariki et al. 2015; Moore 1998, Rocheleau 2015; Sullivan 2003; Wanvik and Caine 2017). As already mentioned, the influential contribution by Ribot and Peluso (2003), which is one of few explicit theorizations of power within political ecology scholarship, took a Weberian understanding of power as a point of departure, combined with Marxist and Foucauldian power perspectives.

In conceptualizing access to natural resources, they found that the various social relationships that constrain or enable such access are associated with "bundles of power" or complex and overlapping "webs of power." In studying these bundles or webs, they propose an actor-oriented understanding of power in combination with a Marxist view, which is both actor- and structure- oriented (see below), as well as Foucauldian interpretations. Hence, actor-oriented power perspectives are central to political ecology. It remains important to study the agency of individual actors in order to explain injustice and a lack of environmental sustainability.

According to Isaac (1987: 5), "[to] locate power is also to fix moral responsibility", and locating power is "an enterprise central to 'normative' … inquiry", which would be congruent with the normative ambitions in political ecology. There are a broad variety of theories to draw from here, including some that are infrequently used in political ecology. Most of these theories provide combinations of actor and structure perspectives in which agency in various ways are shaped, restricted and enabled by structures.

Sen's capability approach (Sen 1999) and Bourdieu's theory of different capitals (Boamah and Overå 2016). In social sciences that place explicit weight on agency, there are also

conceptualizations of social phenomena that impact on individuals' realizations of their will, although these are different from exercises of power. These phenomena include unintended and unanticipated consequences of actions taken more or less directly, and also through effects of social structures (Fine 2006; Merton 1936; Zwart 2015). Actors may meet structural limitations that restrict their options as result of other actors' intentional creation of institutions for that purpose, but structural limitations may also be unintended. These are aspects that are crucial to recognize in the field of political ecology, as in social studies in general.

Marxist political economy is a cornerstone of political ecology, with its focus on inequalities produced in different ways by global capitalism. However, Marx's power perspectives are seldom highlighted as such, although there are various power perspectives in political ecology that are directly or indirectly influenced by Marx. The main focus of Marxist theories of power is on class relations under capitalism, and the persistent powers reproduced by these relations (Isaac 1987). Also for Marx, human agency is at the center of his conception of power, but it is an agency that is socially conditioned, which is reflected in this famous quote: Men make their own history, but they do not make it as they please; they do not make it under self-selected circumstances, but under circumstances existing already, given and transmitted from the past. (Marx 1852: 5) Hence, a Marxist power theory understands human agency as constrained and to a large extent produced by historically established social structures.

While structure generates the potential and limits for the exertion of power, agency tends to reproduce structure. To illustrate this point, Isaac (1987: 81) uses the example of a capitalist such as David Rockefeller (1915–2017), who certainly was a powerful man: But a social theory of power must explain what kinds of social relations exist and how power is distributed by these relations, such that it is possible for David Rockefeller to have the power that he has. To do this is not to deny that it is he who possesses this power, nor to deny those personal attributes determining the particular manner in which he exercises it. It is simply to insist that the power individuals possess has social conditions of existence, and that it is these conditions that should be the primary focus of theoretical analysis.

(Isaac 1987: 81) Michael Watts (1983) provides an early example of such a power analysis in political ecology by focusing on how historically produced social structures condition the agency of individual smallholders, in his study of small-scale farming in northern Nigeria. He

concludes that progressive commodification caused starvation and economic marginalization among a peasantry that became increasingly dependent on an unstable market. This market integration led them to become more vulnerable, and they therefore had to take up loans and generally take more risks. Previously self-sufficient, they gradually changed into underpaid farm workers. This in turn led to decreasing investment of labor on their own land, resulting in the degradation of soils on land where food crops were grown. This is an important structural explanation of processes of deprivation and soil degradation. In addition to Watts' prominent contributions to political ecology, David Harvey's work inspired by Marx has been influential in the social sciences in general, including political ecology, over the last two or three decades.

One example is Harvey's modification of Marx's notion of "primitive accumulation", which Marx saw as a key feature of how capitalism works. This refers to a historical process of divorcing the producer from the means of production through privatization of the commons. According to Harvey (2003: 149): …primitive accumulation as Marx described it … entailed taking land, say, enclosing it, and expelling a resident population to create a landless proletariat, and then releasing the land into the privatized mainstream of capital accumulation. Since accumulation is an ongoing process, Harvey (2003) proposes the term "accumulation by dispossession" to describe current processes. In political ecology, the introduction of this term has sparked a renewed interest in the combination of dispossession and capital accumulation (Benjaminsen and Bryceson 2012; Büscher 2009; Corson 2011; Kelly 2011; Li 2009). Harvey's notion of the "spatial fix" is another structural process that produces power. Falling rates of profit in any industrial sector or geographical area tend to bring into play "elastic powers of capital" to restructure and "fix" some of capital's internal contradictions (Harvey 2006, 2014).

Such spatial fixes take place through moving capital geographically, causing the commodification of non-capitalist spaces. These fixes work as temporary remedies to address a crisis of accumulation, and rather than solving its underlying contradictions, capital "has the nasty habit of simply moving them around" (Harvey 2014: 7). The lens of spatial fix has been used to discuss the role of scale in political ecology (Brown and Purcell 2005; Cohen and Bakker 2014) and, for instance, to explain how the movement of capital to invest in African agriculture produces winners and losers (Bergius et al. 2018), and also to explain the growth in aquaculture as a fix for industrial overfishing (Mansfield 2010). Hall et al. (2011) offer another Marx-inspired power analysis within political ecology, combined with a Polanyian

approach. They focus on the changing ways that people are excluded from land in Southeast Asia. Processes of modernization associated with economic growth, industrialization and urbanization have generally led to de-agrarianization, which means that "agriculture becomes progressively less central to national economies and to the livelihoods of people even in rural areas" (Hall et al. 2011: 1).

As Wisner emphasizes in his definition, political ecology focuses on power relations "up and down a continuum of scales from global to local" (Wisner 2015: 56). In the political ecology literature, we find studies of power exercised not only by actors at the site of an environmental intervention, but also often in centers of power such as national capital cities and the multiple locations of international organizations and corporations. The strong position of neo-Marxist critical thinking in political ecology has influenced the scale-transcending focii of political ecology. As emphasized in neo Marxism, capitalism operates internationally, and as shown above, local conflicts over the use and conservation of regions and natural resources tend to involve economic actors, often in alliances with state and non-state actors. As a methodological rule of the thumb, Blaikie and Brookfield (1987) recommend starting empirical examinations at the level of the immediate land manager, and working upwards in chains of explanations through national and global scales. They call this 'regional political ecology.'

Robbins (2004) and Rocheleau (2008) have, however, pointed out that this can assume rigid hierarchies of power, and it may be more useful to focus on "networks" or "webs" of relations with interactions within and across all scales. Nevertheless, having local sites as points of departure has often proven to be useful for identifying how various actors and processes influence and shape power relations through interaction between local and distant spaces across scales.

The difference between three poststructuralist power perspectives that, to a large extent, are inspired by Michel Foucault and applied in the field of political ecology. These are discursive power, governmentality, and biopower. In environmental studies, Maarten Hajer (1995) and John Dryzek (1997) have introduced discourse analyses that have been used and elaborated by political ecologists and others (e.g. Adger et al. 2001). Furthermore, Emery Roe (1991, 1995, 1999) has been influential in introducing a focus on narratives and storylines as parts of broader discourses to analyze specific cases of environmental conflicts (Leach and Mearns 1996; Stott and Sullivan 2000; Svarstad 2002).

"Discursive power" is exercised when actors such as corporations, government agencies or NGOs, produce discourses and manage to get other groups to adopt and contribute to the reproduction of their discourses. Contrary to some other uses of discourse analyses, in political ecology, discourses tend to be studied in combination with a critical realist epistemology (e.g. Adger et al. 2001; Bassett and Bi Zuéli 2000; Forsyth and Walker 2008; Kull 2004; Leach and Mearns 1996; Svarstad 2002). Thus, central assumptions and claims in the discourses are compared to empirical data on the environmental processes that are subject to strong discursive claims. The prolific political ecology literature on discursive power consists of discourse and narrative analysis, and shows how some actors exercise power through the establishment of discourses on issues and narratives of specific cases in ways that are suitable to themselves. The actors behind such constructions are not only governments, but are also often companies and large environmental NGOs.

In some cases the constructions can be traced back to colonial powers as efforts to legitimate their appropriation of new territories that otherwise are claimed to be managed by the inhabitants in unsustainable manners. Such studies uncover discourses that are more or less hegemonic, while in environmental issues today, two or more parallel and competing discourses are often observed (Agder et al. 2001; Svarstad 2005). While Foucault has provided inspiration for political ecology on discursive power, it is important to note that there are many similar perspectives to those of Foucault, but with a larger space for agency. For instance, in his "third power dimension", Steven Lukes (2005) deals with what we consider to be discursive power. One actor gets other actors to do something they would otherwise not do, by influencing their wishes. For a government, for instance, this could take place through control of information via media and education, so that people only get access to presentations of issues and cases decided by the government. In this situation, people are not forced to act in the manner that the government wants, but they choose to do it themselves. Foucault's discourse perspectives may be interpreted in line with this.

Furthermore, in his Prison Notebooks, Antonio Gramsci (1932/1975) pointed out the power of "hegemonic" presentations of social conditions. Another example of considerable relevance to issues addressed in political ecology is Edward Said's renowned presentation and criticism of orientalism as a discourse produced in the West about the inferior "others" in "the Orient" and also applied more broadly to the Global South (Said 1978). Whereas discursive power may be exercised by a large variety of actors, the two other sets of political ecology

work inspired by Foucault are concerned with power between governments and people (or "subjects").

Many earlier studies of decision-making in conservation focused on lack of participation, both in overt top down governance as well as in approaches presented as "community-based" and "participative" (Brockington 2002; Brosius et al. 2005; West 2006). Political ecologists and other observers have criticized the lack of real influence in cases of such participation (Cooke and Kothari 2001). Foucault's notion of "governmentality" has increasingly been used in political ecology as a key to understand how power works in environmental governance (e.g. Agrawal 2005; Bose et al. 2011; Fletcher 2010; Johnsen and Benjaminsen 2017; Valdivia 2015). Governmentality can be seen as ways in which governments administer citizens to act in accordance with government priorities (Foucault 1991, 2008).

Rob Fletcher (2010) distinguishes between four different governmentalities that are relevant to environmental governance. "Disciplining" implies that the government manages to get citizens to internalize certain "mentalities" in terms of social norms and ethical standards. "Truth" means ruling of people through religion or other overarching truth-defining principles. The next two types of governmentality are not necessarily dependent on people subscribing to believing state presentations or priorities, although they will see it as beneficial to act in accordance with them. "Neoliberal rationality" implies that an incentive structure is established to maximize results, while "sovereign power" means governing through defined rules and sanctions. Each of these governmentalities may work alone, overlap or conflict with any of the other forms (Fletcher 2010).

Qian Zhang (2018) discusses resettlement of Mongolian pastoralists as part of a large-scale national "ecological modernization" scheme in China. The resettlement of pastoralists aimed to reduce the occurrence of sandstorms affecting Beijing. In line with mainstream science-based discourses amplified by media attention, portraying livestock herders as both victims and agents of desertification, the state engaged national and local authorities to implement their resettlement. In her detailed analysis of the origin and effect of ideas and influences in policymaking and implementation at local and national levels, Zhang shows how disciplinary and neoliberal governmentalities work in contradiction at the different scales. The central Chinese government aimed at producing supportive and self-monitoring environmental subjects, protecting the rangeland by moving pastoral households into residential blocks in

cities. Simultaneously, in line with neoliberal rationality, this was seen as part of a state-building process.

At the level of local government, making pastoralists sedentary was presented as an environmental strategy, but instead was intended to produce modern economic subjects. At the level of individual herder households, resistance to the resettlement policy varied depending on their different social, economic and political capital. Whereas the younger generation opted for new opportunities in the city, established herders with a strong pastoral identity opposed resettlement. Arguing that environmental protection is a built-in precondition for their way of life, the opposition of the latter group was not so much a reaction against the central government's environmental subject-making as against the local government's modern subject-making. Zhang's analysis clarifies that different governmentalities are associated with specific scales, which may contradict each other but also interact across scales.

Helene Ahlborg and Andrea Nightingale (2018) look at power in a case of electrification in three villages in Tanzania. In line with some of the recent contributions to feminist political ecology (e.g. Harris 2006; Nightingale 2011), Foucault's ideas of disciplinary power are combined with Judith Butler's (1990) notion of "performativity." The aim is to understand how processes of subjection, seen as the internalization and confirmation of subordinating norms, are integral to society–nature relations and for the legitimation of access rights and authority. Ahlborg and Nightingale thus see power as relational and as produced through actions that generate contradictory effects for differently situated actors, whereby resource governance processes can simultaneously both empower and create relations of domination. Stressing that forms of power are always historically and spatially specific, or "placed", Ahlborg and Nightingale identify four "locations" where power is exercised in the Mwangweni electrification program.

The first location is constituted by knowledges and ontologies shaping the electrification process, such as the established practices and ideas around desired development and project implementation shared by NGOs, the international development cooperation sector, the Tanzanian government and the majority of local citizens. The second location is the implementation of plans and resultant differentiation between households that become connected or remain un-connected to the power grid. The third location consists of processes shaping access and entitlements to electricity, in which outcomes vary with differences in

poverty and wealth, age, and gender. The electrification process thus reproduces established inequalities but also causes some changes. As the final location, the authors note how electrification changes everyday life: routines, timing of activities, and the importance of places and particular offices and persons.

In both of these articles, the notion of governmentality is central, but at the same time the articles expose various ways in which agency matters. Zhang (2018) shows how actors in the local bureaucracy adapt to structures orchestrated by the central government through tactics of career promotion politics and neoliberal environmentalist funding practices. But she also reveals how individual pastoral households interact with the state through their tacit decision-making regarding migration and herding, which shape the outcome of the resettlement program. The most resourceful pastoralists hire herders and invest in new forage markets, and make claims along environmentalist lines about their traditional environmental knowledge and capacity to conserve rangeland. These strategies enable them to resist resettlement as well as the attempt at subjecting them to become "modern" citizens. Ahlborg and Nightingale (2018) distinguish between power as human agency and the Foucauldian concept of "constitutive power", which can be understood as the pressures emerging through network dynamics and multiplicities of interactions.

2.2.1 The traditional narrative of conservation

The International Water Association (IWA) endorsed a notation of water conservation. This looks at minimising loss or waste, the care and protection of water resources and the efficient and effective use of water (Butler Memon, 2006). The IWA notation promotes water conservation “doing less with less” (e.g., taking shorter showers, using bucket system instead of using hosepipes when washing cars), water efficiency, doing the same with less, water sufficiency, reduction of some water uses or the proportion of water available to each user.

Another Department of Water Affairs water management tool is Water Demand Management (WDM), which looks at the adaptation and implementation of a strategy by a water institution or consumer to influence the water demand and usage of water. At times there are conflicts between conservation goals and economic development.

The exploitation of land use and water resources can result in adverse effects for the future health of the terrestrial and aquatic ecosystem and their capacity to perform their duties such as delivering ‘adequate’ goods and services that also contribute to social and economic welfare. With almost all conservation efforts focusing on the protected areas, which tend to

be geographic, economic, and socio-political enclaves, it has monopolized it to the wealthy. More practical solutions will need to be found to ensure adequate biodiversity conservation and to sustain the values taken from ecosystems in South Africa (Turpie, 2003 and Turpie et al., 2003).

It is stated in the Water Services Act No 108 of 1997 (RSA, 1997a) that it is a duty of all municipalities that have been tasked with water services provider status to give measures to promote water conservation and demand management, which will be included in their Water Conservation and Water Demand Management (WC/WDM) strategy and business plan and Water Services Development Plan (WSDP). This follows the requirement from all spheres of government to provide water supply services efficiently, equitable, and sustainable manner. The target for reducing water has been set; however, activities at the municipal level to reach this goal have been limited (McKenzie et al., 2012). This could be pinned to a lack of proper planning and not realizing the implications and potential benefits of WC/WDM.

Also, the Department of Water and Environmental Affairs (DWA) reports that many of the existing strategies are ambiguous and of little value (DWA, 2011). Several municipalities have limited financial, technical, and institutional capacity to prepare a WC/WDM strategy. Hence, municipalities often fail to realise that most WC/WDM activities will pay for themselves, and those financial institutions will fund these projects if a good business case is compiled. Paradoxically, municipalities complain that they cannot obtain funding. In contrast, most financial institutions complain that they cannot find bankable projects because of the poor quality of the applications and strategies. A country must look at its governability as it is vital in assessing the efficacy of a country's water governance. The country's governance capacity is defined as the capability of a country to implement water policies; hence, the next section will discuss more closely the water policy implementation situation in South Africa.

2.3 Shifts in the conceptual framework for conservation Stakeholder Approach

2.3.1 Stakeholder engagement analysis

Laplume et al. (2008) assert that organizations must know and understand all their stakeholders (customers, public, and employees) and consider the interests of all stakeholders and not only of their shareholders. Ostrom (2010) proposes that to successfully address climate change, in the long run, encouraging simultaneous actions at multiple scales is an important strategy to address this problem as substantial changes in the day-to-day activities of individuals, families, firms, communities, and governments at multiple levels, especially in

the more developed world is required. Additionally, stakeholder engagement is gaining prominence due to unethical practices, negative environmental impact, and disregard for human rights by an increasing number of businesses. According to Leonardi (2015) and Manetti and Bellucci (2016), the impact of social media. Luoma-aho (2015) confirms that stakeholder engagement now extends to advertising, environmental management, marketing, and online journalism.

According to Bieluch et al. (2017), partnerships from different research disciplines provide the opportunity to consider various forms of knowledge, experiences, values, and resources by bringing together interdisciplinary scientists with stakeholders in understanding sustainability issues. It is also essential to understand the social, psychological, and contextual variables impacting relationships since building partnerships is a complex process.

Luoma-aho (2015) points out that stakeholder engagement or mutual dependence is essential for sustaining a positive relationship between an organization and its stakeholders. According to the situational theory of the public, stakeholders are not involved or interested at all times. Depending on their interest in an issue, they can be active or inactive at intervals (Ciszek, 2015). This could be relevant to climate change issues, especially as climate change concerns generate increased interest during natural disasters or media attention and wanes when such incidents subside (Gavin, 2016).

2.4 The Role of Stakeholders in addressing Environmental Challenges

The role of stakeholders in addressing environmental issues is supported by Montabon et al. (2016), who advocate a re-focusing of environmental behaviour research to focus on daily life's every day and ordinary practice. Hallegatte (2009) maintains that a range of flexible options such as land-use plans, climate change capacity building, insurance schemes, or early warning systems will influence business investment choices and household decisions and, in turn, also influence the hard-technical investments. Flexible adaptation options are also reversible solutions; for example, an insurance scheme can be adjusted every year, unlike a water reservoir. The risk of ‘sunk costs’ if climate projections are wrong is much lower for institutional and financial strategies than for technical adaptation projects, making them more suitable to the current context of high uncertainty.

This view is strengthened by van Sluisveld et al. (2016), who claims that while there is a focus on technical solutions to meet the 2°C climate target (such as renewable energy, carbon capture, and energy efficiency technologies), it is not easy to reduce global warming from

carbon price-driven technical solutions alone. Van Sluisveld et al. (2016) suggests to focus more on non-economic and non-technological drivers of energy system transformations, which are generally not overtly included in the long-term scenario studies.

Axon (2016) believes that social solutions have not been seriously considered, as there has been an over-reliance on technological responses to climate change. According to Hallegatte (2009), end-users such as managers, planners, and engineers must understand that climate scientists cannot solve this problem by providing precise and accurate climate forecasts timeously. Scientific uncertainty will prevent climate models from providing this information soon. The problem is further compounded since natural variability makes it difficult to detect and attribute climate changes. Cooke (2015) illustrates that end-users have to change how they make decisions to introduce climate uncertainty in their everyday operations. Burke et al. (2015b) point out that uncertainty is already central in many economic decisions, such as energy prices and exchange rates. Since future technological developments are volatile and uncertain and cannot be forecasted with precision, future climate conditions must be added to this already long list of uncertain factors to ensure that all the information climate scientists can produce is used most adequately. Suppose uncertainty is considered in all long-term decisions. In that case, many infrastructure projects will be better adapted in the future, and climate change impacts will remain lower and more manageable (Burke et al., 2015b).

Only such an anticipatory adaptation strategy can buy us the time we need to wait for (still-to-be implemented) mitigation policies to become active. Lee et al. (2015a) and Rauken et al. (2015) indicate that effective decisions of end-users are highly dependent on their level of climate change awareness and capacity, as a literate end user will be able to adapt much better to the uncertain factors around climate change. Ferguson et al. (2016) say that in times of particular global financial and economic limitations, business response to addressing climate change is critical, as there are implications for a variety of consequences for businesses regarding operational, public relations, and financial aspects. Lövbrand et al. (2015) argue that to understand the social science of the environment, researchers must attempt to uncover the underlying processes that lead individuals (or households) to consume in different ways. This approach will reveal the underlying demands that individuals make on the use of vital resources such as energy or water, as it is essential to understand that such consumption is part of everyday, standard practice and must not be viewed as either pro- or anti-environmental (Pink and Mackley, 2016).

Dietz (2015b) comments that trying to understand why specific individuals do or do not 'commit' to environmental practices is concerned with understanding the very basis of consumption itself. Tasquier et al. (2014: 821) point out that "environmental issues are intellectually stimulating for learning science, but seem not to be enough for fostering a behavioural change." This view is supported by Dietz (2015b), who claims that the emergence of issues such as global climate change is beginning to challenge our understandings of how individuals engage with environmental issues and how scientific understandings influence environmentally effective practices in different consumption settings.

Barr et al. (2011a) maintain that in global climate change responses, there is much emphasis on 'low carbon' lifestyles that necessitate changes in behaviour across a wide range of practices, including energy consumption, water use, and waste disposal at home, work while travelling and in places of leisure and tourism. Therefore, an analysis of these stakeholder issues is vital for a better response to climate change, even in the Distribution Division. Brügger et al. (2015) state that climate change is a behaviourally complex and publicly contested environmental issue. There are many potential barriers and conflicts in addressing the issue effectively, and social researchers need to develop new understandings of socio-environmental practices. When existing and embedded practices are challenged through unsettling and disruptive processes, conflicts with the consumer–citizen response to climate change emerge.

Barr et al. (2011a) identify four main factors that cause conflicts with the response to climate change:

- new and contested forms of knowledge;
- contested ascriptions of responsibility;
- alternative conceptions of scale; and
- new sites of practice for activism.

Although there is a lack of research on stakeholders' climate change awareness, particularly for Africa (Bryan et al., 2016; Ofoegbu, 2016), Knight (2016) identified the following three general trends:

- awareness of climate change is more significant in countries that are wealthier and more highly educated and is not influenced by political orientation or vulnerability;
- perceived risk is higher in countries that are wealthier, left-leaning, and more vulnerable to climate change, and not affected by unemployment; and
- perceived human cause is more significant in wealthier, left-leaning, more vulnerable, and more highly educated countries.

This is underscored by Wiest et al. (2015), who illustrates that concern about climate change has increased over the past two decades. In contrast, Clayton et al. (2015a) maintain that climate change is not one of the public's main environmental concerns. It is ranked as less important than many other social issues like the economy and terrorism, especially in developed countries. McCright et al. (2016) maintain that politics strongly influence climate change in the European Union. In recent work on climate change by Ford and King (2015) it is indicated that the prolonged and occasionally extreme media attention afforded to climate change creates more significant levels of uncertainty and a distance between expert and public knowledge.

Ross et al. (2016) indicate that citizens are unwilling or unable to assume responsibility for specific issues on climate change. This is reflected in the research on the 'psychology of denial' (Brügger et al., 2015), where individuals adopt strategies to ascribe responsibility for global climate change to other externalized actors, and this externalization of climate change is regarded as 'shifting the blame.' Barr et al. (2011a) maintain that the notion of responsibility and its role in promoting (or restricting) forms of environmental practice is another critical issue and not only the problem of conflicting knowledge. Bache et al. (2015) and Bliuc et al. (2015) claim that this is complicatedly bound up with trust and political accountability issues.

Kenis (2016) asserts that environmental responsibility has become a central component of the citizen–consumer debate. In contrast, Kennedy and Bateman (2015) maintain that reframing citizenship is considered an automatic and distributed mode of expressing ethical and political concerns. Barr et al. (2011a) believe that the roots of promoting citizen environmental responsibilities within a consumption framework are linked by the universal acceptance of individual and collective rights and responsibilities. Selman and Parker (1997) commented earlier that this pseudo-political agenda underlined many environmental campaigns such as the spread of Local Agenda 21 projects that have urged citizens to 'Think

Globally, Act Locally.' Lorenzoni et al. (2007) indicate that discussions on climate change are held around extreme variations in stated outcomes alongside the disagreement amongst scientific experts. There is a worrying gap emerging between scientific consensus and public ambiguity.

While public engagement with climate change as a topic is relatively high, understanding climate change, its implications, and socio-ecological consequences are weak (Masud et al., 2015). Cloyd et al. (2016) provide many reasons for the lack of meaningful engagement in public. Newell and Dale (2015) and Whitmarsh (2009) explain that recent research has sought to discover the links between public engagement and the popular media. It found that media has brought up essential discussions on climate change and, more significantly, how the public is being pressured to change their behaviour in response to this issue, such as scepticism (distrust) and uncertainty (doubt).

This distrust and doubt about climate change, according to Mayer (2016), is often displayed in the media, which leads to conflicts about the idea of being a 'responsible' citizen within the context of the current consumption patterns. Earlier findings on public understanding of climate change in the UK by Hargreaves et al. (2003) and Ford and King (2015) assert that such perceptions are worsened by the media portrayal of climate change, which highlights scientific and political disagreement. This is confirmed by Jang and Hart (2015). They indicate stakeholders often cite poor or low attention paid towards climate change by media as a reason for uncertainty about the presence and seriousness of the issue. In some cases, it is an apparent reason for an unwillingness to engage. Chang et al. (2016) claim that the media and other interest groups strongly influence stakeholders.

Carlson and McCormick (2015) and Jang and Hart (2015) indicate that the distrust in information sources, particularly mass media and business, is another barrier as media are perceived as prejudiced. It is also exaggerated and inconsistent in their coverage of climate change, and much of the information produced by the business is considered 'greenwash' and marketing ploys. According to Manuel-Navarrete and Pelling (2015) and Ojala (2015), some stakeholders distance themselves from environmental pressure groups as they perceive that there is bias in information from such groups. Clayton et al. (2015b) point out that the source of information is also essential for stakeholders as it demonstrates the credibility of climate change information. Many stakeholders believe that information from a tertiary institution such as a university is most trustworthy.

Studies by Kempton (1997) and Norton and Leaman (2004) in the United States of America (USA) and another British survey by Poortinga et al. (2006) indicate widespread awareness and general concern about climate change but the limited behavioural response. More recent research supported by Brügger et al. (2015), Devine-Wright et al. (2015), and van der Linden et al. (2015) indicates there is a growing concern about climate change even though few citizens are actively involved in pro-climate change actions. Another vital issue is that people's response to climate change is better when they understand the causes of climate change instead of those who do not understand the causes (Blaum et al., 2016).

Many years ago, the UK Department of the Environment Food and Rural Affairs (DEFRA) indicated that environmental issues are a great concern for England's people. It included disposal of hazardous wastes, livestock breeding methods, water, air pollution, loss of plants or animal life, tropical forest destruction and ozone depletion (DEFRA, 2002). Eearlier studies by Bord et al. (2000), Norton and Leaman (2004), and Poortinga and Pidgeon (2003) illustrated that health, security, and other social issues were more important than environmental issues for the British public. Capstick et al. (2015) recently indicated that the public perceptions of climate change are different among different nations and that perceptions also change over time.

Stakeholders' different views and priorities provide a challenge in addressing climate change learning and proposing pro-climate change actions at the local level. This understanding is critically essential in the development of any climate change capacity building program. The views of stakeholders are essential (Luoma-aho, 2015), even on climate change issues. Lorenzoni and Pidgeon (2006) explain that even though climate change is considered socially relevant, most individuals do not feel it poses a major personal threat. Climate change therefore, has been ranked low and reflects a general perception that the issue is removed in space and time. For example, Lorenzoni et al. (2007) illustrate that studies in 2004, in the UK, indicated that 52% of people believe that climate change will have 'little' or 'no effect' on them. Whitmarsh (2008) found that in 2004 85% of UK residents believed the effects of climate change would not be seen for decades.

Notwithstanding, the climate change views of mainly young people have changed recently (Corner et al., 2015). Studies by Capstick et al. (2015) illustrate that concern about climate change has increased over the past two decades. According to van der Linden (2015b),

although climate change is not one of the public's main environmental concerns, people associate climate change with negative feelings and maintain that they are very concerned.

Recently, Corner et al. (2015) indicate that while issues of importance for the British are unemployment, the National Health System, inflation, and rising prices, climate change and energy are now ranked as the fourth important issue. Christersson et al. (2015) suggest that the few people who attempt to conserve energy do so for financial and health reasons rather than for environmental ones. Clayton et al. (2015a) and Corner et al. (2015) point out that there has been a shortage of studies that address stakeholders' understanding of climate change, particularly in business, and their willingness to alter behaviours concerning climate change.

Engaging stakeholders on climate change issues is challenging, as the 'value action or 'attitude behaviour gap of stakeholders, according to Clayton et al. (2015a), is illustrated by the difference between public awareness and concern about climate change on the one hand, and the limited behavioural response on the other. The public perceives a wide variety of barriers to engaging with climate change. Brügger et al. (2015) and Ross et al. (2016) suggest that there are only a few examples in the literature which explicitly address these barriers, and the literature that covers barriers tend to focus mainly on the psychological barriers of dissonance and denial to behavioural change in light of alternative energy futures. Carlson and McCormick (2015) indicate that other barriers, including social and institutional, must be considered when dealing with stakeholders' responses to climate change.

Another issue to consider when engaging with stakeholders, as Bamberg et al. (2015) illustrate, is that social identity influences people's energy use and, therefore, poses a difficulty in changing consumption behaviours. Gifford (2015) confirms that such an attitude, as with other environmental and political issues, indicates the people's deep exclusion and lack of trust.

Some of the barriers, as mentioned earlier, are also encompassed in the Ipsative Theory of Behaviour (Klöckner, 2015), which identifies internal and external conditions as potential constraints to pro-environmental action. According to Daae and Boks (2015), the Ipsative Theory of Behaviour holds that an individual's behaviour may be constrained or hindered by a lack of real or imaginary opportunities imposed by the individual's internal and external conditions. Brügger et al. (2015) and Shackleton et al. (2015) suggest that barriers to climate change experienced by stakeholders can be classified as two distinct but interrelated levels,

namely, individual and social. The existence of widespread and ingrained social barriers poses particular challenges for climate change mitigation efforts and undermines reliance on voluntary action by individuals (Biesbroek et al., 2013). Some of the individual barriers which are essential for active stakeholder engagement, as suggested by Eisenack et al. (2014) and Lorenzoni et al. (2007), include:

- lack of knowledge;
- uncertainty and scepticism;
- distrust in information sources;
- externalizing responsibility and blame;
- reliance on technology;
- climate change perceived as a distant threat;
- importance of other priorities;
- reluctance to change lifestyles;
- fatalism and
- helplessness.

Adger et al. (2013) identified the lack of basic knowledge about causes, impacts, and solutions to climate change as one of the most easily identifiable individual barriers to climate change response. According to Carlson and McCormick (2015) and Lorenzoni et al. (2007), social barriers are subdivided into the following four issues:

- lack of action by governments and business;
- the 'free-rider effect';
- the pressure of social norms and expectations; and
- lack of enabling initiatives.

The identification of a lack of action by the business is relevant and significant for the Distribution Division. It will need to be addressed to motivate the behaviour of its employees. Pasgaard et al. (2015) and Shi et al. (2015) also explain that although information is readily

available to stakeholders, it is not taken up or translated into knowledge or action for the following reasons:

- Lack of knowledge about where to find information;
- Lack of desire to seek information;
- Perceived information over-load;
- Confusion about conflicting information or partial evidence;
- Perceived lack of locally-relevant information, for example, about impacts or solutions;
- Format of information is not accessible to non-experts;
- Source of information is not credible or trustworthy, particularly the mass media;
- Confusion about links between environmental issues and their respective solutions; and
- Information conflicts with values or experience and is therefore ignored.

Sherwood et al. (2015) show divergent ways of understanding climate change that draws on broader discourses than only scientific knowledge. Although the general public interpretation of climate change may denote confusion initially, this is not necessarily the case, as this is a good way of seeing the world from a layperson. An example by Masud et al. (2015) illustrates this, where climate change is brought under an umbrella of environmental issues without being seen as distinct. A lack of knowledge by stakeholders may contribute to a sense of uncertainty about climate change and pro-climate change actions.

The vacillating involvement of stakeholders, as identified by Lee et al. (2015a), can be understood from the observations of McCright et al. (2016a) that there is a general difficulty in interpreting scientific uncertainty and complexity by stakeholders, unlike scientists who are trained to recognize that uncertainty is an integral element of the process of discovery and debate. According to Whitmarsh (2011), uncertainty amongst stakeholders is the scepticism about the reality of climate change, the human influence on the climate, and the necessity and the effects of mitigation actions. Bliuc et al. (2015) and Whitmarsh (2011) observed that scepticism could arise from a particular worldview, such as fatalism or lack of transparent political engagement on the issue.

McCrea et al. (2015) confirm that fatalism acts as a barrier to people's engagement, as such individuals are of the view that there is no value for them to get involved, as the problem has gone too far already and is irreversible by human action. Here lies a key challenge in engaging with the Distribution Division stakeholders, particularly employees who may also experience similar feelings.

Understanding how stakeholders view climate change and its impacts are critical in engaging with such constituencies. Brügger et al. (2015) indicate that some people perceive climate change as distant in space and time, unlike environmental concerns, which tend to focus on local issues with tangible impacts. The examples and imagery of climate change mostly relate to people in other locations or the future, especially those who are well-off (Arnall and Kothari, 2015). Wiest et al. (2015) claim that some people tend to frame change in their local surroundings. Kurz et al. (2015) explicitly recognize the difficulty people have of visualizing the consequences of their current activities, for example, energy use and linking them to future climate change. Brügger et al. (2015) maintain an evolutionary tendency for people to pay attention to immediate and personally relevant issues.

Another critical issue for stakeholders is that while most people accept that individuals play a role in causing climate change, they should be involved in the action to mitigate it. There are fewer opportunities for effective individual action on climate change than local environmental issues that are more visible to the individual (Lorenzoni et al., 2007). According to Bamberg et al. (2015), stakeholders are also of the opinion that the action of large emitters will have a more significant impact than individual actions and that as climate change is a collective problem, it should be tackled at a collective level. Such individuals feel that it is not worthwhile taking action at an individual level, given its limited effectiveness.

Axon (2016) and Simon and Leck (2015) point out that people tend to be reluctant to consider changing many of their routines and habits and consider alternative options, even when these may be more individually and environmentally beneficial. Phillips and Dickie (2015) explain that most people’s carbon-dependent lifestyles make some habitual unconscious behaviours socially acceptable such as driving to work, frequent long-haul holidays and weekend breaks, leaving appliances on, and the weekly supermarket buying.

Thulemark et al. (2016) assert that such ingrained behaviours become unquestioned. There is a stubbornness to change, as ownership and consumption, such as cars and electronic goods, are important status symbols in our society. People feel they are expected to achieve this

since people's perceptions of needs and expectations change once they become accustomed to a particular standard of living. Grasso and Markowitz (2015) support this argument, as they assert that people's revised expectations are spread in arguments about the quality of life, and once absorbed into daily routine, become interpreted as 'needs' rather than 'wants.' Such barriers contribute to stakeholders doubting their effectiveness and externalizing responsibility for mitigation efforts from the individual to the international level.

People have particular views on politics and business (O'Brien, 2015), and these issues are essential when engaging with stakeholders. Bain et al. (2016) state that many people view that there is a limited political action by local, national, and international governments, such as the lack of commitment to mitigate GHG emissions or lack of evidence of substantial action governments. A business's lack of action is also considered a barrier to people's engagement in climate change (Barker, 2015). Kopnina (2016) claims that business is usually and traditionally identified as scapegoats for environmental degradation and climate change. Pasgaard et al. (2015) point out that the lack of action by others in society is also a barrier to individual actions, as people are reluctant to change their behaviour when they feel others would not follow suit, according to Hochberg and Brown (2015), who referred to the issue of free riding and the tragedy of the commons.

People tend to prioritize personal and financial concerns over environmental issues and consider that their actions would be more widespread if proposed actions were equitable and fair for everybody. Shi et al. (2015) claim that lack of action by some stakeholders is due to the lack of enabling infrastructures and mechanisms, such as lack of affordable and reliable public transport, higher prices of environmentally-friendly goods, design of the built environment encouraging car use and the lack of incentives to prevent pollution, for example, lower car taxes for more efficient cars. Recycling (Gould et al., 2016) and energy conservation (Asensio and Delmas, 2016) in the home are the most common actions that people are willing to take. There is a general resistance to changing travel habits.

Incentives and technological solutions for energy policies receive more support than taxes or higher bills. Morton et al. (2010) state investigating the beliefs, attitudes, and orientations toward climate change issues that currently exist among stakeholders help to identify potential opportunities for creating change and the possible points of resistance. Capstick et al. (2015) suggest that accurate knowledge about the causes of climate change is vital for responsible decision-making as climate change is considered one of those problematic issues.

This is linked to energy consumption, and there is a need for a radical change in values, behaviour, and institutions towards lower consumption patterns.

As an example of the radical changes required, Scott and Barrett (2015) claim that the need for widespread social change, including by individuals, was the basis for the UK Government's ambitious target of reducing CO2 emissions by 80% by the year 2050. However, Clayton et al. (2015b) explain that there has been inadequate attention given to behavioural change in the UK's climate change policies. The country has relied primarily on the voluntary reduction of energy use by individuals, which has been supported by the provision of information, economic incentives, and subsidies to such stakeholders. Newell et al. (2015) contend that government reticence emanates from many factors, notably the fear of electoral protest, their close relationship with business, a focus on economic growth, and the short-term priorities of government-linked to its limited period in office.

Van der Linden et al. (2015b) suggest that stakeholder engagement may be used to involve the public in decision-making about science issues, which is a significant concern. However, Eden (1996) earlier maintained that the methods used to educate the public, change behaviour, and gain support for the policy focused primarily on providing scientifically sound information. According to Tal and Wansink (2016), societal values, personal experience, and other contextual factors influence the understanding of science. According to Lee et al. (2015b) and van der Linden et al. (2015), stakeholder engagement involves cognitive, affective, and behavioural aspects. Therefore, engagement implies a personal state of connection with climate change, rather than mere public participation in policymaking only. Bain et al. (2016) argue that it is not enough for people to know about climate change to be engaged; they also need to care about it, be motivated, and take action. Ross et al. (2016) assert that energy conservation can be practised without understanding climate change; for example, it is financially motivated.

Mitigation policies are likely to be ineffective or rejected by a public who does not understand the issues. Cropanzano and Dasborough (2015) explain that the three facets of engagement are not related linearly. Instead, they comprise complex behavioural ecologies. Azevedo (2015) believes that behaviour change can precede cognitive or affective change. In turn, cognitive, affective, and behavioural aspects of engagement largely produce social and institutional contexts (van der Linden, 2015b).

Dietz (2015a) indicates various influences on individual attitudes towards environmental issues such as past behaviour, knowledge, experiences, feelings, social networks, institutional trust, and demographic background. Gifford (2011) explains that the need to conduct research and interventions will grow as the impacts of climate change are more widely experienced. Some focus areas for future research on anthropogenic climate change mitigation is suggested. For Bisaro and Hinkel (2016) and Fujii (2017), the following five issues for stakeholder engagement is essential:

- climate change research should include, wherever possible, measures of actual (rather than self-reported) environmental behaviour;
- the reliability and validity of self-reports should be examined;
- the difference between impact and intent-oriented actions must be considered;
- efforts should be made to study high-GHG impact behaviours, such as the choice of travel mode and energy consumption, as opposed to low-GHG impact behaviours, such as avoiding or not using plastic bags; and
- the focus should be on the strength of effects on the environment and whether those are importantly influenced by psychological variables or are open to well-designed interventions.

Accordingly, Hoover and Harder (2015) postulate that researchers need to focus on the role and power of individuals to effect change due to the possible enormity of climate change as a social (as well as natural) crisis. Such a focus will lead to more extensive and vital interrogations of the relationship between individuals and the state and how behavioural change as political discourse is encouraged and governed.

As Barbaro et al. (2015) note, there are substantial limitations in focus on individuals and the logic of the Attitude-Behaviour-Choice model of policy-making within a consumer-focused society. Huysman et al. (2016) suggest that climate change undermines the logic of the 'citizen consumer' through the emergence of seemingly contradictory ecological practices for individuals as well as researchers and practitioners. To undo this concept requires a questioning of the citizen-consumer model of behavioural change and a focus on how climate change is repositioning the perceived value of environmental practices from being part of everyday life to being mostly in opposition to current forms of consumption.

Dietz (2015a) and Shove (2010) point out that understanding the shifts in behavioural change is vital. Such appreciation provides excellent knowledge of the broader political debate on how radical social change can be brought about through collective and deliberative processes to address the conflicts around climate change. Such an approach can only lead to new ways of dealing with climate change and prepare societies for dealing with other global challenges (Dilling and Berggren, 2015). Klenk et al. (2015) suggest that developing sustainable solutions to climate change involves all societal stakeholders, including government, commerce and business, interest groups, and the wider public. According to Dilling and Berggren (2015), the involvement of stakeholders indicates that some strategies for engagement are more conducive for policy intervention, which tends to operate on short timescales.

Attempts to engage the public will be more effective if they are part of and seen to be part of, coherent and consistent response to climate change. For effective stakeholder engagement on climate change issues, many matters need to be addressed. According to Boon (2015), necessary information is needed to address the ignorance about climate change and its implications for individuals. Carlson and McCormick (2015) and Kimengsi et al. (2016) believe that such basic knowledge will encourage people to channel their energies into appropriate activities, especially those willing to mitigate climate change. Carlton and Jacobson (2016) also recommend that climate change-related regulatory and economic measures be communicated acceptably and transparently. Myers et al. (2015) suggest that information needs to be provided in context, according to its reliability with mainstream scientific opinion and concerning previous findings. Lewandowsky et al. (2015a) claim that there is a role for science education (formal and professional) to promote understanding of the scientific process, including the inherent uncertainty about climate change.

Ford and King (2015) suggest that the media must be educated on climate change, explicitly developing skills to think critically about climate change media content and advertising. There is also a great need to educate younger generations on environmental action and climate change (Corner et al., 2015; Haynes and Tanner, 2015). Burchell et al. (2016) and Laskari et al. (2016) indicate that speedy communication effectively stimulates emotional, behavioural, and intellectual aspects of engagement on climate change. This is underscored by Karlin et al. (2015), who point out that immediate feedback on energy use through household energy meters effectively reduces people's consumption. As the leading electricity

distributor across South Africa, the Distribution Division can play an important role here in influencing its stakeholders' response to climate change.

Chai et al. (2015) maintain that sustained support, such as household interventions and positive reinforcement (in terms of public recognition, social interaction, and material rewards), can, in turn, inspire effective behaviours to be maintained. According to van der Linden (2015a), incentives such as the energy-saving awards can also stimulate a sense of collective effectiveness, highlight good practice, and play a role in fostering action within a social context.

Brügger et al. (2015) and Capstick et al. (2015) argue that it is not sufficient to understand climate change, even for the motivation to act. Such knowledge is vital for engagement. Accordingly, supportive institutions and infrastructure such as affordable and efficient public transport are essential to enable action at an individual level as well as initiatives to change routine behaviours purposely need to be designed and interventions specifically to encourage consideration of alternatives such as free bus tickets, congestion charging and bike-to-work breakfasts (Ryan, 2015).

Childers et al. (2015) and Shaw and Bunce (2015) indicate that demonstration projects of low emission technologies, decentralization of energy systems, including micro-generation and carbon neutral or low carbon buildings, can also show people what is achievable. Bamberg et al. (2015) point out that stakeholders have different responses to climate change, as some people may take voluntary actions while others are not prepared to make any changes without external pressure.

Corry and Jørgensen (2015) therefore suggest that a stronger governing and economic framework is needed to encourage climate change mitigation actions. Furthermore, O'Brien (2015) advocates that in current society, regulation is necessary to drive fairer, collective solutions to climate change and highlight the seriousness of climate change and the necessity to act. Additionally, though, regulation and economic measures only do not necessarily change values underpinning behaviour. Raineri and Paillé (2015) and Rumore et al. (2016), therefore, propose that long-term and deeply rooted social change for sustainability (in support of pro-climate change behaviour) can be promoted gradually through education, creating community values and environmental citizenship in combination with a framework of incentives.

Societal viewpoints of climate change must be integrated within the policy process on an ongoing basis (Knutti et al., 2016). There is a need to explore the understanding of climate change by diverse stakeholders through time and that such understanding should influence policies accordingly. In support, Bernauer et al. (2016) believe that public involvement in the policy process must be a more open and consistent approach to addressing climate change and, therefore, contribute to overcoming political distrust from many stakeholders.

Effective climate change management requires a longer-term perspective and systemic change. Making progress on the UK Government's ambitious CO2 emissions reduction target (Scott and Barrett, 2015) will, therefore, require the engagement of the public on climate change matters, as there is a need for a drastic change in values, behaviour, and institutions towards a pattern of lower consumption. Corry and Jørgensen (2015) suggest that there must also be a genuine political and widespread social commitment for pro-climate change behaviour, even at the individual level. There are still barriers to the public's response to climate change, although public awareness and concern about climate change may have increased since early studies were undertaken. These barriers have not been adequately addressed by the government, and many of these existing barriers continue to be hindrances to more sustainable lifestyles in general (Leck and Roberts, 2015; Shackleton et al., 2015).

2.5 Conclusion

This chapter aimed to lay a foundation by discussing political ecology, one of the frameworks used to analyze water issues. It also centred on understanding the relationship between social and environmental change. The theory is appropriate for analyzing the experiences of people who live in the rural areas with their response to the shortage of water. The other section focused on the conceptual framework for the conservation stakeholder approach and how it addresses climate change. It was noted that in the long run, the encouragement of simultaneous actions at multiple scales is an important strategy to address the issue. Stakeholder engagement involves affective and behavioural aspects. It implies a personal connection with climate change, rather than merely public participation in policymaking only. It's not enough for people to know about climate change to be engaged, but they also need to care about it and take action. This section also covered the role of stakeholders in addressing environmental challenges. The involvement of stakeholders indicates that some strategies for engagement are more conducive for policy intervention, which tends to operate on short timescales. Engaging the public will be more effective if they are part of and seen as part of a consistent response to climate change.

CHAPTER THREE
CLIMATE CHANGE AND GOVERNANCE

3.1 Introduction

Referring to Baird *et al.* (2014), some of the main concerns relating to global environmental change is how contemporary environmental challenges are understood and the corresponding requirements of the governance processes. Crona and Parker (2012: 32) state:

"*Humanity faces increasingly intractable environmental problems characterized by high uncertainty, complexity, and swift change. Natural resource governance must, therefore, involve continuous production and use of new knowledge to adapt to highly complex, rapidly changing social-ecological systems to ensure long-term sustainable development"*.

The water challenges faced by developing countries present unique challenges; some of these issues range from not having enough drinking water to having contaminated floods and rivers. Shah (2010) asserts that some of these issues or challenges are severe and found in developing countries. Some of the barriers faced towards addressing issues in developing countries or nations are focused mainly on poverty, education, and poor governance. This chapter consists of two sections, one focusing on Climate Change and water security. The second focuses on governance, specifically looking at the structure of the governance arrangements in South Africa, then discussing the local government legislative framework and ward committees as institutions for public participation.

In this chapter, the researcher will give an overview of water security and issues that include South Africans' ability to cope with water scarcity through water infrastructure projects like large dams and extensive irrigation projects. In this section, the researcher will consider climate change and how it could impact water security. Water is a vital component of climate change and the primary medium through which it exhibits its impacts. With the planet facing rising water issues in many regions, it is crucial to know how climate change will affect future societies. Climate change cannot be understood without looking at its impact on water, one of our planet's resources. Cullinan (2016) states that South Africa is in a water crisis.

The worst drought has hit the country since 1933 that has caused widespread shortages of water across all provinces (Meissner *et al.*, 2019). Donnenfeld (2018) said that the South African Weather Service (SAWS) mentioned that 2015 was the driest year ever recorded.

This study will review the literature, provide the reader with knowledge of the topic being investigated, and bring together empirical evidence about this study.

3.2 Climate Change

It is appropriate first to understand what the term climate change means to understand its impacts. Climate change refers to the general increase in air temperatures worldwide (Riordan & Rundel, 2014). Policymakers and scientists know for sure that climate change is the biggest threat to sustainable development everywhere; with that being said, unfortunately, the poorest and most vulnerable will feel the impacts significantly, especially those living in developing countries (UNFCC, 2016). Climate change experts see water, specifically, to be at the centre of this vulnerability as the potential impacts on water due to climate change is projected to increase in magnitude, severity, and diversity (IPCC, 2007).

Although climate change is often characterized by debate and scepticism, it is crucial to recognize how it affects South Africa. Studies have shown the damaging impact that warming global measures are having on the country's ecology (Menyah & Wolde-Rufael 2010; Ziervogel et al. 2014; Sweijd et al. 2015). The 2012 National Development Plan (NDP) emphasized that climate change is already impacting South Africa, with marked temperature and rainfall variations and rising sea levels (NPC, 2012). Climate change, therefore, poses a clear present threat to the stability of South Africa's economy and ecology.

Schulze (2012) suggests that not all climate change impacts will be harmful to South Africa. However, it will be most likely that some areas in South Africa will benefit from the impacts, while others will experience detrimental effects like prolonged drought. It is, therefore, essential to look at both these scenarios when considering the future of water security in South Africa (Schulze, 2012). According to the World-Wide Fund (WWF-SA, 2017), water is increasingly becoming a scarce resource. In 2004, the Department of Water Affairs (DWA 2004) already warned that water availability in the country is severely limited, with the majority of catchments already well over the natural availability. The WWF states that South Africa is the 30th driest country globally (WWF-SA, 2019).

Climate Change is referred to as the absorption of heat, which results in increased air temperatures (Williams *et al.*, 2010). According to NASA (2019), the term refers to a wide range of global phenomena created mainly by burning fossil fuels, which traps the heat generated from the gases into the earth's atmosphere. Figure 1 depicts the greenhouse effect. According to the United Nations Framework Convention on Climate Change (UNFCCC),

this phenomenon is described by global warming. Still, it also includes changes in sea level rise and loss in ice mass in Antarctica, Arctic, and mountain glaciers worldwide. It has also been characterized by extreme weather conditions or events (UNFCCC, 2018).

In other words, climate change refers to long-term changes in the climate experienced in a particular region. While climate change occurs naturally over long periods, in the context of this study, climate change refers to the rapid climate change currently being experienced as a result of human activities and the increased production of greenhouse gases. Climate change is likely to significantly impact South Africa, with resulting consequences for people, the economy, and ecosystems (UNFCCC, 2018). Water is the primary medium through which the impact of climate change will be felt in South Africa. Climate change in South Africa will result in changing rainfall patterns, the intensity of storms and the extremes of droughts and floods; increasing evaporation; changes in soil moisture and runoff and thus water availability; changing water quality conditions (including the temperature of aquatic systems) and increasing climate variability (Grecksch, 2015).

Figure 3.1: The Greenhouse Gas Effect

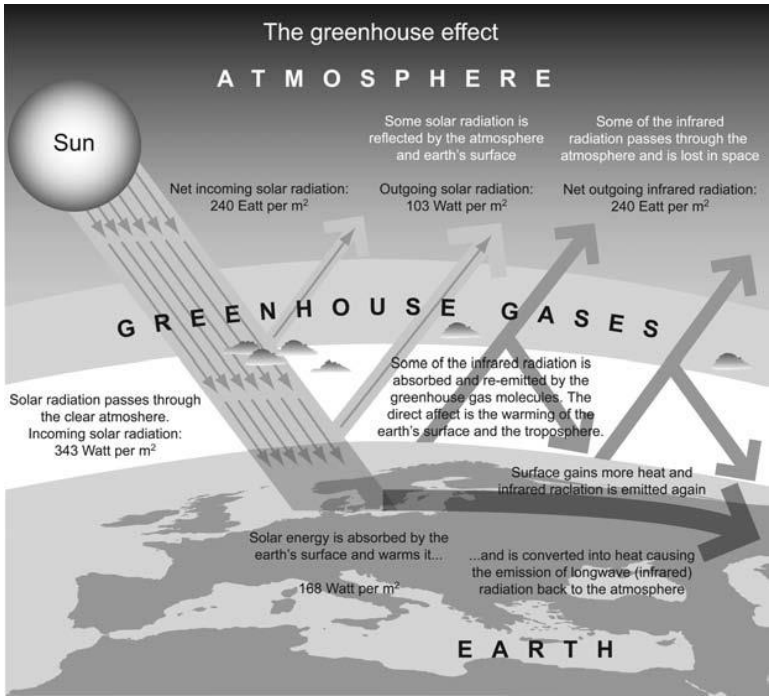


Figure 3.1 The Greenhouse Gas Effect

Source: Britannica (adapted from Britannica platform, 2021)

According to Aryal (2015), it has become increasingly apparent that climate change is one of the paramount challenges to humankind and all other life on Earth. Global climate change has been identified as the cause of global changes in seasonal patterns, weather events, temperature ranges, and other related occurrences. Stern (2016) has identified climate change as one of the two pressing issues facing humans: poverty. Stern (2016) points out that there is a considerable risk for a safe and thriving world in the future if these two issues are not addressed adequately and quickly. According to Chougrani (2016), climate change will contribute to eco-refugees of about half a billion people, less biodiversity, fewer forests, and more eruptions or protests of violence over water and land. Meyer *et al*. (2006:6) are for founding an environment that will enable the development of water resources that will positively impact sustainable development.

Figure 3.2: The Sustainable Development Goals (SDGs) (adapted from UN Sustainable Development Goals Knowledge platform, 2019)

In 2015, the 2030 Agenda for Sustainable Development was adopted by all United Nations member states. This provides a blueprint for peace and prosperity for people and the planet, currently and into the future. At the centre of the Agenda are 17 Sustainable Development Goals (SDGs), which set out the path to achieving a better and more sustainable future for all. Two of the SDGs that are particularly relevant for this study are goal six and goal 13. Goal six of the 17 SDGs focus explicitly on freshwater, including Sustainable Development (SDG six): *"Ensure availability and sustainable management of water and sanitation for all."* Goal six, in particular, calls for improving water quality and protecting and restoring water-related ecosystems (Hering, Maag & Schnoor, 2016). Goal 13: *"Climate action- Take urgent action*

to combat climate change and its impacts." This highlights the impact that climate change has globally on weather patterns, which are changing, sea levels are rising, weather events are becoming more extreme, and greenhouse gas emissions are at their highest levels in history. The goal calls for immediate action.

According to Ortigara *et al.,* 2018 the establishment of SDG six, which ensures the availability and sustainable management of water and sanitation for all, echoes the increased attention on water and sanitation issues in the global political agenda. According to Water-U.N (2018) synthesis report, the 2030 Agenda lists rising inequalities, natural resource depletion, environmental degradation, and climate change among the most significant challenges of our time. It recognizes that social development and economic prosperity depend on the sustainable management of freshwater resources and ecosystems, and it highlights the integrated nature of SDGs. Achieving universal access to safe and affordable drinking water by 2030 presents a huge challenge for all countries, not just those with low incomes. The proportion of the global population using at least a primary drinking water service increased from 81 percent in 2000 to 89 percent in 2015.

The Water-UN (2018) synthesis report also states that only one in five countries below 95 percent coverage is on track to achieve universal essential water services by 2030. Achieving target 6.1 means addressing the "unfinished business" of extending services to 844 million people who still lack basic water service. Secondly, to progressively improving the quality of services to 2.1 billion people who lack accessible water on-premises, available when needed and free from contamination (safely managed drinking water). It also implies going beyond households and providing access to schools, health-care facilities, and other institutional settings.

The continent of Africa has been identified as one of the parts of the world most vulnerable to the impacts of climate change (IPCC 2014; Niang et al. 2014). Projected warming is slightly less intense than that of the global land area, a general feature of the Southern Hemisphere (Serdeczny et al., 2017). The rising demand poses substantial threats to water security in Sub-Saharan Africa. This is exacerbated by climatic changes affecting river runoff, contributing to higher irrigation water demand and posing risks of shallow groundwater contamination due to intense rainfall (MacDonald *et al.,* 2009). The recent severe drought in the Western Cape is a case in point. This drought caused much uncertainty, and citizens and water managers called for crisis management in Cape Town, the Province's largest city (Meissner *et al.,* 2019). The

City Council instituted level 6B Water restrictions, which meant that people were only allowed to use 50 litres of treated tap water per person per day. The Council put the restriction to prevent a situation termed Day-zero—the day that Cape Town would close the taps and where people would have to fetch 25 litres of water per person per day to survive. Dam levels were at their ultimate lowest.

Factors that increase water demand include irrigation and hydropower production. Population and economic growth are expected to rise. It is also affected by climatic changes that increase the evaporative loss (Beck & Bernauer 2011). In many parts of rural Sub-Saharan Africa, groundwater is the sole source of safe drinking water (MacDonald *et al.*, 2009). There now needs to be a new way of addressing climate change. Some scholars have stated that climate change must s to be considered a multilevel problem. There will have to be different decision-making levels at a local, national, and international level (Bulkeley & Newell, 2015).

The South African government has recognized and committed to providing water for South African citizens. In the constitution of the Republic of South Africa section (152), it is noted that the core objectives of local government are "to ensure the provision of services sustainably," and section 27 (1) (b) states that the citizenry must have the "right of access to sufficient water." The local Government is the best place to start because it is the closest sphere to the communities. According to Alexander (1991), the local government is directly responsive to the needs of the different locals in different communities. The local government is responsible for providing such, which places a considerable challenge on ensuring that water is available to everyone. Having access to clean and sufficient water is a constitutional right and requirement (Alexander, 1991).

The (WSA, 2007:4) states that the municipality has an essential role in controlling the water resource infrastructure, such as dams, boreholes, and bulk water supply schemes, and must supply water and sanitation to consumers and operate wastewater collections and treatment systems. For Pollitt (2011:8), water systems are very complex, and they often go beyond the boundaries of municipalities, provinces, and countries. The call for collaborative water governance by everyone involved in the management of water resources has presented itself. Rowlston (2006: 13) states that other national government departments have the general responsibility to support the DWA, as the water services sector leader, in fulfilling its policy, regulatory, support, and information management roles (DWAF, 2003: 23). In addition to this

general responsibility, certain national government departments have specific responsibilities concerning water services.

Marcatelli & Büscher (2019) state that in 2019, many South African citizens, mostly black and those living in the poorest sections of townships or so-called 'informal settlements,' do not have continuous access to safe water. Pipes and taps may be in place, but this is often no guarantee of water flowing through them. The situation is particularly dire in the rural areas of the country, where images of empty buckets 'queuing' at a dry communal tap have become all too common (Marcatelli & Buscher, 2019: 760). Even after more than 20 years since the end of apartheid and much state investment in infrastructure, the fundamental water rights of a large part of the population are still far from guaranteed.

At the 2005 South African Climate Change Conference, it was acknowledged that climate change is real and is happening. A decision was made for the country to develop a climate change response policy through a transparent, participatory, and scientifically informed process, providing a focus for action (Raubenheimer, 2011). According to Hemmati (2012), there is a need for multi-stakeholder processes for sustainability and governance when dealing with climate change. Bulkeley & Newell (2015) state that there are complexities when dealing with climate change because there are three connected factors. The various scales of political decision-making involved, two being the fragmented and unclear roles of state and non-state actors and lastly, the complex nature of the processes that lead to emissions of the greenhouse gages (GHG) in the everyday processes of production and consumption. The authors also suggested that new spheres of governance are needed that cut across boundaries that address climate change.

There are different theoretical perspectives to consider that might have another perspective about the nature of climate change governance; it is, therefore, appropriate to look at the problem itself in more detail. In particular, Bulkeley & Newell (2015) suggest that the complexity of governing climate change stems from three related factors: the multiple scales of political decision-making involved; the fragmented and blurred roles of state and non-state actors; and the deeply embedded nature of many of the processes that lead to emissions of GHG in everyday processes of production and consumption. To the scale of the climate change problem, it is commonly assumed that climate change is a “global problem.” Let's take a closer look at this assumption. We can see that the very nature of how “global” is

interpreted can lead to radically different understandings of where and with whom the challenge of addressing climate change lies (Bulkeley & Newell, 2015).

Bulkeley (2015) mentions that the global nature of climate change comes from the physical nature of the problem because GHG emissions know no boundaries; emissions in one place and time contribute to increasing atmospheric concentrations, which in turn will have impacts across the globe. No one country can tackle climate change alone, so addressing climate change needs a global solution usually interpreted as cooperation between nation-states to reduce emissions worldwide and prevent the problem of free-riding. Some are benefiting from the actions of others (Bulkeley & Newell, 2015). This understanding of the climate change problem has become orthodox. The challenge of governing climate change globally is frequently assumed to be that of agreeing with cooperation, generally in an international treaty, among the relevant nation-states. In effect, this leads to an understanding of climate change as an international problem since states are the primary participants in international institutions and have the authority to sign up to international accords (Bulkeley & Newell, 2015).

For Greenpeace International (1998), however, there are alternative means through which the global nature of climate change could be understood. For example, one approach would be to consider the global processes through which emissions of GHG have generated flows of production, trade, and consumption. For example, which would signal a very different geography of responsibility, suggesting that multinational corporations and consumers had a more significant role in reducing GHG emissions than the countries in which particular goods were produced. , Greenpeace International produced a study that compared the carbon dioxide (CO2) emissions from the burning of fossil fuels by major oil companies with those of specific countries and found that Shell emits more than Saudi Arabia, Amoco more than Canada, Mobil more than Australia, and British Petroleum (BP), Exxon and Texaco more than France, Spain, and the Netherlands.

Framing climate change as a global problem tends to neglect the other scales of decision-making, which shape the trajectories of GHG emissions and the potential to adapt to climate change. Rather than conceiving of climate change as a global problem, many scholars now suggest it needs to be considered as a multilevel problem, in which different levels of decision-making local, regional, national, and international, as well as new spheres and

arenas of governance that cut across such boundaries, are involved in both creating and addressing climate change (Heal, 1998). The focus of many analyses of climate change has been on what nation-states, collectively and individually, are or are not doing to combat the issue. Nation-states have significant power and influence over many processes that contribute to climate change and reduce vulnerability (Heal, 1998).

It is increasingly recognized that nation-states are also limited in the degree to which they can directly affect emissions of GHG and the ability of societies and economies to adapt to climate change. As Geoffrey Heal argues, carbon dioxide is produced due to billions of decentralized and independent decisions by private households for heating and transportation and by corporations for these and other needs, all outside the government sphere. The government can influence these decisions indirectly through regulations or incentives (Heal, 1998). In part, this reflects the changing nature of the state in the current era of globalization and neoliberal economic reform. So that whereas nation-states may once have been able to exercise sovereign authority, particularly in those sectors where emissions of GHG are concentrated, such as energy, transport, and agriculture, it is now more difficult for at least some of them to do so. For example, many energy markets have been liberalized and privatized, leaving the nation-state with little influence over the generation and supply of energy (Smith, 2009).

At the same time, a globalized economy makes many governments wary of introducing policies such as taxation (Newell & Paterson, 1998). When businesses threatened with such measures can relocate to areas of the world with less or virtually no regulation of their emissions. This means that nation-states have to negotiate and cooperate with non-state actors as they are increasingly dependent on the cooperation of stakeholders and communities, often labelled partnership or enabling approaches for realizing their objectives. An analytical framework that seeks to understand how climate change is governed needs to recognize the range of actors that are now involved in the processes of governing climate change (Newell & Paterson, 1998).

The specific variant of this literature concerned with global governance owes much to the work of James Rosenau (2000) and his distinction between “government,” confined to the world of states, and “governance.” It was regarded as a broader phenomenon: governance occurs globally through the coordination of states and the activities of a vast array of rule

systems that exercise authority in the pursuit of goals and that function outside regular national jurisdictions. Some of the systems are formalized, many consists of mainly informal structures, and some are still largely inchoate, but taken together, they cumulate to governance on a global scale (Rosenau, 2000).

According to Rosenau (2000), global governance, therefore, encompasses the numerous activities which are significant both in establishing international rules, shaping policy through 'on-the-ground implementation, even when some such activities originate from actors that, technically speaking, "are not endowed with formal authority." As Rosenau suggests, and in common with other definitions of governance, the involvement of non-state actors in the governing of corporate affairs in particular sets global governance aside from other forms of international relations. The second approach to understanding global governance moves beyond the international arena "*by acknowledging the emergence of autonomous spheres of authority beyond the national/international dichotomy" and by focusing "on the complex interlinkages between different societal actors and governmental institutions."*

Dingwerth & Pattberg (2006) asserts to instead focus solely on the role of non-state actors in shaping international climate institutions, such as the UNFCCC and the related Kyoto Protocol. This body of global governance work considers, for example, global climate governance as comprising of "all purposeful mechanisms and measures aimed at steering social systems towards preventing, mitigating, or adapting to the risks posed by climate change." Scholars such as Jagers & Stripple (2003) have examined the various roles of actors from global civil society, municipal and regional networks, Bulkeley & Betsill (2005), public-private partnerships, and the private sector in the governance of global environmental issues. Regarding where climate governance is seen to take place, perspectives from global governance offer a significant departure from regime approaches (Dingwerth & Pattberg, 2006). Rather than being confined to the international arena, much of the work conducted under the banner of global governance acknowledges both the multi-level and multi-arena nature of climate governance and specifically seeks to examine how the governing of climate change is taking place beyond the international regime.

3.3 South African Discourses and Perspectives on Water Security

It is important to know and understand water security in the South African context. Water security is of considerable global and political significance because it directly links to the

Sustainable Development Goal (SDG). The United Nations Water's (UN-Water) definition of water security is aligned and relevant to the South African context because of the South African government's obligation to implement and report on the SDGs. There are numerous definitions of the term 'water security' that currently exists; this study will use the working definition created by UN-Water which defines water security as "*the capacity of a population to safeguard sustainable access to adequate quantities of acceptable quality water for sustaining livelihoods, human wellbeing, and socio-economic development, for ensuring protection against water-borne pollution and water-related disasters, and for preserving ecosystems in a climate of peace and political stability* (United Nations-Water 2016).

For this international organization, water security encompasses complex and linked challenges. According to Funke et al. (2007), it shows the central role of water to allow society to achieve higher levels of security, sustainability, development, and human well-being. Therefore, Meissner et al. (2019) state that achieving water security requires interdisciplinary collaboration across sectoral, communal, and political boundaries. Given South Africa's water scarcity, water security is an essential topic for academics and practitioners to consider. South Africa is a dry country, and water resources have been distributed unevenly. Ashton et al. (2006) state that geographically, the water resources for South Africa are not where they are needed to be.

In South Africa, during the period of the transition from apartheid to democracy, the new water policy and legislative framework became internationally renowned (Funke et al., 2007). This was when the South African government had a chance to deliberate and address the scope of water security rather than understanding the concept of the supply of water for a small share of the population. Meissner et al. (2019), claim that the introduction of water security by international academics influenced the drafting of the White Paper and water policy for South Africa and the National Water Act of 1998 (RS 1998). In the Department of Water and Sanitation strategy, the document goes into greater detail about water security in the final draft of South Africa's National Water and Sanitation Master Plan (DWS 2017). The plan describes the challenge that water security presents to South Africa's economic growth and social wellbeing; it notes the challenge in detail and gives recommendations to ensuring water security for South Africa (DWS 2017).

It is noteworthy to know how South African and international academics have dealt with the concept of water security. Based on the researcher's analysis of academic literature and

drawing from the works of Meissner (2019), there are several framings of water security in South Africa. Water security is the first to address past inequalities; according to Reddy (2002), water security is "some for all forever." The author mentions water security in the context of scarcity and states that water security is crucial for addressing inequalities in growth and development at all levels.

Reddy (2002) links the provision of clean water, improved human health, and enough sanitation. The second framing of water security is in the context of security of supply, which includes the work of Conley (1995, 1996) and Conley and van Niekerk (1997), both of whom are former government engineers. Their work focused on securing more water resources through built infrastructure such as dams and inter-basin transfer schemes. Sebastian and Warner (2014) also frame water security in the same way and state that the possible desalination of seawater and the government's investment in the Lesotho Highlands Water Project (LHWP) as examples. Regarding the above, they also add a psychological dimension to their framing by pointing out that in South Africa and Lesotho, water security can become a central factor in the politics of both the investor and investee country.

The third framing of water security is in the context of South Africa's international relations. The first to introduce water security in the South and Southern African context was Van Wyk (1998). Van Wyk links water security to state-centric international relations and the role and involvement of non-state actors at both the local and regional levels (Meissner 2016). According to Jacobs (2010), water security in the context of South Africa's international relations and the conflict and cooperation that goes hand in hand with the scarcity of shared water resources in the Southern African region.

Specifically, she interrogates the strengths and weaknesses of the hydro-political complex, a theoretical concept that has been developed to characterize the unique features of the Southern African water environment (Turton 2003). Turton and Ashton (2008) interpret water security as elevating water resource management to the level of a national security concern (also known as "securitization"). They write in the context of the Southern African Development Community (SADC) region, where the four most economically developed states, Botswana, Namibia, South Africa, and Zimbabwe, are water-scarce and are reaching the limits of their readily available water resources. A de-securitization strategy that may work in this context is removing water resource management from the security domain and treating it as a purely technical issue. Warner et al. (2013) add a further dimension to the

"securitization" of water resources at the transboundary water management level. They argue that South Africa has, for a long time, used its knowledge, funds, and hegemonic position to control water resources beyond its political boundaries for irrigation and hydropower and continues to do so.

The fourth framing of water security is from an adaptation perspective; Hay et al. (2014) describe water security as a complicated, messy, and wicked business that needs to be managed in an adaptive manner characterized by reflection, learning, and redefinition. These authors argue that to feel secure about accessing our share of the benefits of aquatic systems, we need to acknowledge other water users and know that others acknowledge our right to use these systems. Hughes and Mantel (2014) link water security to South Africa's climate change adaptation efforts and mention the importance of water demand management and the pivotal role that local government, in close co-operation with other role players, will need to play in this regard. Pegram and Baleta (2014) also refer to the threat of changing climatic conditions but how these may impact South Africa's water, energy, and food security, all of which are closely linked. There is a link to more localized interpretations of the concept and the views of the different water security dimensions.

The fifth framing of water security is based on Meissner et al. (2019, which deals with the localized interpretation of water security as the assurance of water supply, primarily refers to authorities ensuring that water is available to those sectors that need it most. The assurance of supply is, therefore, also linked to a hierarchy of water supply. In other words, some sectors need greater assurance of supply than others. Another localized interpretation is water security is about access to water; the work of Meissner and his colleagues (2019) mentioned that respondents understood water security as "water in the pipes," which can also be a metaphor for a context-specific understanding of water security by different individuals. The findings of his work state that water security means different things to different people is significant because it does not necessarily mean that one requires a tap with running water to consider oneself water secure. Therefore, water security should not only be interpreted from a technocratic perspective, where built infrastructure is required to supply people with water but can also be based on lived experience or people's perceptions of their situation (Meissner et al., 2019).

Another framing of how locals interpret water security is reflective of the quality of the water resource. In his work, Meissner (2019), states that many respondents argued that while the

quantity of water is essential, the quality of South Africa's water resources can be considered an even more pivotal factor when it comes to the country's water security. Water security is the ability to provide water to people at a reasonable price while spending budgets responsibly. Another important theme that emerged from Meissner's work is the management of water so that people can afford it. The last framing under localized interpretations of water security is human security which is an element that can be the reliance of the poor on the water to support specific livelihood strategies such as brickmaking and crafts that can be quite water-intensive. The negative side of this reliance, depending on where the water comes from, is that it can mean increased exposure to waterborne diseases that, in turn, could negatively affect people's health and, ultimately, their ability to provide livelihoods.

In and around South Africa, water availability varies from region to region and from province to province. With 31% in the Eastern Cape and 27% in Limpopo of households with no access to RDP acceptable level, whereas according to 46.3% of households in South Africa have access to piped water and slightly over 85% have access to water that is of a Reconstruction and Development Programme (RDP)-acceptable level (South Africa's 2011 Census 2011, Statistics South Africa, 2012) This proves that in South Africa the levels of access to water are not homogeneously reflected across all provinces.

South Africa, in recent years has seen the worst hydrological drought conditions which has affected different parts of the nine provinces. According to the Deputy Minister of Water and Sanitation, Mrs P Tshwete (2016), the arranged structures and continued engagement with the stakeholders has made it possible for the department to mitigate the drought impacts under the guidance of the National Water Resources Strategy, which supports the transformation of the sector through protecting and conserving this limited resource. Developing countries are going to bear the brunt of climate change and suffer most from it negative impacts. The reality is that the mitigation measures does not come as the solution to the effects of climate change, but rather as partial softening on the situation. There will continue to be change in local climates and terrestrial ecosystem which act as a threat to human livelihood and biota (Louis, 2007). Louis also asserts that water problems vary from time to time (being seasonally or annually) Even within a country, regions experience significantly different water problems. According to Louis (2007), water availability is not the solely solution to water problem. Below is the list of other participating factors in ensuring water security and doing away with water problems:

- Water management processes;
- Capacities and competences of institutions;
- Dictatorship of water planning in socio-political conditions;
- Processes and practices o development management;
- Existing legal framework appropriateness implementation statuses;
- The countries' appropriateness, regarding social- environmental conditions;
- Availability of investment funds;
- Standards or degrees of available and usable technology; and
- Modes of governance in national, regional and international perceptions.

There is a widespread interest in water across the entire world population shown by developmental organisations at central and state levels, municipalities, non-governmental organisations (NGOs), and private sectors. This is due to water problems that are currently in and around the world, commanding high levels of attention in modern societies. Experts have claimed that the widespread interest on water has also been

applicable to other problems like food, energy, environment, health, communication, and transport.

Louis et al. (2007), exerts that many of water have already become far too complex, as they are unified with other development-related problems as well as social, economic ,environmental legal, and political factors at local and national levels, and sometimes at regional and even international levels. This entails that water problems in a country can no longer be resolved by the water experts or water authorities alone. It is agreed that water is of universal interest for reassuring good quality of life.

Louis et al. (2007) argue that the foreseeable future trends indicates that water issues will gradually be linked with other development sectors such as energy, industry, agriculture, transportation, and communication, and with social factors such as education, health, environmental and rural or regional development. It is high time that water must not be seen as isolated by one institution or any other stakeholder or water expert without having a clear and concurrent consideration of other connected sectors. It can be argued that South African country has reached a point whereby it needs to revisit its water policies and water related-

issues for assessment, analysis, and review, so they can be resolved, so to reassure the main objectives of water management, which aims at accomplishing good standard and quality of life for people, poverty alleviation, as well as regional and equitable income distribution. Water professionals are in a quest of overcoming water challenges in a manner which will be socially acceptable and economically efficient.

In conclusion, water security is understood in many different ways in a South African context. UN Water's definition expresses complex and interconnected challenges. It highlights the vital role of water in enabling society to achieve higher levels of security, sustainability, development, and human well-being. This working definition also links water security to several other security areas that lie outside the realm of water, such as human security and national security. Water security as an aspiration requires interdisciplinary collaboration across sectors, communities, and political borders. These elements also feature in the South African policy and legislative context, as is evident in the slogan "some, for all, forever." Given the country's history and its water scarcity and developmental challenges. Academics and researchers have built on the aims of South Africa's water policy and legislative framework by analysing water security-related issues from different perspectives. They are taking this more theoretical understanding of water security as a point of departure.

3.4 Water Policy in South Africa

With South Africa having semi-arid climatic conditions, with an average annual rainfall of 500 mm and is branded by high annual variability and unpredictability (McKay, 2004; Stein, 2005; Ashton et al., 2006; and Naster, 2009). During the apartheid era (prior 1994) , water service provisions were extremely centralised, as water resource management was only the responsibility of the national government sphere and no other bodies were involved (Tewari, 2009; Movik and de Jong, 2011). As a result, there was uneven distribution of water resources and water services between various ethnic groups (Anderson et al., 2008; Naster and Hansen, 2009). The lack or absence of comprehensive national water legislation and effective administrative support structures intensified the issue further (Muller and Lane, 2002).

According to Abraham, the South African water sector and the environment in general were severely impacted, by the fact that during the apartheid era Department of Water Affairs and Forestry (DWAF) were mainly focused on irrigation and forestry. It was only post-apartheid government that a new legal framework and policy was developed, with initiation of extensive reform process in the water sector (RSA, 1999; Thompson *et al.*, 2001 and Ashton

et al., 2006). It was argued that reforming the entire governance process will still continue for years to come, as it is extensive, dynamic and costly (Medema et al., 2008; Tewari, 2009; Movik and de Jong, 2011).

According to the NWA (1998), the Minister of Water and Sanitation is obligated to update the National Water Strategy (NWS) every five years. It is argued that National Water Act (No 31 of 1998) is the two core pillars of the new water legislation. These are linked through the sanitation business cycle. It is the responsibility of the NWRS to make sure that there are enough water resources available to satisfy basic human needs and to cater for socio-economic development, both now and in the future. This can be achieved by engaging in stakeholder consultation and participation as it is very critical (DWAF, 2005; du Toit et al., 2011; NWRS, 2013). The next section will be discuss the National water resources strategy (2013).

3.4.1 Water Conservation

The International Water Association (IWA) endorsed a notation of water conservation. This looks at minimisation of loss or waste, the care and protection of water resources and the efficient and effective use of water, Butler Memon (2006). IWA notation promotes water conservation 'doing less with less' (e.g. taking shorter showers, using bucket system instead of using hosepipes when washing cars),water efficiency, 'doing the same (or more) with less' (such as fixing leaks; hydraulically efficient toilet pan and cistern design), water sufficiency , 'reduction of some water uses or the proportion of water available to each user or sector' (e.g. dual flush toilets, automatic shut-off of taps and so forth), water substitution,' replace water with something else'. In addition, another Department of Water Affairs water management tool is Water Demand Management (WDM), which looks at adaptation and implementation of a strategy by a water institution or consumer to influence the water demand and usage of water in order to meet any of the following objectives: economic efficiency, social development, social equity, and environmental protection, sustainability of water supply and services and political acceptability.

At times there are conflicts between conservation goals and economic development. Turpie (2008) exerts that there is pressure to use land and water resources as opportunities of economic growth driven by social issues on political agenda. Exploitation of land use and water resources can result to negative effects for the future health of terrestrial and aquatic ecosystem and their capacity to perform their duties such as delivering 'adequate' goods and services that also contributes to social and economic welfare. With almost all conservation

efforts focusing on the protected areas, which tend to be geographic, economic, and socio-political enclaves; it has monopolised it to the wealthy. More practical solutions will need to be found to ensure adequate conservation of biodiversity, and to sustain the values taken from ecosystems in South Africa (Turpie, 2003 and Turpie et al., 2003).

It is stated in the Water Services Act, No 108 of 1997 (RSA, 1997a) that it is a duty of all municipalities that have been tasked with water services provider status to give measures to promote water conservation and demand management, which will be included in their Water Conservation and Water Demand Management (WC/WDM) strategy and business plan and Water Services Development Plan (WSDP).This follows the requirement from all spheres of government to provide water supply services efficiently, equitable and sustainable manner. The target for reducing water has been set however activities at municipal level to reach this goal have been limited (McKenzie et al., 2012). This could be pinned to a lack of proper planning, and not realising the implications and potential benefits of WC/WDM. Also the fact that the Department of Water and Environmental Affairs (DWA) report that many of the existing strategies are ambiguous and of little value (DWA, 2011).

A number of municipalities have limited financial, technical and institutional capacity to prepare a WC/WDM strategy. Municipalities are often unsuccessful at realising that the most WC/WDM activities will pay for themselves and those financial institutions will fund these projects if a proper business case could be compiled. Paradoxically, municipalities complain that they are unable to obtain funding while most financial institutions complain that they cannot find bankable projects because of the poor quality of the applications and strategies. It is crucial for a country to look at its governability as it is vital in assessing the efficacy of a country's' water governance. The country's governance capacity is defined as the capability of a country to implement water policies; hence, the next section will discuss more closely the water policy implementation situation in South Africa.

3.5 Governance

Governance is defined as (often non-harmonious) interactive socio-economic and political forms of governing (Rhodes 1996; Meissner et al. 2013) between various non-state and state actors, including individuals, to create opportunities and solve problems in society (Kooiman et al. 2008). Paproski (1993) defines governance as the management process that involves interaction between the public sector and the various actors in civil society (see Harpham and Boateng, 1997). On the other hand, the United Nations (2006) assert that a more inclusive

and more precise definition of governance is that of Hirst (2000) mentioned it to create a practical political framework conducive to private economic activity. Hirst (2000) states that good governance includes stable governments, clear laws, well-organized State administration modified to the roles that governments can perform, and a robust civil society, which is free from the state's influence (UN, 2006).

According to the United Nations Development Programme (UNDP, 2013), good governance incorporates four poverty-centred dimensions: political, economic, social, and environmental. As applied to water, however, governance is defined differently by various users, but the most widely accepted definition of water governance was the one given by the Global Water Partnership (2003). It stated that water governance comprises a range of political, social, economic, and administrative systems in place to develop and manage water resources and manage the delivery of water services at different levels of society.

Figure 0-1 Elements of an effective water governance configuration ***(Source: Dayem & Odeh, 2010)***

Numerous authors have incorporated a similar definition (Rogers and Hall, 2003; JCWRE, 2006; Plummer and Slaymaker, 2007). Expanding from the GWP's definition, Castro (2007 p.107) states that water governance involves interactions between governments, businesses, political parties, civil and other organizations representing sector interests, international agencies, NGOs, and other relevant power holders.

Figure 3-1 above presents all the crucial elements that are a prerequisite for good water governance in a rural area. These elements need to be factored from project initiation to project completion and thereafter, with the monitoring and evaluation phase. The idea at this point in time with respect to monitoring and evaluation is to serve as a means of assessing whether or not the project or program that was being implemented did in fact bring about meaningful change in the lives of the impoverished. Stakeholder participation is essential in the way that it compels every actor to have an input that will help with the programme's or project's objectives. Effective institutions serve as entities that foster sound policy formulation strategies which in turn result in sound policies which encourage political will from political actors to take part in the hydro social cycle, by advocating for mutual inclusiveness and funding thus in aiding the process.

The two other important elements include the assimilation of public private partnerships and respect and dignity for the impoverished in the process. The idea behind respecting people's needs is that the people will find the change to be meaningful and liberating if their concerns are not being taken for granted as no caring implementing agent would be happy to see the opposite. The integration of the public and private sector in addressing the water problem in rural areas is important in a sense that it merges two consciousnesses which aids in resolving the water service delivery dilemma quicker. The private sector tends to be a stronger financial support base in these respective initiatives, whereas the public sector is armed with the knowledge and broader understanding of the underlying issues that exist in the everyday lives of the poor.

According to the UNDP (2013), it is essential to note that the water sector is part of a country's broader social, political, and economic development. Therefore, such developmental decisions impact the water sector as a whole. For Castro (2007), a high level of advancement has been reached in water-related fields of science and technology. However, it will still take some time for anyone to understand the historical, cultural, socio-economic and political processes underpinning water governance and hence, the water crisis. Castro (2007, 99) concludes that achieving water governance grounded on the principles of equity and sustainability is by far the most cause for concern in the water sector today.

Water governance recognizes that water plays an essential role in poverty reduction and the country's economic development and hence emphasizes the importance of the responsible use

of water resources to ensure efficiency (UNDP, 2013). The country's water governance system shows significant elements of fragmentation (Tewari, 2009; DWA, 2011; Movik and de Jong, 2011). There is a high level of disintegration between water stakeholders and various sectors that impact water resources (Ashton et al., 2006; Naster and Hansen, 2009; Movik and de Jong, 2011). A handful of studies have revealed that this is partially due to the legacy of the previous water legislation, in which water resource management was highly centralized and did not allow civil society to influence decision-making (Naster and Hansen, 2009; Tewari, 2009; du Toit et al., 2011; Movik and de Jong, 2011; Quinn, 2013).

Also, recent studies show that two main factors are underpinning the problems of policy implementation. These were the incomplete sector institutional reforms that were thought of in the new National Water Policy and the Department of Water Affairs (Woodwill, 2010; du Toit et al., 2011; DWA, 2011; Schreiner 2013). Many different factors have been found to contribute to the delay in implementation. The major one is the lack of public involvement and insufficient representation of local stakeholders and their vested interests, particularly the poor and disadvantaged groups (DWAF, 1999; Naster and Hansen, 2009; Pollard and du Toit, 2010; Carden and Armitage, 2013). This highlights a need for more research to be undertaken on integrative instruments that will allow for greater coordination and enhanced stakeholder participation and fast track the establishment of the current sector reforms, thereby facilitating the implementation of the NWA (du Toit et al., 2011).

As promised by the country's first democratically elected government (1994) and new Constitution (1996), equitable access to essential services and related infrastructures, including water, sanitation, electricity, and roads, has been paramount to this vision (Tissington, 2010). Today, South Africa undergoes a considerable social, economic, and political transformation from land reform and housing development to improving and extending services infrastructure (Rodina and Harris, 2016). The transformation from apartheid to democracy-based local governments subsequently led to the establishment of district municipalities, who then took over the responsibility for water and sanitation services and attained the water services authority status. The government of national then unity promulgated and established a few statutory frameworks to ensure proper service delivery and transformation in the local government sphere (Rodina and Harris, 2016).

The uptake of the new Constitution of the Republic of South Africa of 1996 hurried up the transformation of sectors in public service. The different policies and legislative instruments

guided it. Section One of the Constitution of 1996 requires that all public services be transformed and democratized following the values of human dignity, the achievement of equality, and the advancement of human rights and freedom. Local government is still faced with poor service delivery, lack of infrastructure, and identification of appropriate vehicles for effective and efficient service delivery. Meyer (2006: 6) supports establishing an enabling environment for the development of water resources for sustainable development.

These constitutional objectives align with the country's efforts to address the backlogs inherited from the apartheid government. According to the Republic of South Africa Constitution, 1996, there are three categories of municipalities in South Africa – metropolitan municipalities, local municipalities, and district municipalities. Table 3.1 shows the composition of the different categories of the municipality.

Table 3.2: Categories of municipalities in South Africa (A, B, and C)

Category	**Description/characteristics**
A	Metropolitan municipalities (metros)
B	District municipalities
C	Local municipalities

Source: Constitution of the Republic of South Africa, 1996

The various categories of municipalities determine the scope and mandate of local governments. Table 1.1 shows that metropolitans (category A) are primarily urban areas, whereas local municipalities (categories B and C) are predominantly small towns and rural areas (Municipal Demarcation Board, 2006). Section 152 of the Constitution instructs municipalities to "promote social and economic development, structure and manage its administration, budgeting and planning processes to prioritize the basic needs of the community and promote the social and economic development of the community" (RSA, 1996: 87). As such, the overall mandate of municipalities in South Africa as stipulated in Section 152(1) of the Constitution is to:

- Provide democratic and accountable government for local communities;
- Ensure the provision of services to communities in a sustainable manner;
- Promote social and economic development;

- Promote a safe and healthy environment; and
- Encourage the involvement of communities and organizations in matters of importance to local government.

Local governments in many parts of the world have failed to adequately deliver services to the community because of inefficiencies caused by a lack of capacity among local government officials (UCLG, 2013; Grindle, 2007), including ward committee members. The Presidency (2015) has highlighted that more than 78% of municipalities in South Africa have failed to perform all their 12 mandated functions. The report also found that approximately 50% of municipalities performed less than half of their constitutional functions. All these factors support the finding that municipalities struggle to deliver on their mandate.

The inability of local municipalities to deliver services has resulted in a weak government system due to a weak ward committee system, maladministration, and corruption, which has led to a loss of trust between citizens and government. The South African Local Government Research Centre (2014) shows that only 33 % of citizens trust their local governments to deliver services.

3.6 Local Government as a Sphere of Local Government

The local government is responsible for service delivery, but a debate is growing over service provider arrangements. Sector skills are dispersed across several hundred municipal water services providers, the majority being municipal technical services departments with considerable disintegration and high overheads. Debates are centred on how best to consolidate the capacity to maximize scale economies and promote effective governance without introducing new risks and discontinuities. Lasting improvement in performance outcomes requires institutional reform at a range of levels such as recruiting necessary skills and competencies, emphasizing performance contracts and service delivery outcomes, ring-fencing water finances and administration, respecting the roles of officials and councillors, arranging partnerships with public, private and establishing separate utilities, among others.

Municipalities need to appoint managers, supervisors, and work operators with the appropriate professional and technical expertise, which is a definite requirement. The Department of Water Affairs is now seeing the need to regulate the competencies of critical water services personnel, such as the option to introduce mandatory minimum qualifications for senior water services staff, possibly linked to accreditation through a relevant body (Muller 2009). Muller (2009) asserts that most municipalities take on service provision

without certainty and without considering what arrangements might best serve the needs of their constituents. The norms and conditions of deciding on municipal services mechanisms are detailed in Section seventy-eight of the Local Government: Municipal Systems Act of 2000. Section seventy-eight is intended to discourage outsourcing by requiring careful consideration of how to enable in-house service provision. Section seventy-eight, however, does not always serve the public interest.

Many municipalities need to recognize that they cannot deliver effective and affordable services. Most municipalities have a non-municipal service provider, a small enterprise in the local area, service partners, and a professional utility that might offer a better service. According to the Municipal Systems Act of 2000, it favours the appointment of internal water services providers by requiring the municipality to assess, for example, whether it could reorganize its administration to develop the necessary human resource capacity to provide the service.

The inception of democracy within South Africa resulted in the implementation of the Water Services Act (Act 107 of 1998), which was to inform all decision making around treated water and the National Water Act (Act 36 of 1998) (Naidoo and Constantinides, 2009). These Acts have made a platform for managing water within the country as they state that the Minister of Water Affairs is the custodian of all waters and water resources on behalf of the country (Stein, 2005). The National Water Act (Act 36 of 1998) has had a considerable impact on how water is managed in the country through the implementation of a public rights system to water provision rather than the former private rights system, and this has resulted in the disassembling of water ownership and water rights (Stein, 2005; Naidoo and Constantinides, 2009).

Concerning water provision, South Africa has to ensure equality to all citizens in terms of their demand for water, and according to Stein (2005), the country has to consider social, economic, and environmental factors. The National Water Act (Act 36 of 1998) shifts the view of water management from the former supply-side management to demand management (Stein, 2005). The post-apartheid government has now found itself in the awkward position of the country becoming increasingly water-scarce, with increasing water demands more significant than the existing supply levels (Pott et al., 2009).

Water services are managed by the local government; the water supply is the fastest growing sector of national water demand. It reflects population growth and increasing living standards

(van Rooyen 2008). The success of municipal water services management has significant consequences for national water security now and increasingly in the future. Handling water services also has different dimensions: managing water demand through active metering and tariff systems, promoting efficient use and minimizing losses, and safeguarding the quality of return flows of treated wastewater, so that surface and groundwater systems remain fit for use. A strong commitment to infrastructure development and spending on servicing subsidies has achieved impressive results in South Africa.

Government figures show that in 2009 water services infrastructure had been extended to 96 percent of the population, up from 59 percent in 1994 (DWAF 2009a). The new water services infrastructure reached far more people since 1994 in the country than the total population of other African countries such as Angola and international such as the Netherlands. Many more people are benefiting from improved sanitation facilities in South Africa than the total population of Zambia. Even more outstanding is that the majority of new toilets in South Africa are flush toilets provided in new housing developments.

Most municipalities have opted for a technocratic, top-down approach to delivery, with decisions taken and implemented with little public involvement. However, many municipalities lack the skills to succeed with a technocratic approach. In too many times, this has led to services not being delivered or poor quality infrastructure without the resources to keep it functioning. The government places high regard on meeting service delivery targets for distributive justice has, however, not been achieved at a high cost. As Seddon (2008) points out, target-driven approaches to service delivery inherently divert resources from areas not targeted, compromising overall performance.

In South Africa, widespread evidence shows that high importance has been placed on new service connections, which has therefore led to neglected maintenance of existing infrastructure and lack of capacity in bulk infrastructure, causing service failures and bottlenecks. Perhaps more importantly, the pressure to meet delivery deadlines have limited local engagement on service options, preferences, and approaches and marginalized the intended beneficiaries. Service delivery has been prioritized and mostly removing people from any role in holding local government accountable for service delivery (Friedman 2006). The roles and responsibilities of individuals in supporting sustainable service provision are not always agreed on or understood. Many community members complain that services are not affordable; they costly and causing them to accrue debt.

Public accountability relationships among different spheres of government are emphasized over relationships between municipalities and service providers: few agreements stipulating performance parameters are in place between municipal seniors and their technical services departments or external service providers. Vast water services achievements in the first ten years of democracy in South Africa can be compromised in the second decade if swift measures are not taken to mitigate the consequences of the current supply-driven approach to service provision. South Africa's state-centric approach to service delivery is top-down, target driven, supply-led, and generously grant funded.

3.7 Ward Committees as Institutions for Public Participation

The study explores public participation, as it is a municipal process that is the key to community buy-in. Without public participation, even the best project with effective plans is bound to fail due to rejection by alienated communities. The principle of participation derives from an acceptance that people are at the heart of development. People are not only the end beneficiaries of development but should be actively involved as agents of development (Thabethe, 2007: 15).

Expectations for what participation can deliver are often implicit, but can be loosely categorized into three types of benefits (Blackstock and Richards, 2007); firstly, 'substantive' benefits, where decision-making will be improved by stakeholders' multiple values and 'local knowledge' (van den Hove, 2000). Secondly, 'instrumental' benefits, where participatory approaches improve stakeholder acceptability and transparency of a plan and hence support for its implementation (Parkins and Mitchell, 2005). Lastly, 'normative' benefits, where inviting stakeholders into decision making, increases the decision legitimacy and supports democracy (Schultz et al., 2010). However, whether and how these benefits arise is not always clear. Many authors who have argued for 'more' or 'better' participation have specified a variety of issues needing attention and resources. The careful selection of stakeholders, space and resourcing for deliberative processes, equitable input of all interests, and empowerment of participants is vital to influence decision-making (Arnstein, 1969; Hemmati et al., 2002).

Ward committees formed with the aim of public participation between municipalities and communities, is conversely facing constant challenges that need interventions. Skills shortages are one of the significant challenges facing not only ward committees but also municipalities across South Africa. Institution for democracy in South Africa (IDASA)

carried out a Citizen Report Card (CRC) exercise in 22 municipalities across the provinces of KwaZulu-Natal, Mpumalanga, Limpopo, and North West. The exercise of the Citizen Report Card revealed several challenges that have an impact onward committee functionality and effectiveness, among these challenges are (IDASA, 2011:67-70):

- **Skills shortage:** The effectiveness of ward committees is severely constrained by the ward committee members' tremendous lack of skill. The IDASA survey shows that the establishment of ward committees did not contribute to meaningful engagement and did not improve the provision of information to communities. In this regard, 38%, which is an average score, thought the ward committees contributed to meaningful engagement. Limpopo scored the same as the average, Mpumalanga scored 44%, KwaZulu-Natal scored 37%, and North West had the lowest score of 28% (IDASA, 2011: 67). This argument is supported by Khawula (2016:69), who says that ward councillors lack skills such as report writing, minute taking, reading, and writing while educationally, some have no matric and expertise. Therefore, this affects the quality of engagement between the councillors, ward committees, and the public.

- **Existence of Community Development Workers (CDWs):** During the exercise of the Citizen Report Card, the key concern was the friction between CDWs and ward committees. The main point of contention is the fee earned by CDWs for their work. While members of the ward committee receive only a stipend for out-of-pocket expenses. In most municipalities where the study was conducted, it was clear that residents often receive conflicting information about public affairs from CDWs, ward committees, and councillors.

- **Visibility of councillors:** The Citizen Report Card found that councillors are not accessible to communities and do not maintain the requisite interaction and coordination with local people except before elections. When ward councillors do not meet regularly, it will cripple the ward committee's functioning. This, therefore, affects the growth of the community that is the ultimate goal of the ward committee structure.

- **Citizens' input and poor participation:** The survey claims that consultation processes have no effect on decision-making processes and that ward councillors do not consider community feedback.

- **Working relationships between ward councillors and the committees:** There is a weak relationship between ward councillors and ward committees. There is also a lack of recognition of the crucial role that different stakeholders in the ward can play in municipal development, and this hinders the cooperation and development process.
- **Lack of resources:** Lack of access to resources such as office space and equipment has adversely affected the effectiveness of ward committees.

Thus, Smith and de Visser (2009:16-21) discuss some critical challenges that the ward committee encounter, which is similar to that of IDASA. More importantly, the effectiveness of ward committees is constrained by restrictions on the level of education, skills, and expertise of members. Some of the challenges are:

- **Representivity:** presumably, ward councillors have a direct hand in selecting members of the award committee under their political affiliations. This led to the argument that ward committees are often merely extensions of party structures and do not cover the full spectrum of public interests.
- **Powers:** one main issue is the concerns around the limitations on the powers of ward committees imposed by the legislature. Ward committees should probably have a role to play in monitoring and evaluating the municipality's performance in their wards. This dimension of their role has been poorly defined and implemented.
- **Functionality:** in some cases, there are no meetings held primarily due to members failing to form a quorum. Also, there are no substantial resources such as ward members with no transport money to attend meetings for an example.
- **Access to information:** ward committees' ability to function effectively as channels of communication between municipal councils and communities is limited by inadequate public communication strategies and lack of available ward level information.
- **Influence on decision-making:** one of the leading indicators of the ward committee's effectiveness is its impact on the decision-making of the Council. In this regard, available research suggests that ward committees are, in general, not having a significant influence on the decisions made by council and resource allocation at the ward level.

The degree to which communities, especially poorer, more marginalized groups, can exercise their citizenship in meaningful ways is thus examined concerning what Kabeer (2005:23) describes as horizontal and vertical axes of participation. Horizontal (community-based) spaces refer to those spaces created by citizens themselves (this includes forms of spontaneous social mobilization as well as social movement activism). Vertical spaces include formal and institutionalized spaces for participation organized by the government. The degree to which participation brings about change, or at least a discernible impact on policy, is taken as the measure of the degree to which participation is meaningful (see, for example, Cornwall and Coelho 2006).

Concerning this, debates on water as a scarce resource have featured prominently in global and national policy discourses. There is significant societal resistance to the types of 'scarcity control' policies advocated by governments, controversy about the construction of scarcity as validation for many of these policies (Mehta 2005). The global environmental movement has been at the forefront of highlighting weaknesses and flaws in local and global constructions of water scarcity, thereby bringing the notion of water scarcity into the realm of public scrutiny.

3.7.1 Public Participation challenges and opportunities

There are various purposes for public participation. Bryson et al. (2013: 29) mentions these purposes which include: "fulfilling legal requirements; embodying the ideals of democratic participation and inclusion; advancing social justice; informing the public; enhancing understanding of public problems and exploring and generating potential solutions; and producing policies, plans and projects of higher quality in terms of their content".

Public participation is an important end in a democratic society. Participation plays a key role in reflecting and creating citizenship, the public and public values as mentioned above. Though public participation requires resources such as skill, time and money, it can create a number of advantages (Quick & Bryson, 2016: 3). The main element in public participation is to encourage the community to have meaningful contributions into the decision-making process (Theron, 2005: 122). Public participation therefore provides the opportunity for communication between decision-makers and the public.

Citizens may contribute to decision-making by providing information and different ways of seeing an issue and the motivation to address problems (Quick & Bryson, 2016: 4).

Participation may assist government decision-makers and the public to become more knowledgeable and informed and to develop a larger view of issues (Fung, 2006: 68). Public participation supports a more equitable distribution of limited public resources (Quick & Bryson, 2016: 4). Public participation can assist by providing resources for future problem-solving and implementation to address public issues. This can be done by enhancing trust and legitimacy, building relationships and knowledge and interest about policy issues and processes (Ibid).

Although there are benefits to participation in the policy process, public participation can also have some challenges. Nanz and Dalferth (2010: 3) state that, public participation is a process where different actors are involved in policy making before political decisions are taken. Theron and Ceaser (2008: 100) are of the view that public participation in South Africa as often being unstructured, unbalanced and uncoordinated. The decentralisation of governance in South Africa was meant to ensure that the government and the community come closer to each other hence for decentralising functions was that it increases official's knowledge and sensitivity to local problems and needs (Gonzalez, 1998: 10).

Hicks (2006) argues that some municipalities are accused of serving as extensions of local councils, rather than as independent community structures. The ability of ward committees to function effectively as communication channels between municipal councils and communities is constrained by poor communication strategies and a lack of accessible information at a ward level. Though there are a number of advantages related to public participation in decision-making processes and planning, there are also disadvantages.

According to Davids (2005: 28), structures established for public participation in the policy process may lead to unnecessary competition and conflict between existing local structures and those established for public participation. Bryson et al. (2013: 28), state that public participation can be time-consuming and sometimes expensive. To be able to perform public participation effectively, institutions need to have capacity and to train staff (Ibid). Creighton (2005: 18) views public participation as a process that involves people and their governing institutions, and, as such, it tends to create the potential for conflict, as people are not all the same, even in the views they possess on particular issues. According to Creighton (2005: 19), when people participate in government activities the emergence of conflict should be anticipated, so that they often reach consensus through a compromise.

The fifth report of the Intergovernmental Panel on Climate Change, released in 2014, clearly details how the world's climate is changing in an unprecedented manner and explains that human impacts on this process are clear. Much of the research on municipal climate change planning in the USA has focused on member communities of national climate networks, such as the US Conference of Mayor's Climate Protection Agreement (USCM CPA) or international climate networks, such as ICLEI's Cities for Climate Protection (CCP) campaign (Dierwechter and Wessells, 2013; Kwon et al., 2014; Pitt and Randolph, 2009; Sharp et al., 2011; Wang, 2012, 2013; Zahran et al., 2008), Less is known about climate change planning efforts in municipalities that are not members of climate networks or those without formal climate action plans.

There is evidence that many municipalities pursue actions related to climate change, even if their climate focus is not explicit (Krause, 2011; Opp et al., 2013), but piecemeal efforts will likely not be sufficient to mitigate or adapt to climate change. Strong leadership is a key factor in promoting climate change issues (Bassett and Shandas, 2010; Bulkeley, 2013; Gore and Robinson, 2009; Pitt and Randolph, 2009). Laurian (2015) found that one of the biggest barriers to sustainability plan implementation was a lack of prioritisation by local governments. A lack of public awareness and opposition from private property interests may also hinder action (Hamin et al., 2014). Leaders in politically conservative municipalities may avoid sustainability and climate change planning in fear of limiting economic development and attracting political opposition (Foss and Howard, 2015; Grodach, 2011; Holman, 2014; Whittemore, 2013).

Examining literature on the role of cultural context provides a framework to analyse climate-related action in conservative communities. Partisan polarisation on climate change is well documented (e.g. Kiley, 2015; McCright and Dunlap, 2011), and research also shows how liberal and conservative groups apply different arguments related to climate policies (Nisbet, 2009; Oreskes and Conway, 2010; Skocpol, 2013). Nisbet (2009: 15) describes these arguments as frames, or 'interpretive storylines that set a specific train of thought in motion, communicating why an issue might be a problem, who or what might be responsible for it, and what should be done about it.'

Frames are shaped by cultural norms and values, and one group might see climate change as a moral obligation while another group sees it as a scientific uncertainty (Nisbet, 2009). The values held by specific communities and groups within the community therefore should be

identified and targeted for effective public engagement on climate change (Corner et al., 2014), and slight differences in values may require significantly different approaches to framing and engagement (Wolf et al., 2013). Understanding the specific cultural context when planning for climate change is necessary to avoid failure.

Attention to cultural context is particularly important when designing and conducting public participation for controversial topics. Communicative planning processes based on authentic dialogue with diverse participants can be a method for overcoming disagreement (Innes and Booher, 2004; McNeal et al., 2014) and can foster creative solutions (Innes, 2016). Collaborative planning processes that engage local values are found to improve learning, legitimacy and action on broad environmental issues (e.g. Mandarano, 2008), increase policy adoption for climate change mitigation (e.g. Pitt, 2010), and diminish political opposition from conservatives regarding clean energy initiatives (Pitt and Bassett, 2013). Including local government officials, community stakeholders and scientific experts in the process creates a sense of accountability and improves implementation (Moser and Ekstrom, 2011). Describing clear impacts of climate change on the community and citizen's lives also helps make the process locally relevant (Sheppard et al., 2011).

Therefore, carefully constructed public participation processes that rely on culturally sensitive frames may be most effective in promoting sustainability and climate change planning. In some ways, this process is cyclical – a lack of public concern contributes to a lack of political support, so raising public awareness may spur local officials to act (Hamin et al., 2014). However, public processes can foster unanticipated tactical coalitions of groups with different values who find common ground in opposition to a planning action (Trapenberg Frick, 2013). Communicative planning has also been critiqued for privileging elite interests (Innes and Booher, 2004), failing to neutralise power differentials (Forester, 2013), and insufficiently challenging the status quo of neoliberal economic development (Purcell, 2009).

In areas without public support for sustainability or climate change planning, planners may find it appealing to link sustainability to economic development (Crawford and Laurian, 2015) or use a frame describing how climate action can foster economic growth (Nisbet, 2009). However, a planning process that frames climate change within economic development may not be able to make the broad changes necessary to prepare for climate change impacts. Even with these limitations, context sensitive framing of climate change

issues within communicative public participation processes may help foster local awareness and political support for action. One case study reveals that carefully designed public participation processes and locally relevant cultural frames can help cities educate residents, build support and expand discussion of sustainability.

3.8 Conclusion

The literature reviewed in this chapter shows that the ongoing rise of the global average temperature triggers climate change. It was argued that not all climate change impacts will be harmful to South Africa. It will be most likely that some areas in South Africa will benefit from the impacts, while others will experience detrimental effects like prolonged drought. It is, therefore, essential to look at both these scenarios when considering the future of water security in South Africa. This chapter focused on governance, specifically looking at the structure of the governance arrangements in South Africa. According to the United Nations Development Programme (UNDP, 2013), good governance incorporates four poverty-centred dimensions: political, economic, social, and environmental. The chapter discussed the local government legislative Framework and ward committees as institutions for public participation. It also looked at participatory best practices and their importance in governance. The following chapter will give the context of ILembe district municipality.

CHAPTER FOUR

CONTEXT OF ILEMBE DISTRICT MUNICIPALITY

4.1 Introduction

This chapter provides a broad perspective of service delivery and public participation at the iLembe District Municipality and explores municipal compliance with the legislative framework when providing services. In their capacity as the third and lowest sphere of government and the one that functions closest to local municipalities, municipal governments are described as comprising the sphere of government that is tasked mainly with the development and provision of services to communities. It is in this light that some writers have commented that if a municipality cannot or does not perform its service delivery obligations, it should forfeit its right to exist. This philosophy is firmly entrenched in the constitutional framework that has been devised for local government. Although all municipalities are constitutionally tasked with providing sustainable and quality services, such realism is not as easy as it may seem. This is evident with the recent wave of public service delivery protests, which dominates most of the South African municipalities.

4.2 The iLembe District Municipality

This section provides a broad perspective of service delivery and public participation at the iLembe District Municipality and explores municipal compliance with the legislative framework when providing services. The iLembe District Municipality is on the east coast of KwaZulu-Natal, between eThekwini Metro in the south and King Cetshwayo District in the

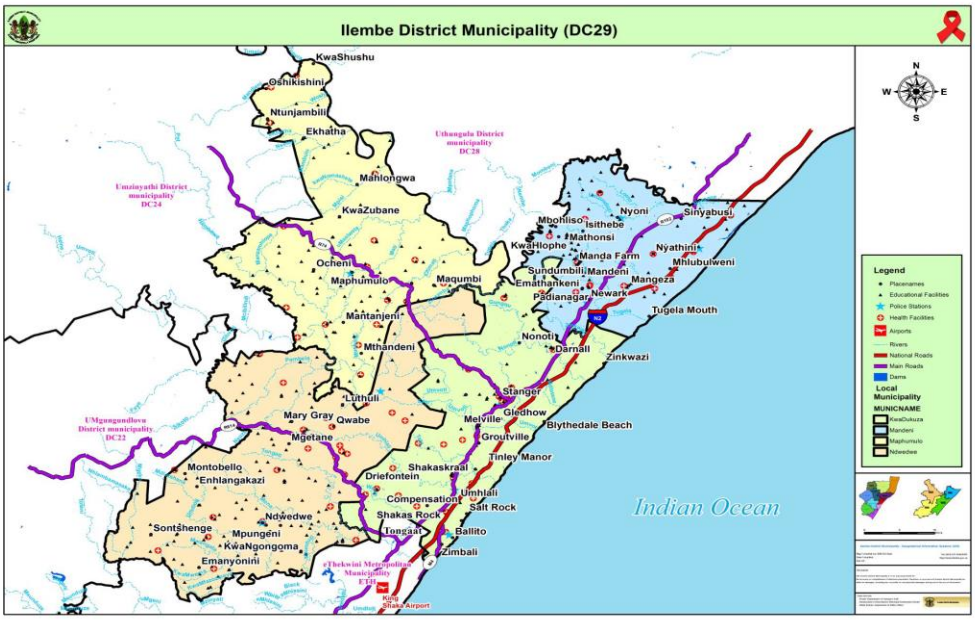


Figure 0-1: iLembe District Map

North. Two Districts border ILembe; uMgungundlovu and uMzinyathi. This district is the smallest of the ten KwaZulu-Natal District Municipalities, with a total population of approximately 657,612 residents (Statistics SA Community Survey 2016). Four Local Municipalities constitute ILembe District, Mandeni, KwaDukuza, Ndwedwe, and Maphumulo. See map 1 for an Overview of the iLembe Region. The district is made up of thirty-five Traditional Authority areas where settlement is controlled by Traditional Authorities through the traditional land tenure system. These TAs areas cover approximately 63% of the total area where the State and Ingonyama Trust own the majority of land within Maphumulo Municipality, 69% of Indwedwe Municipality, and 49% of Mandeni Municipality.

Areas of urbanisation in the district comprise of KwaDukuza/Stanger, Mandeni, the Dolphin Coast and Nkwazi. Land use within these areas is typically urban mixed with high levels of infrastructural and service development and an adequate provision of social facilities and services to support the resident populations. Industrial development is concentrated in KwaDukuza. Informal settlements with limited facilities or infrastructural services occur on the periphery of the developed areas and within the towns of iLembe. Village centres such as Maphumulo and Ndwedwe in the west and Nyoni and Mbizimbelwa in the north comprise commercial and service development in the rural areas.

4.2.1 Demographic Characteristics

The recent Community Survey (2016) results show that the population in iLembe District has grown to 657,612 people. According to the Community Survey 2016, the number of households within iLembe District has risen to 191,369 from 157,692 in 2011 and is now growing at 4.3% per annum. Households in KwaDukuza have grown at a relatively rapid rate of 6.0% per annum; despite a further decline in the population, the number of households in Maphumulo has risen slightly. One could speculate that there is a decline in population but an apparent increase in the number of households may be due to a further decrease in the average size of households.

Municipality	Number (2016)	Household Growth (% p.a.) (2016)	Average Size (2016)	Female Headed % (2016)	Child Headed (2011)	
					Number	%
iLembe	191,369	4.3%	3.4	47.1	614	0.4%
Maphumulo	20,524	0.6%	4.4	61.6	115	0.6%
Mandeni	45,678	3.9%	3.2	51.1	167	0.4%
KwaDukuza	91,284	6.0%	3.0	39.1	113	0.2%
Ndwedwe	33,883	3.2%	4.2	54.6	218	0.7%

Table 4-1: The demographic realities of iLembe District Municipality

Statistics SA Census, 2011 & Community Survey, 2016

4.2.2 Regional Context

ILembe District Municipality is strategically located along the Primary development corridor of the Province and between two strategic gateway points into the continent, namely Durban and Richards Bay harbours. To the South of the District is the King Shaka International Airport (KSIA) and the Dube Trade Port. The iLembe District features sufficient unique selling points to prosper within its niche market on the following basis:

- Pristine beaches and a relatively unspoiled natural environment, underscore the claim of being, “The Jewel of the Kingdom of the Zulu.”
- It is centrally located to the Province’s other significant assets, i.e., Game Reserves, St. Lucia World Heritage Site, the Berg, Battle Fields, and Durban. This places this District within a two-hour drive from many of KZN's natural attractions and two World Heritage Sites.
- International and local recognition and interest in King Shaka Zulu and cultural history. This diverse and rich cultural heritage has the potential for growing and broad international appeal.

The iLembe Regional Spatial Development Plan is a plan with a 30-year development horizon, and it is monitored and evaluated through the District Growth and Development Plan, which is to be reviewed annually. The Integrated Development Plan then depicts the implementation of the goals set out in the IRSDP and the DGDP through municipal initiatives undertaken over five years. The SDF is a spatial translation of the IDP and the IRSDP, and it informs the municipal Land Use Schemes within each of the local municipalities, which will enable appropriate zoning of parcels of land for spatial and economic growth.

4.2.3 Environmental Analysis

The iLembe District is one of the coastal municipalities and covers a large area within the KwaZulu Natal Province, of over 2000 km. The District incorporates a diversity of land uses, including residential, agricultural, natural open spaces, and coastal areas, as well as industrial and commercial areas. The growing needs of an increasing population have resulted in a growing demand for the development and resulting impacts on natural resources. Natural resources occurring within the iLembe District Municipality include vegetation types: rivers, wetlands; coastal resources; estuaries; biomes, freshwater ecosystems, and coastal forest.

The municipality is battling to manage these resources due to natural and human activities. It is a responsibility of the Environmental Management Unit, under the Planning and Integrated Development Plan, to encourage the management of these resources for the benefit of both current and future generations in line with the objectives of the National Environmental Management Act of 1998. The structure responsible for the implementation of the environmental management programmes is the Environmental Management Unit, which is housed under the Planning Section (see the attached organogram under institutional development and transformation). This unit has one environmental specialist, and one Environmental Officer and two vacant posts for Interns. The unit is also assisted by the Department of Environmental Affairs official under the Local Government Support, who has been deployed to the District on a full-time basis.

The District is committed to managing the quality and quantity of its surface and groundwater resources in an integrated manner in order to provide for basic human needs, flow requirements within and between catchments and water systems, the protection of human health and economic activity on a sustainable basis. Part Two of the National Water Act (of the Act) states the Minister of Department of Water and Sanitation, is required to determine the class and resource quality objectives of all or part of water resources considered to be significant.

Freshwater Ecosystems	MAPHUMULO MUNICIPALITY	MANDENI MUNICIPALITY	KWADUKUZA MUNICIPALITY	NDWEDWE MUNICIPALITY
	Water Management Areas: 2 - MVOTI TO UMZIMKULU 35201.8ha (39.29% of the municipality) - THUKELA 54389.1ha (60.71% of the municipality) *Main Rivers:* Hlimbitwa, Mvoti, and Thukela *Wetlands* 41 covering 969ha (1.1%)	Water Management Areas: 3 - MVOTI TO UMZIMKULU 3630.3ha (6.23% of the municipality) - THUKELA 18328.5ha (31.48% of the municipality) - USUTU TO MHLATHUZE 32106ha (55.14% of the municipality) Main Rivers: Matigulu and Thukela Wetlands 550 covering 1170.7ha (2%)	Water Management Areas: 2 - MVOTI TO UMZIMKULU 62702.4ha (99.04% of the municipality) - THUKELA 4216ha (6.66% of the municipality) Main Rivers: Mhlali, Mvoti, Nonoti, Thukela, and Tongati Wetlands 316 covering 988.1ha (1.6%)	Water Management Areas: 2 - MVOTI TO UMZIMKULU 113607.3ha (98.15% of municipality) - THUKELA 2136.8ha (1.85% of the municipality) Main Rivers: Mdloti, Mhlali, Mqeku, Mvoti, Nonoti, and Tongati Wetlands 103 covering 230.9ha (0.2%)

Table 4-2: Water resources within iLembe District

4.3 Pressures related to Biodiversity management

The Convention on Biological Diversity sets out that there are five principal pressures on biodiversity, namely, habitat loss and degradation; climate change; excessive nutrient load and other forms of pollution, over-exploitation and unsustainable use and invasive alien species. A significant driver of these pressures is human activities that place on the environment to support human lifestyles. Below the IDP (2020) sets a list of other possible impacts on the biodiversity with the District as;

- Uncontrolled human settlement and ribbon development is transforming the natural vegetation;
- Overgrazing threatens natural vegetation integrity;
- Alien invader plants infestation is transforming natural vegetation;

- Lack of biodiversity information within tribal areas;
- Loss of sensitive sites due to mismanagement/ lack of appropriate protection;
- Impact of urbanisation on the sensitive dune and coastal forests; and the Impact of urbanisation on an estuary and riverine vegetation.

4.3.1 Opportunities related to Biodiversity management

Opportunities related to biodiversity to be considered include the following:

- Job creation from alien clearing projects, including projects under the Working for Water Programme;
- Job creation from the rehabilitation of degraded wetlands and other valuable ecosystems, including projects under the Working for Wetlands Programme;
- Eco-tourism from scenic, wildlife viewing, birding, nature trails; coast, beach;
- Contribution of Protected Areas to ecotourism and economy in terms of being a drawcard;
- Ecosystem services derived from ecological infrastructure (intact functioning green systems that deliver services), which can contribute to flooding and drought mitigation, protection of infrastructure, water purification, recreational activities;
- Protected areas already contributing to the conservation of the biodiversity network and ecosystem services;
- Combination of land uses (agriculture and protection of biodiversity) on extensive grazing land that can also contribute to the conservation of the biodiversity network;
- Protection of biodiversity network and ecosystem services through municipal managed land; and
- Protection of network through the encouragement of stewardship via rate reductions, rebates.

4.4 Responding to impacts of Climate Change

The commonly anticipated impacts associated with Climate Change, in general, include the warming temperatures and increases in the number, duration, and severity of heatwaves, which will lead to changes in the growth and distribution of plants, animals, and insects; poleward shifts in the distribution of marine species; and increases in coral bleaching.

The IDP of iLembe District Municipality (2020) stated that some of the impacts that are occurring are impacts on infrastructure such as electricity and transport networks. A warmer atmosphere containing more water vapour which will increase the intensity of the whole hydrological cycle, and change in precipitation patterns in time and space. The earth is expected to experience more variable weather than now, with a likelihood of more floods and drought, more intense hurricanes or typhoons, and more heatwaves. The expected rise in global temperatures will affect human health, lifestyles, food production, economic activity, and residential and migration patterns and lastly an anticipated disruption in atmospheric circulation and storm patterns, humanity is expected to face a significant rise in global mean sea-level.

Some of these impacts have been experienced within the iLembe District in several areas, which then required the Municipality to make an effort to avoid and adapting to possible climate change impacts. The iLembe District has hosted two climate change summits in the years 2009 and 2014. Several resolutions were taken during these summits and some of these resolutions were for the district to: a) Undertake a Risk Assessment at a local level to assess risks to inform risk reduction strategies and planning, and b) undertake a Greenhouse Gas Inventory for the District (including local municipalities) to assist in developing Mitigation programmes, and to move the iLembe District Community to a low-carbon society.

The need assessment was conducted by the district and the DEA in previous years and it found that there is a lack of the dedicated environmental management units in most municipalities, resulting in environmental functions placed within varying units of the municipal organizational structure; availability of the budget to perform environmental functions within municipalities; lack of understanding between environmental health and environmental management. This leads to dependence on environmental health practitioners to perform environmental management functions within municipalities. Environmental management is not regarded as service essential to improving quality of life, leading to no attention given to performing the function; lack of general environmental awareness within the municipal structure leading to the lack of environmental management support being received from the municipality; and lack of relevant environmental management tools to guide environmental management within Municipalities. The IDP also stated that the iLembe District Municipality needs to develop an Education and Awareness Plan that will respond to the findings mentioned above.

4.5 Service Delivery

4.5.1 Household infrastructure overview

ILembe District has average access to infrastructure amongst the districts in the Kwa-Zulu Natal province. An overview of household access to infrastructure in the district shows an improvement in access from 38% in 1996 to 56% in 2011 (www.kzncogta.gov,za/ municipalities/iLembe District Municipality).

4.5.2 Water

Access to piped water above the RDP level increased from 36% to 58% from 1996 – 2011. There has been a slight increase as well in access to piped water below the RDP level. About 16% of the households do not have access to piped clean water.

4.6 Good Governance and Public Participation

4.6.1 The Review of Public Participation: The Case of iLembe District Municipality

Globally, there has been an emphasis on the need to promote new forms of interactions among state, civil society, and the private sector. In deciding which mechanisms are most appropriate, the Organisation for Economic Co-operation and Development (OECD) (2001:4) recommended that municipalities should design successful information, consultation, and active citizen participation strategies. The Local Government: Municipal Systems Act, 32 of 2000, encourages the active involvement of the public in municipal affairs.

Against this background, the ILembe District Municipality encourages a culture of public participation, which is primarily viewed as a democratic process for engaging people in decision-making, planning, and generally allowing them to play an active role in their development and service delivery. It was a cornerstone of the preparation of the District's IDP (IDP, 2007-2012). In supporting the notion of public participation, Heleba (2008:1) states that there is, therefore, a need to promote channels and structures through which individuals and communities can exchange views and influence decision-making and legislative processes. For public participation to be active, such structures must be guided by the principles of openness, transparency, inclusivity, diversity, flexibility, accessibility, accountability, and integration.

4.6.2 The Legal Framework for Public Participation in iLembe District Municipality

The duty to facilitate public participation at the local government level finds expression in the Constitution (RSA Constitution Act, 108 of 1996).

Section 152 (1) of the Constitution states that one of the objects of local government is to encourage the involvement of communities and community organizations in local government matters.

Section 195 (1) of the Constitution states that public administration must be governed by the democratic values and principles enshrined in the Constitution, including the principles of responsiveness and public participation.

The Municipal Systems Act 32 of 2000 is the most comprehensive piece of legislation on public participation at the municipal level. The purpose of the act is to provide the core principles, mechanisms, and processes that are necessary to enable municipalities to move progressively towards the social and economic enhancement of local communities and ensure universal access to essential services that are affordable to all.

4.7 The IDP Process as a Mechanism for Public Participation

The IDP of the ILembe District Municipality provides a space for the public to participate in local governance affairs. It reflects an increased desire among citizens to participate in decisions that affect their lives, and an increased need for the policy development process to be informed by inputs from diverse sources, especially from those involved or affected. The previous chapters have shown that public participation is an essential aspect of democratic governance and that it is a vehicle for fair and efficient service delivery. This is highlighted by The Department of Provincial and Local Government (DPLG, now the Cooperative Governance and Traditional Affairs (COGTA) which states that public involvement has five purposes: 'To give information, to get feedback, to allow comment, to bring in new ideas and to create consensus where possible' (DPLG 2007:68).

4.8 Public Participation Analysis

The rationale behind iLembe District Municipality putting community participation on its strategic and operational agenda is because Section 152 (1) (e) of the Constitution of the Republic of South Africa states that one of the objectives of local government is *"to encourage the involvement of communities and community organizations in the matters of local government."* In this regard, the Communication and Public Participation Unit is responsible for facilitating legislated public participation IDP meetings and mayoral meetings as and when requested by the Mayor. To also partner up with various stakeholders, including the community, to support municipal work. Partnering with the provincial and national government in communication service delivery to the community and communicating work that is conceptualized and implemented by all three spheres of government.

The Municipality developed a draft Communication Plan that has been adopted by council. The objective of the plan is to improve communication with the local community as well as other organs of state within the local and provincial spheres of government; to enhance accountability, openness, transparency and responsive local government and to inform the community of the activities and intentions of the municipality

4.9 Ward committee

In terms of the Municipal Structures Act, (117 of 1998), municipalities are required to establish ward committees to enhance community participation in municipal development processes. ILembe District Municipality has elected the ward committees. They have all been inducted and have been provided with training to capacitate them to be able to facilitate service delivery issues in their areas. ILembe District has 770 Ward Committees Members within four local municipalities. The ward committees in the District are primarily functional with the support they receive from local municipalities, the district municipality, and COGTA's Public Participation Department.

The challenges that are being experienced by the local municipalities as they engage with the ward committee:

- Some ward committee members drop out because they receive better jobs elsewhere, which leaves a vacuum in the committees. The process of replacing them sometimes brings delays;
- Some members are demotivated and feel that the remuneration they receive is insufficient.

4.10 District Public Participation Forum

The scope of work of the DPPF is oriented towards planning and monitoring of ward committees concerning the establishment and functionality to ensure co-ordination of all support initiatives and programmes by all spheres of Government, stakeholders. Outside institutions to ensure a common and comprehensive understanding of legislation and policies with regards to public participation, ensuring the establishment of standard practices, policies, and programmes with regards to public participation and closely cooperate with the Provincial Public Participation Steering Committee (PPPSC). To share best practices and case studies in the provincial and national spheres; communicate with municipalities to

inform about the training initiatives and to mobilize for participation; solve emerging problems and coordinate with the PPPSC to solve problems, and lastly to receive information from PPPSC and follow up programme of implementation.

4.11 Good Governance & Public Participation SWOT Analysis of ILembe District Municipality

STRENGTHS	**WEAKNESSES**
• Effective Speakers Forum • District Communicators Forum • Audit Committee, hence clean audit • **Conventional communications tools in place, e.g., SMS system** • Strong management team	• Poor level of Service delivery by contractors. • Limited human resources to serve four local municipalities • Uneven Topography, some areas are not accessible for service delivery and community consultation. • Structures are not fully capacitated to perform their tasks. • Communication timeframes with the community. • Public participation activities are 80% synchronized. • Call centre not functional- calls go unanswered • District-Wide Ward Forum to advocate on water and sanitation issues at ward level is not capacitated.
OPPORTUNITIES	**THREATS**
• Capacitated employees to be used instead of consultants for institutional memory and limiting expenditure	• Lack of communication with internal and external stakeholders might lead to community unrest • Deviations being a norm for Corp Gov- vetting, change of scope, Communication with LMs not intact • Poor planning & nonexistence of KWANALOGA games business plan- the selection of service providers • Councillors' not aware of the SCM policy and processes • Communication through cell phones and radio stations a challenge as it does not reach everyone • Understanding different stakeholders for the various services • Poor road conditions to reach the community for communication of public participation. • Lack of cooperative approach to public participation

Table 4-3: Governance SWOT Analysis Table

4.12 Conclusion

This chapter has provided a broad perspective on service delivery and public participation at iLembe District Municipality. It explored the iLembe District Municipality's compliance with the legislative framework of providing democratic and accountable government,

ensuring the provision of services to communities in a sustainable manner, promoting social and economic development, promoting a safe and healthy environment, and encouraging the involvement of communities and community organisations in local government. One of the challenges facing local government at present is that of translating the essence of the White Paper on Local Government from the mere commitment to service delivery. It is clear from evidence accumulated from this chapter that considerable attention needs to be given to the obstacles preventing the district municipality from fulfilling its core functions of facilitating local democracy.

CHAPTER FIVE
RESEARCH METHODOLOGY AND DESIGN

5.1 Introduction

The empirical investigation focuses on critically examining the governance around water management and climate change attitudes in Noodsburg, Ilembe district municipality. The South African legislation on local government emphasizes that municipalities play a vital role in democratizing society and fulfilling a developmental role within the new dispensation. This suggests that municipalities must have policies and institutional frameworks that support and sustain the development of local people. These plans must move towards achieving the progressive realization of the Sustainable Development Goals (SDGs) and the fundamental rights of the citizens. Moreover, the local government must promote good governance.

According to Moseer (2016), there is a need for in-depth research when focusing on climate change that will examine inconsistencies in beliefs, actions, and values. For instance, how people feel about climate change or changing their lifestyle choices and pressures and how do they perceive and deal with uncertainty about climate change. These issues are essential for informing policy and are best addressed through qualitative research methods. Qualitative research means exploring and understand the meaning of social or human problems, and this process of research involves emerging questions and procedures, data typically collected in the respondents setting.

This study makes use of key research questions to be answered by the study. As indicated in the previous chapters, the study seeks to understand the socio-economic aspects of participation in discussions of governance of the environment and the management of scarce natural resources. It uses Noodsburg, ILembe District Municipality as a case study. The theoretical conception of the study is grounded in the field of public administration and environmental management, using a social science approach. The study takes on the constructivism perspective; it provides a context for constructing the research methods (Bailey 1987:32). The rationale for the research methodology provided a basis for the data collection to collect the requisite data to enable the research objectives and essential questions to be responded to.

5.2 Research Objectives

The study was explored using the following objectives:

- To critically examine critical factors that affect water-related communication and decision making within Noodsburg;
- To assess governance legislative and policy framework that use models for public participation;
- To examine the institutional mechanisms or water service provision strategies put in place by ILembe district municipality that deal with climate change impacts;
- To understand the role of community stakeholders in dealing with climate change impacts such as water shortages; and
- To examine the attitudes and perceptions held by the community in Noordsburg towards climate change and its impact

5.3 Key Research questions

The study identified the following key questions:

- What are the factors that affect water-related communication and decision processes within the iLembe District?
- What are the governance arrangements that use models for inclusive participation in iLembe District Municipality?
- What are the institutional mechanisms or water service provision strategies put in place by the iLembe District?
- What is the role of the community stakeholders in dealing with climate change impacts such as water shortages?
- What are the attitudes and perceptions held by the community in Noordsburg towards climate change and its impact?

5.4 Research Design

This chapter presents the methodology and the techniques used to accomplish the study objectives. This research has adopted a broad research design which includes a case study as a strategy of inquiry, one of the features of a case study research is its flexibility. Adjustments might be made during the data collection method process by deciding to make use of additional data sources (Gray, 2014). This study uses a qualitative research design. This type of research seeks to explore and understand the meaning of human problems and social issues. More recently, there has been increasing use of a mixed-method approach, which is one that utilizes both qualitative and quantitative approaches. The most distinctive difference

between the two methods is that the former uses numbers, graphs, and tables. In contrast, the latter is strictly limited to explanations and not in graphs, as it deals with the nature of things through investigative questions.

In mixed methods, both qualitative and quantitative methods are used. According to Creswell (2013), mixed-method research is relatively new in the social and human sciences as a distinct research approach. It involves the collection of both qualitative (open-ended) and quantitative (close-ended) data in response to research questions or hypotheses (2014:217). Mixed-method research design resides in the middle of this continuum because it incorporates elements of both qualitative and quantitative approaches (Creswell, 2013). It could be argued that the mixed research method emerged as the most used in that it is more conclusive due to the mixture of numbers and explanations. Spector (2005) noted that in as much as qualitative research methods can be a substitute for quantitative methods, the use of both is recommended if the researcher seeks to understand the issues better.

Quantitative research is based on a relationship between dependent and independent variables. These variables are represented through numerical links to quantify dense information. Quantitative methods are widely used to study relationships and to simplify such relationships into numerical order. Quantitative methods are informed through questionnaires, rating scales, tests, and measures (Stone-Romero, 2004). The difference is thus that qualitative research presents results in a descriptive or explanatory manner, while quantitative research shows results in graphs, charts, and diagrams (Creswell, 2014).

The purpose of the research is to discover answers to questions by applying scientific methods or specific procedures. Research has its methodology and procedures to complete the objectives and answer the questions set at the beginning. There are two common types of research designs, quantitative and qualitative (Creswell, 2013). Qualitative research refers to the "meaning, concepts, definitions, characteristics, metaphors, symbols, and descriptions of things" (Gray, 2014). Qualitative research is concerned with developing explanations of social phenomena. That is to say, it aims to help us to understand the social world in which we live and why things are the way they are (Hancock, Ockleford and Windridge, 2007:6).

5.4.1 Research Strategy

This study takes on the constructivism perspective and has used a case study as a strategy of inquiry; one of the features of a case study research is its flexibility. Case studies are often used in exploratory research. The case study method allows for the generation of new research that can be tested and evaluated and produce in-depth for possible use by other similar cases. Case studies provide valuable insight into the illustration and development of theories and existing models demonstrating the relationship between the different variables. The case study strategy has allowed the researcher to examine the data thoroughly within certain limits, which concluded that a case study approach allowed for the selection of a small geographical area or a limited number of participants for the focus of the study.

The case study approach was appropriate to conduct this study as the researcher was provided access to a specific organization "iLembe District Municipality in Noodsburg". This approach has assisted with the investigation of a contemporary phenomenon in-depth and within the real-world context, especially when boundaries between the phenomenon and context may not be evident. The researcher adopted this approach mainly to understand a real-world case and not assume an understanding that is more likely to involve important contextual conditions pertinent to the iLembe District. This research strategy was relevant to this study because of the impact on the water management practices and the causes of the limited water supply that are affecting not only the KZN province but South Africa. In this context, a case study design was preferred to explore the full nature of the phenomenon, while understanding the current underlying issues in the iLembe water region.

5.5 Secondary sources

Secondary data included books, journal articles that have been used to discuss the study's conceptual and theoretical framework. Substantial work has been done in developing the theoretical framework of which has been drawn from an extensive review of literature relating to political ecology and water management. The researcher has used information gathered from national, provincial, and municipal government legislation as well as policy documents.

The desktop analysis involved a literature review on climate change and governance in informing the theoretical framework of the study. The review of the literature has helped to contextualize the study, sharpening our shared understanding of the governance of climate change and public participation. The literature review has also provided a more detailed basis

for developing the skills capacity methodology and research instruments to enhance our understanding of the findings gathered from the one-on-one key informant interviews.

5.6 Primary sources

According to Creswell (2013), "Semi-structured interviews are commonly defined by their conversational nature. Such a conversational approach means that each interview varies according to the interests, experiences, and views of interviewees (Creswell, 2013)". According to Gray (2014), respondents can share their experiences, which they experienced first-hand and in their own words.

The researcher is given a chance to ask the respondents to elaborate further and explain in detail when necessary. In addition to the literature review, the researcher conducted qualitative in-depth one-on-one interviews with key stakeholders. This has enabled the researcher to generate a comprehensive understanding of the participatory processes; for instance, in this study the use of information gathered during the qualitative in-depth one-on-one interviews with key stakeholders helps to contextualize the study. The study has used documents of the Ilembe District municipality, such as the IDP, policy, and strategic plan. The advantage of using documents is that they can be accessed at a time convenient to the researcher. Documents represent data that is thoughtful, in that participants have given attention to compiling and written evidence; it saves the researcher the time and expense of transcribing (Creswell, 2013).

5.6.1 Key informant interviews

It was proposed that approximately three one-on-one qualitative interviews can be conducted. These interviews were drawn from iLembe District Municipality. These key stakeholders are knowledgeable about the iLembe District Municipality and work on the ground with the ward committee members in the local government sector as well as environmental issues.

5.6.2 Focus group discussions

The researcher and the team conducted three focus groups consisting of five community leaders and members in each group of the community in ward six, Noodsburg, iLembe District. A pre-designed focus group interview schedule was used and all focus groups used the same questionnaire which implied a semi-structured interview format. The group of participants were guided by a moderator, who introduced the topics for discussion and helped the group to participate in a lively and natural discussion. The discussion was “focused” on

particular areas of interest, in this case their views climate change. The intention of these focus groups was to interrogate and explore a few topics in greater detail.

5.7 The Sampling process

5.7.1 Target population

According to Gray (2014), "Qualitative research usually works with purposive non-probability samples because it seeks to obtain insights into particular practices that exist in a specific location, context and time." The study was based in KwaZulu-Natal because the researcher is familiar with the area and has worked in the development space there. Data collection was conducted during 2019-2021 at the relevant office and community. The study was conducted in the context of governance and environmental issues. The research is vested in the environmental, political and economic domain as it was informed by the political ecology theory. The population that was chosen for this study was made up officials and community members in Noodsburg, iLembe District. Since purposive sampling is vested in the realm of identifying participants who have rich information on the subject or experience, the researcher's sampling was limited to the various key stakeholders in iLembe District. The study targeted eight provincial officials and conducted three focus groups consisting of community leaders and members of the community in ward 6, Noodsburg.

5.7.2 Sampling strategies

Since the study does not target any particular race to collect its data, it has employed non-probability sampling, which is purposive. It is better to use this approach because the researcher selects the appropriate population (Babbie & Mouton, 2001).

5.7.3 Sample size

- The interviews include four district officials from iLembe District municipality
- The focus groups consisted of fifteen community members in ward 6, Noodsburg ILembe municipality.

5.8 Validity and reliability

Welman, Kruger and Mitchell, (2005:9) notes that qualitative and quantitative researchers aspire to realise outcomes that are reliable and valid. According to Babbie and Mouton (2002:119), reliability is a matter of whether particular techniques, applied repeatedly to the same object, would yield the same results each time. On the other hand, the validity of results

is deemed preferred by qualitative researchers because the outcomes of the study must signify what the study is seeking to investigate.

Our quality control assurance processes involved monitoring and reviewing data to ensure that the data expected from each fieldworker has been received and that it complies with the required quality standards. An experienced in-office data analyst has monitored the incoming data on an on-going basis and reports on any irregularities or inconsistencies as they occur. The data analyst has been in regular contact with the fieldwork team to communicate quality concerns if and when they occur.

5.9 Analysis of data

A variety of different analyses can be conducted to conceptualize possible relations between various pieces of data. According to Creswell (2013), in the data and interpretation, in general, the intent is to make sense of text data. It involves segmenting and taking apart the data as well as putting it back together in light of the research questions. Creswell (2013) also states that the data analysis in qualitative research will proceed hand in hand with other parts of developing the qualitative study, namely, the data collection and the write-up findings. While interviews are going on, for example, researchers may be analyzing an interview collected earlier. This process is unlike quantitative research in which the investigator collects data, then analyses the information, and finally writes the report. Since the written up, data is abundant, and the researcher cannot use all the information that is provided in the study. When the researcher reached the analysis stage, he/she has "winnowed" the information received from participants. Winnowing is a process whereby the researcher keeps or disregards irrelevant information (Guest, MacQueen & Namey, 2012).

The qualitative data analysis has entailed thematic analysis which involves making systematic comparisons across units of data (for example, interviews, statements, or themes) to develop conceptualizations of the relations between various pieces of the data. The idea behind the use of this qualitative data analysis method is to identify the key themes that have emerged from the data and to be able to draw out the critical issues related to the research questions. The thematic analysis consists of six steps according to Braun and Clarke (2006) and these steps were followed:

Step 1: Getting familiar with the data

Step 2: Generating the first set of codes.
Step 3: Searching for themes in the coded data.
Step 4: Reviewing the themes.
Step 5: Redefining the themes and naming the themes.
Step 6: Producing the final report.

During the process of data analysis, the researcher went through each transcript and became familiar with the data by ensuring it was correct, consistent, and useable. The researcher looked for spelling and language errors within the data and corrected the errors while processing to ensure clean data. After this process, the researcher captured and exported the data into ATLAS TI 8 software for subsequent coding and analysis and the researcher was able to identify themes, patterns, and categories as they started to emerge. Coding comprises of seeking codes on topics that readers would expect to find, based on the past literature and common sense, codes that are surprising and that were not anticipated at the beginning of the study, unique codes. The coding process was followed to generate a description of the setting, people, categories, and themes for the analysis. This analysis is useful in designing detailed descriptions and themes that have been represented in the qualitative narrative. The most popular approach is the use of a narrative passage to convey the findings of the analysis. The final step in data analysis involved interpreting the qualitative research of the findings or results (Creswell, 2013).

The goal of the researcher is to provide an analysis of the data collected that is written in a vibrant and explanatory fashion that would enable individuals from non-scientific backgrounds to understand the information provided clearly. The researcher has written a detailed result and analytical chapter. The thesis provides a literature review as well as a methodological discussion that has outlined the research design, fieldwork, data capturing, data cleaning, and other aspects of the data collection process and outlined recommendations for policy and practice.

5.10 Ethical Considerations

According to Welman & Kruger (2001:189), the researcher must ensure that participants' spontaneity is not inhibited regarding concerns about confidentiality and logistical constraints in conducting the data collection processes. Ethical considerations for this study were taken into account by the researcher. Ethical clearance was obtained from the iLembe District

Municipality before this research being undertaken. In particular, ethical consideration was given to ensuring that informed consent was obtained by the research from the respondents.

The right to privacy, anonymity, and confidentiality was assured by the researcher by ensuring that data obtained from the interviews would not be individually traceable. The respondents were also assured of their safety and that no harm to their person would be rendered vulnerable and unsafe through the interviews. The researcher conducted all key informant interviews directly, and administered focus groups with a team directly, using an objective and consistent approach. Babbie & Mouton (2001:5) state the need for researchers to observe strict ethical conduct to ensure the objectivity of the research process. In conducting this research, the researcher made a conscious effort to ensure professionalism and adherence to ethical research conduct and protocols.

5.11 Conclusion

This chapter provided a detailed background of the methodological approaches used in this study to investigate and respond to the key research objectives and questions using qualitative data collection techniques. Noodsburg ward 6 in iLembe District municipality was chosen as a case study for this research for a number of reasons, including the need to understand attitudes towards climate change. The case study, the key informant interviews and the focus group discussions represented the qualitative research approach in this study. The target population was described, as well as how the sample was drawn. The sampling procedure and the data collection methods used were highlighted, and a description of how the interviews were administered was described. The analysis of the data made use of transcribing and coding, which was deemed to be sufficient for this study. The techniques implemented in this study to overcome some of the potential flaws and to ensure a robust analysis of the focus group discussions were also discussed. The next chapter presents and explains the research data in addition to providing an analysis of the findings of the research.

CHAPTER SIX

DATA DESCRIPTION AND ANALYSIS

6.1 Introduction

According to Sharma (2018: 3), data analysis is the process of developing answers to questions through the examination and interpretation of data. The basic steps in the analytic process consist of identifying issues, determining the availability of relevant data, deciding on which methods are appropriate for answering the questions of interest, applying the methods and evaluating, summarising and communicating the result. Chapter five of this study details the various data analysis methods that were used. This chapter presents the results of qualitative techniques used in this study. The focus was on recording and understanding the local knowledge, attitudes and aspirations of the communities within the area. To do this a qualitative method approach was adopted, to collect as wide a range of data as possible.

The data gathered has been analysed and reported on within the context of the focus group discussions and key informant interviews in the following chapter. This chapter addresses the study's research objectives, which are to critically examine critical factors that affect water-related communication and decision making within Noodsburg; to examine the attitudes and perceptions held by the community in Noodsburg towards climate change and its impact and to understand the role of community stakeholders in dealing with the climate change impacts such as water shortages through qualitative analysis.

This section presents the findings of the study and the demographics of respondents who participated in the focus group discussion. The analyses is presented as follows:

- The Socio-demographic profile of community participants;
- The community's attitudes towards environmental issues such as climate change.
- Community participation in environmental issues;
- Responsibility for addressing climate change.

As mentioned in the previous chapter, a pre-designed focus group interview schedule was used, and all focus groups used the same questionnaire, which implied a semi-structured interview format. The participants were guided by a moderator, who introduced the topics for discussion and helped the group participate in a lively and natural discussion. The intention of these focus groups was to interrogate and explore a few topics in greater detail.

6.2 Socio-demographic profile of respondents in Noodsburg

An analysis of the demographic profile of participants is vital in such research as it provides a context to understand the influences they could have on the attitudes and perceptions of climate change in their day-to-day life. The demographic profile also provides insight into the participants' culture, which influences environmental behaviour according to Caldas et al. (2015). Baatz (2014) contends that since it is at the individual level where pro-climate change behaviour rests, it is important to understand individuals' demographic profile. The participant's age and gender are discussed below.

6.2.1 Age of Respondents

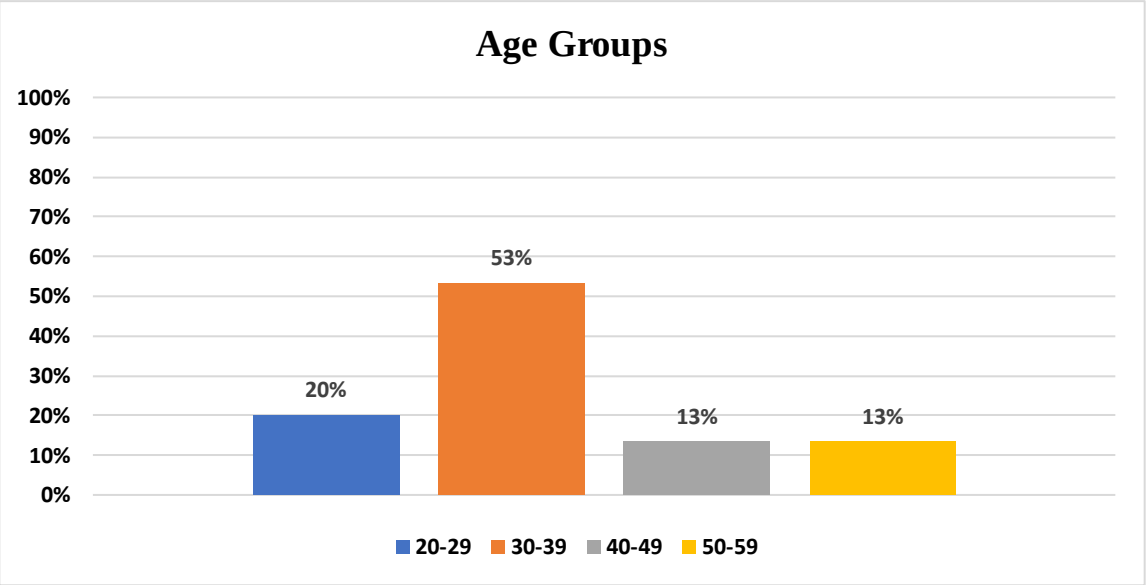
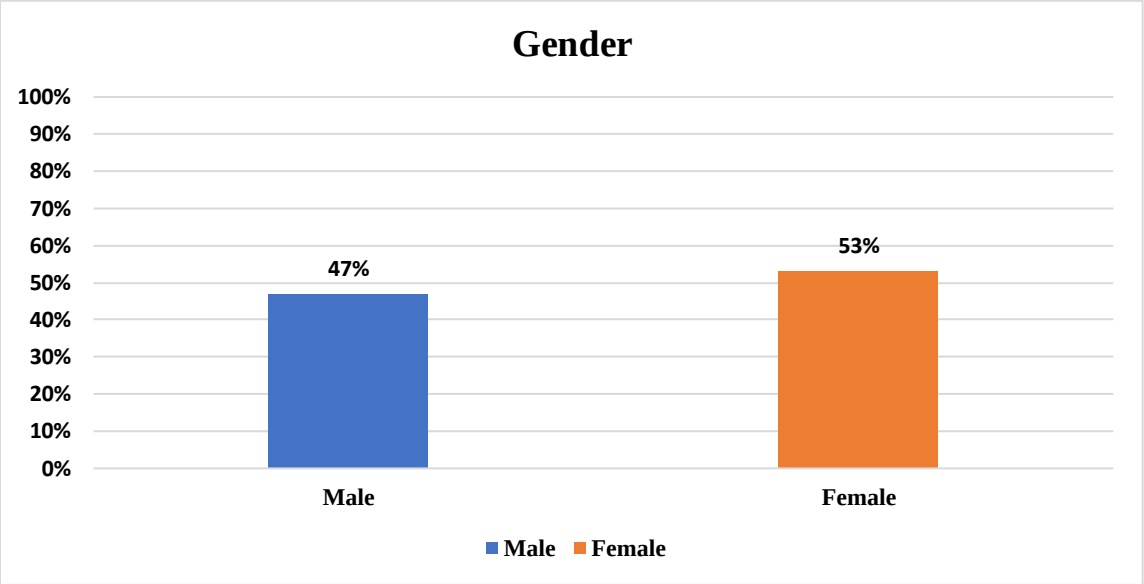


Figure 6.1 illustrates the age of respondents in years

There is much debate about age and environmental knowledge, attitudes and behaviour, and there is no clear trend due to various reasons. Whitmarsh *et al.* (2011) indicate that younger people tend to be more concerned with environmental problems such as climate change, which indicates a negative association of age with environmental attitudes and concerns.

The total sample for this study was divided into four age groups. The range of the age of participants is from 20 years (school leavers) to 59 years, and the mean age is 30-39 years. From Figure 6.1, 53% of the participants are aged 30-39 years old, and these also make up the largest portion, and 20% of the responses are from those aged 20-29 years old. Interestingly, fewer older people participated in the focus group, as reflected by the relatively lower percentage (13%) for those above 50 years old, compared to those between the ages of 30-49 years old. The majority of the respondents are over 30 years (53%). This indicates that the responses gathered are mainly from an adult (mature) source. The responses are reflective

of the age demographics in the community of Noodsburg. The focus group participants also commented that they are aware that few older persons are between the ages of 40-49 and 50-59 years.



6.2.2 Gender of Respondents

Figure 6.2 Illustrates gender of respondents versus percentages of males and females

The UN's Agenda 21 considers women as one of the major groups in tackling environmental issues and suggests that their capacity must be strengthened (Fredericks, 2014). The National Environmental Management Act in South Africa (NEMA) also asserts that women play a vital role in environmental management. Women must therefore be supported and involved in finding solutions to environmental problems.

Figure 6.2 indicates that most participants (53%) were female, while only 47% of the participants were male in this study. Gender has no significant effect on environmental awareness, according to Gupta (2015) and Shivakumara *et al.* (2015). However, this study supports the earlier findings of Brody *et al.* (2008), Davidson and Freudenberg (1996), Schan and Holzer (1990), Tranter (2011) and Wehrmeyer and McNeil (2000). They indicate that women were more environmentally concerned than men and that women are more likely to actively participate in pro-environmental behaviours, as indicated by the better response rate for the completion of this climate change focus group in this study. UNFCCC (2016) identified a gender gap in public participation for climate change policies and actions at the country level. This study on climate change governance can therefore contribute to addressing the aforementioned gender gap, as it demonstrates that women are prepared to be

involved in climate change-related issues given their greater involvement proportionately than males in this study.

6.3 The local community's attitudes towards environmental issues such as climate change

The following section unpacks the participant's conceptualisation of the term climate change. It is important to understand what the term Climate change means and to be able to understand its impacts. Climate change refers to the general increase in air temperatures worldwide (Riordan & Rundel, 2014). Climate change has become a key concern within South Africa. As mentioned in the early chapters, the mean annual temperatures have increased at least 1.5 times and the observed global average increase of 0.65°C during the past 50 years and these changes are likely to continue (Ziervogel et al., 2014). Participants in the focus group discussions that were conducted were asked, "What is climate change or what do they think climate change is?" Participant one in group one said,

"I am not sure, but I think it is the change of weather. As the year's pass, I have noticed that the temperature is increasing. For instance, before, we knew that it would rain a lot between October and December, but that has changed. I do not know what causes it, but I know that things are no longer the same".

Participants indicated that climate change has affected seasonal rainfall patterns by reducing the length of the rainy periods as well as the amount of rain with consequences on crop and livestock production. The same question was asked in group two, and participant five answered and said,

"I think it the change in the weather because now you can't predict what the weather will be like in a certain month. Before or years back, you were able to predict or know that in October, it's a rainy month, so we are going plant and farm. But now, all of that has changed. It's also hot than before now. Back then, it wasn't as hot as it is now".

Another participant in group three said, *"I think it is because of the change in the atmosphere as scientists always mention or tells about the cracks that are happening in the layers in the atmosphere that contributes to abnormal rising and dropping of the temperature".*

In all three FGDs, it was indicated that there had been a change in the onset of the rainy season from October to mid-December, whilst the end of the rainy season has shifted from March to April. Local leadership noted that the community used to receive early rain. The

majority of participants, based on the above discussion, indicated that they have observed onset of the rain season had shifted and is now shorter and that the amount of rainfall has been decreasing. Findings from this discussion indicate that local communities perceive that rainfall is decreasing whilst temperatures are increasing. Findings are in line with IPCC (2014) predictions that temperatures across different scales are set to increase whilst rainfall in southern Africa is set to decrease.

According to Brace and Geoghegan (2011), ambiguities regarding the definition of climate change ought to be addressed for those outside the scientific community, as this enables public understanding of policy and legal frameworks implemented to address climate-related challenges. In this case, of interest is that in the focus group discussions participants' understanding is closely aligned with the scientific concept of climate change as revealed by their interpretations that climate change is linked with changes in weather conditions and patterns. While some participants were able to give a definition or explain what climate change is, the majority of responses to the question about their understanding of climate change centred on the causes of climate change. Participant one in group two said,

"I think it is mainly we the community, by being reckless and not paying attention to our environment which is now causing climate change. Firstly, there are huge factories that manufacture good and release emissions, which then cause climate change and severe weather patterns. Secondly, I think the people themselves cause it by not taking care of their own environment. If you look at the recent flooding we have experienced, instead of water flowing properly and drainage systems working efficiently, wasteful toxins and plastic bags on our drainage, which then blocks the water from flowing. It also creates a situation whereby the drainage is working efficiently, and that causes major problems for the people who are going to be affected by the water".

Participant two in the same group said, *"I think it is factories and toxins waste and the communities who do not do enough to take care of the environment. This is mainly evident when there are floods and how the water ends up ruining roads and houses because the drainages are full of dirt, which makes it difficult for the water to flow properly."*

This shows that there is some basic understanding and observations being made by the public about climate change. This suggests that there is some level of awareness and knowledge about the physical environment that they live in. These discussions in the focus group indicated or suggest a general awareness among the community elders and other community

leaderships that climate change and variability has also been a reality in the area. Adger et al. (2013) suggest that local communities could interpret and construct climate change trends within a cultural setting. The United Nations (UN) recognises the significant role played by indigenous knowledge, cultures, and traditional practices in promoting sustainable development, equity, and management of the environment.

According to Kupika et al. (2019), understanding local community perceptions on impacts, causes, and responses to climate change is vital for the promotion of community resilience towards climate change. Unfortunately, the African continent has been identified as one of the parts of the world most vulnerable to the impacts of climate change (IPCC 2014; Niang et al. 2014).

Participants also had an opportunity to share where do they get their climate change information. When asked the question, "Where do you get most of your current information on climate change?" one of the participants said,

"Sometimes there are natural signs that I can use to tell if it is going to rain or not, for instance, in summer, if the heat is more 33 degrees, 95% chances it will rain that evening and with thunder."

There is an indication here that some community members rely on their local ecological knowledge on climate patterns and impacts. The majority of the participants from across the three focus group, however, get their information through the radio and television; one of the participants shared,

"Sometimes information on climate change is accessed on radio and television; however, there are people who do not have TVs and radios, so they are unable to access this information. Like today, we were told we might have heavy rainfalls; there are people who do not know that. You see, so it depends mainly on the type of life that those people live, but generally, they do not have the resources to access this sort of information."

The above participant indicated that most people might not have access to the radio or television to receive information about climate change. Another participant said,

"*Information is hard to come by; it really is. More especially when one does not have access to television and radio, sometimes when you lucky, you can access it through your phone where you make a ', please call me' are sent a message with a weather warning by chance*. *In*

addition, when we have leaders of our community in meetings, we find out from them at the meetings."

From these focus group responses, it's clear that the majority of the community residents do not receive any information about environmental issues or climate change besides from the media. This confirms the information that has been included in the IDP that the iLembe District Municipality needs to develop an Education and Awareness Plan that will respond to the abovementioned issues. Some of the other responses give an indication that some community members still associate climate change information with weather forecast predictions. For instance, one of the participants said,

"*We get it on television, radio and cell phones, as my colleagues have indicated. However, if one does not have access to any of these mediums, because there are residents who do not have any of them available. You ask your neighbour what the weather looking like tomorrow is".*

The results confirm that there is definitely a need for an education and awareness plan associated with Climate Change. The needs assessment that was conducted by the District and the DEA in previous years found that there is a lack of dedicated environmental management units in most municipalities, resulting in Environmental functions placed within varying units of the municipal organisational structure; availability of the budget to perform environmental functions within municipalities.

The iLembe IDP stated that environmental management is not regarded as service essential to improving quality of life which leads to no attention given to performing the function; lack of general environmental awareness within the municipal structure leading to the lack of environmental management support being received from the municipality; and lack of relevant environmental management tools to guide environmental management within Municipalities. Based upon the above responses of the participants and information from the iLembe IDP, it's clear that not only is there a fragmented understanding of environmental management in the local sphere, it also shows within the citizen ground floor level.

Participants also had an opportunity to discuss the most critical environmental issues that they are currently experiencing or impacting their life, and the majority of the participants mentioned the shortage of water supply. Participant one in group one said,

"It is the shortage of water for me. As the weather keeps on changing, there are no longer many water fountains like before, and that has made a lot of people rely on water tankers. It used to rain a lot during summer but not anymore, and that causes drought, and we suffer as people, our plants and our livestock. It has come to a point where our government has to save the little water that we have so that we can all share. Another challenge is that our government has to recycle the water, purify it with many chemicals and sell it to us, whereas with the water fountains, we used to have free natural water".

Observations from this discussion are also similar to those by Taylor et al. (2012), who noticed that more frequent and intense climate extremes such as droughts and floods increase variability in soil moisture and surface water. Observations from this discussion related to drying up of rivers and poor water quality in surface and groundwater systems coincide with findings by Urama and Ozor (2010), who reported that impacts on water resources act in conjunction with other factors to affect ecosystem health and socioeconomic well-being of human communities.

The South African government has recognised and committed to providing water for South African citizens. In the constitution of the Republic of South Africa section (152), it is noted that the core objectives of local government are "to ensure the provision of services sustainably", and section 27 (1) (b) states that the citizenry must have the "right of access to sufficient water" Having access to clean and sufficient water is a constitutional right and requirement (Alexander, 1991). This isn't the case for these residents who live in Noodsburg. Participant one in group two said,

"There are a few challenges, firstly, water shortage, there is a severe shortage of water in the community. Sometimes when they do bring us water, through water tanks, they only bring them once a month, and that is the only time people get to access clean water. There are also people who live in secluded areas where the water tanks do not reach, which means those people never get to access any water. That is the main problem for me. Water shortages".

It is clear that water is the primary medium through which the impact of climate change is being felt in this area. According to Grecksch (2015), climate change in South Africa will result in changing rainfall patterns, the intensity of storms and the extremes of droughts and floods, increasing evaporation, changes in soil moisture and runoff and thus water availability, changing water quality conditions and increasing climate variability. Participant

one in group three, when asked," Which are the most critical environmental issues that you experience or impact on your life at present?" said:

"The increase or invading of alien or invasive species (introduced outside its normal distribution) into our county has cost the community or the country a large amount of water as alien species consumes more water than indigenous species and lead to more rivers being dried out. Climate change also contributed to the changing of four seasons as now they prolong than the usual way or the way it was previously happening, and that affect the farmers since they end up not knowing when exactly to sow. Secondly, when the season final changes, the temperature changes extremely and affect the growth of the crop, like when there is too much rain the crops get flooded and when there is too much heat they struggle to grow".

From this, we can note that the community member is knowledgeable and aware of the environmental issues affecting the community. The commonly anticipated impacts associated with Climate Change, in general, include the warming temperatures and increases in the number, duration, and severity of heatwaves, which will lead to changes in the growth and distribution of plants, animals, and insects (Cullinan, 2016).

Human communities and natural ecosystems worldwide are under siege from a growing number of destructive invasive alien species (including disease organisms, agricultural weeds, and insect pests). These species erode natural capital, compromise ecosystem stability, and threaten economic productivity. In many parts of the world, the most challenging and time-consuming tasks of conservation biologists and managers are those relating to controlling alien species, preventing impacts and, increasingly, repairing systems damaged by aliens (Byers et al., 2001).

Water is a vital component of climate change and the primary medium through which it exhibits its impacts. Climate Change cannot be understood without looking at its impact on water, which is one of our planet's resources. Cullinan (2016) stated that South Africa is in a water crisis.

Climate change experts see water, specifically, to be at the centre of this vulnerability as the potential impacts on water due to climate change is projected to increase in magnitude, severity, and diversity (IPCC, 2007). South Africa is a dry country, and water resources have been distributed unevenly. Ashton et al. (2007) state that geographically, the water resources for South Africa are not where they are needed to be. Participants were also asked if they are

concerned about Climate Change, what are the main issues are they concerned about. The majority of participants across all focus groups held talked about water access being the main concern that they have. The findings are also in line with United Nations Framework on Climate Change (2006) assertion that Africa faces challenges related to water availability and spatial variations in the location and need for water resources.

Participant one in group two said,

"My biggest concern is definitely water access, and we are not getting water the way we should be. Another thing, our leaders should, at all times, reach out to the community to warn us about the extreme water conditions because when it rains, it rains hard, but when it is hot, it is hot for a very long time. There is no balance, and we do not have information, which makes it worse".

Another participant from the same group also mentioned water access and that they do not have enough access to water:

"Yes, it is water access; there is not enough access to water. In addition, our leaders should be more involved in their communities and see the conditions their people are living under. You find instances, whereby there are strong winds and houses, are blown away and are destitute, so the leaders must intervene and see where they can help in order to make our areas safe".

Goal six of the seventeen SDGs focus explicitly on freshwater, including Sustainable Development (SDG 6): *"Ensure availability and sustainable management of water and sanitation for all"* Goal 6, in particular, calls for improving water quality as well as for protecting and restoring water-related ecosystems (Hering, Maag & Schnoor, 2016). According to Water-U.N (2018) synthesis report, the 2030 Agenda lists rising inequalities, natural resource depletion, environmental degradation, and climate change among the most significant challenges of our time. It recognises that social development and economic prosperity depend on the sustainable management of freshwater resources and ecosystems, and it highlights the integrated nature of SDGs.

From these responses, it is clear that water access is definitely a concern for the community members; additionally, they also mentioned that their community leaders don't reach out and are not involved or communicate with them with regards to environmental issues. Surface water is heavily committed for use, water is imported from neighboring countries, and the

limited groundwater resources do not offer much reprieve (Scholes, 2001). As a result, water availability is predicted to be the single most significant and most urgent development constraint facing South Africa. Water governance recognises that water plays an essential role in poverty reduction and the economic development of a country and hence emphasises the importance of the responsible use of water resources in order to ensure efficiency (UNDP, 2013). The country's water governance system shows significant elements of fragmentation (DWA, 2011). In many areas, there is a high level of disintegration between water stakeholders and various sectors that impact water resources (Movik and de Jong, 2011). A handful of studies have revealed that this is partially due to the legacy of the previous water legislation, in which water resource management was highly centralised and did not allow civil society to influence decision-making (Quinn, 2013).

While the majority of the responses centred around not having enough excess water resources, some responses that came out from the focus group discussions was the concern around the impacts on their livelihood system, which is a disturbance in their agricultural activities since they live in a rural area, some of the community members are dependent on farming for their household needs and are dependent on their crops for their subsistence needs. The below discussion with one of the participants in the focus group indicated that frequent extreme events such as drought and increasing temperatures affect soil moisture and surface water availability for both domestic use and agriculture. The participant shared their main issues concerning climate change and said,

"One of the main issues concerning climate change is the vegetation. Since in rural areas most of the people depend on vegetation to feed on as well as selling, shortage or too much of rain it causes the crops to suffer".

Another participant also added and said, *"The delay of rains cost the farmers too much money because their crops and livestock suffer, and they end not being able to sell and that contribute to poverty as well".*

These findings explain that community members agree, extreme events related to climate change, such as prolonged dry periods and excessive temperatures, have affected agricultural activities and the biophysical environment. Respondents were also asked if they have noticed any changes in the area or community during the time that they have lived there, which may suggest that the climate is changing. One of the respondents said,

"*Yes, there are birds that we grew up seeing (ingududu) that are no more. They used to make a certain noise if there is heavy rain that is coming that day, they will fly together to the opposite direction where the storm will come".*

Another participant added,

Yes, for example, the seasons were almost on time with the calendar. That used to determine which crops to plant, which will lead to a greater harvest. We knew the perfect season to plant maise meal and which perfect season to plant pumpkin but not anymore. A lot of farmers are discouraged because of less harvest that they sometimes get because of the unpredictable weather.

This indicates that local ecological knowledge can provide information on the changing climate. Such information can complement scientific data to inform policy on best practices to build the adaptive capacity of rural communities. Findings in this discussion are in line with the IPCC (2014), which states that climate change impacts affect both natural and human systems. Findings from the above discussion are also aligned with what Stern (2016) has identified, that climate change is one of the two pressing issues facing humans, the other being poverty.

Stern (2016) points out that there is a considerable risk for a safe and thriving world in the future if these two issues are not addressed adequately and quickly. Participants shared that their crops are suffering, and they are not able to conduct their businesses to receive an income for their households, and they aren't able to meet their subsistent needs. Findings show that there is a gap between 'awareness' and 'knowledge' because widespread familiarity of climate change related topics did not result in adequate knowledge. Findings from these responses highlight the necessity for harnessing local knowledge to enhance community resilience and promote ecosystem-based adaptation strategies in the face of a changing climate.

6.4 Community participation in environmental issues

As noted in the earlier chapters, the Organisation for Economic Co-operation and Development (OECD) (2001:4) recommended that municipalities should design successful information, consultation, and active citizen participation strategies. The Local Government: Municipal Systems Act, 32 of 2000, also encourages the active involvement of the public in municipal affairs and against this background, the ILembe District Municipality encourages a culture of public participation, which is primarily viewed as a democratic process for

engaging people in decision-making, planning, and generally allowing them to play an active role in their development and service delivery.

A decision was made for the country to develop a climate change response policy through a transparent, participatory, and scientifically informed process, providing a focus for action (Raubenheimer, 2011). According to Hemmati (2012), there is a need for multi-stakeholder processes for sustainability and governance when dealing with climate change. Participants in the focus group discussion were asked, "Do you think the public should be actively involved in deciding what should be done about climate change?" one of the participants from the focus group answered,

"*It is very important that the public get involved so that they can share the opinions and have an input since they are the ones that experience the change and so that they can be informed as well about the actions that they need to take in order to reduce the towards contributing to climate change."*

Another participant added, *"It is important for the government to bring itself closer to the people because there is nothing the government can do if they have not heard our grievances, and there is nothing we as the community can do without the help of government, so it is important that we work together."*

Another participant responded*, "Yes, the community needs to communicate with the government; however, the government definitely needs to ensure that they bring themselves closer to the people in the local communities because the people cannot communicate with the government if the government is not coming to the people."*

These statements give us an indication and confirmation that what's set out on paper about what needs to be done in terms of including the public and allowing them to play an active role in decision making is still not happening in this community. Almost all participants across all focus groups mentioned that there is a need for the government to come closer to the citizens. The discussion also reveals that there is a need for governance in this area. Paproski (1993) defines governance as the management process that involves interaction between the public sector and the various actors in civil society. According to the United Nations Development Programme (UNDP, 2013), good governance incorporates four poverty-centred dimensions, namely, political, economic, social, and environmental.

It's clear from the discussions in the focus groups conducted that there is a lack of public involvement and insufficient representation of local stakeholders and their vested interests, in particular, the poor and those living in rural areas. One of the participants said,

".... starting with our own local council. In other places, you find out that the Local Councillor does not even stay in that area. How then are they going to represent people while they do not fully understand their everyday struggle? They only come to listen and go."

What is noteworthy is that in one of the focus groups, a councillor was present; however, some participants didn't know this, which gives an indication that there isn't any form of communication or awareness about who is their local leader. The Institution for democracy in South Africa (IDASA) carried out a Citizen Report Card (CRC) exercise in 22 municipalities across the provinces of KwaZulu-Natal, Mpumalanga, Limpopo, and Northwest. The exercise of the Citizen Report Card revealed that the establishment of ward committees did not contribute to meaningful engagement and did not improve the provision of information to communities. The Citizen Report Card found visibility of councillors was a problem, that councillors are not accessible to communities and do not maintain the requisite interaction and coordination with local people except before elections. Another Participant said,

"*....I cannot emphasise that enough. The community must work hand in hand with the government so that they can firstly be on the same page because even in rural areas, problems are not the same, so there is no solution that is one size fits all."*

Clearly, there is no form of participation happening within the Noodsburg community because the participants felt that they are not being included. According to Thabethe (2007:15), the principle of participation derives from an acceptance that people are at the heart of development. People are not only the end beneficiaries of development but should be actively involved as agents of development. This study investigated the relations between role of communication and construction of cultural meanings of climate change risks in the individuals' minds. In particular, this research attempted to identify important sources and actors as well as the structural process of climate change communication at the community level. This study finds that communication of climate change is determined by the structure and process of local communication repertoire. The next section seeks to unpack who is responsible for addressing climate change.

6.5 Responsibility for addressing climate change

According to Bulkeley and Newell (2015), there are complexities when dealing with climate change because there are three factors that are connected. One being the various scales of political decision making that has involved, two being the fragmented and unclear roles of state and non-state actors and lastly, the complex nature of the processes that lead to emissions of the greenhouse gages (GHG) in the everyday processes of production and consumption. Participants were also asked, "Do you think enough is being done by the South African government to take action on climate change?" one of the participants answered,

"No, the government is not doing enough. In most instances, most of what the government is supposed to be doing for us is not being done. The government is dragging its feet when it comes to ensuring that we are safe and able to access water, and I do not know how long it plans to continue dragging its feet on this matter. We plead with the government to take responsibility and communicate with our local community leaders and ourselves as local residents in order to work together and ensure that we get the help we need."

Another participant stated,

"No, our government is not doing enough. Many people do not even know or understand what climate change is and what causes it. Hence, they do what they do without knowing that they are causing damage to climate change. Our government must share knowledge on all platforms, educating people about climate change. That also will make a difference."

Another participant answered, *"No, the South African government is not taking enough actions on the issue of climate change because he is not giving enough information or equipping people on how we can avoid the climate from such a radical change."*

There is an indication based on these answers that information regarding climate change is hard to come by and that not enough being done by the local leaders within the communities and government officials to inform residents about the latest developments in relation to climate. The lack of awareness of government initiatives is an important issue that must be addressed in climate change learning. The majority of the participants shared the same sentiments and feel that there would be a difference if consultation processes are being implemented and people are being equipped with more information about environmental issues. This discussion highlights the lack of political will and understanding of the critical relationship between climate change and biodiversity issues and awareness.

Another participant shared,

"No, the South African government is not taking enough actions concerning the issue of climate change since the government has not yet made means of educating or reaching to people within the communities on how to take care of the environment in order to avoid the continuing of the climate change that we experience every day. Secondly, our government's budget is always not enough towards the resources of preserving or reducing the continuing climate change."

Based on this, it's clear that the government isn't doing enough, especially in sharing information. There is a sense that if the government is sharing information and educating the people in the community, people might actually know how to take care of the environment and will be informed and empowered to do better in the physical environment.

The findings in this study indicate a gap in climate change knowledge that requires to be addressed in any climate change learning initiative. Clayton *et al.* (2015a) advocated that understanding the issues around climate change facilitates better engagement and action. The participant also mentioned that the government has financial challenges, which is an issue to trying to combat the fight against climate change impacts.

Another participant added,

"No, our government is not doing enough. Firstly, one of the things that our government fails to do is to strategize with the communities in coming up with the simplest ways of helping with climate change. They sit on boards and decide on our behalf the solutions that they think are the best, only to find out they are the second or the third option for us. For instance, with the water issue, they use (WaterKan) as a solution to provide water to the community, while many of us prefer to use water fountains for fresh free water. If they can help us build and secure these water fountains, they can supply many people."

Another participant noted,

"Yes, the government needs to intervene. There are instances where you can see the government is trying, but they are finding it hard to make everyone happy. There are some people who are yet to be allocated housing, there are also some people who have not been provided water for, there are areas that do have running water, but there areas that do not. There is huge dissatisfaction, especially around water and housing access. We need to get help regarding that."

South Africa continues to undergo a considerable social, economic, and political transformation from land reform and housing development to improving and extending services infrastructure (Rodina and Harris, 2016). The transformation from apartheid to democracy-based local governments subsequently led to the establishment of district municipalities, who then took over the responsibility for water and sanitation services and attained the water services authority status. The government of national then unity promulgated and established a few statutory frameworks to ensure proper service delivery and transformation in the local government sphere (Rodina and Harris, 2016).

The uptake of the new Constitution of the Republic of South Africa of 1996 hurried up the transformation of sectors in public service and was guided by the different policies and legislative instruments. Section One of the Constitution of 1996 requires that all public services be transformed and democratised following the values of human dignity, the achievement of equality, and the advancement of human rights and freedom. However, local government is still faced with the challenge of poor service delivery, lack of infrastructure, and identification of appropriate vehicles for effective and efficient service delivery.

Climate change action is required from all levels of society by individuals, groups and governments (Butler *et al*., 2015). Additionally, climate change actions can be enhanced at all levels, from individuals to governments (Murphy *et al.*, 2016), while Swim and Becker (2012) believe that the individual plays an important role in climate change actions. In this study, participants were asked, **"**Who do you think should be responsible for making any changes to lessen the impacts of climate change" one of the participants said,

"The municipality should be primarily responsible for ensuring that we access to water and have reliable services. It should be the municipality because they have to ensure that if we do not have water in the river, then they should make provisions through water tanks to ensure that we do get water, and they should not limit it just once a week. It should at least be three times a week to make sure that we all get water, and it should be up to us to then save the provided water." Another participant from a different focus group said,

"I definitely think it is the municipality who should look to provide us with water. In doing so, the municipality should, in consultation with the local residents, communicate when the water will be made available and ensure that on the agreed dates, water is available for people to access."

Some people are of the view that industry, scientists and individuals are responsible for addressing climate change (Zwick and Renn, 2002), while others in a recent South African study indicated that government environmental departments are responsible for dealing with climate change (Pasquini *et al.*, 2013). The responses from this study suggest that the government, especially the local municipality, should be responsible for addressing climate change.

These findings support Kettle and Dow (2016) and Newell *et al.* (2015), who was also of the view that governments have a high degree of responsibility for solving climate change problems. Local government are increasingly recognised as critical to climate change, given their roles in scaling up adaptation of communities, households and civil society and in managing risk information and financing (Porter *et al.*, 2015). Another participant put it this way,

"*We need to work together. There are trees that consume a lot of water, which people plant without knowing. Sometimes government chooses places that people use to plant their crops for building roads or warehouses. Working together can significantly lessen the impacts of climate change, especially water."*

Few participants who felt personally responsible for making any changes to lessen the impacts of climate change, reflect of the views of Brügger et al. (2015) and Capstick et al. (2015), who indicate that people are not likely to adopt pro-climate change behaviour unless they feel empowered to do so and also feel that others in society are also undertaking similar actions. This lag in climate change responsibility is cause for great concern and must be addressed in any climate change learning intervention, as the literature has clearly demonstrated that individual actions on climate change are also important and sorely needed. Participants were asked the question, "would you be prepared to change your behaviour to reduce your contribution to climate change in any way"

Participant one in group three said,

"As the community members, we should make sure that we do litter and also use the toilets given to our community in order to avoid the water resources (rivers) from getting dirt (water pollution), and that will reduce the number of water diseases. The community must have a dumping site to avoid the littering and burning of rubbish anywhere because that contributes to air pollution."

Participant one in group one noted,

"Absolutely, in fact, that is what we need to do as the community. We need to observant, do not allow any unauthorised burning of fire and cutting of trees, as those are things that contribute to climate change."

Participants in the focus group mentioned that the community needs to work together, which suggests that individuals are willing to change their behaviour provided that everybody else is changing their behaviour that way, they will be able to change their behaviour. From the above responses, there is an indication that some community members know what to do and know their needs in order to be able to contribute towards the reduction of their contribution to climate change. Community members are willing to change their behaviours and are willing to work together towards combating climate change.

Participants in group two made suggestions on how they can change their behaviour. Participant one in group two stated,

"I think the leaders maybe, in their respective levels should organise meetings and imbizo to give us guidance on how these things work because a majority of us really do not have the knowledge for it."

Participant three in group two added,

"I think it may be easier if our leaders, councillors, were to create a place of information such as a library whereby accessing information would be much easier so that we can use that platform to get information, where we can get warnings and important information regarding climate change."

Based on the above responses, climate change communications from authority sources and information that continue to the instructor are forced upon people are likely to be successful. Participant four in group two responded,

"I also think it is hard to access information, but it would be easier if the councillors were to provide a place where we all meet maybe we schedule meetings which teach us about climate change so that we can know how it works and what to do and what not to do. On our part as local communities, we too can play our part by trying to stop any of the bad habits we have, which clearly are a contributing factor to this problem. I spoke about irresponsible behaviour earlier. Farming in areas we have been warned against comes to mind."

In view of these findings, the need for climate change learning for community members is substantiated and necessary as participants consider themselves as most trustworthy in taking action on climate change and that the public must be actively involved in deciding what should be done about climate change. Therefore, such learning will also support more climate change actions, enabling the public to provide meaningful input when consulted and actively involved.

One of the barriers that may prevent pro-climate change actions is the lack of reliable information about climate change (Shackleton *et al.*, 2015). People's willingness to adapt to climate change is determined by their knowledge and understanding (Brügger *et al.*, 2015; Shi *et al.*, 2015). This is underscored by Clayton *et al.* (2015a), who claimed that changing people's attitudes and beliefs by educating and providing them with information is sufficient to change their actual behaviour. The public also needs access to information on climate change to support global initiatives (Campos *et al.*, 2017), and Klenk *et al.* (2015) recommend that to improve the climate change response, it is necessary to engage stakeholders and share scientific information.

6.6 Conclusion

This chapter presented the analysis and discussion of the results collected from the focus group discussions. The discussion integrated the relevant literature and found some parallels and variances between the focus group participants and the literature reviewed. The findings were also considered against the theoretical frameworks of political ecology, stakeholder engagement and climate change governance. It is clear that attitudes, values, beliefs, motivation and the ability to adapt to climate change are key ingredients for pro-climate change actions. There is a gap between "awareness" and "knowledge" as identified among the participants when they had attempted to give detailed descriptions of the causes of climate change. A lack of clarity on roles and responsibilities was identified, one also identified by DWAF (2002) as the main reason for failure to deliver effective service. Chapter eight provides the summary and the recommendations emanating from this research endeavour.

CHAPTER SEVEN
FINDINGS AND DISCUSSION ON WATER GOVERNANCE

7.1 Introduction

This part of the study discusses the importance of water governance, and the challenges faced. As mentioned in the literature section, water governance acknowledges that water plays a crucial part in poverty alleviation and the country's economic development and stresses the importance of the responsible use of water resources. The chapter is structured thematically to align to the objectives of the study, which are "To assess governance legislative and policy framework that use models for public participation and "To examine the institutional mechanisms or water service provision strategies put in place by ILembe district municipality that deal with climate change impacts". Numerous studies show how the legacy of the previous water laws and WRM were highly centralised and did not allow communities to influence decision-making (Naster and Hansen, 2009). The institutional approach, interventions, implementation experiences and issues are discussed in relation to the primary data collected from officials at the iLembe District Municipality, Environmental Unit.

7.2 Water Governance Management

The Intergovernmental Relations Framework Act (Act 13 of 2005) mentions that departments within national, provincial and local government are a network of interacting institutions that deal with promoting sustainable service delivery. This is particularly relevant to water delivery as the constitutional principles of co-operative government are "based on the belief that government is more effective, efficient and responsive to community needs when the individuals and organs responsible for exercising state power act in collaborative and cooperative ways..." (Inter-governmental Dispute Prevention and Settlement, 2006: 9). Lack of clarity on roles and responsibilities is identified as the main reason for failure to deliver effective service (DWAF, 2002). The researcher asked the manager of the environmental unit to give an overview of the work the unit is responsible for doing. The participant one responded and said,

"The responsibility of the municipality is to manage natural resources, which include water, rivers, wetlands, biodiversity, ecosystems and coastal resources, your beach and dunes. We manage all of that, and we have climate change programs, waste management. We are also responsible for all of that. Still, at the district level, we coordinate and facilitate the management of those resources, where you will find that maybe a provincial of the national

department will love to have a program that they will love to implement within the Municipal area then we coordinate that".

This discussion confirms what has been stated in chapter four, the responsibility of the Environmental Management Unit, under the Planning and Integrated Development Plan, to encourage the management of these resources for the benefit of both current and future generations in line with the objectives of the National Environmental Management Act of 1998. The officials agreed and knew the roles and responsibilities that the department had set out. In assessing the application of governance principles and the institutional approach to water service delivery, the environmental unit manager emphasised a strong need to coordinate and align activities between the departments. He advised that to prevent wastage of resources at national, provincial or local government tiers must be aligned.

The researcher asked one of the key informants how they ensure good governance and accountability in the Municipality when providing services. The manager of the environmental unit in iLembe District (09 December 2020) said,

"We have a Department called Corporative governance that is responsible for that, it's the one that contacts the different stakeholders for us, and they guide us in terms of how to achieve a certain level of management, and constantly we hold meetings which are talking to governance that is fully functional. We also work hand in hand with uMngeni Water. We also align our plans accordingly so that no wastage in terms of resources used to service. National, provincial and local government spheres must have aligned plans. I must mention that Ilembe is a water service authority whose responsibility is to provide water, and that function is performed only by iLembe".

This reaffirms what has been stated in the constitution that to achieve the goals of co-operative government, it is important to work in an interrelated, independent, yet interdependent manner. To translate the government's mandate into action, a framework of legislation, policy and guidelines were crafted to enable well-coordinated and integrated governance machinery. Previously, the government was organised in a manner that allocated functions of power to one level of government, which was unwise, as other levels of government may have wanted to have a say.

Overall the Constitution gives the three different levels of government common areas of responsibility but also defines their distinct responsibilities. Different levels of government

have to work together and coordinate things. The researcher asked the manager of the environmental unit about challenges that they face with implementing effective water saving methods in the district. The manager responded as follows,

"Yeah we do face challenges such as pipe leaks, we are currently at the moment obviously through environmental management unit we are trying to introduce new technology that will detect pipe leaks somewhere and see how can we respond as quickly as we can, but obviously remember we provide water in stand pipes which we know that wastes water and old. People are not getting water due to non-maintenance of the pipes. the technical services is dealing with that by trying to find ways of instead of providing standpipes find ways on how we can provide more of sustainable kind of technology, informed technology that will be able to show us information about the number of allocations to the different people and that they will use this for instance for flushing, drinking maybe 25 litres but obviously relying on rain water harvesting so we obviously we are also providing tanks that are dealing with that."

Gathered from this is that the infrastructure that is currently being used is old and that little attention is paid to the functioning of these systems, the maintenance and operational constraints as well. From the above discussion one can conclude and state that the water supply can be interrupted when pipes are damaged which can cause households to search for alternative sources of water such as waiting for tanks.

According to Rietveld, Haarhoff and Jagals (2009) in principle, lack of water can be avoided by proper maintenance and repair. The above discussion revealed that the district is aware of their challenges and noteworthy they have plans in place to address those challenges by finding sustainable methods to combat the problems. The researcher also asked the question if there're any problems that are associated with water delivery in the region. The environmental officer one said,

"Well, places that people build for themselves for instance places like Maphumulo and Ndwedwe, you find that the topography will tell you something different, you find that people are located far away from infrastructure now the pipes have to go through mountains, and we can't reach there, so topography and issues of location of residential structures. You find that some are located far away from everything. Those are the challenges, and the issues of the source of water we have to rely ku-Thukela river mostly then uMvoti river and you find sometimes that these rivers have issues such as sand mining and affect the water source. it

changes the river structure, the infrastructure is here and the water-channel but you find that few years down the line the water isn't flowing where it needs too."

Dithebe, Aigbavboa and Thwala (2019) state that the public sector is responsible for the development and sustainability of water infrastructure in South Africa and for ensuring that communities across the country receive adequate service delivery, and this can only occur if the infrastructure required exists and in good condition. From the discussion above, we learn that the district has structures in place to assist the local communities, however some people end up building their households far from where the infrastructure can be built causing households not to have access to water and traveling far to reach the infrastructure. The district ends up being portrayed as not having provided water for the locals.

Sand mining also came up as a challenge, sand mining refers to the actual process of removal of sand or gravel from a place of their occurrence for example rivers (Langer, 2003). Rivers and their floodplains are an economical source of sand. And is required for a variety of purposes, including making concrete, backfill for houses footings amongst other things. Previous studies (Kondolf, 1998; Langer, 2003; Kondolf et al., 2008) show that in-stream mining of these aggregates can reduce water quality as well as degrade the channel bed and banks. The mining of these aggregates on the floodplain can affect the water table and alter the land-use (Langer, 2003). In this era of rapid land development, however, people have turned to rivers and floodplains as major sources of sand and gravel for construction (Kori and Mathada, 2012). The environmental manager of iLembe district (09 December 2020) stated,

"When the water doesn't reach were it needs to reach it then looks like we didn't provide the service, people fail to realise the factor of sand mining which basically delays the entire service or plan. We then have to find someone who will come in and address the issue of the river which is a huge challenge because you cannot spend a lot of money, setting up the infrastructure, and the river doesn't flow where it used to its channeled differently."

The demand for sand for construction is growing every day. This demand has resulted in the increased pressure on the natural environment where these resources occur. Government regulations are failing to keep pace with the rising demand of the resource (Cornejo et al., 2019). Without effective governance, sand mining will remain unsustainable, creating more unknown impacts in the future. The current governance of sand mining is challenging and insufficient at both the global and local levels (Marschke et al., 2020; Torres et al., 2017;

UNEP, 2019) Often in developing countries, governments do not formally designate locations or guidelines for sand extraction (Obura, 2019). The current development trends indicate that demand for sand is going to increase in the coming years, emphasizing the pressing need for an effective global governance system (Torres et al., 2017).

The history of South African local government can be traced in the pre-1994 apartheid system of government. The 1994 general elections paved a way for a democratic government under which a new Constitution of the Republic of South Africa hereafter referred to as the Constitution was passed in 1996. This is the same period that the two-tier system of local government was also entrenched. That is, section 55 of the Constitution (1996) refers to a district as a 'Category C municipality' which shares executive and legislative authority with local municipalities in its area of operation.

The centrepiece of a democratic municipal framework was the concept of a 'developmental local government', which tasks local councils with several roles: to prioritise services to their most vulnerable and marginalised citizens; to promote more participatory interaction with citizens; and to incorporate local forms of economic empowerment (Ministry for Provincial Affairs and Constitutional Development 1998). The researcher asked one of the key informants about the relationship between the local municipality, Ndwedwe and other stakeholders involved with the provision of water services. The manager from the air quality unit (09 December 2020) said,

"The district municipality is in charge of the water. The local municipality doesn't play a role in that. The counsellors are not even aware that the local municipality isn't in charge of the provision of water because when they do their campaigns, they promise people things that they are not even aware of or beyond their control. The people end up wanting water from the wrong place. We keep coming back to this issue that our counsellors need to be capacitated. They need to get the correct knowledge and know-how to respond to people with the correct information."

From the above discussion, its stated that the local municipality doesn't play a role in the provision of water and that the counsellors are not even aware about the role players when it comes to the provision of water. The counsellors don't know anything about the processes that are in place to deliver water services. The officials at iLembe District are in agreement that the councillors have an issue of not having the correct information about what role they

play and the functions of district and local municipalities. The manager from the Environmental unit (09 December 2020) said,

"Some councillors tend to tell the community members that they will get water by tomorrow, which isn't true. The councillors lack information about how things are done. The councillors know that processes are in place, and people like the mayor need to approve certain things. The councillors know that projects can take up to three years to be fully implemented and that other local municipalities will be prioritized than others will follow years later. The community members and counsellors need to be capacitated. One of the major issues is that councillors want the position because they heard that it pays a lot, and then they start competing to be councillors for the money and not to take care of people's needs."

According to Naidoo (2021) ward councillors serve a crucial role in delivering the 'developmental' vision of post-apartheid local government. Councillors are tasked with rebuilding trust with citizens at a neighbourhood level and fostering a more bottom-up approach to municipal reconstruction and development. Ward councillors are directly elected members of a municipal council who represent geographically demarcated wards, and are therefore directly accountable to residents (Naidoo, 2021). The researcher asked one of the participants to explain the challenges that they face with councillors, The manager from the Environmental unit (09 December 2020) said,

"I sometimes compare South Africa and other countries in terms of how we do things here, for instance, the way we choose our councillors is a major problem and effects the municipalities performance because anybody can be a councillor and these people are playing a crucial role in service delivery and I know now it's not something that's going to change now. The person who gets elected is a well-known person in the branch rather than a person who will be capable to do the job. The municipality suffers if the wrong people get elected. Political consideration comes into play when appointments are being made. People think leadership is a person who speaks a lot and they elect that person to lead them. Leadership is something else, so for me the way we elect them is what I have a biggest issue with. One of the most important skills to have is listening skills if you work with people. That is the challenge that we have but that is very personal, it is my personal view."

This reveals that political consideration in appointment of municipal staff without the required qualification or skills, has tremendously affected the performance of the municipality. It also reveals that one of the contributing factors towards the performance of

the municipality is the way the ward councillors are being elected and that anybody can be a councillor without taking into consideration their qualifications or skills. From this discussion the citizens also have no knowledge about what type of person should be elected to become their representative.

According to Masuku and Jili (2019) the literature on ward councillors in South African municipalities portrays a largely disempowered group of actors caught between a centralised municipal executive and administration, and an increasingly assertive citizenry that may choose either to ignore, bypass, or to channel their frustrations through them in a bid to secure longed-for public services.

Political favours and interferences are dominant in local South African government, and they hinder the process of providing services equally. Reddy (2016) offered explanations that municipalities whose councils have a scarcity of skills in political and administrative components consequently have negative impacts on governance and service delivery. The political interface in local municipalities greatly affects effective and efficient administration, as well as growth opportunities. Service delivery in South Africa is often marred by financial irregularities, corruption, and maladministration (Masuku and Jili, 2019).

7.3 Public Participation

In South Africa, under the previous dispensation, basic decisions concerning development were made for the people, who became passive receivers of development with no opportunity to identify their needs, act on them and decide on their destiny (Tadesse et al., 2006). The post-apartheid era, however, brought about changes in the South African governance model. The Constitution of the Republic of South Africa (South Africa, 1996) outlines this new approach to an accountable, transparent government, responsive to the needs and development of the people.

In line with the Government's goals of democratizing development and ensuring that communities actively participate in their own development policies, strategies and mechanisms have also been put in place to support the principles of participatory communication at local government (municipal) level (Department of Provincial and Local Government, 2005: 11). The central principle of local democracy is participation. In a democracy, citizens can participate in the country's affairs freely by expressing their views on political issues, their expectations without feeling intimidated or having fear of repression, by voting in elections, by engaging in civil society organisations or political parties and by

standing up as the candidate in democratic elections. Hofmeister and Grabow (2011) state that democracy is the government of the people, by the people, for the people.

Public participation in environmental decision making is not a new phenomenon. Participatory activities in traditional management are characterised by hierarchical arrangements, the dominance of expert-led decision making, and asymmetrical power relationships between management agencies and the public. Participation is characterised by increasing degrees of local control (Lane, 2012; Watson et al., 2009).

The active participation and involvement of people in decision-making that affects development is therefore central to sustainable development. The research asked one of the key informant participants on what do they think about the community attitudes when it comes to service that the municipality is providing, specifically when it comes to water, whether they hold positive or negative attitudes towards the public participation meetings. The participant one responded and said,

"I think throughout the country, we have developed a behavior, especially community members that I can literally demand anything from the government and the institution. There was a person who came here and said they house collapsed, a small portion because of the quality of the house because of the mud material and now he wants a wheel barrow and he wants us to buy him cement, so at that stage we have a problem because now people will not appreciate what we do for them. I agree as the Municipality sometimes we can be very slow into responding to issues but those we have addressed they are not appreciative."

Another participant said,

"There are problems in the relationship with communities, but in most cases they are started by a kind of behavior that when you doing something everyone will want that thing all at the same time. We do things because there is a budget a budget to do that, if there is no budget you cannot achieve whatever you want to do, having said that like I indicated earlier in terms of responding to problems, that is why the disaster right now is looking into simple things for example if there is a man hole where the sew passes and you may find that its leaking on the side of the house for 5 years, that's a serious issue. So those are serious issues, which I think causes people to riot and start burning tires on the road. As a municipality we are not responding well but still the community will burn roads and will need assistant with the road and now we will need to prioritize the mess that was done by the community and leave out the one that the community was protesting over. To fix the road of less than 2km will cost over 2

million where else the other thing the community was protesting over, cost less than 2 million."

From the above discussion it is evident that the relationship between the municipality and the community members is depraved in the sense that there isn't enough communication about the dealings of the municipality. When the public don't get what they want or are not heard then they start to protest and vandalize government property. The community members feel entitled to other things more over the services that the municipality is providing. This suggests that the community members might not know the functions of the municipality or it may mean that the municipality hasn't shared enough information to the public about their functions. Environmental officer two said,

"It is fair to say that the community doesn't know its own responsibilities and they do not know which door to knock and who to share their grievances too and how to share their grievances the one thing that we don't have , which we are beginning but isn't falling through which I do not know why, two things very critical, it's a research and development unit that will tell the municipality is on a right track, give us information that we need, unity is very crucial, how can we influence information that they have its by education and awareness it will help so both if research and development unit provides information that we need to take to the community and more relevant and recent information. So that helps the behavior within the organization and able to deal with it."

This confirms that the local community members don't know their role and the roles played by the municipality, there seems to be a lack of communication. South Africa acknowledges the importance of following a participatory communication approach for development, and policies and strategies both on national as well as local government level support this resolve. The White Paper on Local Government (1998a), often referred to as the constitution for local government, visualizes a process where communities will be involved in governance matters, including planning, implementation and performance monitoring, and review. It states that communities should be empowered to identify their needs, set performance indicators and targets and thereby hold municipalities accountable for their performance in service delivery. The researcher proceeded and asked the key informant about how they ensure participation and to ensure that it remains inclusive, Environmental officer two responded and said,

"Literally we visit every ward, we host an imbizo, and in terms of information, we communicate with ward counselor and ward committee. However sometimes there are

challenges such as ward committee members aren't available or they take on other employment."

This confirms that the local municipality hosts information sharing platforms and communicate with the ward counselor and the committee. As stated in the literature chapter in terms of the Municipal Structures Act, (Act 117 of 1998), municipalities are required to establish ward committees to enhance community participation in municipal development processes. There are challenges that are being experienced by the local municipalities as they engage with the ward committees such as members dropping out because they receive better jobs elsewhere, which leaves a vacuum in the committees. The process of replacing them can extend over a long period. In light of the COVID- 19, the researcher asked, "Do you think COVID-19 has affected the way you as Municipality was going to provide water?" The environmental unit manager responded and said,

"Not that COVID-19 has affected our behavior. Consultation is not the same anymore because you can arrange a meeting, they will tell us about social-distancing, which is not easy to achieve, so it affects consultation. In terms of time, the process we know now takes longer because of COVID-19 maybe the official is not in the office, maybe the office is closed, so it has definitely affected the way things are done. The offices need to be fumigated so that the public will have access to our offices"

As we all know the coronavirus disease 2019 (COVID-19), also known as SARS-CoV-2, has posed an enormous challenge to South Africa and the world. The virus originated in Wuhan City in China towards the year end of 2019 before it spread to other countries in the world (Mpofu, Moyo, Gilbert, Dikobe, Nishimoto, Katiko, Batuka, Satti, Qambayot, Mahler and Kitso, 2021). The World Health Organization (WHO) has declared it a pandemic because of the rapid and wide spread. Governance is recognised by many scholars and practitioners alike as a solution to world developmental challenges including but not limited to poverty, unemployment and inequality (Helalo 2015; Khalil-Babatunde 2014; Munzhedzi and Makwembere, 2019).

The coronavirus disease 2019 (COVID-19), is a respiratory virus that poses a major developmental challenge as a result of the fact that most economies in the world were on lockdown from the first quarter of 2020 (Mpofu *et al.*, 2021).

The above discussion the research gathered that Covid-19 affected how the effectiveness of rendering services to the public. The application of effectiveness and efficiency during the achievement of developmental local government mandates cannot be overemphasised during the COVID-19 pandemic in South Africa. This means that the provision of all necessary assets that are needed the most during this COVID-19 pandemic era such as water tankers, fumigating and sanitising equipment. Such must not only be provided on time but within the most limited financial resources. The researcher also asked about the nature of the relationship dynamic between uMngeni water, the district municipality, the community and the ward counselors which are the local leaders. Environmental officer one responded and said,

"....As far as I know we've got that constant meeting with the community members and Mngeni water whereby we explain what we expect and the demand and also explain what we expected and this is the demand. We need to remember Mngeni pipe runs from here in iLembe District right through to Mhlathuze area and we constantly meet to discuss with iLembe this is how many in terms of liters now and that we will do a small reservoir and obviously state that the water we will get from Mngeni. We've got a good working relationship and they understand what our aspiration is and they know communication is the key."

The above discussions show that there is a good working relationship between the stakeholders. Partnerships among complementary organizations are very important because these organizations can learn from each other. According to Pateman (1970), participation is taken as collective, sustained activity for the purpose of achieving common objectives, especially regarding a more equitable distribution of the benefits of development. The interviewer also asked if there are any challenges in this working relationship, the Environmental officer one responded and said,

"There are like in any other relationship obviously, the number one being communication especially between the locals and the district. There is a break somewhere when it comes to communication. Another challenge the relevant people who should be there at the meeting are not there and with no solution. The public is disengaged sometimes but however we still proceed with the plans put in place with the department and facilitate public participation gatherings and try grow this relationship. Traditional authority councils have a healthy working relationship with the district municipality and the locals as well, so we work closely

with them because we invite them to whatever is happening in their respective areas such as public participation meeting, conferences and municipal portfolio committees etc….."

In any relationship there are bound to be challenges, especially of communication such as the majority of the public who may be disengaged and the people from ward committees not being available. In principle the South African government, through local government, endorses and acknowledges the importance of communication that is participatory and democratic in nature as an instrument for social change and sustainable development.

The iLembe District municipality has a total of 35 Amakhosi. The new Local Traditional House was reinstituted in September 2017 and is currently led by Inkosi NA Bhengu as an EXCO member in the provincial house in KZN. There is a healthy working relationship between the Local Traditional House and the iLembe District Municipality. Amakhosi are invited to community activities that are happening in their areas and district activities that will have an impact on service delivery in their areas. These activities include IDP Public Participation meetings, conferences, and seminars, to mention a few. The iLembe traditional leadership is participating in the municipal portfolio committees and the full council. The environmental manager also added and shared that

"Obviously like everywhere, people come and complain that we've got this challenge and ask if we can solve and then the municipality and will go there and if there is a need, so in other words planning department they know that in terms of provision of water they know that we are here. There is consultation but though I'm not sure which forum that deals with that but I know that there are constant meetings in forum from time to time. People come and complain and then we see how we respond or address the issue, if people complain about a particular project we then may prioritise that project because of funds."

From the above two reports conclusions can be made that the partnerships and relationships between the community and the local government are still in a developing phase. Public participation is a two-way communication and collaborative problem-solving mechanism with the goal of achieving representative and more acceptable decisions. What is noteworthy is that consultation will still proceed with the relevant stakeholders and ultimately the municipality need to know the needs of the public and must be able to address the issues and in iLembe District they prioritize the most pressing issues that the public is currently facing. According to the Water Resource Commission (2017), representative community and

stakeholder participation, amongst other principles of integrated water resources management, across sectors needs to be strengthened.

The researcher asked one of the key informants if any projects are in place to address water issues in this region and who are the role players in these projects. The manager of the environmental unit in iLembe District (09 December, 2020) said,

"There are many. There is actually one that I can remember at the top of my head, the provision of water called Off-take-Nine which provides water to people who live on this side. It's connected from uMngeni main pipe, and that's why we call it off-take. The pipe comes through this site, and we supply it to the communities. There are many projects we are involved in, and in most cases, you will find that there will be consultation with the community, and then the community says that they need water for this area. The community is always aware, and when we design such projects, obviously because the municipality in most cases doesn't have money, we rely on MIG funding, which is the Municipality Infrastructure Grant, which is facilitated by Department of Water and Sanitation and then after we have collected information in terms of the need then we facilitate..."

One of the key informants also mentioned that *"we have lots of projects in place and those still in the planning phase that are geared towards development and addressing challenges of climate change and water security. We also have consultations with community members and key stakeholders about the projects that will get implemented. This will help with service delivery. The majority of our projects also involve other stakeholders like from uMngeni water, and they will also have discussions with community members." (Environmental Management official, 09 December, 2020)*

There are many facilitations and consultations made between the relevant stakeholders, the discussions above reveal that there are projects in place to address the water issue in the area and that in this case partnerships are key and that it can enhance the level of service delivery in the water sector. While engineering solutions have provided a great deal of improvements in development and human well-being, they alone are unlikely to help deal with the water security challenges as well as the uncertainty posed by climate change.

Healthy intact relationships between all the relevant stakeholders is key in achieving the goals that have been set out by government for the people. The White Paper on Local Government (South Africa, 1998a) states that municipalities must be committed to working

with citizens, groups and communities to create sustainable human settlements, provide an acceptable quality of life and meet the social, economic and material needs of communities.

7.4 Poverty alleviation

The importance of water for the economy and as a life sustaining substance is exemplified in the vision, goal, principles and objectives of the NWRS2. The vision is 'sustainable, equitable and secure water for a better life and environment for all.' The centrality of water is further exemplified in the strategy's objectives. Three objectives support the country's social and economic goals and the sustainable management of water resources. Water is essential for development and the eradication of poverty and inequality. Water also needs to contribute to the economy and job creation and water has to be protected, developed, used, conserved, controlled and managed in an equitable and sustainable manner (DWA, 2013: 12). The researcher mentioned and asked the key informant that "*poverty is something that is remains the challenge, and the government across from local to national has been acknowledge to be a problem. Do you think there are strong relationships between water and poverty alleviation?"* Environmental officer one responded and said,

"Yes. Well I will be a bit personal on this one, I doubt whether we understand how to respond to poverty, I think reliance to what government can do than what people can create on their own and I think those are two issues one not being able to understand. I will make a typical example; there is this R350 COVID social relief, it is dealing with poverty honesty but whether it is relevant program or whatever. I will make a typical example, in areas where we've got plenty of land and we know what we need to do about that land, we need trucks, infrastructure for the people to be active and we know that we have a problem of skills. We won't be able to hire everyone because they do not have skills that are required, but what is it that we can do, people have resource that we call land and they want tractors so that they will start to run away from subsistence farming into commercial so that they will farm and use water in some areas there is no water available and when we send department of Agriculture to advise people on what they can do, but we seem to have one way of solving poverty that government must do something out of nothing so for me that is the problem.

When it comes to agriculture or subsistence farming, water plays a crucial role because it's what the farmers use for their crops and plants. If there is a water challenge that means economically there will be a challenge for the homes. The United Nation's Intergovernmental Panel on Climate Change (IPCC) has stated that Africa in general and sub-Saharan Africa in particular is highly vulnerable to the impact of climate change "because of

factors such as widespread poverty, recurrent droughts, inequitable land distribution, and over-dependence on rain-fed agriculture" (IPCC 2001). This has serious implications for many sectors including those related to food security, water resources, the productivity of natural resources, sea-level rise, desertification, and the spread of disease.

The researcher asked "*So do you feel that they should be more initiative from the community side?"* Environmental officer two responded,

"*Let us understand their problems, let us understand what is causing the level of poverty because definition of Poverty is not what we think it is like not having money or food the person knows what poverty is."*

Environmental officer one said,

"We should consider water and electricity as most basic necessities. Let me make an example when I was home in the rural area, there was no electricity for about a week because of the heavy winds but I think because people at the rural area have become used to it because it was not that much of an issue and they have gas stoves but when I went to where I work in the city we did not have for about maybe for about an hour like from 9 am to 1 am but the response was very different, people were angry and asked questions how will we survive without water? So I think there is a bit of a conditioning that people get used to and they respond and adjust to it. Because we have a situation whereby people who didn't have electricity for the whole week but they were making plans like buying gas etc. and we have people who don't have electricity for about four hours not even one day but they were losing their minds so people don't take initiative and try and help themselves where they can, but maybe it is not necessarily translating or reaching their local municipality, I think there must be other ways that can residence can get to share their experiences with the municipality so that the municipality can help people that really need to be helped."

From this one can gather that people in the rural areas can find copying strategies to deal with the shortage of water and electricity. People in the rural areas have been using gas for the longest time even with electric stoves they would opt to use gas stove because it costs less and much more effective. They have become used to not having these basic necessities since the municipalities find it hard to provide these services due to budgets and infrastructure constraints such as homes in the rural areas may be built on unfavourable land where

infrastructure can't reach (pipes for water and electricity poles) so they have become accustomed to not having these basic human needs. While in the city the municipality can deliver services much faster because of the infrastructure is already there and people have access to complain and call if there is an issue.

"Firstly I think there should be a platform everywhere both rural and urban settlements there is platform for communication, right now I think all areas from government originally, you know urban vs. rural, each and every area has its ward counsellor, so counsellor is the first lower some person that can grievances from the community to relevant institution and two I think all numbers of municipalities should be shared with everyone, so having said that I know there is an attitude in the municipality even institutional, I know that the water through rates from urban residence is how much vs those that I make through people living in the rural areas so I will respond quickly to those who contribute more and everywhere is the same thing. So that's the thing that's killing us even if we want to provide services. So you introduce a little bit of business into this thing."

The above response from the Environmental manager, one can see that there is a need for the development of strategies that will use the water scarcity crisis together with the wish for sustainable natural resources use as a driver of job creation and economic development. According to Naidoo and Constantinides (2009), the current water dilemma facing South Africa can only be discussed through the lens of history, which is through the apartheid years (1948-1994), driven by the motive of racial segregation, water policies shaped the country's access to and development of the water resources. The policies within this era were skewed towards the privatisation of water for commercial agriculture, a sector dominated by white South Africans, who owned eighty three percent of the country's arable land, requiring more than fifty four percent of the country's available water.

7.5 Conclusion

The first part of this section focused on water governance management. This section assessed governance arrangements that used models for inclusive participation as the researcher explored the value and impact that the iLembe District municipality had created in the community. Conclusions can be established that the partnerships and relationship dynamic between the community and the local government are still in a developing phase. In this section it was noted that there was a need for the development of strategies that will use the

water scarcity crisis together with the wish for sustainable natural resources use as a driver of job creation and economic development.

The second section of this chapter examined public participation. Noteworthy from the discussion with the representative from the water catchment management forum, is that local government is under pressure to produce high-level outcomes which cause a delay in solving some of the issues. This discussion aimed to clarify the role of the iLembe District in acting as a driving force in mitigating climate change. In this last section of the chapter the researcher examined the role of water in poverty alleviation as represented through the sustainable Development Goals within the iLembe District Municipality. The following chapter provides the overall conclusions to the study and suggests recommendations based on the discussions from this chapter.

CHAPTER EIGHT

CONCLUSION AND RECOMMENDATIONS

8.1 Introduction

This study was conducted to critically examine the governance of water management and climate change attitudes in Noodsburg, Ilembe district municipality. This chapter merges sections of the study in order to show how the study's aims and objects were realized. This final chapter begins with a concise re-examination and synthesis of the principal findings emanating from the qualitative analysis presented in chapters six and seven. It will identify and locate the significance of the study's findings by contextualising them within the existing pool of knowledge. This chapter also aims to provide recommendations based on the different aspects that were examined in the study. The chapter concludes with an outline of the key limitations of the empirical work undertaken, with suggestions regarding future directions for work concerning the governance of climate change impacts. The summary, recommendations and final remarks on the study end the chapter.

Chapter Two of this research provided relevant theoretical contexts from political ecology framework used to analyse water issues. It was argued that the post-structural political ecology framework is appropriate for analysing the experiences of rural people and their response to water scarcity. The theory is appropriate for analysing the experiences of people who live in the rural areas with their response to water issues. It's also centred on understanding the relationship between social and environmental change. The second part of this chapter discussed the stakeholder engagement theory which holds the notion that organizations must know and understand all their stakeholders (customers, public, employees) and consider the interests of all stakeholders and not only of their shareholders. The role of stakeholders in addressing environmental issues is supported by Montabon et al. (2016), who advocate a re-focusing of environmental behaviour research to focus on daily life and ordinary practice.

Chapter Three focused on climate change and water security. It is important to know and understand water security in the South African context as water security is of considerable global and political significance because it directly links to the Sustainable Development Goal (SDG). It also focused on the structure of the governance arrangements in South Africa. The local governance system is built upon an effective interface between political office-bearers, political structures, councillors and officials, the delegation of appropriate powers to achieve maximum operational and administrative efficiency. Participatory best practices and

their importance in governance and the local government legislative framework which enables the provision of services were discussed. The current policy and legislative framework supporting local governance are contained in the Constitution, the Local Government White Paper, the Local Government Municipal Structures Act, and the Local Government Municipal Systems Act. All these pieces of legislation were discussed in detail in the study. The Chapter concludes discussing ward committees as institutions for public participation.

Chapter Four The chapter provided a broad perspective on service delivery and public participation at iLembe District Municipality. It evaluated the institutional mechanisms and processes in place and looked at public participation and service delivery processes at iLembe district Municipality. It highlighted the municipality's compliance with service delivery and public participation policies. The municipality has created a climate and conditions that are favourable to investment and economic growth. Partnerships have been established with other stakeholders, such as iLembe Enterprise to promote socio-economic growth in the area. Their ultimate goal is to provide a better-quality infrastructure and services on a sustainable basis for the residents. To meet this challenge, the municipality is looking for alternative and creative ways such as establishing private-public partnerships. Public participation has also been enhanced to deliver high quality services to all their residents over a short period. It is imperative to mention that municipal service delivery is an on-going process rather than a one-off or isolated event and it requires continuous improvement for the benefit on the community.

Chapter Five presents the methodology and the instruments used to accomplish the study objectives. The study adopted a qualitative approach to gain a deeper understanding of climate change perceptions and attitudes, public participation and service delivery discourse in South Africa. A case study research strategy was employed as a method of inquiry. A critical review was undertaken to evaluate the role of different stakeholders in rendering quality services at iLembe District Municipality. The role of public participation as an 'enabler' of good governance was discussed in detail. The research design, approach and the data collection methods were discussed in detail. The research was guided by the research objectives and the key research questions posed in posed in Chapter One. The data collection and presentation of methodology was discussed in this chapter.

Chapters Six and Seven focused on the data presentation, analysis and the interpretation of the results gained from the focus groups and the interviews. The data was captured,

transcribed, and analysed using ATLAS TI version 8. The analysed data was assembled using graphs, tables, and diagrams; the data was supported by concise summaries of the empirical study. This chapter draws conclusions from the themes that emerged from the literature study as well the key findings of the study. Appropriate and relevant recommendations are provided. The focal point of these chapters is to draw conclusions that are justified by this study. The findings of this study raise new questions and problems for future research in climate change and local governance, public participation and service delivery.

8.2 Research Objectives

This section provides an overview of the study, based on the aim of the study and culminating in the findings. The first chapter of the study provided a background regarding the purpose of the study. In order to satisfy the aim of this study, the following objectives were identified:

- To critically examine critical factors that affect water-related communication and decision making within Noodsburg;
- To assess governance legislative and policy framework that use models for public participation;
- To examine the institutional mechanisms or water service provision strategies put in place by ILembe district municipality that deal with climate change impacts;
- To understand the role of community stakeholders in dealing with climate change impacts such as water shortages; and
- To examine the attitudes and perceptions held by the community in Noodsburg towards climate change and its impact.

8.3 Research Questions

The study attempted to answer the following research questions:

- What are the factors that affect water-related communication and decision processes within the iLembe District?
- What are the governance arrangements that use models for inclusive participation in iLembe District Municipality?
- What are the institutional mechanisms or water service provision strategies put in place by the iLembe District?
- What is the role of the community stakeholders in dealing with climate change impacts such as water shortages?

- What are the communities of Noodsburg's attitudes and perceptions towards climate change and its impact?

8.4 Summary of the key research findings

The main findings of the research are summarised in relation to the objectives presented in Chapter One. The summary indicates that the objectives were achieved and the research questions that emanated from the objectives (presented in Chapter Five) were addressed.

8.4.1 Socio-demographic of participants in Noodsburg

According to Whitmarsh *et al.* (2011) younger people tend to be more concerned with environmental problems such as climate change, which indicates a negative association of age with environmental attitudes and concerns. The participants live in Noodsburg. The range of the age of participants is from 20 years (school leavers) to 59 years and the majority of the participants in the focus group are aged 30 to 39 years old, and these also make up the largest portion of the group.

The majority of the participants were female (53%) and male (47%). According to Gupta (2015) and Shivakumara *et al.* (2015) gender has no significant effect on environmental awareness, however this study supports the findings of Tranter (2011) indicating that women were more environmentally concerned than men and that women are more likely to actively participate in pro-environmental behaviours, as indicated by the better response rate for the completion of this climate change focus group in this study. The National Environmental Management Act in South Africa (NEMA) states that women play a vital role in environmental management. Women must therefore be supported and involved in finding solutions to environmental problems.

8.4.2 The local community's attitudes towards environmental issues such as climate change

Climate change has become a key concern within South Africa. According to Kupika et al. (2019), understanding local community perceptions on impacts, causes, and responses to climate change is vital for the promotion of community resilience towards climate change. In this section the participant's conceptualisation of the term climate change was unpacked.

In the focus group discussions participants understanding of climate change is closely aligned with the scientific concept of climate change as revealed by their interpretations that climate change is linked with changes in weather conditions or in other words patterns of local extreme weather events. While some participants were able to give a definition or explain

what climate change is, the majority of responses to the question about their understanding of climate change centred on the causes of climate change. There is some basic understanding and observations being made by the public about climate change. This suggests that there is some level of awareness and knowledge about the physical environment that they live in. Climate change perceptions determined by complex interplay between personal experiences, circumstances and social norms.

In this section participants were asked about where they get their information about climate change. Communication plays an equally important role in sensitising climate change issues in the people's minds with clear influence on their perception construction. It was noted that some community members rely on their local ecological knowledge on climate patterns and impacts while the majority of the participants from across the three focus group that were conducted mentioned that they get their information through radio and television. Media is treated as main channels to inform people about risks of climate change. But, communication *per se*, as found in this research, is grounded in dialogical forms. In this case, media are important channels.

Findings revealed that there is a gap between 'awareness' and 'knowledge' because widespread familiarity of climate change related topics does not result in adequate knowledge. The discussion also indicated that local ecological knowledge could provide information on the changing climate. Such information can complement scientific data to inform policy on best practices to build the adaptive capacity of rural communities. Findings also reveal that there are also many individual and societal barriers that limit engagement with climate change. Table 8.1 lists some of the barriers people perceive to engaging with climate change.

Barriers	Description
Low prioritization of climate change	Some participants argued that there are more important immediate priorities, including family and finances.
Small Problem	The scale of the problem leads some to feel individually helpless.
Lack of political action	Lack of action taken by local, national, and international governments has created a distrust of governments to take responsibility or meaningful, successful action against climate change.
Free-rider effect	Individuals may refrain from taking an interest in, or acting on, climate change because they perceive that other people are not taking action.
Lack of enabling initiatives	Existing infrastructure and economy locks people into current behavioural patterns. More sustainable facilities are costly, inconvenient, sparse, or not viable.

Table 8.1: Individual and Social Barriers to Engaging with Climate Change

8.4.3 Community participation in environmental issues

The Local Government: Municipal Systems Act, 32 of 2000, also encourages the active involvement of the public in municipal affairs. The Organisation for Economic Co-operation and Development (OECD) (2001:4) recommended that municipalities should design successful information, consultation, and active citizen participation strategies. In this section participants in the focus group discussion were asked, “Do you think the public should be actively involved in deciding what should be done about climate change?” Responses shared gave us an indication and confirmation that what’s set out on paper about what needs to be done in terms of including the public and allowing them to play an active role in decision making is still not happening in this community. Almost all participants across all focus groups mentioned that there is a need for the government to come closer to the citizens.

In line with the Government's goals of democratizing development and ensuring that communities actively participate in their own development policies, strategies and mechanisms have also been put in place to support the principles of participatory communication at local government (municipal) level (Department of Provincial and Local Government, 2005: 11).

There is a lack of awareness of government initiatives of which is an important issue that must be addressed in climate change learning. This research investigated mutual relations between communicators and the construction of cultural meanings of climate change risks in the individuals' minds. In particular, this research attempted to identify important sources and actors as well as the structural process of climate change communication at the community level. It finds that the communication of climate change is determined by the structure and process of local communication repertoire.

8.4.4 Responsibility for addressing climate change

The finding in this section showed that there is a lack of political will and understanding of the critical relationship between climate change and biodiversity issues and awareness. It was clear from the discussions in the focus groups conducted that there is a lack of public involvement and insufficient representation of local stakeholders. A councillor was present; however, some participants didn't know that, which gives an indication that there isn't any form of communication or awareness about who is their local leader. The local traditional leaders should also be in the forefront when it comes to environmental issues.

The Citizen Report Card found visibility of councillors was a problem, that councillors are not accessible to communities and do not maintain the requisite interaction and coordination with local people except before elections. Finds also reveal that information regarding climate change is hard to come by and that not enough being done by the local leaders within the communities and government officials to inform residents about the latest developments in relation to climate. There are insufficient and ineffective communication structures.

The research also found that ward committees' ability to function effectively as channels of communication between municipal councils and communities is limited by inadequate public communication strategies and lack of available ward level information. There is a sense that if the government is sharing information and educating the people in the community, people might actually know how to take care of the environment and will be informed and empowered to do better in the physical environment.

The findings in this study indicate a gap in climate change knowledge that needs to be addressed in any climate change learning initiative, as Clayton *et al.* (2015a) advocated; that understanding the issues around climate change facilitates better engagement and action.

Water Governance Management

The United Nations Development Programme (UNDP, 2013) stated that "good governance incorporates four poverty-centred dimensions: political, economic, social, and environmental. As applied to water, however, governance is defined differently by various users." Findings show that iLembe District Municipality's environmental unit's role is to encourage the management of these resources for the benefit of both current and future generations in line with the objectives of the National Environmental Management Act of 1998. The officials agreed and knew the roles and responsibilities that the department had set out. In assessing the application of governance principles and the institutional approach to water service delivery, the environmental unit manager emphasised a strong need to coordinate and align activities between the departments. According to Dithebe, Aigbavboa and Thwala (2019) the public sector is responsible for the development and sustainability of water infrastructure in South Africa and for ensuring that communities across the country receive adequate service delivery, and this can only occur if the infrastructure required exists and in good condition. Overall the Constitution gives the three different levels of government common areas of responsibility but also defines their distinct responsibilities.

The discussions with public officials also reaffirm what has been stated in the constitution that to achieve the goals of co-operative government, it is important to work in an interrelated, independent, yet interdependent manner. To translate the government's mandate into action, a framework of legislation, policy and guidelines has to be crafted to enable well-coordinated and integrated governance machinery.

8.4.5 Public Participation

The central principle of local democracy is participation. In a democracy, citizens can participate the country's affairs freely by expressing their views on political issues, their expectations without feeling intimidated or being afraid of repression, by voting in elections, by engaging in civil society organisations or political parties and by standing up as the candidate in democratic elections.

According to Swai (2016), public participation in governance is an important pillar. In any democratic country worldwide, it is regarded as an integral part of social, economic and

political activities. The involvement of the local community is important in bringing about local development. It was evident that the relationship between the municipality and the community members are deprived in the sense that there isn't enough communication about the dealings of the municipality. When the public doesn't get what they want or are not heard then they start to protest and vandalize government property. Another finding from the key informant interviews is that the community members feel entitled to other services that the municipality doesn't deal with. It was also clear that the roles and responsibilities are not known by the community members.

It's important to know that ward committees are formed with the aim of public participation between municipalities and communities. In this section it was noted that ward committees pose different challenges such as members not having skills, lack of visibility from the councillors and that the relationship between the ward councillors and committee members is weak. In this section findings show that it can be established that the partnership and relationship dynamic between the community members, local leaders, traditional authority leaders and the local government is still in a developing phase. According to the Water Resource Commission (2017), representative community and stakeholder participation, amongst other principles of integrated water resources management, across sectors needs to be strengthened.

8.4.6 Poverty Alleviation

The National Water Resource Strategy sets out how it will achieve the core objectives, which are firstly water support and development pertaining to the elimination of poverty and inequality. Secondly, water has to contribute to the economy and also job creation, and, lastly, water has to be protected, used, developed, conserved, managed and controlled sustainably and equitably (National Water Strategy, 2013). It was noted in this research after speaking with key informants that when it comes to agriculture or subsistence farming water plays a crucial role because it's what the farmers use for their crops and plants. If there is a water challenge it means economically there will be a challenge for homes.

The United Nation's Intergovernmental Panel on Climate Change (IPCC) has stated that Africa in general and sub-Saharan Africa in particular is highly vulnerable to the impact of climate change "because of factors such as widespread poverty, recurrent droughts, inequitable land distribution, and over-dependence on rain-fed agriculture" (IPCC 2001).

This has serious implications for many sectors including those related to food security, water resources, the productivity of natural resources and the spread of diseases.

There is a need for the development of strategies that will use the water scarcity crisis together with the wish for sustainable natural resources use as a driver of job creation and economic development. According to Naidoo and Constantinides (2009), the current water dilemma facing South Africa can only be discussed through the lens of history, which is through the apartheid years (1948-1994), driven by the motive of racial segregation, water policies shaped the country's access to and development of the water resources.

The policies within this era were skewed towards the privatisation of water for commercial agriculture, a sector dominated by white South Africans, who owned 83 percent of the country's arable land, requiring more than 54 percent of the country's available water. Stein (2005) confirms this view when stating that during the apartheid era water was allocated on racial grounds and that the distribution was linked to access to land.

8.5 Key contributions to the literature

8.5.1 Methodological contributions

The study presented in this thesis represents one of the more in depth, local qualitative examinations of the governance of water resources, climate change beliefs, concerns, and support for specific public participation policies that have been undertaken to date in the South African context. While other qualitative -based research has been conducted, many are macro-studies and have not been designed to yield in-depth findings.

8.5.2 Theoretical and empirical contributions

It is my contention through this thesis that the political ecology idea of linkages between society and natural resources has particular heuristic relevance in approaching and understanding the dynamic relationship between, climate change, water governance and participatory processes in the South African case. The study analysis I conducted aimed to provide empirical evidence with which to begin to respond to the question of what the governance arrangements models for inclusive participation are when it comes to the natural environment and what are the attitudes and perceptions held by the community members towards climate change and its impact.

Theory of an egalitarian political environment in the governance of Water Resources.	**Theory of congruence of participatory mechanisms and processes in the governance of water resources.**	**Theory of the level and impact of public participatory governance processes in the administration of climate change.**
The necessity to recognise the importance of multi-stakeholder engagement.	The involvement of the local community in policy formulation and implementation.	Stakeholder collaboration especially with non-state actors in a bid to increase collaboration and public acceptance of climate change.
Community engagement in decision making.	Sharing information with the community on multi stakeholder engagement in decision making.	Re-alignment of municipal participatory governance that involves the natural environment.
	To understand international practices in civic involvement and governance.	Multi-stakeholder understanding and acceptance of local government/municipal climate change policies.
	To set up participatory structures, institutions and mechanisms that promotes citizenry participation.	
	The need to relook and re-arranging of participatory processes, systems and structures plus governance.	
Theoretical Assumption		
Tolerance and inclusivity: crucial to a multi-stakeholder governance system which is an important ingredient towards a sustainable institutional as well as socio-economic and political development.	• Capacitation of communities through training and capacity building as well as the involvement of non-state actors in a bid to increase efficiency, acceptability of policies and accountability. • Re-calibration of participatory processes and systems with the aim of increasing participatory governance and involvement.	• Training and capacitation of public officials increase efficiency, effectiveness and good governance • Community involvement increases collaboration, acceptance of policies and developmental economy will create opportunities for local communities.

Table 8.2: Theoretical propositions emerging from the study

The theoretical propositions in Table 8.2 illustrate that public participation, collaborative governance and community involvement in decision making is crucial if policies are to have public acceptance and backing. Therefore, the theoretical proposition is that diversity and inclusivity are of paramount importance. It is crucial for society to tolerate divergent political ideologies as this will promote active public participation and a participatory governance structure and system in iLembe Municipality.

The involvement of the citizenry in climate change policy formulation and implementation is particularly important. Emphasis should also be placed on the primacy of conscientizing the community on the importance of a multi-faceted stakeholder and civic engagement in decision-making. There is also a need for the re-arrangement of participatory processes, systems and structures. In terms of inculcating participatory culture amongst people and communities, it emerged that there is a need to understand and international best practices on civic involvement and governance as well as to set up participatory structures, institutions and mechanisms that promote citizenry participation. The theoretical propositions in Table 8.2, state the need for the capacitation of communities through training and capacity building as well as the involvement of non-state actors in a bid to increase efficiency, acceptability of policies and accountability. It urges the recalibration of participatory processes and systems with the aim of increasing participatory governance and involvement.

Stakeholder collaboration, especially with non-state actors, increases general collaboration and public acceptance; it was observed that there has to be re-align Municipal participatory governance. In addition, multi-stakeholder understanding and acceptance of local government concerning municipal policies are paramount for an effective and sustainable participatory culture. The theoretical propositions of this research are:

• Training and capacitation of public officials increases efficiency, effectiveness and good governance; and

• Community involvement increases collaboration, acceptance of policies and development.

A deeper understanding as well as insights into South Africa's participatory democracy, articulated the importance of collaborative governance and public participation in the management of natural resources. From the data, the study suggests the necessity to inculcate participatory democracy and an active citizenry through participation. The study proposed that policymakers should consult their constituents prior to formulation and implementation

of policies and that all stakeholders should be involved in all decision-making processes across the SADC region.

This study will hopefully contribute towards the devising of public participation strategies, specifically aimed at how to administer and govern the natural resources such as water within the Southern African region. It is also hoped that the findings of this study may influence policy planning and its implementation. The theoretical propositions offered are that there is requirement to ingrain citizen participation into local politics and ensuring that well thought-out stringent measures are implemented so that participation is sacrosanct as well as that training and capacitation of public officials should be at the core in order to increase efficiency, effectiveness and good governance. It is anticipated that these theoretical propositions will underpin future and related research on collaborative governance and public participation in the environmental sector.

8.6 Recommendations

In the preceding chapters, climate change and public participation at local government level was discussed, and it was discovered that there is some basic understanding and observations being made by the public about climate change. Communication plays an equally important role in sensitising climate change issues in the people's minds with clear influence on their perception construction.

Some community members rely on their local ecological knowledge on climate patterns and impacts while the majority of the participants from across the three focus group that were conducted mentioned that they get their information through radio and television. It was also noted that ward committees should play a constructive role in the quest for community development. It was also discovered that ward committees are not functioning as required; instead they are a highly partisan unit aligned to serve interests of political affiliations. The following section presents recommendations emanating from both the empirical study and literature review.

8.6.1 Policy implications of the findings

Policymakers should focus on messages that depict the seriousness of climate change, the human contribution to the treat but also possible action that can be taken to mitigate impacts. Public perceptions are well established as a key factor in support for climate change mitigation policies, and they tend to vary both within and between countries.

It is essential to formulate climate change awareness policies and programmes that can reach all sections of the population, providing them with the necessary information about climate change, as well as information about mitigation measures at the level relevant to them. Communication of climate change impacts is processed through local communication repertoires involving both formal and informal modes of communications. This clearly implies that public perception and communication of climate change is largely contextual and locally situated.

Findings of this research bear important implications for formulating climate change communication strategies – both for content development, and processes and structures of communication. As for communicators and educators should take into account what patterns of public perceptions people have in their minds, and what are the possible impacts of climate change in the region. Emphasis on local impacts of climate change is a potential way to bring people in the discourses of climate change and possibly towards intended behavioural changes.

Media and climate change communicators have mainly focused on some occasional events of extreme weather (e.g., storms). As such public concern of climate change recedes once they are not exposed to extreme weather events for a long time. This type of communication approach has failed to address climate change as a continuous and long-lasting risk, which could affect other aspects of the people's livelihood.

Accordingly, the wide-ranging effects of climate change in agriculture, environment, human health, biodiversity and other socio-economic and related issues are not included in the discourses of climate change. In particular, food security and attempts to eradicate poverty might be challenged because of adverse effects of climate change in developing countries. Therefore, communication contents of climate change should integrate these potential effects.

Any policy initiative to tackle adverse impacts of climate change, enhance resiliency of vulnerable people, and to communicate the risks effectively to address local or regional aspects and the way local people perceive the risks. Promoting engagement around climate change, at both a formal level (public forums with government and private sector stakeholders etc), as well as at a more informal level (community level programmes) with the view of finding best localised solutions and strategies should be at the forefront of policy regulations. This indicates the necessity of a bottom-up approach for formulating policy

strategies with due considerations of the desires and perceived knowledge of vulnerable people.

8.6.2 Community's perceptions and attitudes towards climate change

Addressing human behaviour and climate change requires interdisciplinary and integrated approaches. To successfully address climate change, every tool that is available must be used , drawing on expertise from all relevant disciplines. Some segments of the policy and research community have already recognized that human behaviour will be critical in the fight against climate change. Key factors that interventions should target are as follows.

1. **Communication**

   Communication plays an equally important role in sensitising climate change issues in the people's minds.

   - There should be joint effort to make climate change communiques simpler using images as well as more balanced approaches.
   - The source of climate change information must come from scientific reports, Eskom, the UN and NGOs or media as these were identified as the most reliable sources of climate change information.
   - Make climate change initiatives more practical and, according to Aune et al. (2016) and Fernandez et al. (2016), attractive, convincing, relevant and part of the normal routine or habit of daily life.

2. **Climate Change Awareness**
   - Sustaining climate change learning initiatives over a longer period of time and not for a limited period.
   - climate change experts must be invited to address the public; according to Ziervogel *et al.* (2014), the lack of expertise is one of the major barriers that hinders effective climate change action.

3. **Lack of political action**
   - leadership to undertake and showcase pro-climate change actions, similar to the recent energy efficiency initiatives in their own homes.
   - Community members to be consulted and involved when internal climate change programmes are developed so that their views are incorporated in developing climate change learning interventions.

4. **Low prioritization of climate change**

Given that South Africa is a developing country with large proportions of poor and marginalised people, concerns such as unemployment and food scarcity are often more immediate than environmental concerns.

- Environmental issues should also be prioritized as one of the pressing challenges so that attitudes towards climate change will change.

8.6.3 To enhance co-ordination between local government and citizens

This study recommends the use of diverse communication and engagement tools which include,

- stakeholder roundtable sessions;
- public open houses across the region;
- a dedicated project web page;
- an online questionnaire;
- an online "do it yourself" consultation process;
- an online video presentation with voiceover and captioning;
- a social media campaign; promotion through an online "blogging community.";
- a discussion guide;
- interactive open house panels;
- media advertising;
- a summary and analysis of all of the feedback that was received.

The wide scope and variety of methods used will help with the engagement of many residents and community groups, as well as business. It may also include voluntary associations and organizations, faith-based organizations, and labour groups. But, it must be ensured that participants' feedback is accurately documented for consideration and that suggestions for policy changes are incorporated into the final policies.

Web-based platforms, such as blogs, Twitter, Facebook, and YouTube, enable people to interact in a variety of different ways and can facilitate the open engagement of a large group of participants. This can be achieved through a regularly updated blog covering the public involvement process and addressing issues related to it; through the use of a Twitter hashtag and general outreach through Twitter; by using a Facebook group page or general outreach through Facebook; and, finally, through other micro-blogging social media sites.

Wikis offer another good example of a collaborative social media tool that incorporates features of both traditional face-to-face deliberation and online participation. A wiki is a web application that allows visitors to edit existing web pages by adding, modifying, or deleting content in collaboration with other participants. They are most commonly used to aggregate information from multiple sources.

Two examples of the successful use of wiki platforms in open government internationally include a wiki hosted on the website of the U.S. Environmental Protection Agency, which allows watershed organizations, managers, and communities to share watershed management plans and identify best practices; and the U.S. Department of Energy's Open Energy Information website, which uses a wiki platform to share resources and data between government, private sector, project developers, and the community.

While each of these initiatives can be viewed as examples of best practices in open engagement, the best initiatives go beyond simply implementing an online discussion forum or using social media to engage citizens in government decision making. The best initiatives in open engagement are iterative in nature and are customized to ensure relevance for the particular constituency.

8.6.4 The need for strong citizenship and participatory governance in addressing environmental issues

The study recommends the compilation of the public participation handbook. The handbook will assist in educating all the participants about the system, how and when it is implemented. Included in the handbook should be the public participation framework and policy, timelines for the implementation, reporting processes in the system and evaluation of both the programs and the system as a whole.

The public participation handbook will give details step by step about the full process of implementation. In the handbook, it's also very important for the residents to know the roles and responsibilities of all stakeholders that are involved. The rules and regulations should be formulated and included in the handbook. The research found that some key local leaders abandon their roles and are not visible until it's time for the elections. Community members will not abandon projects that they have ownership too thus enabling successful implementation of projects. The handbook can be developed by key experts in the field.

Local government is an employment and economic driver that delivers key social, environmental and economic services to communities across the country. To be effective and

efficient, municipalities require a skilled workforce. Research shows that institutions should not consider the completion of formal training the end of the learning process.

Training should be followed up with after action reviews, discussions, practice and feedback in order to promote skills transfer. Job aids are also a relatively simple way to increase the probability that trained skills will be applied to the job. The global economy and current technological advances require both private and public institutions to make constant adjustments in order to maintain a competitive advantage. One such change is the set of knowledge, skills and abilities that are now critical for success.

Emphasis on the Batho Pele principles should be emphasized if the initiative aims to enhance the quality and accessibility of government services by improving efficiency and accountability to the recipients of public goods and services. The eight Batho Pele principles are;

Consultation

Consultation simply means - interact with, listen to and learn from the people you serve. Public servants should make sure that they stay in touch with the people they serve, by finding out what services they need, how they would like their services to be delivered and what they are dissatisfied about. Consultation is meaningless, unless it is fed back to the management so that they can change the system, or take the steps needed to improve the service given to the customers.

Service standards

Every department has to set service standards that guide exactly what they deliver and to what quality or standard. Service standards should clearly state how long it will take and exactly what people can expect from the public service. For example, if you apply for an ID book from Home Affairs, and you have all the necessary documents, it should only take about 6 weeks, to get the ID book. If this standard is not kept, the department owes the customer an explanation and probably an apology.

Redress

When people do not get what they are entitled to from the Public Service, they have a right to redress. This means that the public servant should immediately apologise to them and also tell them what solution they are offering to their problem. If the public servant has none, they

should speak to their manager or supervisor and make sure that the problem is sorted out. The Public Service's success and image is built on its ability to deliver what people expect from them. When complaints are made, citizens should receive a sympathetic and a positive response. The Promotion of Administrative Justice Act allows for citizens to ask for reasons for any decision taken by government that affects them. The Act ensures that citizens have a right to administrative decisions that are lawful, reasonable and procedurally fair. Where citizens are dissatisfied with the reasons given, the Act allows people to appeal the decision or ask for the review of the administrative action by a court or, where appropriate, an independent and impartial tribunal.

Access

All citizens have the right to equal access to the services to which they are entitled. This especially applies to disabled people, illiterate people and rural people who may have difficulty accessing government services. Public servants have a special role to play, to make sure that those who need extra assistance get it. Managers should ensure that these services are accessible to disabled people and that people who use wheelchairs and walking aids can get into public buildings. Special arrangements should be made to assist people with hearing or visual disabilities.

Courtesy

Public servants have to remember that they are employed to help the people and to give them access to the services that are their rights. They are not there to stop people or to be obstacles. This means that in their contact with the public, public servants should always be courteous and helpful.

Information

All citizens should be given full information about the services that they have a right to get. If a public servant does not have information, they should try to find out and help the person. When referring them somewhere else, they need to be very clear about what they will get there, what they need to take with them and which person they must go and see. The better informed people are, the easier it will be for the public service to do its job and the fewer people there will be in the queues. Public servants are encouraged to spend some extra time with people who need a better explanation or special assistance because they cannot understand or cannot access the services themselves.

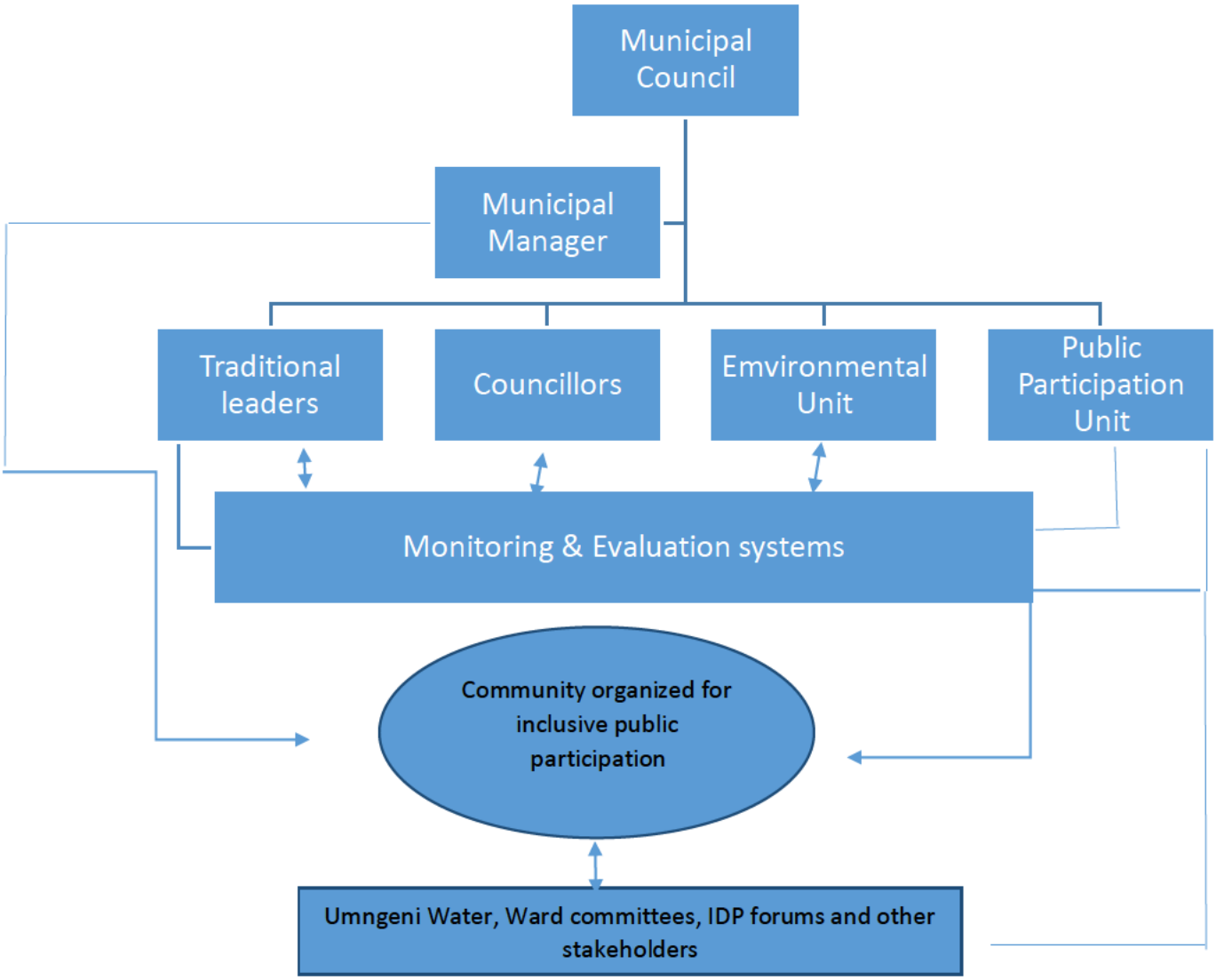
Transparency

It is very important for the Public Service and administration to be run as an open book. The Public Service is there to serve the people and they have a right to the services it offers. Many people, especially poor people, do not yet have access to things like free basic services, or social grants, simply because they do not have the information to access it. The people also have the right to know how decisions are made, how a department works, who is in charge and what its plans and budgets are.

Value for money

It is very important that public servants do not waste the scarce resources of government and that they deliver a service that is as cost-effective and efficient as possible. It is their duty to inform management of any wastage of resources and to look for ways of saving money and time, without compromising the quality of the service delivered to people.

8.6.5 Model of inclusive service delivery and participatory development in addressing environmental issues.



Source: (Own Diagram, 2021)

Figure 8.5.6: Model of inclusive service delivery and participatory development in addressing environmental issues.

The researcher notes that, it is important to state that, because local governments respond to unique needs within the areas they serve, there is no tailor-made model or specific step-by-step strategy that can be rolled out across the board for all municipalities. The proposed model has been adapted from (Zondi, 2015) which outlines the plan of action to be adopted in fostering best practices in local government for the enhancement of efficient and effective service delivery and public participation strategies.

The model recommends the need for close co-operation between municipalities, Municipal Managers, traditional Leaders, Municipal Councillors, Environmental Unit, Ward Committees, IDP forums, Umngeni Water and communities in the quest for successful provision of services. There needs to be a dedicated unit that should play an increased monitoring role over municipalities. It should ensure that municipality are well capacitated to deal with issues of service delivery.

It needs all these parties to work collectively and progressively towards achieving a common goal of inclusive service delivery. This is particularly important because according to Meldon et al, (2005:5) the definition of participation needs to accommodate the complexity inherent in participation and power relationships that enables or hinder participation.

In line with participatory democracy, as enshrined in the Local Government Systems Act (2000), communities are entitled to involvement in decision making, where they propose, debate, decide, plan and implement the decisions that affect their lives. This needs communities to be able to group themselves and be more organized in terms of understanding local government processes.

The constitutional values for good governance, public participation is more than mere consultation but active involvement that moves to more direct forms of influence and control over decision that affect the lives of local communities.

8.6.6 Framework of service delivery standards in line with the relevant legislations in Local Government

Legislation provides little guidance to municipalities on standards, and, generally, municipalities have to decide for themselves, within the available resources, revenue and demands, as well as the socio-economic context, which standards should be set and how the municipality will enforce adherence to these standards. There needs to be a framework developed that will make provisions and reference to service standards guidelines, a tool to measure service delivery satisfaction, and dispute resolution/redress mechanisms to address citizens' concerns. A broad-based blueprint setting out the vision, roles and responsibilities of the various partners to enhance and improve service delivery. This framework may also contain,

- **Citizen satisfaction for municipalities** Rating/Percentile to determine the overall rating of the current level of satisfaction and governance arrangement and monitoring and evaluation;

- **A dispute resolution/redress mechanism** to address citizens' complaints;
- **A service standard implementation guideline and roadmap** will enable municipalities to perform the task.

Standards are needed for a number of reasons:

a. Uncertainty about what quality/quantity is required by law;

b. Uneven delivery, often against lowest standards without consequences;

c. Lack of resources/revenue to deliver optimal services;

e. Inefficient and ineffective service delivery procedures;

h. Illiteracy of service seekers;

j. Municipal capacity constraints and challenges.

Setting standards empowers both the municipality and its citizens/customers:

- It makes efforts at measuring customer satisfaction more effectively (citizen surveys; output as indicators, such as the number of complaints; and throughput measures such as indirect proxies for measuring direct impact of programmes on clients); and
- It encourages more focus on the long-term impact of programmes, particularly in evaluating such programmes, and allows immediate responses from municipalities and customers;

Public services cover wide range of services provided by local, regional and central governments to their citizens and communities. Under Section 152 of the South African Constitution of 1996, local government is the engine of basic service delivery. Local government is charged, among other things, with ensuring the provision of services to communities in a sustainable manner, promoting social and economic development, and promoting a safe and healthy environment (Constitution, 1996).

According to SAHRC, it is a minimum level of service that local government must adhere to in terms of service provision to its customers as aligned with the Constitution of the Republic of South Africa. The researcher also considered how the social and economic dynamics of different types of municipalities in South Africa would impact on the implementation of the standards across all municipalities.

For instance, rural municipalities might prioritise social services over environmental issues. The researcher recognises that the level of the engagement with the municipal residents is crucial in the implementation of the standards irrespective of the type of municipality concerned.

8.6.7 Climate Change capacity building programmes framework for external stakeholders in the district

From this study, it emerged that there has to be a framework for external climate change capacity building programmes. There is a need to go beyond the results from individual projects and look at overall climate change and environmental performance, particularly at the community's awareness level. A robust climate change capacity building framework will enable the District to effectively implement the national Climate Change response Policy and support the UN SDGs and improve overall environmental and climate change behaviour. As demonstrated in this study, climate change has far-reaching implications for human populations, ecosystem services, business and infrastructure.

It is evident that climate change learning, will play a significant role in addressing this global crisis. Ika and Donnelly (2017) indicate that capacity building is defined as a process that improves the ability of a person, group, organisation or system to meet its objectives or to perform better and is a multi-dimensional and dynamic process that should lead to an improvement in performance at each level and contribute to sustainability. It is therefore crucial to develop a suite of indicators of climate change learning, to monitor and quantify the effectiveness of such interventions, and to ensure a meaningful contribution to pro-climate change actions.

To realise any objectives of a programme, policy or project, Ika and Donnelly (2017) assert that resources and adequate capacity to use those resources effectively is required. Moreover, capacity building is considered vital for sustaining behaviour. The purpose of a climate change capacity building framework is to enhance the capacity and ability of all stakeholders to take effective climate change action, including the implementation of adaptation and mitigation actions, and to enable everyone to provide meaningful input to climate change proposals at the organisational and country level. In developing these indicators (Table 6.1), it must be ensured that the indicators are cover all the key issues in this research, makes a meaningful impact to the findings, is sustainable and can be replicated.

- Guiding principles for the climate change capacity building programme;

- All stakeholders must be involved in the planning and implementation phases, as listening to stakeholder needs and perspectives, according to Klenk *et al.* (2015), improves the response to climate change. Additionally, Brügger *et al.* (2015) and Shi *et al.* (2015) suggested that at the individual or cognitive level, people's willingness to adapt to climate change is determined by their knowledge, understanding, beliefs and attitudes regarding climate change and the environment.

After the climate change learning programme, all stakeholders involved should:

- (i) understand the science of climate change better;
- (ii) appreciate their (and the human) contribution to climate change;
- (iii) be able to undertake simple pro-climate change actions in their work and home activities routinely;
- (iv) be able to meaningfully influence company and country climate change policies and
- initiatives; and
- (v) take actions to reduce their individual contributions to climate change.

The climate change capacity building programme should be for all stakeholders across the district, from senior managers to lower level employees, councillors, ward committee members and tailored (in terms of duration and content) for these specific internal stakeholders as Ziervogel and Taylor (2008) were of the view that stakeholders respond to climate change according to their particular experiences and priorities, due to their different views on climate change.

Implementation of the climate change capacity building programme

(i) Responsibilities

Facilitators of the climate change capacity building programmes must become content experts

Building the climate change capacity for stakeholders			
	Action	**Target Per Year**	**Output**
Develop and roll out climate change learning interventions	Number of climate change Expert talks	Twice a year	Aware and trained stakeholders; Learnings used to promote pro climate change actions
	Number of climate change short courses	Twice a year	
	Number of climate change communiques issued	Four times a year	
	Number of sites with climate change-related posters	Around the district	

Table 8.3: Building Climate Change Capacity for stakeholders

8.7 Limitations

While this research makes significant contributions to the fields of climate change and governance it also suffers from some "inevitable" limitations of any qualitative research. First, findings and analysis of this research are grounded on a limited number of respondents. Despite all strengths and qualities of qualitative research, if it is judged against quantitative criteria, study findings are not generalizable across a large population. Secondly, data of this research is derived from attributions made by the respondents.

Such data has certain risks to determine whether views described by the research participants were accurate. Lastly, there might be a difference between participants' 'intended' and 'actual' behavioural practices. This is the gap between what people say they do, and what actually they do. This research has taken a number of measures to minimise social desirability effect in the data. On the other hand, this study was exploratory in nature mainly because the chosen case was under-researched and there was extremely limited empirical data to understand the case in question.

8.8 Concluding Remarks

There are number of conceivable ways that the empirical research included in the thesis could be taken forward, covering data, methodological and analytical issues. Methodological techniques and theoretical findings of this research could be applied to other regions of South Africa as well as regions in other countries to compare findings. In particular, a comparative case study between developed and non-developed will be an interesting topic of research to

see how different socio-cultural and economic conditions and communication repertoires. This research draws a communication repertoire of climate change at the community level and identifies its different elements.

There are scopes to conduct in-depth and specific research on each of these elements in the communication repertoire to compare their respective roles. For example, this research finds interest groups, as important elements in the communication repertoires of climate change, which transfer some salient features of climate change to the public. Future research should focus on in-depth analysis of communication strategies of these organizations and their roles in creating awareness and motivating behavioural changes of people. Such research may also analyse the communication tools and contents that are used by non-stakeholders and examine their effectiveness.

The findings from this study will hopefully provide decision-makers with contemporary and detailed data on climate change attitudes in the country and, in particular, impart a better understanding of these attitudes towards climate change. Given that South Africa is a developing country with large proportions of poor and marginalised people, concerns such as unemployment and food scarcity are often more immediate than environmental concerns. The reality is that the poor and marginalised are the most vulnerable to the effects of climate change and awareness-raising of the reality and enduring impact of climate change are critical. The uptake of such messages among marginalised societies can potentially result in actions and innovative solutions that can help mitigate the impact of climate change. Governments should try to move away from engagement mechanisms that involve one-way communication with the public and should pursue more innovative approaches with a focus on stimulating more robust, meaningful, and open citizen participation.

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APPENDICES

Appendix 1: Permission Letter

ILEMBE DISTRICT MUNICIPALITY
ILEMBE –UMASIPALA WESIFUNDA

ENQUIRIES: THANDAZANI MAKHOBA | E-mail: TMakhoba@ilembegov.za | Date: 27 May 2019
IMIBUZO : | Usuku:

Ms Thobeka Zondi (Radebe)
Doctoral Researcher
Human Sciences Research Council
Durban Regional Office
5th Floor, The Atrium
430 Peter Mokaba Ridge Rd
Overport, Durban
+2731 242 5604(w), +27620640059(c)
Email tzondi@hsrc.ac.za
Web: www.hsrc.ac.za

HSRC Human Sciences Research Council | DCES

Fellow Compatriot Ms Thobeka Zondi (Radebe)

REQUEST FOR PERMISSION TO CONDUCT DOCTORAL RESEARCH AS PER DISSERTATION TOPIC "THE GOVERNANCE OF WATER RESOURCES IN THE CONTEXT OF CLIMATE A CASE OF NOODSBURG IN ILEMBE DISTRICT"

I refer to your letter dated the 11th of August 2010 from Prof. T.I. Nzimakwe, same attached for your ease of reference.

The delayed responsiveness is regretted.

I accordingly confirm that you are duly authorised to conduct the said academic research.

The primary conditions thereof, in addition to your undertaking), are as follows:

1. Your research must be undertaken with the least possible amount of intrusion into governance and administrative processes as well service delivery operations intended to sustain service delivery excellence.
2. All information collated and/or reports and/or documents compiled will be made available to iLembe District Municipality at no direct or indirect cost.
3. iLembe District Municipality shall reserve to embargo any information deemed detrimental to its service deliver process or reputation.
4. No information on iLembe District Municipality shall be disseminated to any other party without prior authorisation by the Municipal Manager or his Designate.
5. Any envisaged contact with any municipal official shall be arranged and facilitated through the Senior Manager: Corporate Services.
6. Municipal service delivery imperatives as well as governance and administrative obligations shall take precedence over any envisaged contact with any municipal official.

Yours in relentless pursuit of governance and administration excellence.

Thandazani Makhoba | Senior Manager: Corporate Services
iLembe District Municipality
iLembe House, 59/61 Mahatma Gandhi Street, KwaDukuza, 4450
Tel: +27 (32) 437 9505 | **Cell:** +27 (79) 800 9340
E-mail: TMakhoba@ilembe.gov.za
Website: www.ilembe.gov.za

[redacted]

MR T. MAKHOBA
SENIOR MANAGER: CORPORATE SERVICES

Ilembe House, 59/61 Mahatma Gandhi Street, KwaDukuza 4450, South Africa
Tel:+27 32 437 9500 Fax: +27 32 437 9587
P.O Box 1788, KwaDukuza 4450
All correspondence to be addressed to the Municipal Manager

Ilembe House, 59/61 Mahatma Gandhi Street, KwaDukuza 4450, South Africa
Tel:+27 32 437 9500 Fax: +27 32 437 9587
P.O Box 1788, KwaDukuza 4450
All correspondence to be addressed to the Municipal Manager

Appendix 2: Key Informant Interview Schedule

Introduce myself

I am currently undertaking a Doctoral degree in public administration at the University of KwaZulu-Natal, and I am interested in participatory processes around water management and climate change attitudes in Noodsburg, ILembe municipality in understanding how the municipality and the communities holders deal with deals with the water crisis that the region is facing.

Introduce Thesis topic

In broad terms, my thesis looks The Governance of Water Resources in the Context of Climate Change a case of Noodsburg, ILembe District.

The interview is intended to be an informal discussion; the following outline gives you a sense of the issues I would like to discuss with you.

- A brief description of your department and responsibilities and functions, as well as your area of responsibility.
- Governance arrangements that use models for inclusive participation with the particular emphasis on water.

General Questions

1. Please could you give me an overview of your professional experience, the type of work you are involved in, and your interest and expertise?
2. Provide background on how the department is set up and how it works.
3. Are there any projects put in place to mitigate or address the water issue in the region, and who were the most dominant role players in the projects?
4. Where there any conflictual issues, disagreements negotiations, compromise as part of the project? How did these get resolved?
5. Are there any forums or groups that come together to address the water issue?

Objectives and questions

- **To critically examine critical factors that affect water-related communication and decision processes within Noodsburg.**
    - How do you address the problems associated with water in the region?

- Do you encounter any problems when approaching the community with water queries?
- Are there any obstacles that prevent you from implementing effective water saving methods?
- Briefly elaborate as to what are problems associated with water delivery in the region?
- Specific community questions relationship
- Get a perspective

➢ **To assess governance arrangements that use models for inclusive participation.**

- How do you make sure that inclusive participation happens or occurs in development of municipal planning? What are the trade off, is it talking to ward councillors or community members?
- What are the emerging trends which require policy responses and innovation in governance? The new priorities that COVID19 has brought up, has COVID19 changed anything
- How do you Enhance Good Governance and Accountability how do you ensure responsiveness ? do you think the district model that puts power will improve responsiveness and municipal elections (Batho Pele principles) maintaining a certain standard and way you respond to communities needs

➢ **To examine institutional mechanisms or service provision strategies put in place by the ILembe district.**

- Are there any institutional mechanisms put in place by the municipality or strategies that deal with the provision of water? How do they work?
- Inclusion of the sustainable development goals within strategies and policies?
- What is the role of water in poverty alleviation?
- What is the department doing in trying to combat or overcome this problem?
- How do you promote effective and efficient water resources management to ensure sustainable economic and social development?
- The relationship between Mngeni water how often do you meet how often do you plan with them. What's working well and what's not (Communities, local, ward leaders)
- In what way does the district and local with

- What’s the relationship between the community and the district, what’s their role in water management
- Community attitudes positive and negative, what’s working and what’s not?
- Community members feelings
- Municipalities view
- What’s your view of Ndwendwe, ward councillorcouncillor Mngeni and district?

Appendix 3: Focus Group Interview Schedule

Introduction

Good morning / afternoon / evening my name is …….I'm from the University of KwaZulu-Natal (UKZN) and we are conducting a focus group in iLembe District in Noodsburg area. The main aim of the focus groups is to understand what is the community's attitudes and perceptions towards climate change and its impacts.

IsiZulu Introduction

Injongo yalomhlangano noma ucwaningo ukuzophenya nokuqonda ukuthi amalungu omphakathi yiluphi ulwazi analo mayelana nendlela umphakathi ophatha ngayo iMvelo, (ikakhulukazi mayelana nesomiso noma ukushoda kwamanzi). Nomthelela wokushintshashintsha kwesimo sezulu emphakathini, kanye nokuzwa nemibono yenu ngalokho.

I would like to thank you for agreeing to participate in this research activity. I would like to assure you that the information you will give to us is required for research purposes only, and will be kept confidential by the University of KwaZulu-Natal. Furthermore, the information provided will not be used against you in any way whatsoever. Finally, your participation in the study is voluntary and if you participate in this focus group but you want to withdraw at any stage, you are welcome to do so without any penalty. Before we proceed with that, let us introduce ourselves to each other… (Moderator and note taker start by giving your own name and details first.

Objective 2: **To understand the community's attitudes and perceptions towards climate change and its impacts.**		
Question [60 min]	**Prescribed Action**	**Additional Probing**
What do you think climate change is? <u>Zulu Question</u> Ngokucabanga noma ngokwazi kwakho kuyini noma kubangwa yini ukushintshashintsha kwesimo sezulu?		
Which are the most critical environmental issues that you experience or impact on your life at present? <u>Zulu Question</u> Yiziphi izinkinga eziphathelene neMvelo enihlangabezana nazo nezinomthelela ezimpilweni zenu njengamanje?		
Where do you get most of your current information on climate change? <u>Zulu Question</u> Niluthola kuphi ulwazi mayelana nokushintshoshintsho kwamanje kwesimo sezulu	**<u>Moderator:</u>** - Make sure all participants are given a chance to answer - Pose question to the group. Make sure each person in the groups gives an account **<u>Note Taker:</u>**	
Would you be prepared to change your behaviour to reduce		

your contribution to climate change in any way? Zulu Question Ngabe umphakathi uzimisele yini ukwenza ukushintshashintsha kwesimo sezulu ukuthi sibengcono.		
Have you noticed any changes in your area/community during the time that you have lived there, which may suggest that the climate is changing? Zulu Question Selokhu waba khona nje kulomphakathi, zikhona yini izinkomba zokuthi isimo sezulu siyashintshashitsha?		
If you are concerned about Climate Change, what are the main issues for you? Zulu Question Uma onokukhazeka mayelana nokuguquka kwesimo sezulu, iziphi izinto ezikukhathazayo kakhulu?		

	Objective1: **To understand the role of community stakeholders in dealing with the Climate change impacts such as water shortages (You don't need to read this out)**		
Question [60 min]		**Prescribed Action**	**Additional Probing**
Do you think enough is being done by the South African government to take action on climate change? <u>Zulu Question</u> Kungabe uhulumeni wenza okwanele yini mayelana nokuguquka kwesimo sezulu		**<u>Moderator:</u>** - Make sure all participants are given a chance to answer - Pose question to the group. Make sure each person in the groups gives an account **<u>Note Taker:</u>**	
Do you think the public should be actively involved in deciding what should be done about climate change? <u>Zulu Question</u> Ngokubona kwakho, kungabe kumele yini umphakathi uhlanganyele nohulumeni ekuthatheni izinqumo ngokushintsha kwesimo			

sezulu			
Do you think that government policy-makers (informed by scientific experts) should decide which measures to adopt against climate change? Zulu Question Ngokubona kwakho, kungabe abenzi zinqumo bahulumeni kumele bazinqumele okumele noma nokungamele kwenziwe ngokugukuka kwesimo sezulu?			
Whom do you think should be responsible for making any changes to lessen the impacts of climate change such as water? Zulu Question Ngokubona kwakho ubani okumele enze ushintsho ekwehliseni imithelela			

yokushintshashintsha kwesimo sezulu, ikhakhulu kazi isomiso.			

Appendix 4: Participant information and consent

UKZN HUMANITIES AND SOCIAL SCIENCES RESEARCH ETHICS COMMITTEE (HSSREC)

APPLICATION FOR ETHICS APPROVAL
For research with human participants

Information Sheet and Consent to participate in research

Govan Mbeki Building
Private Bag X 54001
Durban 4000 KwaZulu-Natal, SOUTH AFRICA
Tel: 27 31 2604557- Fax: 27 31 2604609
Email: HSSREC@ukzn.ac.za

Your participation in the study is voluntary and by participating, you are granting the researcher permission to use your responses. You may refuse to participate or withdraw from the study at any time with no negative consequence. There will be no monetary gain from participating in the study. Your anonymity will be maintained by the researcher and the School of Management, I.T. & Governance and your responses will not be used for any purposes outside of this study.

All data, both electronic and hard copy, will be securely stored during the study and archived for 5 years. After this time, all data will be destroyed.

If you have any questions or concerns about participating in the study, please contact me or my research supervisor at the numbers listed above.

Sincerely

……

CONSENT TO PARTICIPATE

I ……. have been informed about the study entitled *"The Governance of Water Resources in the Context of Climate Change: a case study of Noodsburg, ILembe District Municipality."* by Thobeka Zondi.

I understand the purpose and procedures of the study.

I have been given an opportunity to ask questions about the study and have had answers to my satisfaction.

I declare that my participation in this study is entirely voluntary and that I may withdraw at any time without affecting any of the benefits that I usually am entitled to.

If I have any further questions/concerns or queries related to the study I understand that I may contact the researcher at (Cell: 0658000003).

If I have any questions or concerns about my rights as a study participant, or if I am concerned about an aspect of the study or the researchers then I may contact:

HUMANITIES & SOCIAL SCIENCES RESEARCH ETHICS ADMINISTRATION
Research Office, Westville Campus
Govan Mbeki Building
Private Bag X 54001
Durban
4000
KwaZulu-Natal, SOUTH AFRICA
Tel: 27 31 2604557 - Fax: 27 31 2604609
Email: HSSREC@ukzn.ac.za

Additional consent, where applicable

I hereby provide consent to:

Audio-record my interview / focus group discussion YES / NO

_____ _____
Signature of Participant **Date**

_____ _____
Signature of Witness **Date**
(Where applicable)

_____ _____
Signature of Translator **Date**
(Where applicable)

Appendix 5: Ethical Clearance Certificate

UNIVERSITY OF KWAZULU-NATAL
INYUVESI YAKWAZULU-NATALI

14 February 2021

Mrs Nokukhanya Thobeka Radebe (210503823)
School Of Man Info Tech & Gov
Westville Campus

Dear Mrs Radebe,

Protocol reference number: HSSREC/00002344/2021
Project title: The governance of water resources in the context of climate change: A case of Noodsburg, ILembe District.
Degree: PhD

Approval Notification – Expedited Application

This letter serves to notify you that your application received on 17 December 2020 in connection with the above, was reviewed by the Humanities and Social Sciences Research Ethics Committee (HSSREC) and the protocol has been granted **FULL APPROVAL**.

Any alteration/s to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through the amendment/modification prior to its implementation. In case you have further queries, please quote the above reference number. PLEASE NOTE: Research data should be securely stored in the discipline/department for a period of 5 years.

This approval is valid until 14 February 2022.
To ensure uninterrupted approval of this study beyond the approval expiry date, a progress report must be submitted to the Research Office on the appropriate form 2 - 3 months before the expiry date. A close-out report to be submitted when study is finished.

All research conducted during the COVID-19 period must adhere to the national and UKZN guidelines.

HSSREC is registered with the South African National Research Ethics Council (REC-040414-040).

Yours sincerely,

[redacted]

Professor Dipane Hlalele (Chair)

/dd