AN INVESTIGATION OF SOUTH AFRICA'S POLICY RESPONSE TO CLIMATE CHANGE IN THE CONTEXT OF SUSTAINABLE DEVELOPMENT GOALS

by

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DEDICATION

I dedicate this thesis to my late parents, Mrs Nyembezi Mthembu and Mr Msongi Mqedeleni Mthembu, both of whom never got the opportunity to be educated. My father would have wanted to study law to become a prosecutor or a magistrate. He taught us that, “imfundo isinkwa sakho sokuphila” meaning that education is like your daily bread; and once you have it, it can never be taken away from you. May their souls rest in eternal peace.

I would also like to dedicate it to my family including, my extended family for their unconditional support and encouragement.

DECLARTION

I declare that this thesis: An investigation of South Africa's policy response to climate change within the context of the Sustainable Development Goals is my own work and that all the sources that I have used have been credited and acknowledged by means of complete references.

Name: Dumisani Emmanuel Mthembu

Signature: **----------**

Date: **----------**

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ABREVIATIONS

AfSD	Agenda for Sustainable Development
ARC	Agricultural Research Council
AR4	Fourth Assessment Report
BEE	Black Economic Empowerment
CBDR	Common but Differentiated Responsibility
CCMSF	Climate Change Mitigation System Framework
CER	Certified Emission Reduction
COGTA	Cooperative Governance and Traditional Affairs
COP	Conference of the Parties
CSIR	Council for Scientific and Industrial Research
CSTI	Council for Science, Technology and Innovation
CTF	Clean Technology Fund
CMCI	Capital Climate Markets Initiative
CIF	Climate Investment Fund
CTCN	Climate Technology Centre and Network
CSO	Civil Society Organization
CSTI	Council for Science, Technology and Innovation
DAFF	Department of Agriculture, Forestry and Fisheries
DBSA	Development Bank of Southern Africa
DEA	Department of Environmental Affairs
DERO	Desired Emission Reduction Outcome
DIRCO	Department of International Relations and Cooperation
DECC	Department of Energy and Climate Change
Defra	Department for Environment, Food and Rural Affairs
DoE	Department of Energy
DOT	Department of Transport
DST	Department of Science and Technology
DTI	Department of Trade and Industry

DTIC	Department of Trade, Industry and Competition
EU	European Union
GCF	Green Climate Fund
GoU	Government of Uganda
GDP	Gross Domestic Product
GEF	Global Environmental Facility
GHG	Green House Gas
GIB	Green Investment Bank
HMT	Her Majesty's Treasury
IATT	Inter-Agency Task Team
ICF	International Climate Finance
IGCCC	Intergovernmental Committee on Climate Change
INDC	Intended Nationally Determined Contributions
IPCC	Intergovernmental Panel on Climate Change
IRP	Integrated Resource Plan
ISC	Implementation Steering Committee
JSTA	Japan Science and Technology Agency
LEDS	Low Economy Development Strategy
LTAS	Long-Term Adaptation Scenarios
LTMS	Long-Term Mitigation Scenarios
MCEP	Manufacturing Competitiveness Enhancement Programme
MDB	Multilateral Development Bank
MDGs	Millennium Development Goals
MFA	Ministry of Foreign Affairs
MINECOFIN	Ministry of Finance, Planning and Economic Development
MMR	Mixed Method Research
NCCRWP	National Climate Change Response White Paper

NAMA	Nationally Appropriate Mitigation Action
NCCC	National Committee on Climate Change
NCPC	National Cleaner Production Centre
NDCs	Nationally Determined Contributions
NDMC	National Disaster Management Centre
NDP	National Development Plan
NPA	National Planning Authority
NPC	National Planning Commission
NEMA	National Environment Management Act
NGO	Non-Governmental Organizations
NPO	Non-Profit Organizations
NTF	National Task Force
PPC	Policy coordination Committee
PPD	Peak, Plateau, Decline
OAG	Office of the Auditor-General
OPM	Office of the Prime Minister
R&D	Research and Development
REIPPP	Renewable Energy Independent Power Producer Programme
SA	South Africa
SANBI	South African National Botanical Institute
SAWS	South African Weather Service
SDGs	Sustainable Development Goals
SOE	State-Owned Entity
SREP	Scaling Up Renewable Energy Programme
Stats SA	Statistics South Africa
STI	Science, Technology and Innovation
TAR	Third Assessment Report

TEC	Technology Executive Committee
TWG	Technical Working Group
UNEP	United Nations Environment Programme
UK	United Kingdom
UN	United Nations
UNISA	University of South Africa
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
USA	United States of America
VNR	Voluntary National Review
WEF	World Economic Forum
WTO	World Trade Organization

ABSTRACT

Climate change is recognized as one of the environmental challenges with disastrous consequences for the human well-being. Hence, there is no doubt that climate change is not only a great environmental concern, but also a developmental challenge that overlaps at many levels. Accordingly, the global community sees climate change and sustainable development as two major challenges of the 21st century that require urgent collective action. The aim of the study was to investigate and analyse South Africa's policy response in addressing climate change, also considering the added dynamics and imperatives presented by the 2030 Agenda for Sustainable Development (AfSD) that enshrines 17 interwoven Sustainable Development Goals (SDGs) and 169 targets.

In order to fulfil this task, five research objectives were developed; namely: (i) to determine the extent to which the South African government has been involved in domesticating and localizing the SDGs agenda (in general) since its birth in January 2016, (ii) to identify policies and institutions dealing with climate change mitigation (including sustainable consumption and production) and document the provisions of such policies, (iii) to determine policy coverage and institutional spread regarding the addressing of climate change adaptation and adaptive capacity, (iv) to audit and present an inventory of institutions and major financial arrangements existing as means of implementing climate change policy in South Africa, and (v) to establish measures in place to improve education, awareness-raising, and human and institutional capacity development on climate mitigation and adaptation, impact reduction and early warning.

A research methodology was adopted which took the form of evaluation research. This research approach is mostly used in large bureaucratic organizations such as government to determine the extent to which a programme or policy is effective. The research design followed a Mixed-Methods Research (MMR), which combines qualitative and quantitative approaches. Primary data was collected from purposefully selected respondents, who participated in the online survey and face to face interviews.

The analysis of data entailed the reduction and display of data. Data reduction and display made it possible to code, create themes and concepts; as well as enable the study to make cogent inferences and rational conclusions. In addition, primary data was complemented by document analysis that scrutinized relevant documents to climate change and sustainable development.

The study concluded that South Africa has taken reasonable steps to achieve the SDGs because the National Development Plan (NDP) which is aligned to the SDGs was already being implemented. The study also showed that South Africa has put in place institutional mechanisms to implement the SDGs, even though it took longer to put them in place and have them operationalised. The study concluded that South Africa has policies and strategies designed to respond to climate change mitigation and adaptation. However, there are several challenges inherent in the policies and strategies that make them ineffective, including policy implementation inertia. While the study confirmed that there are institutions in place to implement climate change policies and strategies; it emerged that capacity is concentrated at the national level, as opposed to the provincial and local government levels, and relies on few experts which makes the system vulnerable and fragile.

Regarding funding for both climate change and the SDGs, it emerged that South Africa does not budget enough money, and relies heavily on international donations. The study further revealed that there is dissatisfaction with the public's involvement in climate change management in the country. It also highlighted the need to improve early warning systems and preparedness to respond to extreme weather events. Hence, the study suggests that there is a need for a serious introspection with regard to the implementation model to ensure that the issues raised by the study are resolved.

Key words: climate change, sustainable development goals, mitigation, adaptation, climate finance, early warning systems. localization, institutions, education, awareness

CHAPTER 1: BACKGROUND AND INTRODUCTION

1.1 Introduction

There is a growing acknowledgement of the effects of climate change across various sectors of life and the economy. This is so because climate change has brought an additional layer of burden to the already economically, socially, environmentally and politically challenged economies. Even though climate change is unprecedented, global climate policy has not been without problems. There has been an overemphasis on climate mitigation at the expense of climate adaptation. As a result, critical issues relating to climate resilience that fall within the adaptation realm; with severe impacts on economic sectors like agriculture, health and water appear to have remained peripheral in global discourses.

There was also a period in which climate debate was dominated by denialism. Tucker (2012), extensively documents climate change denialism that emanated from the United States of America (USA). This denialism sought to create doubt about climate change science. This happened at the time when there was a growing consensus in the global community that saw climate change and sustainable development as two major challenges of the 21st century that required urgent collective action.

Consequently, Tucker (2012), argues that humanity now has to deal with a climate crisis that has never been seen before due to the failure to take effective actions to combat climate change in a timely manner. Rosales (2014), acknowledges that climate change has inevitable effects on all global issues that are at the forefront of the United Nations (UN) agenda. From Rosales' (2014), perspective, such issues include among others: poverty eradication, economic growth, population increase, sustainable development and resource management.

To this end, some scholars see climate change and sustainable development as part of the same agenda. That being the case, increasingly, there are suggestions that combating climate change is necessary for achieving sustainable development. However, it is perplexing to recall that climate change; whether wittingly or not, was not explicitly addressed as a distinct goal in the Millennium Development Goals

(MDGs) and only emerged as an add-on through the MDGs indicators (Janetos *et al.*, 2012). The authors attribute this to the fact that development and climate communities have in the past evolved separately.

The 20th anniversary of sustainable development (commonly known as the Rio+20 Conference) held in 2012 resuscitated global obligations to ensure a sustainable future that is responsive economically and socially (Orellana, 2016). The Rio+20 summit devoted nations to develop a new global sustainable development agenda to 2030 (United Nations, 2012).

The Agenda for Sustainable Development (AfSD) incorporates a set of universal Sustainable Development Goals (SDGs) to build on the MDGs (United Nations, 2015a). Unlike the MDGs, the 17 SDGs have among them SDG 13 that exclusively focuses on climate change (Table 1.1). This development has been hailed as the most important and ambitious development agenda of the 21st century; and linked to the 17 SDGs are 169 targets that must be achieved by 2030 (Griggs *et al.*, 2014).

Table 1.1: Details regarding the climate change SDG

Goal 13	Targets
Take urgent action to combat climate change and its impacts	• 13.1 Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries • 13.2 Integrate climate change measures into national policies, strategies and planning • 13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning • 13.a Implement the commitment undertaken by developed-country parties to the United Nations Framework Convention on Climate Change to a goal of mobilizing jointly $100 billion annually by 2020 from all sources to address the needs of developing countries in the context of meaningful mitigation actions and transparency on implementation and fully operationalize the Green Climate Fund through its capitalization as soon as possible • 13.b Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized Communities

Source: United Nations (2015a:24)

There is a strong belief that the SDGs are intertwined with the climate change agenda. Addressing climate change and promoting sustainable development agendas are

therefore deemed to be two sides of the same coin (Rosales, 2014). The author further contends that SDGs are irrelevant without addressing climate change. It is perhaps for this reason that the author strongly cautions against dealing with the two agendas separately and in a fragmented manner.

The study analysed South Africa's policy response to climate change within the context of the 2030 AfSD that enshrines the SDGs. To this end, the study investigated how South Africa is responding to climate change as embedded into the SDGs at a national policy level, particularly SDG 13.

1.2. Research problem

For many years, one of the hottest topics at the forefront of the United Nations agenda and at the top of many world leaders' political agendas has been the pressing issue of climate change (Rosales, 2014). As argued by scholars such as Scott (2012), and Arnall *et al.* (2014), this is because climate change remains a complex environmental issue with wide and far-reaching economic, societal and political implications. According to Munasinghe (2010), climate change presents an unprecedented challenge to human-kind. The devastating impact of climate change is being experienced at a time when the world is also facing difficult socio-economic development setbacks, be it in poverty eradication or environmental degradation; hence the 2030 AfSD. Most recently, the world experienced the outbreak of the Corona Virus (COVID-19) that has been declared as the global pandemic by the World Health Organization (WHO). South Africa is no exception to this phenomenon.

There is no doubt that climate change is not only a great environmental concern, but also a developmental challenge that overlaps at many levels. As such, the global community sees climate change and sustainable development as two major challenges of the 21st century that require urgent collective action. Rosales (2014), reports Ban Ki-Moon (former Secretary-General of the United Nations) cautioning that, "If we fail to adequately address climate change; we will be unable to build a world that supports a life of dignity for all" (Rosales, 2014: 209).

It is not just eminent people like Ban Ki-Moon who held this view, scholars such as Matthew and Hammill (2009), have suggested that climate change impacts will reinforce the various forces that for years have restricted and even prevented progress towards sustainable development across the globe. Lack of adequate mitigation, and more specifically, adaptation action, which should emanate from both global and national policy frameworks remain a worrying aspect.

Accordingly, the World Bank (2010), advised that dealing with the enormous and multidimensional challenge of climate change requires extraordinary resourcefulness and cooperation. The United Nations Environment Programme (UNEP – Now United Nations Environment) has decried the fact that global policy bias has created an adaptation gap (UNEP, 2016). This begs the question if the South African government policy response has the requisite inventiveness, pragmatism and rigour to deal with this momentous challenge.

Given the foregoing, it is essential to comprehend the extent to which South Africa's policy response is geared and flexible to deal with climate change in the context of the SDGs. Policy responses must be dynamic, forward looking and appropriate to yield the greatest good to the greatest number of people at minimal social costs and unintended consequences. It is precisely for this reason that South Africa's response to climate change within the context of SDGs must be interrogated and analysed deeply. Accordingly, the study interrogates how South Africa has responded to climate change impacts from a policy point of view, also taking into account the SDGs. Further elaboration of the aim of the study is provided in section 4.1.

The challenge for South Africa is not a simple one. The country has to find ways to make development more compatible to climate change, but also equally address the socioeconomic challenges identified in the SDGs and from its history of apartheid. Although a lot of academic work has been done on climate change and sustainable development, little is known about the integration and implementation of climate change policies through the prism of SDGs in the South African context. This is expected given that the SDGs were adopted in 2015 to be implemented starting January 2016. With such a setup, the assumption is that South Africa and many other

countries would re-orient climate policy to address some of the pressing issues raised in the SDGs, particularly SDG 13 that deals with climate change.

Given the persistence of climate change and its broad ramifications, its impacts cannot be ignored. It is incumbent upon governments to act and put measures in place. According to Owen (2006), policies are the most pervasive form of social intervention. The author notes that the interventions that governments take be it through programmes or policies cost money and resources that are always limited. Anderson (1994), notes that it is precisely for this reason that policy-makers and administrators, including academia must make judgments about the worth or effectiveness of particular policies. Hence, this study aims to systematically and based on evidence; assess the true worth of the policy interventions undertaken by government to deal with climate change impacts and their effectiveness thereof. The absence of such an assessment implies that government interventions continues to be implemented not informed by new knowledge and evidence from which it could benefit immensely.

This study therefore interrogates the system-wide South African national[1] government response in addressing climate change in the context of SDGs. The work has a huge potential not only to inform and shape future policies in climate change and sustainable development, but also contribute in knowledge generation in this area.

1.3. Significance of the study

Climate change is recognized as one of the pressing environmental challenges with disastrous consequences for the human well-being. Its impacts reverberate across the world. As such, the United Nations has conceded that climate change is a seminal human development challenge of the 21st century (Davis-Reddy and Vincent, 2017). In South Africa, the National Development Plan (NDP 2012), which is South Africa's development blueprint until 2030 also recognizes the adverse impacts of climate change on its development aspirations (National Planning Commission (NPC), 2012). Given that climate change is recognized as a risk multiplier and a fundamental stressor on other sectors, its severe impacts have a potential to reverse the gains that have

[1] There are three spheres of government in South Africa namely: The National Government, Provincial Government and Local Government.

been made in socio-economic development; and it could further derail future development. As a result, the World Economic Forum (WEF) (2011), ranked climate change among the top ten risk factors that require urgent attention by decision-makers worldwide. Clearly, this is a risk too great to be taken for granted be it by government, policy-makers, decision-makers, practitioners, academia and other relevant stakeholders.

Given the foregoing, it is not surprising that the AfSD included tackling climate change and its impacts as one of the 17 goals. As such, the NDP asserts that the political difficulty in the coming years will be to come up with policies and regulatory interventions that adequately respond to climate change and its negative impacts in order to achieve sustainable development. Given this challenge, government response requires effective policy clarity and coherence. Clearly, an effective response of government on this momentous challenge will be guided by the policy decisions it takes, its commitment to implement them and the extent to which policies are flexible and dynamic to respond to prevailing circumstances.

Creswell (2014), highlights that in dealing with the significance of the research, the study should at least contribute to scholarly research and literature in the field, including extending research in the field. Furthermore, the author notes that the work should inform and improve practice, policy and decision-making. In this case, while a lot of studies have been undertaken on climate change science, the interface between policy and institutional frameworks, particularly within the context of climate change and the SDGs has not received adequate attention. Hence, this study has a huge potential to inform and shape future policies in climate change and sustainable development, contribute to knowledge generation in this area and assist in decision-making and the evolution of practice, particularly in government and other stakeholders highlighted herein. This research analysed the policy options taken by government to deal with the challenges attributed to climate change taking into account the SDGs agenda. The study further identified gaps where they exist and suggested appropriate and robust policy options that have a potential to yield maximum impact cost-effectively.

1.4. Research aim, questions and objectives

1.4.1 The aim of the study

The aim of the study is to investigate and analyse South Africa's policy response to climate change, taking into account the added dynamics and imperatives presented by the SDGs agenda. Effectively, the work will tease out the extent to which national climate policy presents an urgent action to combat climate change and its impacts as stipulated under SDG 13.

1.4.2 Research questions

Given the purpose of the research outlined herein, the following research questions are presented:

1.4.2.1 To what extent has the South African government localized the SDGs agenda (in general) since its birth in January 2016?

1.4.2.2 Which policies and institutions are dealing with climate change mitigation (including sustainable consumption and production) and what are the provisions of such policies?

1.4.2.3 Which policies and institutions are dealing with climate change adaptation and adaptive capacity, and what are the provisions of such policies?

1.4.2.4 What key institutions and major financial arrangements exist as means of implementing climate change policy in South Africa?

1.4.2.5 To what extent are measures in place to improve education, awareness-raising and human and institutional capacity development on climate mitigation, adaptation, impact reduction and early warning?

1.4.3 Research objectives

Drawing from the aim of the study and associated research questions, the following research objectives are stipulated:

1.4.3.1 To determine the extent to which the South African government has been involved in domesticating and localizing the SDGs agenda (in general) since its birth in January 2016.

1.4.3.2 To identify policies and institutions dealing with climate change mitigation (including sustainable consumption and production) and document the provisions of such policies.

1.4.3.3 To determine policy coverage and institutional spread regarding the addressing of climate change adaptation and adaptive capacity.

1.4.3.4 To audit and present an inventory of institutions and major financial arrangements existing as means of implementing climate change policy in South Africa.

1.4.3.5 To establish measures in place to improve education, awareness-raising and human and institutional capacity development on climate mitigation, adaptation, impact reduction and early warning.

1.5 Scope and limitations of the study

The discipline and science of climate change is very broad and transcends many other disciplines. In order to narrow the scope of the study in a manageable way, the study focused on analysing the national policy context of South Africa in trying to deal with climate change. This was done to limit the scope of the study without necessarily discounting the importance of other SDGs. Some SDGs were covered implicitly during the study. Furthermore, there are 17 SDGs in total covering different thematic areas. However, the study focused primarily on Goal 13 relating to climate change.

Furthermore, given the fact that the SDGs were adopted in 2015; this may have had impact with regard to the availability of relevant literature from diverse spectrum. The study conducted interviews and a survey of purposively selected respondents. The number of respondents was also limited due to time and financial constraints and this may affect the generalization of the findings. The analysis of documents focused largely on key policy documents and strategies, and this may have excluded sectoral strategies that could have enriched the study.

1.6 Thesis outline

The thesis is made up of eight Chapters. The first Chapter provides the background to the study, taking into account the dichotomy between climate change and sustainable development. Chapter one further outlines the research problem, research objective and research questions. The significance of the study and its scope and limitations are also covered.

Chapter two builds from the background provided in the first Chapter and highlights the relevant literature. This Chapter provides the theoretical underpinnings of the study. It begins by discussing the implications of climate change on development from different perspectives; and highlight what might be the appropriate responses to the challenges it presents. It further looks at the politics of sustainable development; including experiences on how the SDGs have been domesticated in other countries. Sectoral approaches and instruments in climate change policies builds on this, and is followed by highlighting the global gaps and barriers in adaptation. It then delves on the contentious issues of climate finance and technology development and transfer. It then interrogates the role of education, awareness and capacity building in climate change response. It then concludes by reflecting on the dynamics and considerations for effective policy implementation.

Chapter three presents the methodology that was used in the study. The research design was underpinned by the Mixed-Methods Research (MMR), which combines qualitative and quantitative approaches. This Chapter provide details on how sampling was undertaken, data collection and analysis as well as the ethical considerations that might have had an impact on the study.

Chapter four details the research findings with regard to the process and extent to which the SDGs have been localized in South Africa. Chapter five presents research findings with regard to perceptions relating to climate change mitigation in South Africa, taking into account existing policies and strategies. Chapter six details the research findings regarding perceptions relating to climate change adaptation in South Africa. Chapter seven presents findings with regard to funding arrangements and institutional set-up in South Africa for implementing the climate change policy. Chapter

seven also presents research findings relating to measures that are in place to promote climate change education and advocacy, including South Africa's preparedness to respond to extreme weather events. The last and final Chapter presents the conclusions and recommendations from the study; as well as highlighting further areas of research that may be necessary.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

The purpose of this Chapter is to review the literature and present the theoretical framework that guided the study. This literature review comes in eight sections. The first section focuses on the consequences of climate change on development. This is followed by a deliberation on the politics of sustainable development and sustainability. A discussion on the experiences of domestication of SDGs builds further from this section. The sectoral approaches and instruments in climate change policies is the focus of fourth section. The fifth section deals with global gaps and barriers in adaptation policies. The sixth section reflects on the contentious debate of climate change financing and technology development and transfer. The seventh section outlines the role of education, awareness and capacity building in mitigating climate change impacts. The eighth and the last section interrogates the dynamics and considerations for policy implementation.

2.2 The implications of climate change on development

Scott (2012), has characterized climate change as an environmental issue with serious implications in society, economically and politically. Understandably, Arnall *et al*. (2014), have concurred with scholars who claim that climate change is one of the significant present-day international development issues. The impression by Rosales (2014), is that climate change is a complex problem to understand, and consequently complex to remedy. Against this backdrop, Arnall *et al*. (2014), have noted that already there has been a notable increase in interest in the impact of climate change. There is no doubt that for many years to come, the climate change phenomenon will remain trending and will increasingly receive significant attention across the world. It is almost certain that the effect of climate change will trigger responses from countries and will continue to influence the policy choices that countries make.

The momentous surge in the interest in climate change has resulted in climate change science becoming increasingly complex and marked by higher levels of precision in its assessments, explanations and predictions in recent years (Matthew and Hammill, 2009). However, that does not mean that scientists have all the answers to the climate

change problems, or have always agreed. The posture taken by the USA to discredit climate science must not be taken lightly from a global policy point of view. Admittedly, the USA remains the world's largest economy with considerable financial and technological resources that can be directed at environmental problems abroad (Harris, 2009). Its influence in international relations and diplomacy is well recognized and respected. As Keller (2017), correctly points out, given the critical role of the USA in what is unavoidably a global issue, what is an impasse for the USA is also an impasse for the world.

Therefore, if the USA were to lead on tackling climate change, it could send a positive signal that other countries could follow, thus its leadership remains critical in global climate change and developmental policies. Arguably, the same can be said about South Africa from a developing country perspective; its leadership in this area remains critical too. For instance, Nhamo (2011), concurs that South Africa wields influence in climate change negotiations. Hence, he further argues that South Africa's role in climate change negotiations cannot be ignored due to its political and economic capital, both on the continent and internationally.

Despite the doubt created about climate change science, it is encouraging though that scientists agree that the global community should act vigorously to decrease greenhouse gas (GHG) emissions and try to normalize the world's climate, failing which could have dire consequences. Predictions show that if the world continues to depend on carbon-intensive energy and continue to use technologies that are not environmentally sound, global average temperatures would increase drastically to more than two degrees Celsius pre-industrial levels (Gao *et al.*, 2017).

Climate change is largely attributed to human behaviour, which is significantly altering the composition of the atmosphere through the emission of GHGs. The GHGs cause global warming that in turn alters the functioning of the climate system leading to climate change (Arnall *et al*., 2014). Grist (2008), suggests that one of the main catalysts of human-induced climate change and the high-levels of GHG emissions from industrial processes, can be attributed to energy provision needs. According to Sanaeepur *et al.* (2014), a substantial amount of the world's energy is generated by the combustion of fossil fuels.

This is a dilemma that is highly prevalent in some developing countries. In South Africa for instance, the energy sector is highly reliant on fossil fuels to generate electricity. As a result, this sees the country being counted amongst the world's top 15 GHG emitters, contributing 1% of total carbon dioxide in 2004 (Thambiran and Diab, 2010). Given the inevitable increasing demand, Sanaeepur *et al.* (2014), have questioned whether it would be possible for the energy demands that are necessary for sustainable development to be met without leading to the worsening of climate change.

Sanaeepur *et al.* (2014), suggest that the solution lies with the new advanced technologies and the expansion of renewable energy resources. On the other hand, Grist (2008), has suggested that increasing energy efficiency offers attractive financial prospects for businesses and customers. The added advantage for this, Grist (2008), argues, is that it could enhance sustainable consumption and production initiatives.

Even though the solutions proposed make a lot of sense, it seems they do not go far enough to reduce scepticism. As such, scholars such as Matthew and Hammill (2009), have cautioned that even in the best possible scenarios, with green technologies in place such as renewable energy, robust mitigation efforts and a steady world population, scholars believe that the world cannot avert further increase in warming by at least one more degree Celsius.

With this kind of conviction, the authors have warned that climate change is a pressing global problem with inevitable and dire consequences which presents long-term implications for the sustainable development of all countries. Given the focus of this study, some of these elements were investigated to check how the South African government policy orients itself to such.

Climate change has direct ramifications for trade relations and economic policies among countries. Barbier (2014), has cautioned that if mitigation policies focus too much on reducing the burning of fossil fuel by developed countries, then they may be forced politically and otherwise to respond accordingly, including by taking trade actions that may foster their international competitiveness. According to Barbier (2014), studies have shown that the impact and ramifications for overall trade and

economic growth in developing countries will depend principally on which response measures rich countries take to sustain their competitiveness. Such discussions must not be divorced from climate change debate and the policy options that a developing country like South Africa has to grapple with. If the rich countries impose charges just on imports deemed not to have been produced according to cleaner production standards, such as energy-intensive products, then developing country manufacturing exports would be affected negatively; and thus, predicted to decline by 1.2% (Ibid).

Tosam and Mbih (2015), warn that climate change further intensifies poverty, dependence and underdevelopment and thwarts development efforts particularly in Africa. Given the sensitivity of agriculture to climate change, efforts to improve resilience must be intensified. Matthew and Hammill (2009), argue that while climate change will present a strong case for sustainable development, its impacts will reinforce the various forces that for many years have retarded and prevented progress towards sustainable development.

As a result, Toroitich and Kerber (2014), have asserted that climate change raises legitimate questions about the development and economic trajectory upon which human development has been pursued. Grist (2008), reckons that climate change got included in the development arena as a result of the environmental considerations of the wider agenda of sustainable development. Toroitich and Kerber (2014), therefore observe that initially, climate change and sustainable development were based in different scientific worldviews, and continue to follow largely separate epistemic paradigms. Matthew and Hammill (2009), have argued that attempts to reconcile economic development, equity and environmental protection should be realized through the lens of climate change.

Given the foregoing, there have been efforts lately by the international community to establish links between climate change interventions with human development goals that are designed to reduce poverty and promote equity (Arnall *et al.,* 2014). This perhaps seeks to compensate for the missed opportunity during the MDGs process that did not explicitly address climate change, but general environmental concerns. This was despite the overwhelming evidence that climate change would delay the pace of sustainable development (Halvorssen, 2008; Janetos *et al*., 2012).

Accordingly, Halvorssen (2008), and Janetos *et al*. (2012), have warned that if those links are not established, the impacts of climate change will destroy most of the progress made toward sustainable development. Hence the desire from this work to establish how South Africa's policy response to climate change interfaces with the SDGs. One thing certain though, is that the MDGs were developed at the time when there was a lot of political noise regarding whether or not climate change existed and the doubt that had been created around climate science.

Tucker (2012), posits that humanity now faces a climate crisis of astounding proportions, due to failure to take effective steps to address climate change in a timely manner. Rosales (2014), as well as Tosam and Mbih (2015), concede that climate change has inevitable effects on all global socio-economic and environmental issues that are at the forefront of the United Nations developmental agenda.

The foregoing discussion has sought to demonstrate this point that sustainable development should be climate sensitive and vice versa. As noted by Rosales (2014), one cannot ignore the observation made during the twentieth anniversary of sustainable development; Rio+20 that recognized the threat of climate change as a substantial factor that could undermine the attainment of the SDGs. Hence, it would be ill-advised to interrogate climate change in isolation without embedding it within the context of sustainable development and the SDGs.

2.3 The politics of sustainable development and sustainability

The famous and widely used definition of sustainable development was popularized by the Brundtland report (Our Common Future) in 1987. This report defined sustainable development as, "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (Brundland Report, 1987: 41).

The concept of sustainable development is used widely and sometimes loosely and therefore can mean different things to different people. Keiner (2006), cautions that sustainable development is a concept that is in good currency and overused. To this end, every kind of development, even those that do not conform to the sustainable

development doctrine can be unduly justified as sustainable. As a result, Springett (2005), has noted that it has resulted in strong contestation and even repudiation. According to Barclay (2006), some people merely see it as a buzzword and an idealistic concept whose usefulness is fundamentally limited to developing countries. Given these dynamics, there is a concern that the concept has lost much of its radical cutting edge because it is often loosely interpreted (Connelly and Smith, 1999).

Despite its problems, the concept of sustainable development has succeeded to place development and environmental debate at the centre stage in international discourse. As such, sustainable development has increasingly triggered notable attention among development practitioners, scholars and politicians (Barclay, 2006); and has elevated international debates about environment and development policy-making (Lafferty and Meadowcroft, 2003). Hence, even the 2030 AfSD has adopted the 1987 definition, to which South Africa also subscribes.

According to Gupta and Vegelin (2016), studies on the politics of sustainable development reveal that realizing strong sustainability, which makes no compromise between the economic, social and ecological goals is not common because politics tend to compromise in support of the economy at the expense of social and ecological issues. For instance, Toroitich and Kerber (2014: 292), have argued that:

> On the one hand, climate change is a result of unsustainable practices, on the other hand, it is one of the major threats to sustainability of lives and livelihoods, particularly of the poor and vulnerable.

Ultimately, it is governments that have to grapple with these difficult questions whether to ensure food security or environmental protection. These are not easy choices to make, be it at policy formulation or implementation levels; given other equally important competing priorities. After all has been said, sustainable development has endured over many years and is now widely acknowledged as a global objective.
The 20th anniversary of sustainable development (Rio+20 Conference) invigorated earlier global commitments and aspirations to bring about a sustainable future that takes into account economic, social and environmental considerations (Orellana, 2016). The Rio+20 summit urged the global community to develop a set of universal

SDGs that would not only replace, but also build on the MDGs, dubbed the 2030 AfSD (United Nations, 2012). The SDGs have been hailed as the most important and ambitious development agenda of the 21st century (United Nations, 2015a). In concurring, Chasek *et al.* (2016), suggest that countries set a very high bar for themselves at the Rio+20 Conference. The SDGs also aim to put in place a coherent and inclusive programme that embraces environmental sustainability and social concerns with the poverty eradication agenda. In fact, the global battle cry from the SDGs is 'Let no one be left behind' (Ibid: 2).

From Griggs' *et al.* (2014) analysis, the primary aims of the SDGs encompass poverty eradication, sustainable lifestyles for all, and a stable resilient planetary life-support system. While the SDGs have been hailed globally for being integrated and indivisible, they have also been criticized for being incoherent. Critics have implied in their arguments that there is a danger that while individual goals may be achieved, but ultimately, this may not lead in meeting the spirit of the goals (Kim, 2016: 17).

Furthermore, the non-hierarchical arrangement of the SDGs is problematic because the goals and targets interrelate (Kim, 2016:17). The author, further notes that while some targets are interdependent or complement each other, some may have a negative effect on others. For instance, the need to ensure food security that is addressed in goal 2 may negatively impact the availability and sustainable management of water addressed in goal 6. It is for this reason that the author claims that some of the SDGs and targets, in an environment of limited resources, are likely to compete for limited resources or even exacerbate rather than solve problems.

It must be noted that not all scholars agree with the criticism presented. Rosales (2014), observes that unlike the MDGs, the SDGs look more promising because they address change on two frontiers, namely: development and climate. The author contends that the value of the SDGs is diminished if climate change is not addressed. This way, the author places climate change at the centre of the SDGs.

To this end, SDG 13 dealing with climate change remains the only SDG whose mandate has been ceded to a United Nations body, namely, the United Nations Framework Convention on Climate Change (UNFCCC) Secretariat. While Rosales

(2014), has noted the inclusion of SDG 13 on climate change, the author is of the view that this does not go far enough. The author observes that among the SDGs are goals designed to: ensure food security, eradicate poverty, better human health, ensure access to clean water, sustainable energy, and promote economic growth, all of which are indirectly, if not directly affected by goal 13 relating to climate change. No doubt, agriculture deserves a special mention in this regard. As far as Rosales (2014: 233), is concerned:

> To achieve the SDGs we must address climate change, and to address climate change, we must achieve the SDGs, therefore, it is necessary that these agendas be interwoven because each agenda provides the narrative to address each issue.

It is perhaps for this reason that the author strongly cautions against dealing with the two agendas separately in a fragmented way. If this is not done, the author cautions that the SDGs may not be implemented successfully, as it happened with the MDGs. Given the current arrangement where there is a specific climate SDG addressed under the UNFCCC, there are good grounds to believe that the necessary instrument for implementing interventions is in place through the Paris Agreement. Accordingly, Chong (2018), highlights that the SDGs, taken together with the Paris Agreement, they represent an unprecedented attempt by the international community to recognise the links between climate change and development.

Although a lot of noise emerged from the USA on its desire to withdraw from the Paris Agreement, the Nationally Determined Contributions (NDCs) which outline the countries' commitment to addressing climate change have put SDG 13 to life. These commitments have been widely received as the Paris Agreement came into effect on 4 November 2016 (Ravindranath *et al.*, 2017). Despite this, on 4 November 2019, the USA followed through on its publicly stated intention to withdraw from the Paris Agreement by officially notifying the Secretary-General of the United Nations in his capacity as depository that it was withdrawing from the Paris Agreement.

The NDCs present intervention measures across a range of themes that are mainly centred on climate change mitigation and adaptation. Other cross cutting themes with

a bearing on this research like capacity development, financing, awareness, technology and education are addressed too. These issues also have relevance and implications for the domestication of the SDGs as they may in one way or another impact on the successful implementation of the SDGs. Thus, the domestication provides the impetus and serves as the beginning of the internalisation process for government to prepare for the implementation of the SDGs.

2.4 Domestication of the SDGs: experiences from Uganda, Rwanda and Japan

From an international law perspective, the 2030 AfSD is considered to be soft law (Persson *et al.*, 2016a). Therefore, there are no strict obligations to achieve them. According to Persson *et al*. (2016a), the softness of the SDGs and its associated low level of obligation has resulted in universal participation and depth of commitments. Now that the agenda 2030 has been adopted, attention has focused to their implementation (Ibid). According to these authors, arrangements for domestic implementation of the SDGs by countries were not well expounded. This was because of the consideration of sovereignty issues and the fact that Agenda 2030 is so broad and all-encompassing that it is rather challenging to prescribe detailed implementation processes and responsibilities (Ibid).

Furthermore, the SDG targets are aspirational and global, the expectation is that each country should set its own national targets based on the international level of ambition but cognizant of national circumstances (Persson *et al*., 2016a). This architecture was designed to ensure national ownership and respect for national sovereignty. The challenge then becomes which targets and commitments should be given more consideration at a country level. As countries domesticate, they are expected to adapt the SDGs agenda commitment to respective national circumstances by setting national targets (Ibid).

International commitments generally become binding domestic law or at least implementable through a legitimate and complex process of domestication or localizing them. Without proper domestication, international obligations frequently lack legitimacy or even justification by government of why they are implemented (Raustiala, 1995). According to Alasuutari (2009), although the concept of domestication stems

from disciplines such as anthropology and consumption studies and most recently in information and communication technologies, it is spontaneously useful when thinking about the creation and harmonization of global trends.

Domestication is also about the naturalization of global policy outcomes within national framework policy context. This is because external models should ideally not just be adopted, but rather when implemented, they should be incorporated and integrated with local conditions which may be different from the original blueprint under which they were formulated. Hence, in domesticating the policy, it must consider the role of domestic stakeholders and actors into account. The end result of the domesticated policy is that it becomes no longer perceived as something external or strange (Alasuutari, 2009). As such, the 2030 AfSD is one such global accord developed through a multilateral process that must be domesticated and implemented at a national level. Amongst the countries that have pioneered the domestication of the SDGs are Uganda, Rwanda and Japan. These countries' experiences can provide valuable lessons on the domestication of the SDGs.

In a document published by the Government of Uganda (GoU) (2015), entitled: Uganda - Our Constitution, Our Vision and Our SDGs, Uganda has elaborated extensively on how it has gone about domesticating the SDGs. A number of factors contributed to Uganda's drive to move with speed in the domestication of the SDGs. Among others, was the development of the Vision 2040 and the second National Development Plan (NDP) just before the SDGs were adopted in 2015 (Office of the Auditor General (OAG), 2018).

Furthermore, was the election of Honourable Sam Kutesa, a Ugandan Minister of Foreign Affairs at the time as President of the United Nations General Assembly to oversee the inter-governmental negotiations that developed the SDGs (GoU, 2015). This placed Uganda in an envious position to move swiftly in the localization and popularizing the 2030 AfSD (National Planning Authority (NPA), 2015; OAG, 2018). Accordingly, NPA (2016), (2020), notes that this enabled Uganda to be one of the first countries to localize the SDGs in national planning frameworks. Furthermore, it enabled Uganda to volunteer to participate in the first voluntary national reviews (VNRs) that are conducted through the United Nations' High-Level Political Forum

annually. The pillars of the SDG domestication in Uganda focused on its alignment with national policies, securing political-will and buy-in, stakeholder consultation and participation, communication and to some degree funding.

Part of the domestication entailed the analysis of the Constitution, National Development Plan, sector development strategies and even the National Anthem for alignment with the SDGs. An analysis of the Constitution of Uganda and its Vision 2040 showed a substantial alignment of the SDGs, as such, reinforced national ownership and political buy-in (OAG, 2018; GoU, 2015). At least there is a 76% alignment between the SDGs and the second National Development Plan of Uganda (GoU, 2015).

The SDGs by far reinforces the future that Uganda wants and aspires to become as outlined in its Vision 2040 (NPA, 2015). In this regard, Uganda ambitiously desire to be a “transformed Society from a peasant to a modern and prosperous country within 30 years” (NPA, 2013: 4). Interestingly, parallels were also drawn between Ugandan National Anthem and the SDGs and it was found that the Anthem itself has common synergies with the SDGs. Overall, it is reported that Uganda has achieved 89% alignment of the SDGs and the second National Development Plan; if the United Nations Development Assistance Framework is factored in which is intended to support the implementation of the development plan (GoU, 2015).

In order to ensure inclusiveness and citizen buy-in, Uganda held national consultations attended by at least 10 877 (GoU, 2015: 12), to make sure that no one was left behind particularly the vulnerable and marginalized groups (GoU, 2015). This consultation happened concurrently with the Vision 2040 consultations (NPA, 2016). This means that even before the SDGs were adopted, Uganda had already started a process to engage its citizens on the SDGs. These engagements included among others: the National Consultative Forum, regional workshops on SDG localization, and high-level national briefing; all of which enjoyed political support. Hence, a political decision was taken to integrate the SDGs in the second National Development Plan before the SDGs were adopted (GoU, 2015).

This decision was based on feedback from a number of workshops and meetings that Uganda had undertaken with stakeholders. In 2015, Uganda held a dialogue to discuss funding for the SDGs. The sentiment for Uganda's approach to financing the SDGs can best be summed by what the Honourable Matia Kasaija Minister of Finance, Planning and Economic Development is reported to have said, "nobody owes us our living" (GoU, 2015: 28); and reiterated the need for countries to design mechanisms for their own development.

In this respect, Uganda seeks to enhance mechanisms for the collection of domestic tax revenues. According to the NPA (2016), the Fiscal Strategy is the main instrument to achieve this goal. Hence, the Ministry of Finance, Planning and Economic Development is tasked with a difficult responsibility to mobilize the resources, allocate those resources as well as ensuring alignment with the SDGs and monitoring (NPA, 2020). Furthermore, the government of Uganda has undertaken to invest in strategic sectors of the economy such as oil and gas, energy and transport (NPA, 2013), to grow the economy which will in turn generate enough resources for the implementation of the SDGs.

Taking the lessons from the MDGs process that was criticized for its lack of consultation in its formulation, implementation and monitoring, Uganda pursued a bottom-up approach that ensured that Ugandans understood the essence of the SDGs irrespective of their standing in society and levels of education (GoU, 2015). As such, the SDGs Communications Strategy was put in place. Working with youth and communities, SDG messages were developed, translated into local context, concepts, culture as well as local languages (OAG, 2018). This was to ensure that everyone and everywhere regardless of their standing in society and location would have the basic understanding of sustainable development. Government initiatives in this regard were supported by Civil Society Organisations (CSOs) through the CSO SDG Core Reference Group that mobilized and engaged citizens across the country (Office of the Prime Minister (OPM), 2020). These CSO engagements resulted in the launch of the Tondeka Mabenga (leave no one behind) initiative by focusing of marginalized groups (Ibid).

Following on the Kampala Declaration on Developmental Local Government which recognized that local government is at the centre of development, Uganda felt the need to embed the AfSD at local government level by integrating the SDGs in sectoral and sub-national plans. In order to ensure monitoring and evaluation, Uganda Bureau of Statistics jointly with the National Planning Authority of Uganda developed indicators that are used to measure the SDGs progress as part of the implementation of the second National Development Plan (OAG, 2018; United Nations Development Programme (UNDP), 2018).

Uganda hosts one of the three United Nations Global Pulse Network. This programme is an innovation initiative that was inspired by the United Nation's former Secretary-General Ban Ki-moon. This initiative explores new ways of assessing, monitoring and measuring development with data innovation and new technologies (GoU, 2015). To this end, cooperation arrangements have been put in place with the National Planning Authority and the Lab to monitor progress of the second National Development Plan and the SDGs through real-time data tools.

The tools support both United Nations and the Government of Uganda in developing baseline data and real-time monitoring mechanisms to enhance the monitoring of implementation progress. According to NPA (2016), Uganda has the National Coordination Policy in place to facilitate the coordination framework on the SDGs that is overseen by the Prime Minister.

In line with this policy, various political and technical committees were established. Among the structures that are in place are: (i) the SDGs Policy Coordination Committee (PCC) (GoU, 2015; OPM, 2018; OAG, 2018). This Committee is constituted by members of Cabinet, Heads of United Nations Agencies, and Heads of Missions and presided by the Prime Minister. (ii) the SDGs Implementation Steering Committee (ISC) formed by the Permanent Secretaries, Heads of Agencies, and Development Partners and headed by the Head of Public Service and Secretary to Cabinet (OPM, 2018). This Committee is tasked with the mandate to review progress and make recommendations to the PCC. Other structures that are already in place include the SDGs National Task Force (NTF) and five SDGs Technical Working

Groups[2] (TWGs) that cuts across different ministries. What is clear from these structures is that they enjoy high-level political support (GoU, 2015; NPA, 2020). Even though a lot of commendable work was done, the review of the readiness of government to implement the SDGs revealed weaknesses in the operationalization of the coordination framework and highlights low level of public awareness (OAG, 2018).

Similar progress has been observed in Rwanda, coincidentally, following the same template that was applied in Uganda in many respects. According to Rizinde *et al.* (2018), Rwanda is among the first countries worldwide that undertook the process of SDGs domestication, accordingly, it prides itself as one of the front-runners in Africa (UN Women, 2017). Rwanda has endeavoured to integrate and harmonize the SDGs targets in national development and its various poverty elimination policies. The domestication process went beyond a mere valuation of whether the SDGs' targets are included in national development strategies, but it also focused on their meaningful integration with the ultimate goal of ensuring their implementation, in order to achieve the 2030 sustainable development agenda (Bizoza, 2016).

The Ministry of Finance, Planning and Economic Development (MINECOFIN) is charged with the responsibility to mobilize resources for the SDGs. Importantly, it is also mandated with the responsibility to ensure ownership across government (MINECOFIN, 2019). In April 2016, MINECOFIN (2016), outlined Rwanda's approach to implementing the SDGs (in a paper that was presented during a Conference on Regional Solutions to Achieve the SDGs). According to the UNDP (2016), Rwanda was chosen to participate in the SDG pilot project that focused on governance and the rule of law. It also hosts the Africa SDGs Centre which aim to drive innovation and research towards achieving the SDGs in Africa (UN Women, 2017). Rwanda developed the SDG domestication Roadmap which was approved by Cabinet (MINCOFIN, 2019).

On the communication front, Rwanda translated the SDGs into local language (Kinyarwanda) and the translated material was used during the National Dialogue

[2] (i) Coordination, Monitoring & Evaluation and Reporting, (ii) Planning, (iii) Financing and Resource Mobilization, (iv) Data, and (v) Advocacy and communication

Council workshop (MINECOFIN, 2019). It further undertook an analysis in 2015 and 2017 respectively to assess the alignment of the SDGs with the National Development Plans and sector strategies (UN Women, 2017). The 2015 analysis showed that 38 targets (27% of indicators) are fully aligned with the National Development Plan with regard to content and how they have been formulated, disaggregated as well as measurement unit. At least 51 targets (39.9% of indicators) were found to be partially aligned while 51 targets (39.9% of indicators) were not aligned respectively (MINECOFIN, 2016). According to Kindornay, and Gendron (2019), this shows that the SDGs have been comprehensively integrated to National Development Framework. The VNR report (2019) notes that despite efforts to align the national development strategies at national and district levels and SDGs, there are still challenges with regard to the level of ambition and what can be realistically achieved based on the availability of resources (MINECOFIN, 2019).

To enhance national coordination, the Office of the Prime Minister was given the overall responsibility to oversee all coordination including monitoring and evaluation, reporting and awareness of SDGs (UN Women, 2017). Existing forums that were used to facilitate the stakeholder consultation of sector plans and strategies were used such as the Development Partners Coordination Group, Sector Working Groups and Joint Action Development Forum (MINECOFIN, 2015). These Forums ensure coordination at different levels of government and sectors.

The Japanese approach is different in that the Prime Minister created coordination mechanisms from the very high-level and followed a multi-disciplinary approach. According to the Ministry of Foreign Affairs (MFA) (2017), Japan was actively engaged in the SDG dialogue even before the SDGs were adopted by implementing measures in an integrated way to build a sustainable society. The Japan Science and Technology Agency (JSTA) (2018), highlights that this was driven by Japan's desire to be exemplary to the world in the implementation of measures to achieve the SDGs. The Prime Minister of Japan took keen interest and organized a number of policy dialogues during the development phase of the SDGs. Japan's efforts in this regard have been recognized and has been ranked 11th in the SDG Index and Dashboards Report 2017 (Sachs *et al.*, 2017).

Following Japan's commitment to fully implement the SDGs, it established a Cabinet Coordination Body called the SDGs Promotion Headquarters (MFA, 2016). This body is presided over by the Prime Minister and is composed of all Ministers. This was to ensure that the implementation of SDGs in Japan is harmonized, comprehensive and effective across government. The Cabinet Body decided to develop the SDGs Implementation Guiding Principles (MFA, 2016).

Following extensive consultation from all stakeholders in 2016, Japan completed developing the SDGs Implementation Guiding Principles. According to the MFA (2016), the Implementation Guiding Principles portrays Japan's national strategy to deal with the pressing challenges for the implementation of the 2030 Agenda. Accordingly, the Guiding Principles document outlines first and foremost the vision, priority areas and implementation principles. Furthermore, it outlines the implementation framework, approach to the SDG monitoring and review processes and proposes solid measures grouped under priority areas. In this regard, Japan's ambitious vision with regard to SDGs is to "Become a leader toward a future where economic, social and environmental improvements are attained in an integrated, sustainable and resilient manner while leaving no one behind" (JSTA, 2018: 56).

Clearly, the Guiding Principles were used as a mechanism to galvanize and marshal all government ministries and agencies in collaboration with other stakeholders to implement a variety of measures in an effective and coherent manner. To this end, Japan and its agencies committed to include the SDGs into their plans, strategies and policies and explore means to address systemic reforms and mobilize financial resources (MFA, 2016). Accordingly, Japan has developed domestic measures which adapted the global targets and indicators to Japan's national context and identified the relevant ministries and agencies that will champion them.

Japan has also pioneered the development of science, technology and innovation (STI) Roadmap for SDGs. According to the United Nations Inter-Agency Task Team for the SDGs (IATT) (2020), this can be attributed to the fact that historically, Japan has been very successful at technological catch-up and has become exemplary using STI as part of its development strategies. To deepen the discussions on STI for SDGs Roadmap, the IATT in partnership with Japan organized an Expert Group Meeting in

May 2018 in Tokyo, attended by around 70 experts and practitioners, including representatives from 12 countries (Kenya, Ghana, Rwanda, Brazil, Colombia, Jamaica, Guatemala, Serbia, Thailand, UK, Australia, Japan). Japan also provided seed funding for the development of the STI Roadmap guidebook as well as technical expertise and leadership in the IATT sub-working group on STI Roadmaps (IATT, 2020).

Japan recognizes that by achieving the SDGs, it will equally solve its social problems. In April 2016, the government of Japan adopted the 5th Science and Technology Basic Plan (also known as Society 5.0). The Council for Science, Technology and Innovation (CSTI) (2016), highlights that in this plan, STI has been portrayed as a major policy intervention for the economy, society and the public. Accordingly, JSTA (2018), notes that Japan has undertaken to promote Society 5.0 and Productivity Revolution in its pursuit to respond to challenges related to SDGs. This Plan covers various aspects, including innovation promotion and internationalization. Furthermore, this Plan recognizes the rapid technological change and the impact it may have in the implementation of the SDGs. According to the CSTI (2016), central to this Plan is the transformation of the society towards a Super Smart Society (the Society 5.0). The other central pillar is the Human Resource Development drive in Artificial Intelligence and Information Technology corresponding to the envisaged disruptive innovation. Japan has set itself numerical targets to train engineers in these areas by 2020 based on the current shortage as well as foster Information Technology literacy among all citizens (CSTI, 2016).

These issues discussed herein have been integrated in Japan's STI for SDGs Roadmap which is highly institutionalized and well-coordinated. The Roadmap also enjoys high-level buy-in through the leadership of the Prime Minister and the SDGs Promotion Headquarters. There is also a Multi-Stakeholder Engagement related to the SDGs where ministries, local government, Non-Governmental Organizations (NGOs), universities and other stakeholders participate. There is also a Council for Science, Technology and Innovation of Cabinet Office whose role is to promote STI for SDGs.

Other institutional mechanisms include STI for SDGs Task Force that involve all relevant stakeholders from government, private sector, academia and NGOs. There is also the SDGs Promotion Roundtable Meeting that feeds into the CSTI that includes NGOs, academia, private sector, international organizations and various other organizations. The setting up of proper structures for coordination was intended to facilitate the implementation of the SDGs.

It is clear that domestication should not happen in a vacuum, proper coordination structures must be put in place to ensure effective implementation and the leveraging of resources. Furthermore, if domestication and harmonization is not done, this could lead to duplication of efforts and be costly in an environment that already requires mobilization of additional resources and reprioritization. Domestication should also be seen within the prism of change management, hence the need to consult and communicate with stakeholders cannot be overstated enough. After all is said and done, the SDGs are about transforming the world by ending poverty, protecting the environment and ensuring prosperity for all; and in a way shaping the development trajectory for the future.

2.5 Sectoral approaches and instruments in climate change policies

It is acknowledged that climate change mitigation and adaptation strategies are the most common methods to address climate change impacts. The Intergovernmental Panel on Climate Change (IPCC) (2001), in its Third Assessment Report (TAR) and IPCC (2018), defined mitigation as a human-induced endeavour to reduce the sources or enhance the sinks of GHGs. In that same report, the IPCC (2001), defined adaptation as modification of natural or human systems as a way to respond to actual or expected climatic stimuli or their effects, which diminishes harm or exploits beneficial opportunities.

However, experts differ in terms of what to prioritize as some advocate for more mitigation, while others prefer more adaptation, although for many years, the mitigation agenda has been prioritized. This is proof of the global climate policy set-up that has witnessed the Kyoto Protocol that is a mitigation instrument in place as of 1987, while the Intended Nationally Determined Contributions (INDCs) that have significant

elements of adaptation only came into place in 2015. In fact, the adaptation agenda made its way onto the global climate negotiation space only in Bali, during COP 13 in 2007. Otto *et al.* (2015), have questioned the slow progress to mitigation, citing a combination of economic and political barriers to action caused by poor incentives to mitigate and robust incentives to benefit on the efforts of others. The authors contend that for any climate change mitigation policy to be successful, it should overcome these barriers and further be able to withstand and be flexible to other external pressures that may be caused by changes in the economy and political interests.

Otto *et al*. (2015), have emphasized the need for climate change mitigation policies to be robust to withstand external pressures, and anti-fragile to be responsive to scientific uncertainty that allows trial and error with minimal societal costs. Linked to this is a precautionary approach to mitigation that allows development to continue while staying within the limits posed by the climate system. The authors warn that the precautionary approach can provide a legitimate justification to defer decisions until the uncertainties are resolved.

A perspective from Barbier (2014), suggests that climate change mitigation policies tend to have regressive effects as they place higher financial strain on the poor, rather than those households that can afford. They also tend to be incompatible with efforts to expand modern energy services such as electricity generation. It seems though that this perspective does not consider that there are co-benefits that accrue to the poor such as improved air quality, clean energy, health and energy efficiency innovations.

Lee (2014), portrays that energy efficiency is perhaps one of the most crucial and cost-effective ways by which industries can reduce their GHG emissions for sustainable development. It has been observed that other factors are forcing a growing number of industries to use energy more efficiently. These factors include among others: pressures from the markets, growing public awareness of environmental sustainability and increasing energy costs and volatility. These socio-economic pressures regarding cleaner production efforts and services are important change agents for the introduction of energy efficiency improvements (Ibid). Renewable energy too, has been propelled by many entities, both private and public in order to address climate change mitigation. To this end, SDG 7 focuses on energy (United Nations, 2015a).

The economics of climate change is an essential issue in policy-making discourse at international and national levels (Grist, 2008). For instance, the development of the carbon market has been found to be the most economically important endeavour related to climate change; that is cost-effective to achieve policy goals. Another issue in climate change policy is dealing with sustainable consumption and production. According to Langhelle (2003), and Stevens (2010), sustainable production and consumption have become one of the main issues of sustainable development and are currently addressed through SDG 12 (United Nations, 2015a). Stevens (2010), provides a detailed analysis on how sustainable production and consumption should be approached to achieve maximum benefit. The author further highlights the role of government in this regard through command and control instruments, providing enabling environments and incentives, as well as regulation and taxes.

However, Stevens (2010), cautions that these policy instruments can influence consumers' behaviour only if the financial incentives are strong enough to influence their decision-making processes. Unfortunately, in many cases, taxes are not set high enough to have a deterrent and significant effects on consumption patterns due to lack of political-will and industry lobbyists (Ibid); as well as the use of outdated and colonial times laws in many developing countries (Kupika and Nhamo, 2016).

While this is an important debate on climate change; Stevens (2010), decries that the concept of sustainable consumption and production has not been fully effective because of its overemphasis on consumption and paying little attention to production. Of concern is that the role of the consumers does not appear to have taken centre stage in the process, which can help drive sustainable production and achieve sustainable development. Accordingly, there have been calls for an integrated approach, which addresses both consumption and production at the same time because they tend to be mutually reinforcing, as opposed to a fragmented approach which is deemed inefficient.

2.6 Global gaps and barriers in adaptation policies

While comments by Otto *et al*. (2015), on the slow progress on mitigation are noted, there is overwhelming evidence that supports the view that a global drive on climate

change initially was a mitigation agenda as noted earlier. Several scholars (see for example, Janetos *et al*. 2012; Halvorssen 2008; Simonet and Fatoric 2016; Saab 2016; Masters 2011; and Biesbroek *et al.* 2011), have supported this proposition. In 2016, UNEP published a report, building on its previous reports documenting in detail the adaptation gap. In this report, UNEP (2016), acknowledges that the Paris Agreement has elevated the political stature of climate resilience because climate adaptation is substantially addressed in Article seven of the Paris Agreement. Furthermore, there is now an agreed global goal on climate adaptation.

Saab (2016), is of the view that bias in favour of mitigation can be traced from the earlier reports of the IPCC, the texts of the UNFCCC and Kyoto Protocol. The author indicates that the objectives of the UNFCCC and the Kyoto Protocol prove this point. The author further argues that the few general references to adaptation in these instruments do not appear to go far enough, because they are vague, broad, open-ended and lack specificity.

Masters (2011), as well as Simonet and Fatoric (2016), have criticized the framing of the concept of adaptation in international climate change discourse. Adaptation is portrayed as a local issue that does not require global policy discourse. Even though Masters (2011), acknowledges that the contestations around adaptation have heightened tensions in international negotiations, it is disappointing that Africa's approach to adaptation has been largely perceived to be reactive. This could be an indication that adaptation has not been a mainstream issue in climate change response. Given the foregoing, and the changing policy terrain in South Africa, this work will get into depth in analysing South Africa policy as it relates to the climate change adaptation agenda.

Recent developments are however, encouraging. Africa's Agenda 2063 undertakes to respond to climate change by prioritizing adaptation in all its actions, while participating in global efforts for climate change mitigation that enhance and strengthen the policy direction for sustainable development in Africa (African Union Commission, 2015). If adaptation is prioritized, it will make sure that adaptation measures do not become a peripheral and nice to have interventions in the continent.

Laves *et al.* (2014), recall that during the early 1990s, adaptation measures were often viewed with scepticism as an indication of the failure of mitigation policies. For instance, Al Gore associated adaptation with laziness that side-tracked efforts and resources away from the core issue of mitigating impacts (Laves *et al*., 2014). As noted by the authors, it is indeed heartening that adaptation has been accepted as a valid and essential intervention for addressing the inevitable effects of climate change. Recently, there has been a growing body of knowledge focusing on auditing how African countries have been reporting on adaptation in their National Communications with papers done on livestock and fisheries (Muchuru and Nhamo, 2017a and 2017b).

Be that as it may, this cannot take away the fact that there was a missed opportunity to adapt to climate change. Similarly, given the prioritization globally of mitigation measures, it can be concluded that most countries at the national level may have followed this trend where adaptation was not given the urgency it deserves; because national policies are by far influenced by trends in policies at a global level. With the growing agreement about the necessity to adapt, recent discussions are paying more attention on finding effective ways to operationalize adaptation in policy practice (Biesbroek *et al*., 2011).

Linked to the growing agreement about the need to adapt, Simonet and Fatoric (2016), posit that since 2001, adaptation was given prominence in IPCC assessment reports, signalling that the urgency to focus on adaptation strategies was no longer inevitable. The fourth assessment report (AR4) released in 2007 confirmed that adaptation remained the only available and appropriate response to impacts that were already being felt and those that would arise in future (IPCC, 2007).

Masters (2011), has highlighted the urgency of adaptation in Africa within the context of sustainable development. The author warns that the failure to address adaptation could threaten to reverse the gains of the MDGs. The author further argues that an understanding of adaptation needs to go beyond environmentalism and highlight true socioeconomic and developmental impact of climate change on issues such as food, health, water, poverty and migration. Given the sensitivity of agriculture, Mccarl *et al.* (2016), posit that this in turn will impact agricultural output and water requirements. As

such, the author recommends that more efforts may be required in adaptation in the foreseeable future given the rate at which the climate is projected to change.

While increasing voices for more adaptation measures are warranted, such measures may be hindered by the existence of the plethora of barriers to adaptation. While there are challenges with adaptation in general, Simonet and Fatoric (2016), have acknowledged that the literature on adaptation to climate change is emerging as a distinct field of science even though there is still a challenge of vagueness and unclear definition of adaptation and its various interpretations. This could hinder implementation. Furthermore, there is still a research gap regarding the availability of relevant knowledge to sufficiently inform climate change adaptation policy makers (Laves *et al*., 2014). This is attributed to the paucity of research reporting on the success of implemented adaptation strategies and the fragmented nature of the adaptation research scholars and the discrepancy between disciplinary perspectives.

Evidence suggests that barriers tend to differ from project to project and from area to area. Biesbroek *et al*. (2011), maintain that because barriers are highly context-specific, it is challenging to compare and difficult to use for a more generalized understanding. For instance, experience from the Netherlands, which is considered to be among the frontrunners in climate change research and policy, provides a comprehensive and instructive perspective on barriers to adaptation. Lessons from the Netherlands highlight the following barriers: (i) uncertainty; (ii) the high cost of adaptation measures, (iii) fragmentation, (iv) unavailability of data, (v) lack of national focus to climate change, (vi) pre-existing cultural beliefs, and (vii) inadequate appreciation of the possible effects of climate change.

There are also numerous underlying causes of these barriers. Barriers caused by conflicting timescales were found to be the most prominent group of barriers. This is critical because climate change is one issue that has to compete with other critical socio-economic issues for an already inadequate amount of political attention; issues that are more pressing in nature, whose impacts are more immediately felt or have more visible short-term results than adaptation effects which are long-term (Biesbroek *et al*., 2011). As a result, the conflicting timescales makes it more challenging to integrate adaptation in new and existing policies and practices.

The availability of resources is an essential factor in adapting to climate change, inadequate resources or the inaccessibility thereof can admittedly be a major barrier to climate change adaptation. Saab (2016), has decried the fact that private sector involvement is not properly defined; at a time when it is felt adaptation efforts should not be an exclusive responsibility of government. One, however, should be cautious when dealing with the issue of resource availability as it is not a silver bullet, as it may seem. Generating adaptive capacity may be one thing but mobilizing already existing adaptive capacity and turning it into effective adaptive machinery may be a different challenge altogether.

Another group of barriers worth scrutinizing is social barriers. Social barriers tend to be widespread and difficult to manage. Paradoxically, they are integral in determining the level of success of adaptation efforts. For instance, in Australia, the community rejected the proposal to drink recycled water, which highlighted the significance for policy makers to gain the community buy-in before applying adaptation measures (Laves *et al*., 2014). It is for this reason that an emerging priority area of research in this field is communication to deal with perceptions, attitudes, ethical beliefs, norms, emotions, and trust needed (Ibid). This will increase public consciousness and awareness and the role of communities in adaptation.

Oberlack (2017), has highlighted the role of institutions in providing an enabling environment for adaptation. Institutional crowdedness and institutional voids present a different set of challenges. For instance, lack of enabling institutions as well as policies, guidelines and legislation can make communication and facilitation among stakeholders more challenging, particularly where there are no common guidelines, principles, values or standards about adaptation (Ibid).

By contrast, institutional crowdedness manifests itself through the existence of a plethora of institutions, which influence the decision-making process on climate change adaptation. This may result in unnecessary competition among institutions, cause confusion about roles and responsibilities, and lead to different approaches and perceptions about the problem (Ibid). Clearly, such a situation would be untenable and it could even cause confusion on how the problem should be solved. As this research

was unfolding, critical attention was made to identify some of the challenges highlighted herein for South Africa.

Laves *et al*. (2014), notes that most climate change adaptation efforts are being integrated through a policy that may not be recognized as such by adaptation experts. Consequently, its benefits are realized unintentionally as by-products of non-climate change issues such as disaster risk management, sustainable development, cost savings and efficiency measures (Ibid). Arguably, this diminishes the role of adaptation in policy and broader political discourse. There is also a problem of maladaptation.

According to Mccarl, *et al*. (2016), maladaptation occurs when adaptation actions of one party have unintended consequences on other parties or areas. Lack of proven adaptation experience increase the potential for unforeseen and undesirable outcomes (Laves *et al*., 2014). Given all these challenges, one can sympathize with Halvorssen (2008), who maintains that climate change effects demand a strong action and international cooperation comparable to the Marshall Plan that was put in place after the Second World War. Such strong action must be supported by multidisciplinary tools and instruments to ensure an effective and enhanced response. While these tools and instruments are critical, they themselves may provide a different set of challenges and barriers that must be understood.

2.7 The unfinished business of climate change financing and technology development and transfer

The means of implementation particularly finance and technology development and transfer have a long history in international climate change negotiations (Chuffart-Finsterwald, 2014). Not only that, Wen and Xun (2016), note that finance and technology development and transfer have always remained prominent in the climate change negotiating process. The origin of this protracted debate comes from the Convention, which explicitly outlines the obligations of developed countries to developing countries on these issues.

According to Wen and Xun (2016), the Convention compels rich countries to facilitate new and additional funding to poor countries to support full or incremental cost for its

implementation. Accordingly, Flaherty *et al.* (2017), observes that the funding of climate mitigation and adaptation policies has become a critical issue in climate negotiations. With regard to technology transfer, Latif (2015), cites article 4.5 of the Convention which compels rich countries to pursue all sensible measures to stimulate, facilitate and finance not only the transfer of but also access to climate friendly technologies and know-how particularly to developing countries to assist them to implement the provisions of the Convention.

It would appear that these obligations are underpinned by an important principle in international law: a principle of common but differentiated responsibilities and capability (CBDR). This principle recognizes historical differences in the manner in which poor and rich countries have contributed to global problems. Furthermore, it acknowledges that there are differences in their respective economic and technical capacity to deal with these environmental problems. Accordingly, finance and technology transfer have been used as proxies to measure the extent to which developed countries have fulfilled their historical responsibility (Wen and Xun, 2016).

Apart from being prominent, climate funding has remained contentious because of the cost implications. Another contention it would seem is the unwillingness to take moral, financial responsibility and otherwise emerging from historical responsibilities. To this end, there have also been differences on how climate finance should be funded. Accordingly, a number of scenarios have emerged on the funding models ranging from auctioning emissions allowances, tax instruments on global aviation and shipping emissions, international carbon tax and emissions trading levy to generate funds (Cui and Huang, 2018).

Even the allotting of climate bonds to augment climate finance have been bandied about in the debate. The diversity of views of the different funding proposals has not made the negotiations easier, thus making reaching consensus and progress rather difficult. The issue of burden sharing to climate change has also muddied the waters. It has been advocated that there should be a fair international burden sharing mechanism that considers historical responsibilities and capacity to pay.

Notwithstanding the difficulties, some progress has been observed. In the many years of negotiations, one of the notable milestones in the climate finance outcomes was in the Copenhagen Accord that was adopted during the Conference of the Parties (COP 15) in 2009. Wen and Xun (2016), and Cui and Huang (2018), cite three main reasons, namely: for the first time, countries agreed to quantify financing goals. Secondly, developed countries promised to make available US$30 billion quick-start finance between 2010 and 2012. Thirdly, developed countries pledged to mobilize US$100 billion in long-term finance every year until 2020 (Cooper, 2012).

All of this was linked to the groundbreaking development which saw the establishment of the Green Climate Fund (GCF) in Copenhagen; which was widely welcomed. However, Cooper (2012), expressed some reservations in that the Copenhagen Accord appeared to repeat the mistakes that had been committed in the Kyoto Protocol which only obligated the developed countries to reduce their emissions. According to the author, climate change cannot be significantly slowed through actions by the developed countries alone and therefore there needs to be active accountability by largest emitters equally from the developing countries. Needless to say, that a country like South Africa would fit this category and characterization.

The operationalization of the GCF has not been without controversies. Among others, the mobilization of pledges has not progressed smoothly, thus creating doubt if the 2020 target will be achieved. The developed countries did not have clear cut rules on how they would raise their contributions. Furthermore, the GCF did not have clear guidelines for distributing the contributions. These are some of the challenges that Cui and Huang (2018), have observed which in some way have been the criticism of the performance of the GCF. Accordingly, there have been calls for the need to develop mechanisms for assigning the finance responsibilities between developed countries.

Given the challenges cited above, after 2009, interest shifted to focus on how the GCF should raise funds, their distribution, and the need to allocate funds equitably between adaptation and mitigation efforts. Despite the calls from Cancun to address adaptation in the same measure as mitigation, Cui and Huang (2018), disappointingly notes that the current trends of international finance still show a strong bias towards mitigation efforts. This is despite the existence of the Adaptation Fund since 2001, as observed

by Nhamo and Nhamo (2016), to support concrete adaptation projects and programmes in developing countries.

In addition to the funding scenarios discussed earlier, countries have continued to grapple with these issues. Cui and Huang (2018), have elaborated extensively on the funding models for the GCF that have been bandied about. These range from: (i) funding based on the ability to pay, (ii) funding based on the United Nations membership fees, (iii) funding based on the Official Development Assistance, and (iv) funding based on the Global Environmental Facility (GEF) among others. These issues become relevant and critical because the Copenhagen Accord decided that the funding for the GCF would come from sources such as bilateral, multilateral, public and private.

Having said that, this does not absolve countries from taking national initiatives and putting climate change funding instruments in place to support their climate change response. For example, Flanagan (2014), notes that the United Kingdom (UK) has put in place a lot of institutional mechanisms and climate change funding instruments. The UK Climate Change Act that was enacted in 2008 has been hailed for bringing about openness and accountability for climate change and putting in place targets to reduce carbon. Importantly, it created carbon budgets and an autonomous Committee on Climate Change to observe progress and provide oversight of the impact of measures to respond to climate change. It also created an adaptation Sub-Committee which performs similar functions but with emphasis on adaptation.

According to Flanagan (2014), amongst the main institutions that are responsible for climate change coordination and response in the UK are the Department of Energy and Climate Change (DECC), which is primarily responsible for mitigation policy, including energy supply and the Department for Environment, Food and Rural Affairs (Defra), which is tasked with adaptation policy and investment. The DECC also provides oversight by regulating energy related investment and infrastructure. Through regulatory mechanisms, the DECC guides investment decisions at national and other levels of government.

The economics and finance department, Her Majesty's Treasury (HMT) plays an important role in assigning public resources for low-carbon and climate resilient economic development in the UK. While the institutional mechanisms are important, the main purpose of this discussion is to pay more attention on the funding mechanisms and arrangements for climate change in the UK. Table 2.1 provides a synthesis of the funding instruments for climate change in the UK.

Table 2.1: Overview of the main climate finance arrangements in the UK

Name of institution	Purpose and impact of intervention
Green Investment Bank (GIB)	The GIB was established by the UK government in 2012 with a budget of £3.8 billion. In August 2017, the GIB was sold to Macquarie Group Limited. Its mandate to promote investment in low-carbon and environmentally conscious enterprises, infrastructure projects. Through this ground-breaking initiative in the world, the bank finances sustainable projects and further provides equity finance in renewable and energy efficient projects undertaken by the private sector in developing countries.
International Climate Finance (ICF)	The ICF was put in place to stimulate green private investment and kindle markets for sustainable, low-carbon ventures worldwide. It further assists poor countries in mitigating and adapting to the effects of climate change, minimizing deforestation and ensuring sustainable economic development. From 2011, the UK has through ICF programme connected more than 400 megawatts of clean energy technologies. This in turn contributed to the abatement of approximately 9.2 million tonnes of carbon dioxide. The ICF is amongst one of the biggest funders to the UNFCCC financial mechanisms such as the GCF and the Climate Investment Funds.
Prosperity Fund	Prosperity Fund Programmes promote reforms in energy markets based on UK's renowned experience on proven policy, energy system enhancement, fostering of clean energy, implementation of smart technologies, and developing a carbon neutral finance industry to fast-track the transition to low-carbon development.
Climate Bonds Initiative	The Climate Bonds Initiative leverages funding for climate change mitigation or adaptation-related programmes. It uses bond markets to mobilize resources.
Capital Climate Markets Initiative (CCMI)	The Capital Climate Markets Initiative (CMCI) was initiated to support developing countries to better understand and facilitate ways to cost effectively leverage private capital by helping them to deal with challenges associated with the information barriers.
Global Challenges Research Fund and the Newton Fund	The Global Challenges Research Fund and the Newton Fund uses UK's strength and capability in research and development to ensure that UK's science base can lead in fostering research and innovation to solve developmental challenges associated with climate change and stimulate the development of low-carbon energy.
Multilateral Climate Funds	The UK has generously supported the GEF and the GCF since their formation. During the initial resource leveraging period, the UK pledged £720 million. The UK has also consistently contributed to the GEF for climate change related issues and broader environmental issues. In addition to mandatory contributions to UNFCCC, UK also contributes to UNFCCC Trust Fund. The UK also voluntarily supports the IPCC, every year (IPCC Trust Fund).

Name of institution	Purpose and impact of intervention
Climate Investment Fund	The UK is one of the largest investors in the Climate Investment Funds (CIFs). The CIF consists of four key programmes: Clean Technology Fund (CTF), Scaling Up Renewable Energy Programme (SREP), Nationally Appropriate Mitigation Action (NAMA) Facility and Strategic Climate Fund. The CTF has rendered concessional finance and technical assistance in 21 countries including South Africa. It has rendered support to national governments to select and implement low-carbon investment strategies, and helped in the demonstration of technologies and creating markets. With regard to the SREP, the UK has provided funding to facilitate access to energy and stimulating economic activity by supporting governments to stimulate markets for renewable energy. The Nationally Appropriate Mitigation Action Facility supports the implementation of the promising aspects of the NAMAs, for which countries are unable to raise private sector funding.

Source: (Konrad Adenauer Stiftung, 2017); (Flanagan, 2014) and synthesized by the Author.

Table 2.1 shows the climate finance landscape particularly in the UK. It also depicts that climate finance is used to support largely climate friendly technologies. It is contended therefore that the issue of climate finance cannot be divorced from technology development and transfer negotiations, hence Glachant and Dechezlepretre (2017), note that both have remained central in the climate change discourse.

According to Chuffart-Finsterwald (2014), response to climate change will mainly depend on various factors to mitigate and adapt to climate change. These factors include among others, the cost, performance, availability of and access to technologies. This is partly because there is a view that technological progress in innovation can reduce the cost of accomplishing environmental objectives (Ibid). In the negotiations, the debate on technology development and transfer has remained largely polarized due to strong divergent views. Most of this polarization has centered around the role of intellectual property rights in the development and transfer of technology. To this end, it has remained one of the long standing divisive and recurrent issue in the debate. The developed countries claim that intellectual property rights incentivize innovation while the developing countries perceive it as a barrier to technology transfer (Latif, 2015).

The issue of intellectual property rights is an important concern that should not be ignored irrespective of the school of thought one subscribes to and difficult questions have to be asked. For example, are the developing countries entitled to free technology from developed countries? How should the developed countries be

compensated for their investments in research, development and innovations? Is there a moral responsibility for developed countries to support developing countries with access to technologies? What would be the most reasonable and practicable modalities for the transfer of technologies to developing countries; in particular considering the notion of the transfer of technology in mutually agreed terms or preferential terms. These are some of the difficult issues that have made the debate difficult and hindered progress.

Having noted these challenges, Chuffart-Finsterwald (2014), observes that there has been a notable upsurge in the rate of patenting of environmental technologies since the adoption of the Kyoto Protocol in 1997. Latif (2015), makes similar observation, particularly the considerable upsurge in the importance of intellectual property rights in the international innovation landscape in recent years. According to the author, the number of patent applications worldwide which drastically went up after the adoption of the Kyoto Protocol supports this observation.

Figures from the World Intellectual Property Organization show that the overall number of filings made through the Patent Cooperation Treaty System in 2012, increased drastically; doubling the figure that was recorded in 2000 (Latif, 2015). One would argue that this upsurge was not incidental. Having said that, Chuffart-Finsterwald (2014), cautions that intellectual property rights are not the only impediments to the successful diffusion of environmental technologies. For instance, other factors such as the capacity to assimilate and technological aptitudes by recipient countries are equally important. However, these issues often become relevant once the issue of intellectual property has been resolved.

This has left scholars with mixed feelings on whether there has been adequate progress in the technology transfer debate. For instance, Chuffart-Finsterwald (2014), argue that despite the long history of the negotiations, there is still a need for effective environmental technology dissemination. On the other hand, Glachant and Dechezlepretre (2017), are disappointed by the lack of meaningful progress that has been made in the technology transfer debate over the years. Paradoxically, Chuffart-Finsterwald (2014), concedes that the dissemination of climate change mitigation technologies to poor countries has increased noticeably over the same period.

Nevertheless, both Chuffart-Finsterwald (2014), and Glachant and Dechezlepretre (2017), highlight the following notable developments in technology development and transfer. In 2001, the Technology Transfer Framework was adopted as part of the Marrakesh Accord. It also put in place the Expert Group on Technology Transfer to guide the implementation of the Framework. The COP 13 that was held in Bali (Indonesia) in 2007 laid a solid foundation for the adoption of the Poznan Strategic Programme on technology transfer.

According to Latif (2015), the Bali Action Plan highlighted technology transfer as one of the key areas that needed attention. To this end, the Bali Action Plan urged the GEF to put in place a strategic programme that would be used to grow the level of investment for technology transfer (Chuffart-Finsterwald, 2014). It came as no surprise in 2008 during COP 14, when the Poznan Strategic Programme on Technology Transfer was adopted. Chuffart-Finsterwald (2014), posits that it modestly set aside US$ 50 million to fund the development of the technology needs assessments by the developing countries and pilot technology projects.

The COP 16 that was held in Mexico (Cancun) in 2010 resulted in the establishment of the Technology Mechanism. It must be pointed out that the Technology Mechanism was first mentioned in the Copenhagen Accord in 2009, but its solidification and elaboration took place in Cancun. This development was viewed as a positive step in the debate around technology development and transfer (Latif, 2015). The Technology Mechanism consists of the Technology Executive Committee (TEC) to advise on policy and technical issues relating to climate technology; and the Climate Technology Centre and Network (CTCN), which focuses on climate technology operational issues and technical assistance.

While Latif (2015), has hailed this as a significant step forward and a promising development beyond window-dressing, some scholars such as Glachant and Dechezlepretre (2017), have expressed reservations. This is because not much was expected from a TEC that was still relatively new while the CTCN has limited capacity due to funding model that is problematic.

Another notable development is Article 10 of the Paris Agreement. This article in its entirety deals with technology issues and has reinforced the role of the Technology Mechanism. However, Glachant and Dechezlepretre (2017), are of the view that the main novelty of Article 10 is the founding of the Technology Framework which provides an all-encompassing guidance to the mandate of the Technology Mechanism in encouraging and enabling enhanced response to technology development and transfer. However, the real test of this novelty lies ultimately on the final text that was adopted by Parties negotiations during COP 24 that was held in Katowice (Poland) in 2018. It remains to be seen whether the final text lives up to its expectations.

Some believe that the benefit of the Technology Mechanism is that it operates in a less politicized environment because TEC members are not intended to be government representatives (at least in theory), but experts are nominated to serve in their personal capacity. Experience shows otherwise because the same experts who participate in the TEC meetings are often the same officials who represent government in negotiations.

While noting these developments, Glachant and Dechezlepretre (2017), appear to be pessimistic about all these developments. The authors contend that technology transfer has really not been at the center of climate change discourse and therefore it would be justified to infer that these initiatives have probably had insignificant effect on international technology transfer since 1992. These sentiments reflect the difficulty of the climate change technology negotiations and the lack of political-will to deal with the issues. The jury is still out to judge whether there has been meaningful progress and the extent to which these developments have helped in real terms to facilitate technology and climate finance to developing countries. That said, there is always a danger emanating from the notion of the tragedy of the commons if climate change response measures are not accompanied by the necessary education and awareness of the public about the dangers imposed by climate change impacts.

2.8 Education, awareness and capacity building on climate change impacts

Dealing with climate change impacts requires a variety of instruments and tools. One of the instruments that have been advocated is education and awareness. Dal *et al.*

(2015), have highlighted the importance of education. The authors have characterized it as perhaps the most important strategic tool human beings have against climate change. This is because, in addition to its potential to influence behavioral choices, McNamara (2013), argues that education can promote positive environmental values, behaviors and management and thus reinforce responsive activism to climate change.

On the other hand, public awareness can galvanize collective action to mitigate and adapt (Dal *et al*., 2015). However, Tiller and Schott (2013), note that while there has been a great momentum about climate change across all levels, there is still a lack of understanding of whether this upsurge in impetus has translated to a greater fascination with the general public than it had a decade ago.

Nevertheless, Dal *et al*. (2015), reiterated the need for individuals to be given the necessary knowledge and relevant strategies to deal with climate change. To enhance effectiveness, such education and awareness interventions should start from the foundation years of formal education for it to influence appropriate behavioral responses (Dal *et al*., 2015). To this end, skillful and informed personnel is a key to educate and raise awareness on climate change. Accordingly, the authors have cautioned that those responsible for education and awareness themselves need to be properly skilled and informed about climate change so that they can be in a position to impart credible knowledge and awareness.

This proposition is informed by the fact that Dal, *et al*. (2015), are of the view that there are many alternative conceptions about climate change. Hence, Wall and Woosely (2012), have characterized the misinterpretation of climate science as a substantial challenge to public education. As such, the authors have advocated for innovative ways to communicate climate science that are non-traditional to powerfully convey the message.

According to McNamara (2013), there is evidence that knowledge and awareness are instrumental in influencing people's perceptions, attitudes, behavioral patterns and future responses. Apart from enhancing acceptance of the reality of climate change, it has the potential to even trigger voluntary action and stimulate support for climate change policies. While this makes sense, some scholars have cautioned that the

problem may not necessarily lie with the lack of awareness of the dangers of climate change but rather more about the lack of effective action.

Foster (2010), has called for the need to examine the link between awareness and action. Other authors such as Lee *et al.*, (2015); and Li (2015), have noted that there are a number of other factors that must be considered in climate change education and awareness. For instance, climate change education and awareness tend to vary geographically, between rich and poor, urban and rural, developed and developing countries.

As a result, at a global level, the awareness of climate change and related perception on risk remain unevenly distributed (Lee *et al*., 2015). For instance, the authors note that the level of awareness in developed countries is substantially higher when contrasted with developing countries. In concurring with this observation, Li (2015), cites geographical disparities while at the same time highlighted issues relating to gender, age, religion and culture, level of development, technological capacity, affluence or ethnic group that influence how people react to climate change among others.

Given the foregoing, it is imperative that policy and programme interventions should consider the reality of these disparities (Li, 2015). Understanding public opinion on climate change in these circumstances is an important pre-requisite for their behavioral change (Ibid). This is important because for a low-carbon future to gain traction, it requires change and action at all fronts and levels, be it organizational, individual, national or otherwise (Ibid). From a policy point of view, this essentially implies that the strategies and mechanisms used for these groups must be context-specific and tailor-made to suit specific groups and circumstances. Given this, there is no universal approach in raising awareness and dealing with these issues.

Lee *et al*. (2015), claim that climate policy efforts in most countries will rely on strengthening and fostering public support for various portfolio of societal changes. While this may be true, there is concern that the public tends to prioritize more tangible and pressing issues such as health, finances and others that impose immediate threat and urgency to them than climate change (Tiller and Schott, 2013). This is because

climate change is viewed as far removed comparatively in time and space than these pressing issues. As a result, such disconnect tends to influence the choices that people make when it comes to environmental issues.

Accordingly, Tiller and Schott (2013), claim that it is easy for the public to reject personal responsibility or shift it to external agents such as the government. Failure to take responsibility implies that there are limited attempts to deal with climate change problems at a personal level. The observations by the authors highlight the limitations of climate change education and awareness. The authors argue that even where people are well informed about climate change, this rarely translates into environmentally friendly decision-making and behavior. The authors see this is as a result of a propensity and unwillingness to sacrifice personal comfort and lifestyle consumption and behavior for the benefit of climate change.

Such conduct often results in the attitude-behavior gap (awareness-action gap which is the inconsistency between awareness and action). Whitmarsh (2009), maintains that this supports the belief that current mitigation strategies, which depend on individual voluntary action are not effective. Given this, it would be fair to infer that strategies to deal with climate change should not rely primarily on individual action but rather with government for them to be effective.

Pinar (2017), entered the debate from the disaster management point of view. The author suggests that the behaviors of individuals and the ability to cope with disasters are directly linked to their level of awareness and preparedness. The level of individual knowledge is a critical element in enhancing disaster management in society. While the author acknowledges the responsibilities of government in disaster management, he argues equally that being prepared to deal with disasters should be the onus and responsibility of the individual. Some scholars have gone further to suggest that the individuals should in fact be taking the measures, while the government should support measures to avert disasters. It is for this reason that it has been stressed that all stakeholders need to be knowledgeable and conscious to reduce the adverse effects of disasters. Such a level of consciousness about disasters could contribute to social disaster management. In light of the above, it is clear that climate change education and awareness remain crucial to ameliorate the effects of climate change. However,

that ideally should happen within the context of an enabling policy and institutional frameworks to facilitate implementation.

2.9 Reflections on dynamics and considerations for policy implementation

For decades, the policy implementation studies have been mainly concerned about finding mechanisms to close the gap between specified objectives of the policy and what is really accomplished in practice (Galvani, 2018). This is because, it is widely acknowledged that there are often misalignments between what the policy is intended and what is actually achieved by implementation.

Galvani (2018), has attributed these gaps to mainly the lack of explicit policy objectives and the limitations of administrative control particularly in situations where a large number of agencies and layers of governance are involved in implementation, arguably, just like in South Africa. This arrangement is not foreign in South Africa, given the political system that relies on three spheres of government, characterised by concurrent mandates in some instances, and whose policy implementation is supported by a network of State-Owned Entities (SOEs). Given this complex governance system highlighted herein, there seems to be a lack of a clear blueprint in government to ensure that policy and institutional frameworks including resources are neatly aligned to foster effective implementation of policies and programmes, particularly, difficult and wicked problems.

However, in recent years, the focus of policy implementation research has evolved, resulting in more attention being paid on how to improve performance in a multi-actor and multi-level implementation scenario, in which the success of implementation is highly influenced by local performance (Galvani, 2018). In the same vein, Vento and Sjoblom (2018), have also noted that over the past years the collaborative approach to policy implementation has progressively gained prominence. This is despite the fact that previously, relying on collaborative approach was criticized for diminishing the role of the government in public governance (Vento and Sjoblom, 2018). However, this perception appears to have changed because scholars now recognize the potentially influential role of government institutions in governing and directing collaborative actions (Ibid).

Hence, Ansell (2016), posits that increasingly, governments are able to solve stubborn societal problems through collaborative arrangements that involves the public, private and third sector role-players to devise innovative and enduring solutions. Furthermore, the role of government agencies has been recognized in supporting government. Hence, Vento and Sjoblom (2018), assert that government agencies presents a number of opportunities and practices for involving the public and role-players across the policy cycle, that is, if they have the required and adequate collaborative capacities.

The issue of multi-level implementation of policies also raises an important aspect of intergovernmental and collaborative implementation. Irrespective of the governance system, it is imperative that for effective policy implementation, one must consider how the local context may impact on policy implementation; particularly where different spheres of government have uneven institutional capacity, resources and other critical elements that are necessary for policy implementation. Under these circumstances, the role of the local context cannot be ignored, as local conditions have a potential to impose crippling constraints to policy implementation.

While the intergovernmental implementation has been lauded, the problem with it is that it is usually underpinned by varying degrees of political autonomy of implementers. Similarly, it has been asserted that public sector partnerships are highly and contextually dependant phenomenon but their strength lies more in providing organizational flexibility and reduced level of formalization which makes it easy to deal with complex governance challenges (Vento and Sjoblom, 2018). Hence, collaborative actions are by design expected to enhance the transformative capacities of the decision-making process and to strengthen successful policy implementation.

Vento and Sjoblom (2018), have written extensively about the value of government agencies in policy implementation including contributing to legitimate government action by broadening the actors that are involved and strengthening coordination, enabling and dealing with multiple actors in policy processes without resorting to traditional forms of command and control amongst others. Be that as it may, it remains unclear if government agencies can assist in minimizing the phenomenon of uneven capacities in different jurisdictions.

According to Galvani (2018), this phenomenon is more pronounced in lower levels of administration such as in regional and local level authorities that enjoy significant independence in the implementation of national policies and programmes. While this is less prevalent in unitary states, local and regional authorities in such administrations also tend to have increasing flexibility in the implementation of national government policies.

Clearly, in an environment where power is shared and control is dispersed across levels, policy implementation becomes even more challenging. For example, Hupe (2011), argues that the larger the discretion to act, the bigger the effect of local characteristics will be. Studies have also shown that a government's socio-economic situation not only determines its competence and potential to act but it can impact the communication within and between government levels (Goggin, 1990).

Hence, scholars such as Galvani (2018), have noted the effect of the disparity in administrative capacity between poor and wealthier states; a phenomenon that was observed in the European Union (EU) policy implementation among EU member states. South Africa is not immune to this dilemma, with nine provincial administrations and 178 municipalities across the country all with varying degrees of administrative capacity to implement policies and programmes.

Expectedly, poor jurisdictions tend to have feeble overall organizational strength, and often fail to provide implementing agencies with the infrastructure and resources that are essential to carry out implementation. Hence, scholars such as Haverland and Romeijin (2007); McLaughlin (2006), have expressed that the more technically intricate the policy, the more difficult it is for such jurisdictions to implement it.
There is also a political dimension to policy implementation that may be demonstrated by the willingness or the lack of political-will. Studies show that the level of support or disapproval by public officials to a policy relies largely on how they perceive the policy, including its salience and visibility (Giacchino and Kakabadse, 2003); as well as on public and elite perception (Ebinger *et al.*, 2011). In addition, support for a policy may be triggered by the probable electoral benefits provided by a given policy. This means that the implementation of a given policy is to some degree determined by how it is being viewed politically.

For example, it has been suggested that local political elite are more inclined to favour policies that are intended to solve problems which are deemed imperative to their areas and which have widespread buy-in from the local population, particularly the local elite (Galvani, 2018). This behaviour is not only limited to politicians, the temperament of bureaucrats may also be influenced by their own perceptions, bias and preferences of the meaningfulness of a policy to their local context. Hence, the local implementing bureaucrats tend to be keener to execute policies which they deem make sensible contribution to local society considering the local socio-economic characteristics (Ibid). Apart from their own biases, Thomann *et al.* (2016), suggests that the choices that the officials make may also be determined by the extent to which they are exposed to several accounting regimes, each with different set of norms. This can be a challenge for officials especially where such accountability regimes present the officials with demands that are incongruent.

Linked to this political perspective are resources that can be derived from policy implementation and other benefits that may accrue such as remunerative mechanisms that may have a bearing. This is largely because poor jurisdictions tend to be more reliant on national funding, hence they are more likely receptive to national programmes irrespective of their objectives. Poor authorities also tend to have a greater tolerance to the conditions attached to resources whereas more affluent jurisdictions may be less susceptible to such inducements (Galvani, 2018). Hence, poor jurisdictions that are more dependent on policy incentives are also more susceptible to policy enforcement.

Experience in China shows that policy implementation evolved from mass mobilization and campaigns (yundong) between the 1950s and 1970s, to policy pushes and modern-day bureaucratic routines (Kennedy and Chen, 2018). The mass mobilization and campaigns meant that state employees and citizens alike had to literally stop everything and focus on the campaigns. The mobilization efforts have been lambasted by scholars for being unsettling and for diminishing the bureaucratic authority. However, they have a benefit in that they tend to close the gap between national policy goals and devolved local implementation.

As mobilization paradigm evolved later in the years, emphasis shifted and there was more focus on developing modern bureaucracy (Kennedy and Chen, 2018). This was amplified by the decentralization of functions that allowed local administrative structures to fine-tune national policies to local circumstances. Another area of focus was the mobilization of local officials while at the same time advancing a single policy objective in order to fully administer the policy down to the lower levels of administration (Ibid).

This was in the form of policy pushes that primarily focused on bureaucratic inertia and mobilizing government employees down to grass roots levels. Policy pushes can be used to demonstrate commitment by national government to specific policies (Kennedy and Chen, 2018). Accordingly, policy pushes are characterized by an adaptable and flexible mode of implementation where national or provincial government can prioritize a specific policy objective down to the lower level only for a limited period, after which, allow the return of standard bureaucratic procedures to continue.

Such policy pushes are designed to close the gap between national policy goals and local level administration. Furthermore, they can also serve to remind local government employees of the national government devotion to specific objectives. This helps national government to obtain quick noticeable policy outcomes. Surely, these interventions would require political leadership, commitment and buy-in for them to work.

Even though reliance on administrative processes has been found to be beneficial to all stakeholders, however, if there is a tension between national and local interests, there is a tendency to use campaign style approaches including policy pushes to facilitate stringent enforcement. For instance, tensions may arise from the lack of thorough implementation of environmental protection policies in order to protect local industries which generate revenue for local government (Kennedy and Chen, 2018). In South Africa, in order to deal with intergovernmental disputes, the Intergovernmental Relations Framework Act was enacted in 2005. This was to primarily establish a mechanism for all spheres of government to promote and facilitate intergovernmental relations; to provide for framework and procedures to facilitate the

resolution of intergovernmental disputes (The Presidency, 2005). It is worth noting that repeated campaigns and policy pushes have been seen as an indication of unsuccessful attempts to resolve specific issues through normal bureaucratic processes including uneven implementation of critical policies.

Hence, policy pushes have been described as reactive but also indicative of a tug of war between national policy goals and interests (Kennedy and Chen, 2018). This is a complex dynamic between local government and national authorities. The authors contend that in order to stimulate investment and economic growth, local leaders may turn a blind eye to certain industries that disregard applicable policies and illegally degrade the environment. Furthermore, due to local government fiscal challenges, politicians tend to depend more on local businesses to generate revenues and thus pay lip service when they enforce environmental protection policies (Ibid).

The desire to generate revenue may exacerbate this problem, wherein local government may tolerate businesses that cause environmental degradation. In South Africa, national government provides a policy framework, local authorities are expected to implement those policies. These dynamics may not be ruled out in the South African context. Hence, the authors argue that it is incumbent upon state institutions and government agencies to play an effective role in organizing, facilitating and handling multi-actor policy processes without resorting to traditional forms of command and control.

2.10 Conclusion

This Chapter endeavored to elucidate the complexity of climate change; not only as a pressing issue but how it is intertwined with developmental imperatives across the board. As such, its implications warrant serious attention. The effect of climate change on sustainable development was diligently sketched-out, while at the same time addressing the politics of sustainable development and sustainability in general. The confluence of climate change and the SDGs was highlighted as an area that needs proper consideration if the SDGs are to be realized through national policy frameworks. Hence, it delved on what is understood to be domestication and reflected

on some experiences from countries that have been in the forefront of SDG domestication.

The literature review further recognized that there are different factors that affect climate change and its policy formulation within national domains. Similarly, there are various approaches that can be used to deal with it. Climate change mitigation and adaptation strategies were identified as the most common approaches, even though they are not being used evenly. For instance, literature showed that climate change adaptation has not been given the urgency it deserves.

Even though it is emerging as an area of focus, barriers to it could prove to be a serious hurdle in climate change adaptation. The literature also reflected on the contentious international debate of climate change funding as well as technology development and transfer. Given the complexity of the issues surrounding climate change and sustainable development, and the need for public buy-in, there was a further discussion on climate change education, awareness and capacity building as one of the instruments that can be used to foster effective climate change mitigation and adaptation and enhance the much-needed behavioral change by the public. The dynamics and critical factors that must be considered when implementing a policy were interrogated, to anchor the study on relevant current debates about policy implementation.

CHAPTER 3: RESEARCH METHODOLOGY

3.1 Introduction

This Chapter elaborates on the research methodology that was used to conduct the study. It highlights that the research is evaluative, and used both qualitative and quantitative methods to collect data, such as interviews, online surveys and content analysis. The data analysis is also discussed as well as the methods that were used to sample the respondents. It then concludes by elaborating on the ethical considerations that were put in place to enhance the integrity of the study.

3.2 Research design

According to Creswell (2013a), a research design is a plan or blue print that details how the researcher intends undertaking the research. It includes strategies and methods to be followed such as the collection and analysis of data. The research study took the form of evaluation research. According to Neuman (2011), evaluation research is mostly used in large bureaucratic organizations such as government to determine the extent to which a new programme or policy is effective; and this is done after a period of three or more years of implementation. As such, it is useful to offer practical solutions to problems faced by decision-makers. To this end, both the climate change and sustainable development policy spaces in South Africa have gone past four years of implementation. However, Neuman (2011), cautions that ethical and political conflicts may arise in evaluation research because stakeholders may have conflicting interests in the findings about the policy.

It is therefore clear that evaluation research is more appropriate for difficult and more persistent phenomena and in this case, climate change and sustainable development will remain the most pressing issues that will dominate the international arena for many years to come. The research design followed a Mixed-Methods Research (MMR), which combines qualitative and quantitative approaches. Primary data was collected from purposefully selected respondents (judgmental sampling).

3.3 Research methodology

The MMR, also known as method triangulation emerged as a distinct orientation in the late 1970s (Teddlie and Tashakkori, 2013). Even though Neuman (2011), acknowledges that qualitative and quantitative approaches differ in many ways, Teddlie and Tashakkori (2013), have praised the MMR because it provides a third alternative that is pragmatic. The MMR can be useful to assist the researcher to tell a full story about the enquiry and develop a theory about the phenomenon. The two approaches have proven to be compatible and can be used successfully together.

Teddlie and Tashakkori (2013), caution against characterizing the MMR merely as a combination of qualitative and quantitative methods. Rather, it should be seen as selecting the best techniques from a myriad in order to thoroughly investigate the phenomenon and answer research questions. Given the complexity of the climate change phenomenon and sustainable development, it was appropriate that this methodology be employed. Having said that, Creswell (2013b), has documented some of the controversies of the MMR ranging from multiple interpretations, whether or not it is a third-generation as well as its perceived bias towards positivist thinking over interpretive approaches.

The qualitative element of the MMR ensured that the research is based on insider perspective and naturalism. Neuman (2011), as well as Sarantakos (2013), have written extensively on qualitative research attributes. The insider perspective involved the respondents with the first-hand information about climate change policies and sustainable development, while naturalism was significant because it ensured that the attitudes and behaviours were studied within their natural setting rather than artificial settings common in other approaches. It also helped to provide perspective on how the respondents interpret and make sense of the climate change and sustainable development phenomena. Accordingly, all research questions were subjected to qualitative analysis.

The quantitative element of the MMR put emphasis on measuring variables, and integrating descriptive surveys into the research, given its crucial role to measure perceptions and attitudes. A descriptive survey design was used to gather data from

respondents by asking them a series of questions relating to the adequacy of climate change policies, summarized responses with percentages, frequency counts and statistical analysis with an aim of drawing extrapolations about population from the responses of the sample (Leedy and Ormrod, 2015).

Furthermore, the survey endeavoured to obtain information regarding balance between climate change mitigation and adaptation measures, perceptions and attitudes towards climate change adaptation including barriers. In addition, the respondents were required to share their views regarding gaps in policy orientation, the adequacy or lack of economic instruments such as incentives and taxes as well as cleaner production and consumption measures that are in place. The education and awareness measures to raise public consciousness in order to change the livelihood lifestyles of the industry and the public were also featured.

The quantitative approach also enriched the study by introducing a linear research path that employed a reconstructed logic. As such, it put emphasis on reorganizing the data, normalizing and codifying research knowledge into explicit rules, formal procedures and techniques (Neuman, 2011). The benefit of quantitative research is that it adds credibility in the research process by eliminating the human factor, hence it relies on precise statements, standard techniques, numerical measures and replication (Ibid). This design also allows better analysis and interpretation of data and results through sorting, recording, tables, charts (graphing), and statistically relative to the research question.

The advantage of the survey technique is that it makes it possible to reach a big sample. Surveys can also be standardised making measurement easy. In this case, the survey was emailed to approximately 700 respondents. Numerous reminders were sent to the respondents and this enabled them to participate in the study at their own time and pace as opposed to the interviews which have to be done in the presence of the researcher and on the agreed time. However, because of the fixed nature of questions in the survey instrument, it did not provide rich information as was the case with interviews, hence the MMR was used. Hence Barbie (2016), observes that surveys can rarely provide a context for a social life.

3.4 Data collection

The study used the following techniques to gather data, namely: questionnaires, interviews, descriptive surveys and document analysis. These techniques were complemented by the observations of the researcher. The techniques highlighted here were applicable to all research objectives of the study to complement and triangulate data collection methods. The questionnaire had open-ended questions to enable respondents to provide free responses (unstructured), and close-ended questions (structured), in that the questions provided the respondents with fixed responses from which to choose.

Open-ended questions are ideally suited to focus on naturally occurring, everyday events in normal settings. Open-ended questions enable respondents to communicate their experiences and opinions without being restricted while closed questions are useful where definite and unambiguous answers are needed. The closed questions were used where specific and explicit responses were required. For example, respondents were given an option to answer yes or no. The respondents were also required to choose from the fixed list, making it easy to compare and standardize responses during data analysis.

Where deemed necessary, the respondents were asked to give perceptions regarding the extent to which they agreed or disagreed with a particular statement. To answer the question, the respondents were required to choose from two opposing extremes of strongly agree and strongly disagree as well as other common and acceptable Likert scale responses. This restricted and standardized the responses. Where relevant, follow up open-ended questions were asked to enable the respondents to explain in their own words why they agreed or disagreed. The respondents were requested to participate in the study prior to the interviews and the online survey being undertaken; also considering appropriate ethical considerations.

Interviews were held with key informants, based on pre-developed questionnaire. The interviews helped the researcher to obtain firsthand information from the key informants concerning the research objectives of the study. The advantage of the interviews was that they allowed the researcher to manage the line of questioning.

However, the presence of the researcher may introduce some level of bias and even some discomfort to the respondent (Creswell, 2014). This was explained in the participant information sheet and further explained during the introductory remarks before the interview to ensure that the respondents were relaxed and focused. Having said that, not all respondents were eloquent enough, while some respondents tended to provide a general response rather than being explicit. This resulted in taking more time in concluding the interviews. The researcher endeavoured to probe and guide the interview accordingly.

Barbie (2016), notes that the chief strength of interviews lies in the depth of understanding it provides, and that interviews can be adapted as dictated by conditions. Furthermore, the author avers that all it takes generally to conduct an interview is a researcher, a notebook, a pen and a recording device and there is no need for sophisticated equipment. This makes it cost effective. Interviews also have the ability to generate rich data. However, during the study, the researcher had to travel to meet the respondents where it was convenient for them; thus, adding additional costs. There were also challenges with availability of some respondents due to their busy schedule including being located too far from where the researcher was based. As such, meeting requests were made well in advance to accommodate the availability of respondents.

Among some of the key informants were government officials involved in drawing up national policies related to climate change and sustainable development as well as global negotiations. The interviews have an advantage of assisting and enabling the researcher to connect with respondents and therefore gain their cooperation. Even though they are time consuming and expensive, interviews tend to yield the highest response rates (Leedy and Ormrod, 2015).

Notwithstanding the difficulty of participant observation, it was also used, given the researcher's experience in climate change negotiations and implementation as well as the domestication and localization of the SDGs. The insider perspective of the researcher provided useful insight and information to the study. The research also

used secondary data. The secondary data entailed scrutinizing and analyzing existing policy and legislative documents.

According to Leedy and Ormrod (2015), the three techniques that can facilitate the quantification of complex phenomena are rating scales, checklists, and rubrics. The rating scale techniques were built in the data collection methods in order to obtain information relating to the research objectives. For example, the Likert technique is relevant for studies that may be perceived by some as controversial by asking questions that are not normally asked. The study raised issues that had to be opinion rated, and that might be perceived to be critical of government policies. Furthermore, to probe underlying meaning, semantic differential and categorical responses techniques were employed.

The semantic differential technique is useful to measure indirectly how the respondents feel about a particular issue and to compare responses among respondents. The semantic technique allows respondents to express feelings by ratings with respect to opposing concepts. The categorical responses technique was used for questions deemed to be of sensitive nature. Some of the questions were designed to obtain information indirectly using this technique. This technique allows the respondents to place themselves in categories rather than to give exact answers. The key to the effective application of this technique is to ensure that all possible options are covered and guard against overlaps between categories.

The foregoing discussion shows that a combination of complementary methods were used to gather data such as online survey, interviews, observations by the researcher and content analysis. This was done to ensure that data was gathered from different angles and perspectives. A lot of value was derived from this approach by providing means of triangulation in order to enhance data validity and reliability. On the basis of the research questions, the research instruments were developed for both the online survey and the face to face interviews. An additional set of questions were developed for the face to face interviews in order to obtain rich data from the interviews. Furthermore, the interview questionnaire made provision for open ended questions and responses to allow respondents to expatiate their responses and facilitate for a meaningful engagement with the researcher.

The interviews were held from March to September 2019. Prior to the interviews, the participant information sheet that was approved by the Research Ethics Review Committee of the College of Agriculture and Environmental Sciences (UNISA) was sent to all respondents. This provided them with all the necessary information about the study, why they had been selected to participate in the study and what was expected of them. It further informed them of their rights, how the data would be handled and used, assured them that their privacy and anonymity would be protected and that they would be required to consent in writing to participate in the study.

Accordingly, during the interviews, all respondents provided written consent to participate in the study. The responses were recorded in the questionnaire against each question in the spaces that were provided for that purpose. Permission was also requested to record the interviews purely for the purpose of ensuring that the responses were accurately recorded and to avoid distortion. After the interviews, all the responses were transcribed and coded in a word document to facilitate data analysis. Accordingly, respondents were coded from Respondent 1 to 21 to ensure anonymity and confidentiality.

The researcher had to overcome some challenges during the interviews. Amongst the challenges experienced during the interviews were that there appeared to be different interpretations of some questions and concepts. Furthermore, some respondents responded to questions by providing a broader context without being specific to issues as was required. However, the researcher was able to clarify questions that were misunderstood while at the same time providing an opportunity for the researcher to better deal with such problems with other respondents that were yet to be interviewed. With regard to broad responses, the researcher was able to probe further based on the response without necessarily unduly influencing them or making them uncomfortable. Some respondents took it for granted that the researcher knew the answers given his knowledge of the subject matter. The researcher had to constantly remind the respondents to express their views in their own words without assuming that the researcher might know the answer.

3.5 Sampling

The main purpose of sampling is to select specific cases, events or actions that can clarify and enhance understanding (Neuman, 2011). There are two main sampling techniques; these are probability and non-probability. This research used non-probability sampling techniques; in particular purposive sampling to select key informants and the respondents that took part in the survey. Neuman (2011), indicates that purposive sampling is a valuable kind of sampling for special situations. It relies on the judgement of the researcher; hence it is also known as judgement sampling (Vogt *et al.*, 2012).

Flyvbjerg (2013), notes that purposive sampling is useful when the objective is to maximize the amount of information on a given problem or phenomenon, where a random sample may not be the most effective way to gather information. Importantly, Vogt *et al*. (2012), note that judgement sampling can provide legitimacy to a non-probability sample. The authors further highly recommend it for interview research, which relies on few good informants. Hence, Leedy and Ormrod (2015), contend that in purposive sampling, respondents are chosen for a particular purpose. Furthermore, the authors indicate that respondents are typical of a group that represent diverse perspectives on an issue.

Consistent with Creswell (2014), contention that the idea behind qualitative research is to purposefully select participants, sites or documents that best assist the researcher understand the problem and the research question. Accordingly, this study relied on the researcher's judgement to select the respondents, organisations, policies and strategies that were deemed crucial to help the researcher better understand the research problem. Since policy on climate change is the responsibility of national government departments, most respondents, particularly key informants were purposefully selected from them. Most of these departments are based in Pretoria where the study was located, even though the outcome of the study may have national impact given the devolution of policy at all spheres of government. Respondents (middle to senior management) were purposefully selected from mainly the environmental and economic clusters of government departments. These included among others, the Department of Environmental Affairs (DEA), Department of Energy

(DoE), Department of Planning, Monitoring and Evaluation (DPME), Department of Science and Technology (DST), Department of Agriculture, Forestry and Fisheries (DAFF), Department of Transport (DOT), and the Department of International Relations and Cooperation (DIRCO). The study sampled 21 key informants from various government departments and entities. Table 3.1 provides details regarding the sampling of key informants. Having said that, Vogt *et al.* (2012), highlight the need for researchers to reach the saturation point when collecting data. Accordingly, this principle was observed during data collection. Accordingly, data was collected until the point of redundancy was reached and therefore continuing with data collection would not have yielded any new data, knowledge and or themes.

Table 3.1: Details regarding the sampling of key informants

Department	**Number of respondents**
Department Environmental Affairs	12
Department of Science and Technology	1
Department of Energy	1
Department of Planning, Monitoring and Evaluation	1
Department of Agriculture, Fisheries and Forestry	1
Department of International Relations and Cooperation	2
Council for Scientific and Industrial Research	1
Human Rights Commission	1
National Department of Transport	1
Total	21

Source: Author, 2017

In addition to focusing on national government departments, the study also collected data using an online survey technique from SOEs that perform government mandate related to climate change and sustainable development, research organizations and NGOs. The SOEs included among others ESKOM, South African National Botanical Institute (SANBI), Council for Scientific and Industrial Research (CSIR), South African Weather Service (SAWS), South African Environmental Observation Network, Applied Centre for Climate and Earth Systems Science, South African Energy Development Institute, National Cleaner Production Centre (NCPC), Statistics South Africa (Stats

SA), National Disaster Management Centre (NDMC), stakeholders in the renewable energy industry, academia and others.

Through the descriptive survey, 103 respondents completed the online survey from about 700 respondents that the survey instrument was mailed to. Referral and opportunity sampling were also used to provide flexibility, improve the initial sampling plan and identify potential key informants that could contribute meaningfully to the study. Among others, respondents were requested to provide their perceptions and attitudes regarding climate change response and funding, institutional capacity and alignment, roles and responsibilities, South Africa's priorities in climate change response and the domestication of the climate change SDG.

QuestionPro platform was used to conduct an online survey. QuestionPro is web-based platform that provides a software for creating and distributing surveys. It consists of tools for distributing surveys via email as well as recording, analysing and presenting the results. Using QuestionPro, the online survey was sent to all potential respondents with an email which provided a link to the survey. The email link provided information regarding the survey and further informed respondents of their rights including consent, if they chose to participate in the survey in line with the ethics approval for the study.

The respondents were informed that clicking on start link was deemed to imply having given consent to participate in the online survey. It must be highlighted that the online survey was further useful in providing a platform that enabled the researcher to reach all identified stakeholders from different regions and institutions efficiently and was able to track the response rate from time to time. The survey was initiated in December 2018 and was concluded in August 2019.

3.6 Pilot testing

The research instruments were pilot tested on the field before the research was undertaken. According to Stopher (2012), before the research is undertaken on the field, various designs and procedures of the research should be tested. Pilot testing allows the researcher an opportunity to run through the entire research study

execution; hence it is regarded as a dress rehearsal of the study. This helps the researcher to effect the necessary refinements and improvements in the research instruments to ensure that the study is able to have the desired outcomes.

Stopher (2012), argues that this is essential because issues will always emerge relating to different interpretations among respondents hence it becomes imperative to have such things resolved before the study is executed. Hence, one must be cognizant of how questions are worded to avoid misinterpretations and the appropriateness of procedures that are used to conduct the study. Hence it is imperative that a pilot study be conducted to test and refine the study before it is actually fielded.

According to Stopher (2012), experience has proven that research that is conducted without undertaking a dress rehearsal first lead to problems that could have been foreseen and avoided had such prior testing been conducted. Hence, pilot testing becomes a critical imperative to ensure that all aspects of the research are tested to make sure that everything in the research works as intended. Furthermore, pilot testing can also be used to test alternative approaches to various aspects of the research design and execution, including to assess response rates and completion rates of a survey and to refine the instruments and protocols as may be required based on field experience (Stopher, 2012).

In order to comply with these prescripts, the researcher ensured that the questionnaires were peer reviewed by experts in the field of climate change and sustainable development as well as by academics in the field. The inputs that were received helped in refining the questions to ensure that they are technically relevant, and the concepts and terminology that were used were unambiguous and making sure that the questions were more precise and specific. Furthermore, the online survey was tested with a small sample of respondents typical of the population to inform further refinements between September and October 2018.

This was to ensure that preventable problems were avoided during the online survey. Pilot testing assisted in further enhancing the questionnaire with regard to its length,

duplication of questions and concepts, terminology and interpretation that had a potential to confuse the respondents during the survey. As a result, the questions were more pointed and specific while at the same time enabling the researcher to deal precisely and effectively with the intended objectives of the research questions. This also made it easy for respondents to provide answers, thus enhancing the reliability and validity of responses.

3.7 Data analysis

The analysis of data entailed the reduction and display of data. Data reduction and display made it possible to code data, create themes and concepts. Creswell (2013b), highlights the advantage of applying data reduction in that it provides a clear indication of what data chunks to code and which to pull out. Secondly, it highlights evolving stories, themes, and patterns that best depict a number of data chunks and makes it easy and possible to make cogent inferences and rational conclusions.

Furthermore, primary data was complemented by the discursive analysis and scrutinizing of policies (document analysis) relevant to climate change and sustainable development. According to Leedy and Ormrod (2015), and Bowen (2009), content analysis is a systematic examination of the contents of a particular body of material, in a detailed manner, in order to identify trends, themes or biases. Content analysis was both latent and inductive in that the researcher searched for underlying meanings in data and derived themes and constructs from data without imposing a prior framework.

Furthermore, quantitative analysis was applied with regard to the frequencies of relevant phrases, concepts and patterns. These were indicators that assessed the gist of policy interventions and strategies with regard to parity of climate change mitigation and adaptation, the governance arrangements and capacity to implement the policies. Content analysis necessitates that data be analysed and interpreted in order to produce meaning, gain understanding with a view to develop empirical knowledge. The selection of policies was based on sampling mostly of all major key policies on climate change. This was also informed by the insider perspective of the researcher as a government official who has also been involved in these policies.

Accordingly, relevant South African government policy documents relating to climate change and sustainable development were purposefully searched and analysed, particularly the White Papers and relevant legislation, national communications to UNFCCC, NDC, sectoral strategies and Bi-Annual reports on climate change that are submitted to the UNFCCC. The qualitative and quantitative review and analysis of policies served as a means of triangulation in order to seek convergence and corroboration through the use of different and diverse data sources. The analysis was iterative including skimming, reading and interpretation; combined with thematic analysis.

According to the information extracted from QuestionPro, the survey was sent to approximately 700 respondents. On average, it took 20 minutes for the respondents to complete the survey. The QuestionPro platform revealed that 300 respondents viewed the survey, of those respondents, 170 started the survey. Overall, only 103 respondents completed the survey, and this constituted 60.59% completion rate.

3.8 Biographical character of respondents

Hundred and three respondents took part in the online survey and 21 face to face interviews were conducted with key informants. Of the respondents that took part in the online survey, 51% were male, 46% were female, while the rest chose not to disclose their gender. With regard to the racial composition of the sample, 56% were black, 29% white and 15% fell in other racial groups. The table 3.2 depicts the age composition of the respondents.

Table 3.2: Indicating the age composition of respondents

Age group	Percentage
20-29	10
30-39	30
40-49	31
50-59	22
Other	10

Source: Author, Field Survey, 2019

Ninety-five percent of respondents were employed, the majority of whom (31%) held middle management positions, 26% in senior management and 11% in executive

management. Similarly, 90% of the surveyed respondents possessed honours degree and above while 10% had a diploma and undergraduate qualifications.

Table 3.3: Indicating experience of respondents in climate change and sustainable development

Number of years' experience in climate change	Percentage	Number of years' experience in sustainable development	Percentage
0-5	45	0-5	43
6-10	28	6-10	21
11 and above	27	11 and above	36

Source: Author, Field Survey, 2019

Table 3.3 shows that all respondents had experience both in climate change management and sustainable development. This was further supported by their responses when asked explicitly about their familiarity with climate change policies and strategies and sustainable development respectively. Accordingly, 45% of respondents were very familiar with climate change management policies in South Africa while 46% were moderately familiar with only 9% that indicated that they were not familiar.

With regard to sustainable development, overall, 95% of respondents were very familiar with sustainable development strategies in South Africa. Only 5% indicated that they were not familiar with sustainable development. These demographics herein depict that the respondents were highly educated. They also depict that the respondents were highly experienced and familiar with the subject matter. Importantly, it shows that the majority of them were employed in middle and senior management positions that may have a lot of relevance in policy formulation and implementation.

3.9 Ethical considerations

Vogt *et al.* (2012), have described ethics as good conduct towards others. They also associate ethics with a branch of philosophy that studies good and bad conduct and the moral obligations or responsibilities that researchers have on others. Hence, ethical considerations are an important aspect of conducting research. As a result, codes of ethics have been developed in various disciplines to regulate the conduct of

researchers, safeguard the interests of those that participate in the research and to improve the integrity of the research outcomes.

For instance, measures such as an informed consent by participants in the study have been put in place to enable participants to agree to participate in the study based on information made available to them by the researcher. Furthermore, Ethics Committees have also been introduced to ensure that research methods and instruments adhere to the prescribed ethical standards. Ethics approval was sought and obtained; and respondents voluntarily consented to taking part in the study.

Ethical considerations were considered during the research. An application was made to the University's Research Ethics Review Committee of the College of Agriculture and Environmental Sciences to conduct the study. Following the application, the ethics approval was issued with specific conditions that had to be adhered to (ethics approval reference number: 2018/CAES/049). This authorization was renewed every year until the study was concluded. Furthermore, permissions were sought from the organizations whose employees had been identified to participate in the face to face interviews, even though only three organizations responded positively; namely: the Department of Science and Technology, the Department of Environmental Affairs and the Department of Energy respectively. There appeared to be no uniform approach in government to deal with such requests and therefore processing of such requests appeared to largely depend on the discretion of the officials concerned. This was reported to the Research Ethics Review Committee of the College of Agriculture and Environmental Sciences when the renewal of the ethics approval was sought.

Accordingly, this research ensured that respondents were provided with adequate information about the study, including the risks so that they could make an informed decision of whether or not they wished to participate in the study. Furthermore, the researcher ensured that the integrity and quality of the research are not compromised, hence the need to ensure the well-being of the participants in the study. One way of achieving this was to guarantee the privacy of participants in the study by protecting their identity as well as ensuring that the information obtained remains secret and is stored securely at all times.

Encryption of specific details was employed where relevant to protect the identities of respondents so that colleagues from the same organization could not identify the participants from information about the study. As such, participants were asked to indicate which information should be kept secret. All data collected was used for the sole purpose of achieving the research objectives. Should the need arise to use the data in future, necessary authorization will be obtained.

3.10 Conclusion

This Chapter provided an in-depth reflection on how the study was conducted. The Chapter showed that an evaluation research was found to be most appropriate for the study. The study was underpinned by a mixed method approach which includes both qualitative and quantitative means to collect data. Accordingly, data collection was undertaken using questionnaires, interviews, online survey and document analysis. A purposive sampling technique was applied to ensure that selected respondents are fit for the purpose of the study in order to provide useful insights. The data analytical framework entailed data reduction, coding, thematization and graphical display and analysis amongst others. Ethical considerations were observed in line with the university's code of ethics and the approval that was granted.

CHAPTER 4: LOCALIZATION OF THE SUSTAINABLE DEVELOPMENT GOALS IN SOUTH AFRICA

4.1 Introduction

The focus of this Chapter is to present the findings in relation to the localization of the SDGs in South Africa. The Chapter will first deal with the localization with a specific focus on institutional arrangements, coordination and effectiveness of those arrangements. It will then focus on policy coherence within the context of the SDGs and other policies, as well as funding and monitoring of the implementation of the SDGs. It then concludes by discussing how the SDGs affect climate change and vice versa.

4.2 Localization and implementation of the Sustainable Development Goals

The respondents were asked if South Africa has made reasonable steps to ensure the realization of the SDGs within the South African context. Figure 4.1 demonstrates that sixty-six percent of the respondents surveyed felt that South Africa has taken reasonable steps to achieve the SDGs. The respondents expressed that such steps must be seen within the context of the development trajectory that South Africa has pursued since the dawn of democracy in 1994. Furthermore, they indicated that the democratic dispensation enabled South Africa to play a pivotal role in shaping global discourse and dialogues such as the MDGs, the Africa Agenda 2063, the Paris Agreement on climate change and the SDGs among others.

The respondents also highlighted that the development trajectory got impetus in 2012, when South Africa adopted its NDP which came before the SDGs were negotiated and adopted at the international level. Because of this, it was argued that even before the SDGs were adopted at a global level, South Africa already had its own developmental agenda designed to address the same socio-economic and environmental issues that have been highlighted by the SDGs (Respondent 15). This means that irrespective of whether or not the SDGs came in place, this development agenda would have continued anyway (regardless).

Literature review in Chapter 2 demonstrated how Uganda, Rwanda and Japan approached the domestication of the SDGs. Just like Uganda and Rwanda, South Africa relied a lot on the implementation of the NDP to achieve the SDGs objectives. Hence these countries undertook an assessment of the convergence of the two policies. However, Uganda went as far as assessing the alignment of the SDGs with the national anthem, the Constitution and sector strategies.

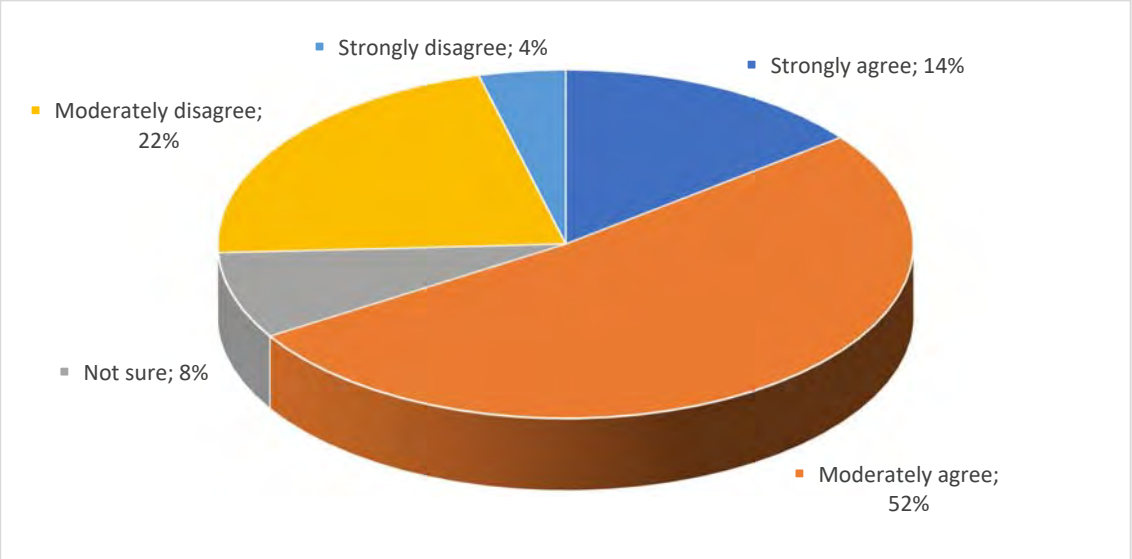

Figure 4.1 Depicting perceptions on measures taken by government to realize the SDGs

Source: Author, Field Survey, 2019

Among the initial steps that were cited by the respondents that South Africa undertook was the mapping of the NDP and the SDGs to assess the level of convergence and synergy between the two. According to Respondent 16, that assessment revealed that the SDGs and the NDP are aligned and share almost similar objectives such as eradicating unemployment, poverty, inequality and others.

According to the DPME (2017), there is a 74% alignment of the NDP and the SDGs, of which 57% of the targets of the SDGs are fully addressed in the NDP while 17% of the targets are partially addressed in the NDP. However, some respondents expressed concern that the process to domesticate the SDGs was not fully inclusive. They lamented the fact that some key sector departments felt left out in the process.

Furthermore, they criticized the process of localizing the SDGs because they felt that it was largely driven by private consultants rather than the government itself.

When asked if government had put in place institutional arrangements to support the implementation of the SDGs, 54% of respondents surveyed were of the view that government had done enough as shown by Figure 4.2. The respondents acknowledged the fact that government has put in place the coordination mechanism to provide a governance framework, even though it appeared not to be strong. It was criticized for failing to provide clearly defined roles and assigned responsibilities of various stakeholders.

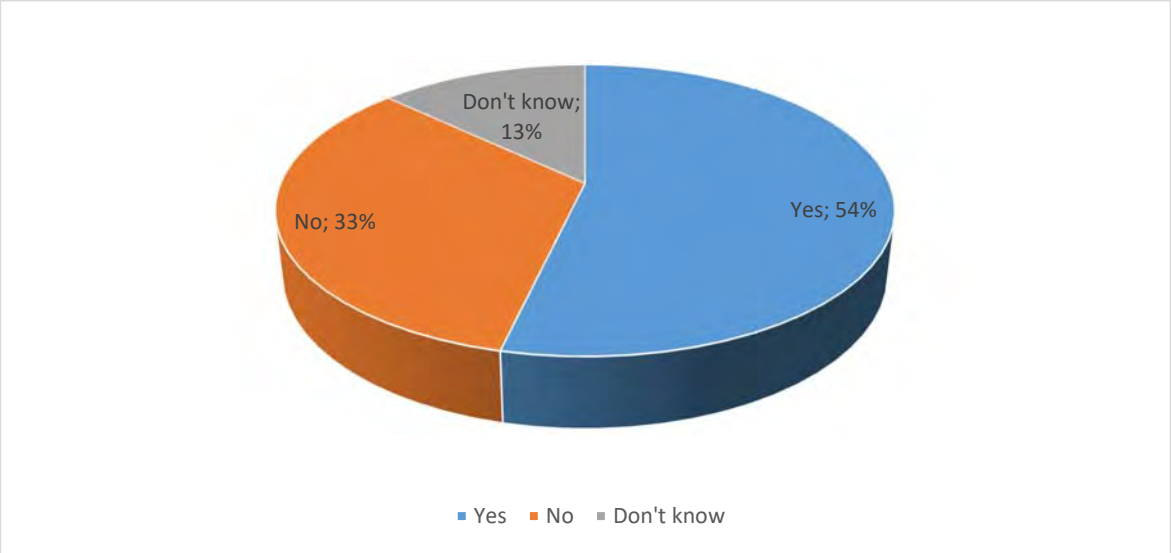

Figure 4.2: Institutional mechanism in place to support the implementation of the SDGs

Source: Author, Field Survey, 2019

In addition to perceived weakness of the institutional mechanism, government was criticized for taking quite a long time to put in place the coordination mechanism. The institutional mechanism was only approved by Cabinet in March 2019, more than three years after the adoption of the SDGs (Respondent 16). This delay was attributed to the lack of clarity of who should lead the coordination mechanism and which departments should form part of that coordination (Respondent 7). Clearly, the delay in putting in place the institutional mechanism created a leadership vacuum, resulting in poor coordination and communication.

Another view that emerged related to the mechanisms that had been used to implement the MDGs. It was felt that they should have been revived rather than creating a new one for the SDGs (Respondent 8). This would ensure that the experience that was gained during the MDGs era was put to good use. Figure 4.3 shows the institutional mechanism that was put in place in South Africa. The DPME is responsible for the overall coordination of government response to the SDGs, hence, with the support of Stats SA, it was also responsible for developing the VNR and stakeholder consultations (DPME, 2019).

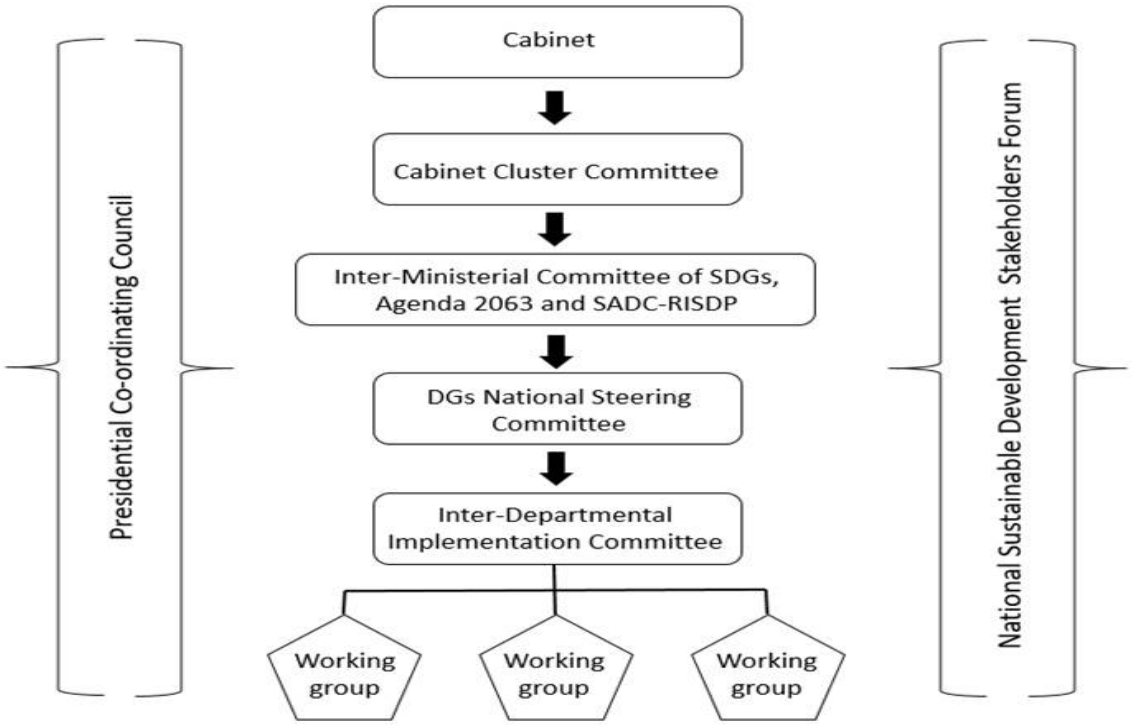

Figure 4.3: SDG institutional Mechanism

Source: (DPME, 2019)

Given the delay in setting up institutional mechanism, the respondents indicated that not much explicit implementation of the SDGs had been observed. Another criticism that was levelled against the coordination mechanism was that it did not appear to be tailor made for implementation. Instead, it was felt that it is more suited to coordinate South Africa's participation in international forums rather than on the ground implementation (Respondent 15). This was informed by a perception that it convenes at that particular time as opposed to ongoing coordination that is more nationally

focused. An example was made of the HIV AIDs[3] interventions in South Africa which are overseen by a National AIDs Council (Respondent 18). Based on this arrangement, the respondents implied that the SDGs and climate change could benefit if it had similar modalities. Lack of such arrangements fuelled the perception that climate change issues are dealt with coincidentally because the world is moving towards that direction.

In addition to the coordination mechanism, the respondents acknowledged that government operates in a cluster system to implement its outcomes, strategies and plans; albeit with its weaknesses because the clusters tend to operate in silos and focus on sectoral implementation. Even though such a system is in place, the respondents noted that there is still a challenge in government implementation of strategic plans and the SDGs are not seen as the same thing (Respondent 15). The respondents emphasized the need to work across the different spheres of government, and include the civil society, private sector and NGOs because each sphere of government and sector has a different role to play. To this end, it is imperative that there should be continued alignment and localization of the SDGs also at the provincial and local government levels to ensure effective implementation at all levels.

Given the challenges highlighted above, 43% of respondents surveyed felt that the institutional mechanism that is in place does not appear to be effective. Correctly so, it was inferred that, in light of the fact that it was only adopted in March 2019 and had not yet been operationalized; perhaps it was too early even to make a judgement call on its effectiveness.

There was a perception that the institutional architecture is organized in a way that seem to focus at high-level issues at national level and do not filter down to local government level. There was a concern perceived or real that other departments are imposing on others on what needs to be done which has resulted in a lack of buy-in from other departments (Respondent 13).

[3] Human Immunodeficiency Virus, Acquired Immunodeficiency Syndrome

It was felt that the effectiveness of the mechanism could have been bolstered if the architecture had built-in monitoring and evaluation systems in line with government reporting cycles of Annual Performance Plans. Respondent 20 deemed these challenges to be indicative of the fact that this is a complex agenda and we are struggling how best to coordinate. Having too many coordination institutions was seen to be a challenge on its own as it could not happen without risking causing institutional fatigue.

Unlike in Uganda, Rwanda and Japan which urgently put in place coordination and institutional mechanisms in place as highlighted in the literature review, South Africa appeared to lack political-will, resulting in these measures only being taken in 2019. There appeared to be inadequate government buy-in due to lack of top government officials that were championing the SDGs. The countries mentioned herein acted decisively with a sense of urgency to put measures in place. In Japan, the Prime Minister took keen interest and led the process from the top by presiding on a Cabinet Coordinating Body on SDGs.

There were also no high-level summits similar to those that were held in Uganda and Rwanda in South Africa. Notwithstanding the fact that the coordinating mechanism promises to have National Sustainable Development Stakeholder Forum. Unlike in Japan, line ministries' allocation of responsibilities remained opaque. Instead, there appeared to be more contestation of who should lead rather than coherent coordination and delegation of responsibilities. It is worth highlighting that all of this happened at the time when the ruling African National Congress was engulfed in the leadership contestation that took place in December 2017. Perhaps preoccupation with political contestation may have paralyzed government leadership including on the SDGs. Hence, it was only in 2019 that formal coordination mechanism was adopted. Given the poor coordination highlighted herein, the next section looks at how monitoring, funding and policy coherence were undertaken.

4.3 Monitoring, funding, and policy coherence of the Sustainable Development Goals

When asked whether South Africa has mechanisms in place to measure and monitor the progress on the implementation of the SDGs, 57% of the respondents surveyed felt that there are adequate measures to monitor and evaluate the implementation of the SDGs. Respondent 1 made a distinction on monitoring and evaluation that happens at national and international levels. At a national level, the respondents cited the normal government reporting and oversight mechanisms that are in place. The introduction of an outcomes-based approach in 2010 which includes reporting, monitoring and evaluation of government programmes was also found to be relevant. With regard to more specific monitoring measures for the SDGs, Respondent 17 highlighted that South Africa developed the SDGs Baseline Report in 2017 that was published by Stats SA, the Voluntary National Review report (2019) which was submitted to the United Nations as part of the UN High-Level Political Forum monitoring mechanism (UN system of monitoring) and the Sustainable Development Goal report (2019). According to Respondent 2, this is complemented through the participation in international platforms in the UN system, summits and forums such as High-Level Political Forum in which South Africa has good presence.

Even though there are efforts to monitor and evaluate the realization of the SDGs, Respondent 12 noted that there are still many programmes and projects that are not monitored in government, hence the need for monitoring structures to be strengthened. For instance, the respondents were concerned that the existing monitoring and evaluation mechanisms are not specific to the SDGs even though SDG specific data can be extracted from the reports. There was also a feeling that the coordination and communication remain poor, and because of this, some key stakeholders are sometimes left out in the evaluation process. Respondent 14 further argued that improvement can also be made on the quality of monitoring by making sure that it conforms to international standards and enhance its accuracy.

Overall, when the respondents were asked about their overall satisfaction with the domestication of the SDGs, 49% of the respondents surveyed felt that not enough had been done to domesticate the SDGs (Figure 4.4). They particularly cited the lack of

the whole of society approach to domestication process. Furthermore, the dissatisfaction was attributed in part to the lack of political-will, hence it took a long time to internalize the SDGs.

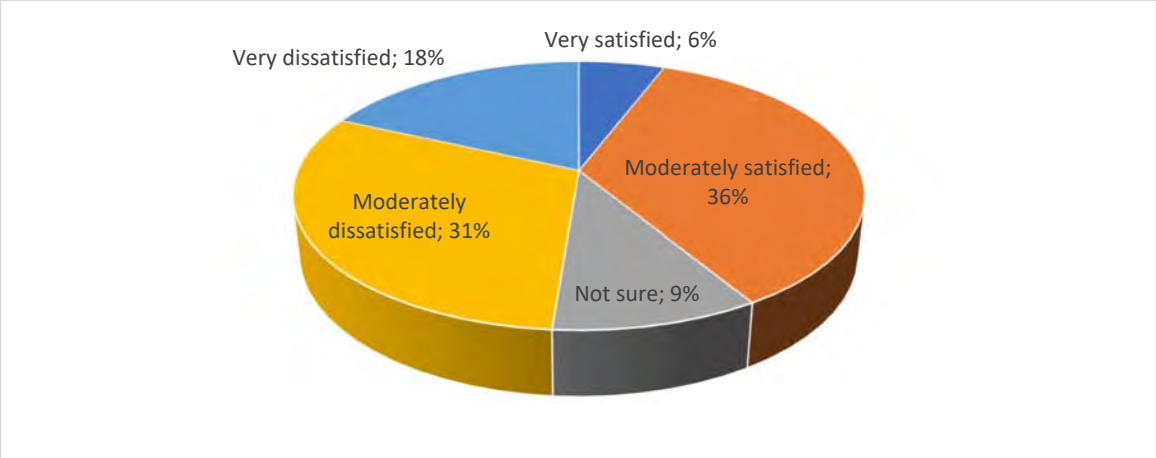

Figure 4.4: Satisfaction with domestication of SDGs

Source: Author, Field Survey, 2019

There was a perception that some sections of society and sectors such as grassroots, local government, civil society and private sector were left out during the domestication process (Respondent 17). Accordingly, lack of inclusiveness was found to be problematic. Hence, Respondent 18 argued that the domestication process should have been supported by a strong advocacy, awareness and education campaign. That would have ensured that it is inclusive and that the general public at large knows what the SDGs are about. Because of the lack of such campaigns, there was a feeling that there appears to be a lack of full consciousness of the SDGs at the community level, and perhaps including some government officials. On the contrary, the fact that 42% of respondents were satisfied with the domestication is indicative of a somewhat mixed reaction.

Against this backdrop, the literature review highlighted that both Uganda and Rwanda embarked on national and regional consultative processes with all stakeholders which considered local contexts and local communities. Rwanda went as far as translating the SDGs into local language (Kinyarwanda). Unfortunately, similar measures were

not pursued in South Africa which could have probably built momentum across sectors, mobilized everybody to ensure that no one was left behind.

Even though the domestication remains largely unsatisfactory, however, it was recognized that it is a start to a right direction. It was also argued that it was worth noting that South Africa's approach is more about implementing the NDP, hence the first step was to assess how the SDGs are aligned to the NDP. While this is welcome, it would be naïve not to consider the unprecedented impact of the outbreak across the world of the Corona Virus (COVID-19) which has been declared as a global epidemic by the World Health Organization. Hence the progress report of the United Nations Secretary-General on the implementation of the SDGs released in 2020 by the Economic and Social Council highlights the impacts and implications of the COVID-19 pandemic on all 17 Goals. This report further laments that what started as a health challenge quickly escalated to become the most human and economic catastrophe ever seen (United Nations, 2020). Naidoo and Fisher (2020), appear to be even more sceptical in their commentary published in Nature. According to these authors, COVID-19 has exposed the fragility of the SDGs and present an urgent need to reset them in light of the pandemic. The authors have noted that if the progress on the implementation of the SDGs was slow even before the pandemic, the impact of the pandemic is so severe that the majority of the SDG targets will not be met by 2030. This situation could also be aggravated by the fact that some SDGs could be counterproductive. The concerns herein demonstrate the seriousness with which the implementation of the SDGs will be affected; and even threatening to reverse the gains that have been made.

When asked if South Africa has taken steps to ensure policy coherence in the implementation of the SDGs and climate change, most respondents were satisfied with the level of coherence. This is depicted in Figure 4.5. The respondents felt that by the very nature of ratifying these global policies, South Africa has to ensure that such policies are coherent by internalizing them within the national context (Respondent 15). The respondents cautioned that the challenge is not so much the coherence of the policies but rather with implementation. For instance, the climate change response policy is anchored on sustainable development principles. With regard to goal 13 on climate change, the respondents felt that a lot of progress has

been made in the past ten years including alignment with the SDGs and the NDCs). The draft National Adaptation Strategy[4] has SDG component embedded in it.

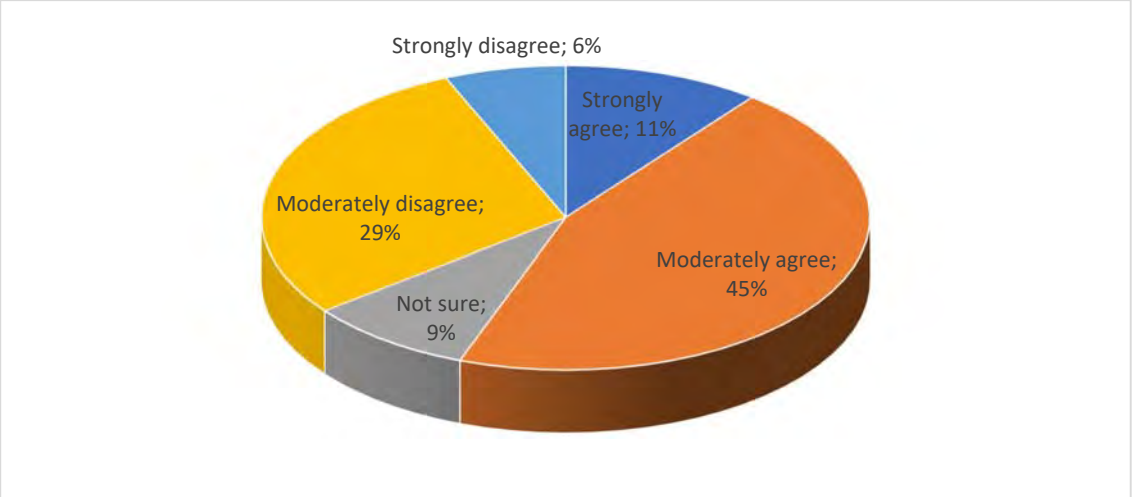

Figure 4.5: Policy coherence between SDGs and climate change

Source: Author, Field Survey, 2019

However, Respondent 15 noted the reluctance of the government to take tough decisions even if such decisions may result in unpopular reactions. This lack of decisiveness tends to undermine policy coherence.

The question of coherence brought in the international dimension to the debate. Respondent 14 argued that there has to be synergies rather than linkages between SDGs and climate change due to international dynamics that are playing out on this issue. Such synergies have a lot of merits technically at a national level. It was suggested that the politics of this globally is that the developed countries are strongly advocating for linkages of the SDGs and climate change. This drive is linked to the funding arrangements for the SDGs and climate change.

The respondents suggested that the motive behind the linkage drive is to reduce the financial obligations of developed countries for funding the SDGs and climate change. Respondent 15 asserted that according to the developed country perspective, if the SDGs and climate change are linked, this would mean that the funding they make

[4] Approved by Cabinet in August 2020

would be used to support both agendas rather than funding climate change and SDGs separately. That scenario would result in double counting where the funding would be counted for the SDGs and climate change respectively. Hence it is more preferable to align the two agendas at the national level rather than at the international level as such a move could potentially cut international funding for the SDGs and climate change.

When asked if there is funding set aside exclusively to foster the attainment of the SDGs, the picture that emerged was worrying. There was a lot of uncertainty among respondents regarding the funding of the SDGs in South Africa. This is despite a call for the domestic mobilization of resources (United Nations, 2015b). This picture is depicted in Figure 4.6.

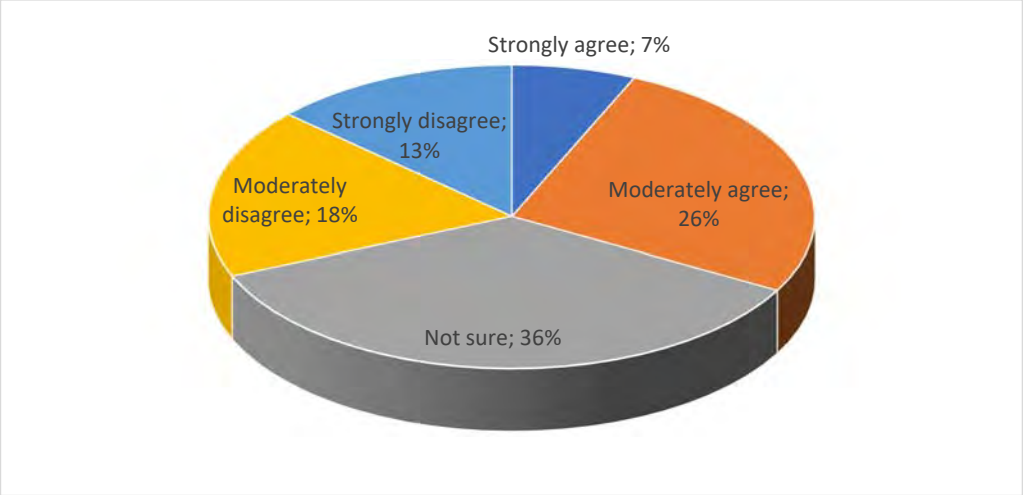

Figure 4.6: Funding for the SDGs

Source: Author, Field Survey, 2019

This picture may have been driven by the fact that the SDGs are not seen as separate development plans that would warrant exclusive funding (Respondent 16). Instead, it has been found to be complimentary to the NDP, hence there is the feeling that there is no need for it to be implemented in isolation.

Furthermore, it was suggested that unless the SDGs are seen as completely the same as the strategic plan, no budget would be set aside for their implementation (Respondent 15). Like climate change, it was asserted that the SDGs are global agendas whose bulk of the funding relies on donor funding rather than from the budget

from the government. It was acknowledged that, even though the SDGs may not have dedicated funding, they do benefit from the implementation of existing projects and programmes (Respondent 18). It is against this background that there was a call for the prioritization of the implementation of such programmes in which SDGs have been mainstreamed or those that have co-benefits.

Having said that, the debate on the synergy between climate change and SDGs remains an important one. The respondents were questioned what they thought would be the effect of climate change on achieving the SDGs. Figure 4.7 illustrates how respondents responded to the question.

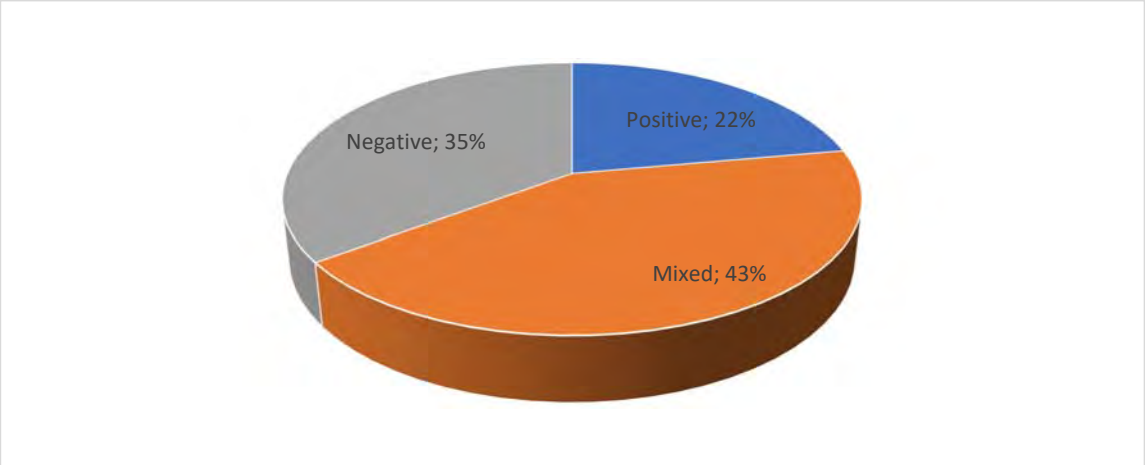

Figure 4.7: Effect of climate change on SDGs

Source: Author, Field Survey, 2019

This graph shows that the respondents were of the view that the effect of climate change on the SDGs is mixed. They acknowledged the fact that climate change has greater ramifications for the SDGs (Respondent 18). Climate change was seen as being at the centre of development that is embedded in sustainable development (Respondent 16). They argued that if climate change is not addressed, it was very likely that the SDGs would not be realized. Similarly, they argued that in order to arrest climate change, intervention measures must address sustainable development because there are significant overlaps between them. These sentiments resonate well with what emerged in the literature review. They suggested that climate change provides an ideal opportunity to mainstream the SDGs (Respondent 8). Having said

that, there was caution that some climate change interventions may have unintended consequences such as for example on biodiversity even though the overall outcome would be positive, citing renewable energy installations which may affect birds negatively (Respondent 6).

Hence 53% of the respondents surveyed were of the view that sustainable development places constraints on policy proposals concerning climate change. This was primarily because they viewed climate change and sustainable development as a multi-faceted and complicated phenomenon (Respondent 1). They argued that climate change interventions must have socio-economic benefits including environmental benefits.

Respondent 18 conceded that sometimes it is difficult to meet all of the pillars of sustainable development (social, economic and environmental). Similarly, they acknowledged that it is sometimes inevitable to incur unintended consequences on some of the pillars. Even where the pillars of sustainable development are addressed, in most cases, they are not addressed at the same level. Quite often, trade-offs have to be made. Faced with such predicament, policy makers must understand the implications of those trade-offs so that mitigation measures can be put in place.

In highlighting this point, Respondent 15 indicated that a just transition scenario in South Africa whose energy sector is coal dependent is a challenging one. It was argued that perhaps the implication of addressing the environmental pillar to ensure just transition would be to move away completely from coal. But if South Africa were to do that it would have unintended consequences on the social pillar. It was argued that to suggest that one can do all of that without consequences would be utopian thinking.

It was felt that South Africa should always strive to balance the pillars while mindful of the unintended consequences and the trade-offs that must be made. Hence, Respondent 16 indicated that inherent in the policy formulation process in South Africa is the consideration of sustainable development. Government must consider the effects of climate change on its policies and planning, otherwise, failure to do so, climate change impacts would hit the country unprepared with dire consequences.

4.4 Conclusion

The purpose of this Chapter was to present results regarding the extent to which the South African government has domesticated and localized the SDGs agenda (in general) since its birth in January 2016. The foregoing discussion showed that South Africa has taken reasonable steps to achieve the SDGs; largely informed by initiatives that existed before the SDGs were put in place. The study also showed that South Africa has put in place institutional mechanisms to implement the SDGs even though they were found to be ineffective. There was a lot of uncertainty regarding the funding of the SDGs in South Africa. Regarding the effect of climate change on SDGs, it was found to be mixed while noting that sustainable development may place constraints on policy proposals for climate change. Ultimately, it is imperative that there should be alignment and localization of the SDGs also at the provincial and local government levels to ensure effective implementation at all levels of government.

CHAPTER 5: CLIMATE CHANGE MITIGATION POLICIES, STRATEGIES AND INSTITUTIONAL SETUP

5.1 Introduction

The focus of this Chapter is to present the findings in relation to climate change policies, strategies and institutional setup with a focus on mitigation. The Chapter will first deal with the policies and strategies that are in place, as well as the institutional arrangements. It will then focus on how the policies affect economic development, interrogate industry focused measures including incentives and then deal with the nexus between mitigation and adaptation.

5.2 Climate change policies and strategies for mitigation

According to Arndt *et al.* (2012), one way to ameliorate a country's exposure to climate change is to execute policies that reduce future GHG emissions. However, Marquardt (2017), notes that in South Africa, the national government fails to execute comprehensive environmental policies because of competing demands and interests. Given this proposition, the respondents were asked if South Africa has policies in place to respond to climate change. There was a high degree of agreement among respondents that South Africa has policies and strategies in place designed to respond to climate change mitigation. Eighty-four percent of respondents surveyed agreed that there are policies in place that are progressive and development oriented. Table 4.1 list some of the policies and strategies that were highlighted by the respondents.

Table 5.1: List of key climate change policies and strategies in South Africa

Name of policy or strategy	**Year**
National Environmental Management Act (NEMA)	1998
National Environmental Management: Air Quality Act	2004
National Climate Change Strategy	2007
Long-Term Mitigation Scenarios (LTMS)	2007
Ten Year Innovation Plan	2008
National Climate Change Response White Paper (NCCRWP)	2011
National Development Plan (NDP)	2012
Draft Climate Change Sector Plan for Agriculture, Forestry and Fisheries -Climate Smart Agriculture Strategic Framework	2013
The National Climate Change Response Monitoring and Evaluation	2015
Nationally Determined Contributions (NDCs)	2015
National Pollution Prevention Plan Regulations	2017

Name of policy or strategy	Year
Low Emissions Development Strategy 2050 (LEDS)	2018
Green Transport Strategy	2018
Climate Change Bill	2018
Industrial Policy Action Plan X	2018
Carbon Tax Act	2019
Integrated Resource Plan (IRP)	2019
Reports mandated by UNFCCC Secretariat	Ongoing

Source: Author, Field Work, 2019

The respondents were then asked what they thought are the intended policy outcomes for climate change mitigation policies in South Africa. Three observations emerged out of this question. The first observation was that the respondents felt that the main intended outcome of South Africa's policy response to climate change is to minimize and stabilize the GHG emissions by ensuring that emissions remain within the trajectory range, and for South Africa to demonstrate its fair contribution to the global agenda.

In pursuit of this intended outcome, it was indicated that South Africa has set itself a Peak, Plateau and Decline (PPD) development trajectory that will assist it in transitioning to a low-carbon economy and move towards a temperature goal as set by the Paris Agreement and its commitments it made through the NDC. While this is noble, Northrop (2017), argues that the fact that the use of fossil fuel, carbon emissions and global Gross Domestic Product (GDP) are all increasing is evidence enough to demonstrate that the Paris outcome has somewhat failed to obtain national pledges that adequately constrain emissions.

Nevertheless, the National Climate Change Response White Paper (NCCRWP) of 2011 envisages a scenario where emissions will peak from 2020 to 2025, remain steady for approximately 10 years, and begin to decline thereafter in absolute terms (DEA, 2011). Respondent 15 suggested that the trajectory range may have to change considering the changes that have occurred in technology evolution and the changes in prices over time that were not there when the policy was put in place.

This sentiment is well recognized in the Integrated Resource Plan (IRP) of 2019, which acknowledges the fact that the IRP was developed at a time that was characterized

by rapid changes in energy technologies, and uncertainty of the impact of those technological developments on the future energy landscape (DoE, 2019). The introduction of renewable energy technologies in South Africa has remained topical and somewhat contested including by the labour movements for some time. Even the state-owned electricity producer's actions have sometimes been perceived to be at odds with government's intentions on renewable energy.

The second thing that emerged was that respondents saw the climate change policy within the context of the NDP objectives such as poverty eradication, job creation, improving the well-being of society, impacting on behavioural change, raising awareness, improving reporting, transitioning to sustainable consumption and production practices and promoting sustainable development.

Thirdly, Respondent 19 who previously led South Africa's negotiations under UNFCCC provided a different perspective. This was based on a perception that South African policy on climate change is driven more by international pressures and expectations rather than domestic awareness and activism. From this observation, the respondent continues to indicate that climate change is not acted upon based on a clearly defined national interest. As a result, it was argued that climate change is just a consideration rather than a driver. Hence interventions do not appear to be embedded in the development trajectory decision-making. With that in mind, the respondent asserted that climate change is seen as an add-on due to external pressures, hence it is not at the centre of decision-making. Given that, it was felt that its intended outcome is largely driven by the desire to be seen as a globally responsible citizen that is progressive and that make its fair contribution to the global agenda. The impression that one gets from this discussion is that, while South Africa has developed climate change policies, it seems that its actions on climate change are driven largely by how it wants to be perceived rather than tackling climate change impacts. Clearly, if that is one of the considerations, one can expect real challenges when it comes to implementation.

In reflecting on the policy, overall, the respondents echoed the generally held sentiments that South Africa is known for having good environmental policies. However, some respondents went as far as suggesting that its climate change policies are largely driven by a strong environmental bias. Respondent 15 suggested that this

bias can be attributed to international pressures, donors and the consultants who shape the policy intents. Once again, the issue of public perception becomes relevant especially by donor countries to South Africa. Hence the ongoing debate about the heavy dependence on official development assistance and the implications of aid to developing countries.

It is perhaps for this reason that Llorah (2008), has cautioned against over-reliance on international aid. The author argues that the donors tend to use their economic power to unduly influence the policies of recipient African governments in ways that are unfavourable for development. Importantly, the author goes as far as suggesting that relying on donor countries and organizations is synonymous to surrendering the country's authority to powerful international organizations that often interfere with the sovereignty of national governments and the autonomy of their domestic institutions.

Related to the questions that were posed to respondents was one on the issue of policy coherence. The respondents argued that the value of the policy is diminished by existing inconsistencies in the broader policy framework. Such inconsistencies were criticized for not being generally supportive of achieving the broader climate change objectives. In illustrating this challenge, Respondent 19, made an example of the climate change policy juxtaposed to the IRP. To this end, there was a perception that while the climate change policy may give a specific direction, the IRP would be pursuing objectives that are not complimentary to it. It was contended that the focus of the IRP would be more on energy security rather than reducing carbon emissions. Respondent 19 went further to suggest that the same trend could be observed in the industrial policy relative to climate change policy. It is not surprising that the IRP of 2019 that was released for implementation on 17 October 2019 is seen primarily as an electricity infrastructure development plan. This is because it is largely driven by the most economical electricity supply and demand balance considerations, taking into account the assurance of supply and the environmental considerations such as water and carbon emissions (DoE, 2019).

On the occasion of the release of the IRP, Van der Poel (2019) reports that the Minister of Mineral Resources and Energy stated that:

> The IRP 2019 supports a diverse energy mix and sets out nine policy interventions to ensure the security of South Africa's electricity supply. (*Independent Online*, 2019, October 22)

Hence, the IRP advocates that South Africa will continue to follow a diversified combination of energy sources that reduces dependence on a single or a few primary energy sources. Given that, it envisages that coal will continue to feature significantly in energy generation in the foreseeable future; also considering the abundance of coal resources in South Africa. This is despite the fact that coal has been branded as the dirtiest of all fuels and hence the world's leading source of GHGs (Keller, 2017). However, the IRP envisages that new and additional resources will be made available in order to focus energy development in more efficient coal technologies.

It is perhaps for this reason that Respondent 15 suggested that a lot more could be achieved by merely liberalizing the energy sector and also deal with structural problems related to the energy grid and renewable energy. However, there was a recognition that this option does not seem to be a popular option politically (Respondent 15). Ebinger *et al*. (2011), earlier highlighted how political considerations may ultimately influence policy options that are pursued. Despite this criticism, 53% of the respondents surveyed felt that the climate change policies adequately address the climate change mitigation challenges that are faced by South Africa, while 36% disagreed with that assertion.

It came as no surprise that when the respondents were asked which sectors should be given priority in the policy, it was strongly advocated that a lot more emphasis is needed in the energy sector. Respondent 14 asserted that one way of achieving that would be to fix the disjuncture between the energy policy and climate change policy and ensure that they are aligned. If this were to be done, Respondent 13 felt that it could unleash the huge potential in the renewable energy sector. Furthermore, Respondent 13 argued that it could potentially stimulate manufacturing in the renewable energy sector which remains largely untapped. Ultimately, this would facilitate transition to low-carbon-economy.

Other sectors that were highlighted that need attention include transport, agriculture, spatial planning, human settlements, carbon sequestration, technology and the land sector which has a potential to remove carbon. It was felt that clarity on targets per sector and more specificity on those targets were among the issues that needs further attention.

The respondents, however cautioned that irrespective of what options South Africa pursues, it must not shock the economy. Hence, Akram (2012), acknowledges that environmental policy may have an impact on the economic growth depending on the level of development of the country. In emphasizing this sentiment, Respondent 9 indicated that climate change interventions must consider the ripple effects in the value chain and its related unintended consequences with a view to ensure a just and full transition.

The same sentiments were raised by the Minister of Mineral Resources and Energy who is reported to have argued that some towns could be wiped out if there was no proper consideration to just transition. Perhaps this thinking is informed by what Akram (2012), calls a general discernment that environmental policies may impose undesirable constraints on production processes, resulting in negative impacts on economic development. Another important context in this discussion is that while the NCCRWP commits South Africa to deal with climate change, however, it is unambiguous in that as it builds climate resilience, it will be done, “in a manner that simultaneously addresses South Africa’s over-riding national priorities for sustainable development, job creation, improved public and environmental health, poverty eradication, and social equality” (DEA, 2011: 11). It can then be expected that given the high levels of unemployment, trade-offs should be made between addressing climate change and creating jobs. Whether this can be achieved without compromising the other remains a dilemma, hence the imperative for a just transition that ideally should take into account these issues.

Lenferna (2019), wrote an opinion piece that was published by the Mail and Guardian on 16 October 2019, headlined: “Mantashe’s dangerous energy agenda is from the Trump playbook”; Minister Mantashe is quoted to have indicated that:

> Just ask the devastated coal workers and communities in Hendrina who have seen their livelihoods disappear with no plan to protect them as coal mines and power stations are shut down (*Mail & Guardian*, 2019, Oct. 16).

According to the Minister's view, Hendrina provides a classical example of what could happen to the majority of towns in Mpumalanga province were coal to be phased out prematurely without considering the domino effects of such a move. The Minister further indicated that South Africa could not be expected to be held to the same standards that apply to developed countries as a developing country when it comes to emissions reductions as that would affect South Africa's economy and its industrial ambitions. This thinking is in keeping with the principle of common but differentiated responsibility discussed earlier which underpins most of the developing countries' position in the global negotiations.

That being the case, it is not immediately clear whether the utterances by the Minister are in defence of energy security or continued use of coal. Having said that, Karimu and Mensah (2015), acknowledge the role that energy play as a key component in human development progress as well as its importance in the modern economy. The authors further concur with reports that no country in the world has managed to progress from the subsistence economy without benefitting from the services and infrastructure that the modern economy provides.

Based on the diverse and somewhat confrontational reactions following the release of the IRP, it is clear that the contestation is not merely about issues related to just transition that are at play; but other considerations appear to be at stake given this highly contested document by stakeholders. In the midst of all this contestation, the Minister implied that those that were opposed to the IRP were a lobby group for specific energy technologies disguised as concerned environmental organisations. Given the court challenge that was lodged in July 2020 by one of the NGOs in the North Gauteng High Court, it is clear that the contestation over this energy policy is far from over.

Another issue that emerged from the respondents was policy implementation inertia and poor implementation. According to Fischer-Smith (2018), effective policy

execution is often seen as an exception to the norm. This is because there are numerous obstacles that may hinder the implementation, such as unclear chain of command, multiple role-players, and inadequate resources, can act as barrier points to effective implementation (Fischer-Smith, 2018). As already demonstrated earlier, multi-actor and multi-level implementation presents its set of challenges. In addition to this, effective implementation is attained when those that are responsible for implementing a policy execute it in a manner intended hence the authors have emphasised the link between policy design and implementation processes.

There was unanimity among respondents that climate change strategies are in place, but they are not supported by a strong implementation. The respondents felt that while the policies appear to say all the right things, actions are not always consistent with those policy intents. Perhaps, another subtle confirmation of the suspicion that there seems to be no real commitment to address climate change other than managing perceptions. The failure to implement policies was in part attributed to the fact that climate change is not at the centre of decision-making and economic development trajectory but rather is seen as an add-on issue (Respondent 19). Clearly, poor implementation cannot be interrogated in isolation without addressing the question of institutional capacity. The respondents further expressed doubt whether the required institutional arrangements to implement the policies and strategies are in place. The same doubt was raised regarding the capacity to deliver on the expectations and the availability of knowledge or evidence base to deliver on those expectations. In addition to the institutional challenges to implement, the architecture of the policies was questioned by respondents. For instance, there was a perception that policies lack the ‘teeth’, citing the Climate Change Mitigation System Framework (CCMSF) which includes Pollution Prevention Plans, Carbon Budgets and the Desired Emission Reduction Outcomes (DEROs) which are not mandatory.

While this criticism is noted, Respondent 18 highlighted that the criticism should be contextualized by equally acknowledging that the CCMSF has been implemented in a phased approach. It is expected that the non-mandatory dispensation which is part of the first phase that started in 2016 is envisaged to end in 2020. The second phase which will commence after 2020 is envisaged to become mandatory given that by that time, there will probably be a legal framework in place if the Climate Change Bill is

approved. This phase will also see the introduction of Sectoral Emissions Targets for key economic sectors as well as Carbon Budgets which will assign a certain amount of carbon emissions for individual companies. However, it is worth noting that the finalisation of the Climate Change Bill appears to be taking longer than is expected given that it was published for public comment in June 2018.

Even though the policies were found to be good and ambitious, however Respondent 6 in particular disagreed and went as far as branding them as unimplementable. It was felt that implementation can only be effective if it is supported by resources. Hence a need for a clear regulatory framework for climate change that is enforceable and monitorable was found to be more compelling. Clearly, the reservations around the availability of capacity is something that is concerning and is reflected upon in the next section.

5.3 Institutional capacity to implement different climate mitigation measures

The institutional capacity to implement climate change policies was primarily broken down into three main categories. These include government departments, research institutions and institutions of higher learning such as universities. The following research institutions were identified: Council for Scientific and Industrial Research (CSIR), South African Weather Service (SAWS), Agricultural Research Council (ARC), Water Research Commission (WRC), and National Cleaner Production Centre (NCPC).

Even though these institutions were identified, when asked if South Africa has institutional mechanisms in place to implement climate change mitigation policies, the respondents expressed mixed reactions. Forty-six percent of the respondents (Figure 5.1) felt that there is inadequate institutional capacity to implement mitigation measures. It is worth noting that 19% of the 46% strongly felt that there is a lack of institutional capacity. On the other hand, 42% of respondents felt that South Africa does indeed have institutional mechanisms (capacity) to implement climate change mitigation measures, of which 15% strongly agreed.

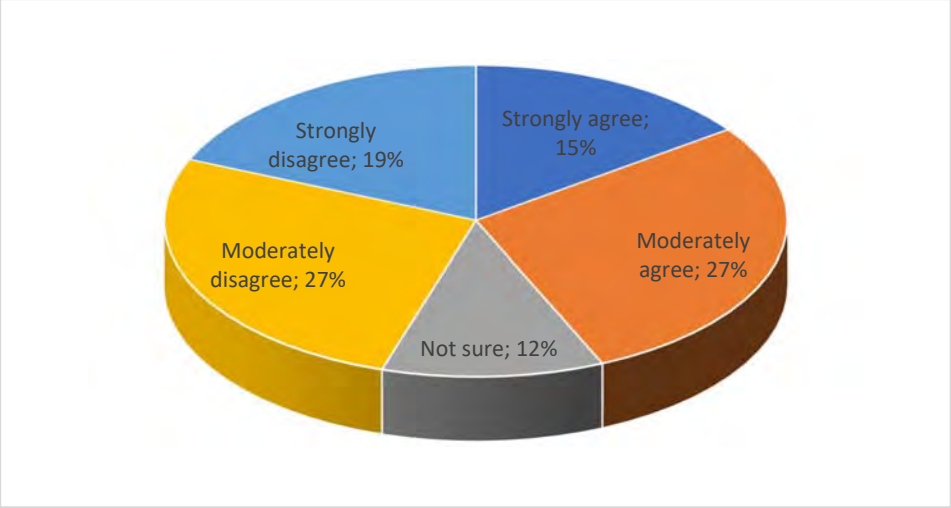

Figure 5.1: Institutional mechanism to implement mitigation measures

Source: Author, Field Survey, 2019

At a government level, the respondents indicated that capacity appears to be concentrated at the national level (in national departments) (Respondent 21). Marquardt (2017), however cautions that it does not matter how powerful a national ministry might be, due to dependence to some degree on sub-national authorities for implementation. Hence intergovernmental and collaborative implementation was highlighted as a necessary imperative in the literature review. Even though this may be the case, that technical capacity is there at the national level but the ability to implement appears to be hindered by limited resources and funding challenges. The respondents highlighted that in order to facilitate coordination, the government has set up coordination mechanisms such as an Intergovernmental Committee on Climate Change (IGCCC) and the Inter-Ministerial Committee.

The IGCCC is overseen by a department responsible for Environmental Affairs. However, Respondent 16 felt that by its nature, climate change cuts across various disciplines and therefore warrants that it should not be purely categorized as an environmental issue left to that department alone to champion it. The respondents advocated that other sector departments must mainstream climate change in the implementation of their own sector programmes. The gap in government coordination may be closed should the proposal in the Climate Change Bill be fulfilled. The Bill proposes the establishment of the Ministerial Committee on Climate Change

consisting of the Minister responsible for planning, monitoring and evaluation in the Presidency, the Minister responsible for environmental affairs, other sector Ministers as specified and all Members of Executive Council responsible for the environment from provinces (DEA, 2018a). Furthermore, the Presidential Climate Change Coordinating Commission to coordinate and oversee the just transition to low-carbon and climate-resilient economy has been bandied about.

Although that appears to be an ideal situation, Respondent 18 felt that this is not always possible because sector departments tend to be first and foremost more interested in implementing their core mandates. This means that mainstreaming climate change becomes secondary to them. This is supported by Galvani (2018), who claims that local implementing staff are more inclined to execute policies that they deem make a meaningful contribution to their stakeholders. It was felt that what would matter most to them is the delivery of the service that they are mandated to deliver and the satisfaction of its clients on the services rendered. The respondents suggested that most likely, the satisfaction with the service would not be judged on whether the climate change considerations were taken into account or not.

Given the perceived concentration of capacity at the national level, coupled with technical expertise that is limited to a few experts elsewhere, Respondent 1 described the system as “fragile” because it is heavily dependent on few experts. As observed earlier in the literature review, Galvani (2018), posits that implementation becomes challenging in an environment where there is multi-actor and multi-level implementation especially where it is compounded by uneven capacity and resources.

It was noteworthy to observe Respondent 19 use the analogy of the structure of the Paris Agreement as a framework through which the capacity of government can be assessed. The Paris Agreement is broadly structured in a manner that requires countries to set goals, implement actions and then report on progress made regarding the contribution to the global effort. Respondent 19 suggested that, that is where the fragility of the system becomes an issue of concern because it was contended that South Africa does not appear to have strong institutional arrangements to undertake all three functions as envisaged in the Paris Agreement.

Furthermore, Respondent 19 found it odd and concerning that the target setting component in South Africa is largely driven by very few individuals (three guys) in a single department of a university. It was argued that such a small team does not appear to have multidisciplinary expertise to centre target setting on economic development imperatives. As a result, target setting appears to be more anchored from a technical and technology driven perspective rather than being wholly inclusive of other relevant factors.

Moreover, the fact that prioritization and target setting is driven by consultants rather than the government was found to be problematic on its own because determining national interest remains the sole preserve of government which it must define itself (Respondent 19). In this regard, it was inferred that South Africa lacks strong institutions and the capacity to perform that function. With regard to implementing the action, even though the respondents recognized the existence of multiple players, but the challenge lies with the centre that is not holding and that fails to drive the vision. Undoubtedly, for the centre to hold requires leadership both at political and technical levels to drive the vision and ensure the coordination and implementation of policies.

As a result, there was a feeling that the implementation appears to be haphazard and not coordinated. This may change once the Ministerial Committee on Climate Change indicated earlier is put in place. On reporting, there was an acknowledgement that there seems to be systems in place to understand the impact of the policies that have been put forward as well as the data streams that are necessary to do that. The inference that Respondent 15 highlighted was that the capacity constraints are as a result of the lack of intellectual capacity and leadership rather than the warm bodies that are needed to implement the policies; in a manner that is responsive to economic challenges that prevail. The next section deliberates on the robustness of the climate change policies to support economic growth in detail.

5.4 Robustness of policies to support economic development

Climate change and economic development remain intertwined. Hence Northrop (2017), argues that the adverse effects of climate change on economic growth are no longer speculative but are rapidly becoming a stark reality. As much as economic

development drives climate change in a way, climate change policies must take into account their implications on the economy. According to Arndt *et al*. (2012), overall, climate change hinders the already formidable task of stimulating long-run development.

There was a mixed reaction from respondents when asked if climate change policies are adequate to promote economic growth (Figure 5.2). Therefore, the respondents felt that climate change interventions must not be seen to be stifling economic development in order to ensure broader buy-in and acceptance from all stakeholders including business. This is consistent with the overriding consideration in the climate change policy implementation that was discussed earlier, that it should not compromise sustainable development, poverty reduction and job creation amongst others. Forty-six percent of the respondents surveyed indicated that climate change policies are sufficient to promote economic development. Figure 5.2 shows that an almost similar number of respondents were not convinced that climate change policies are supportive of economic growth.

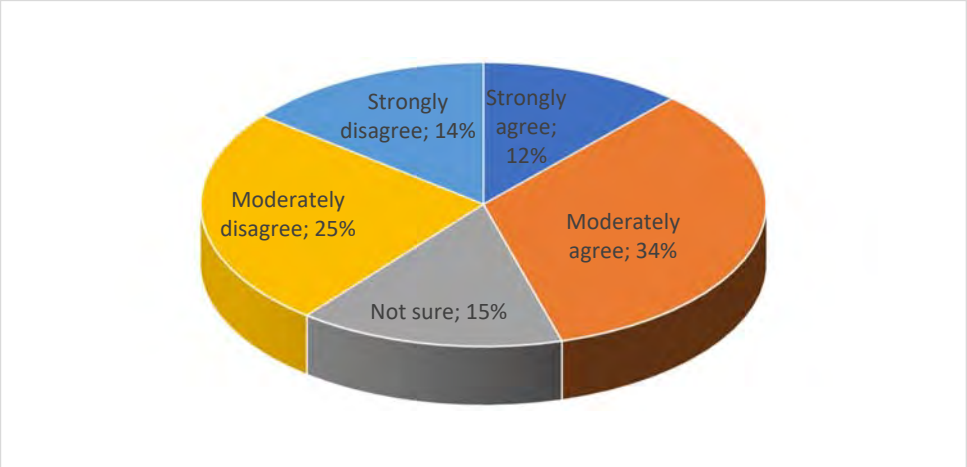

Figure 5.2: Promotion of economic development by climate change policies

Source: Author, Field Survey, 2019

The respondents that agreed that climate change policies are complimentary to economic growth emphasized that South Africa's negotiating stance at a global level is more about economic growth. Hence it has welcomed a broad flexible deal in the Paris Agreement. Furthermore, they argued that the fact that the climate change policy

deals with issues such as inequality, poverty eradication and other socio-economic issues shows that economic growth considerations are included in the policy. In addition, they also indicated that South Africa's climate change policy can contribute to economic growth provided there is innovative implementation. Such innovative measures would also explore new growth opportunities and industries emerging out of policy implementation.

Ideally, that should be the case. However, given the weaknesses in implementation and capacity that was discussed earlier, this remains a far-fetched dream. Innovative implementation can only occur if there is effective leadership and requisite capacity. A distinction was made on the impact of the policies in the economy on the short-term and long-term respectively. This was to clarify that while in the short-term the economic growth may be affected as a result of the policies, in the long-term, such policies would be beneficial to the economy (Respondent 16). Arndt *et al.* (2012), highlight the need to withstand short-term shocks in order to proceed on a positive long-term development trajectory should often be a central consideration. This is an important point to caution against short-termism and lose sight of the long-term benefits of policies.

The sentiment that was expressed earlier that climate change policies appear to be more centred around the environmental pillar and less on economic pillar of sustainable development resurfaced. It was reiterated that greening of the economy must be done in a responsible manner that facilitate economic growth given that South Africa is a developing country. Hence the just transition was advocated as a necessary imperative.

The argument that environmentally friendly technologies may assist industries to continue sustainably was welcomed with scepticism because that would also depend on how the industry and other players react to those measures. In highlighting this point, Respondent 6 felt that there is a point where the industry sees measures as a burden to them. For example, the respondents indicated that the Carbon Tax Act has been viewed as increasing the cost of doing business in the country.

The issue of green technologies, particularly renewable energy was a recurring feature. However, some respondents cautioned that renewable energy should not be perceived as a panacea to South Africa's climate change problems. Northrop (2017), seems to share the sentiment based on the fact that despite the widespread confidence in technological innovation, there is still no empirical basis that a technological solution can be developed and disseminated in time to make current and near-term global economic growth safe for the climate. It was asserted that the renewable energy will not provide the baseload that the country needs at any given point. Apart from that, as has been highlighted earlier, the introduction of renewable energy in the energy mix has not been an easy one and it is imperative for government to begin to sing from the same script on these issues and send a clear signal.

The respondents re-emphasized that for as long as economic policies and climate change policies remain incoherent, not much can be achieved. Respondent 19 argued that the incoherence is yet another signal that the centre does not hold and therefore measures are haphazard. For example, renewable energy was cited as one area which has a huge potential for economic growth but that has not been fully exploited. Perhaps, certainty is what is needed to ensure that renewable energy contributes meaningfully to the economic development objectives of the policy.

According to the IRP of 2019, a total of 6 422 megawatts under the Renewable Energy Independent Power Producers Programme (REIPPP) has been procured. Of this, at least 3 876 megawatts are operational and connected to the national grid (DoE, 2019). Even though South Africa has rolled out renewable energy in the past, the respondents felt that very few if any of those technologies are South African. Furthermore, there was also a feeling that the components used in those technologies do not appear to have been manufactured in South Africa.

That being the case, Respondent 19 indicated that the REIPPP may have deprived the country of enormous opportunity to increase its manufacturing capacity and create green jobs. Related to this would be the spill-over effects on the value chain and the ability to minimize the negative impact on the balance of payment as South Africa invest on these technologies because there is no value-add that is undertaken in South Africa other than the construction phase. It is for this reason that Respondent 19

implied that the REIPPP programme missed an opportunity to revolutionize the manufacturing sector in green economy, something that could have been used to boost the economy rather than merely address the emissions reductions. This happened despite the tools that the Department of Trade, Industry and Competition (DTIC) has put in place such as minimum content requirements and Black Economic Empowerment (BEE). Hence the respondents questioned the extent to which these tools are implemented and complied with. Once again, this symbolizes weaknesses in policy implementation and monitoring across government.

With this in mind, perhaps those respondents that questioned if the policy is having the desired effects should not be lightly dismissed. Similarly, those that suggested that given the sluggish economy that is growing below 1% and its persistence thereof in future, South Africa may not have to do anything to meet its PPD trajectory as envisaged in the policy because energy variations will largely be influenced by economic growth and GDP (Respondent 9). Hence, Northrop (2017), concedes that economic growth remains obstinately dependant on the increased combustion of fossil fuels, despite the significant strides in non-carbon-based energy solutions.

What seemed to be the emerging sentiment from the respondents is that South Africa must unlock the renewable energy sector potential. Furthermore, the respondents suggested that South Africa must define and clarify for itself the nature and form of the future economy so that it can transform and be geared to that eventuality. Unfortunately, it was the respondent's view that such a vision of the future economy seems to be lacking and things seems to continue as business as usual. It was asserted that this is a serious issue that must not be taken for granted, otherwise, South Africa risks its economic trajectory being dictated by other countries through response measures on trade that may be imposed to it.

With regard to issues of trade, there are protocols and treaties that govern the international trade relations. South Africa as a responsible global citizen participates in those forums to shape the global policy framework. As a member of World Trade Organization (WTO), South Africa has a responsibility to implement the international obligations it has made on trade. The respondents felt that failing to honour those obligations could have repercussions for its international trade. The respondents were

asked to express their opinions whether or not the climate change policies are robust enough to withstand response measures that may be imposed by other countries to South Africa. This question elicited mixed reactions from the respondents (Figure 5.3).

The difficulty of the response measures debate was reflected in how respondents expressed their views with 43% suggesting that South Africa's policies cannot withstand response measures while 40% felt that the policies were robust enough not to affect the economic growth.

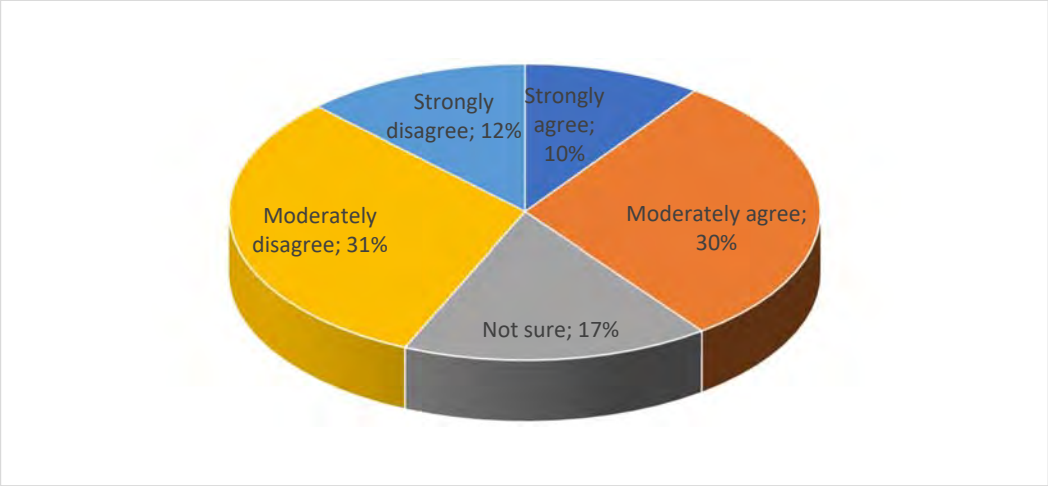

Figure 5.3: Robustness of policies to withstand response measures

Source: Author, Field Survey, 2019

Respondent 1 felt that international policy on response measures is largely dominated primarily by developed countries. Response measures generally include border tax adjustments, tariffs, labelling and others. In concurring, Respondent 19 cautioned that South Africa is not able to deal with those types of response measures. This is primarily because South Africa's policies are not nested on the national interest. Issues related to response measures it seems may not be divorced from competitiveness, trade barriers and other unintended consequences that may deprive countries to trade freely and fairly. Hence, Respondent 18 indicated that the developing countries have argued that it creates uneven playing field when it comes to international trade. These concerns appear to confirm what Barbier (2014), cautions against in the literature review; that over-emphasizing on reducing the burning of fossil fuel by developed

countries, then they may be forced to respond accordingly, including by taking trade actions that may foster their international competitiveness.

Respondent 6 felt that even domestically, South Africa has to meet the trade union demands who have not fully bought to the energy mix trajectory that South Africa has set itself for fear of job losses. Similarly, it was felt that the business sector decries the increasing cost of doing business attributed to some of the measures. While at a government level, the respondents found it worrying that the different departments dealing with trade, economic policies and environment appear not to be singing from the same script (Respondent 4). Hence, Marquarrdt (2017), cautions that lack of coordination across levels and sectors may affect implementation.

Globally, it was felt that the effect of response measures could be such that it could potentially interfere will South Africa's sovereign right to determine its developmental trajectory (Respondent 5). Balancing all of these issues appears to be a hard nut to crack and indeed would require innovative implementation as highlighted earlier.

Irrespective of where one stands on the issues, it was clear from the respondents that green economy is increasingly becoming inevitable. Response measures whether imposed justly or unjustly could cost the economy. Recently, in 2019, Brazil was forced to act on the raging fire in the Amazon forest, failing which it could have suffered the punitive measures that were already bundied about by the developed countries. Some EU countries were swift to threaten to terminate a trade deal that was concluded in June 2019. Given how serious the EU took the issue, the French President recommended to elevate the issue to the Group of 7 meeting that took place in August 2019.

Interestingly, when respondents were asked explicitly if it is an appropriate response to impose tariffs on energy-intensive imports based on the carbon content of domestic production, a somewhat interesting picture emerged. Overwhelmingly, 70% of the respondents surveyed felt that imposing tariffs would be a necessary measure. Figure 5.4 illustrates this point.

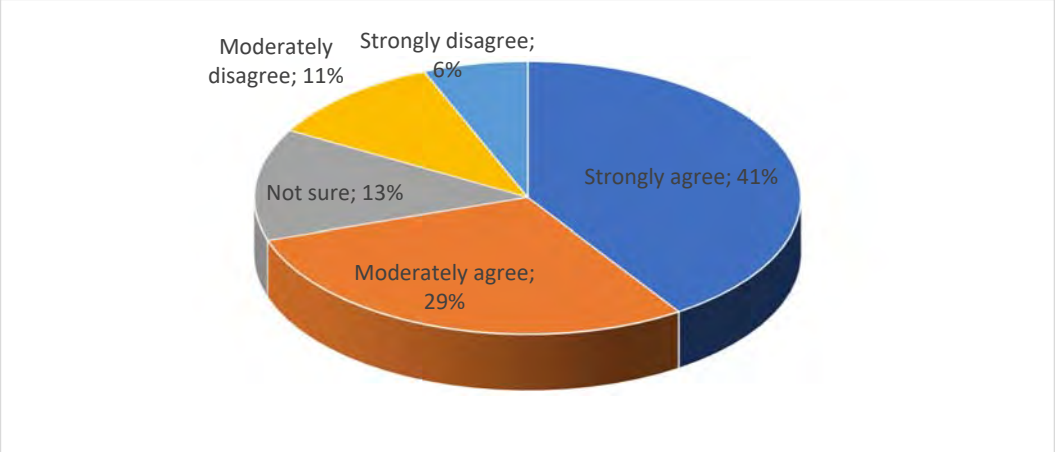

Figure 5.4: Appropriateness of imposing tariffs on energy-intensive products

Source: Author, Field Survey, 2019

Figure 5.4 depicts that out of the 70% that agreed that imposing tariffs on energy-intensive products would be a necessary response, 41% of those strongly agreed. This is despite the mixed reaction of respondents on the question of response measures. Those that agreed with the imposition of tariffs on energy-intensive products indicated that if South Africa is serious about mitigating emissions and the only measure that it has at its disposal is to impose tariffs, then it must be done.

Respondent 16 suggested that the revenue generated from those tariffs could then be re-invested back in the economy and the cleaner technologies that are less energy-intensive. Furthermore, Respondent 18 implied that South Africa does not have many options as the trends globally are towards transitioning to a low-carbon economy and South Africa has to follow suit before such measures are forced on to it. If South Africa did not decarbonize its economy, Respondent 18 argued that there is also a danger that South Africa could be used as a dumping ground for high carbon technologies and processes.

However, the dissenting view from Respondents 7 & 8 was that imposing tariffs would be inappropriate for a developing and emerging country like South Africa that is still strongly reliant on coal. It was felt that South Africa remains a big exporter of fossil fuels and the majority of its exports still remain largely energy-intensive while its capacity to low-carbon economy is still fledgling. As South Africa ponders on the

options for the low-carbon economy, there must also be a discussion of what then becomes of the coal reserves that it has. With this in mind, it was implied that it is almost given that South Africa's products will continue to have high carbon footprint and measures to impose tariffs would not only be untimely but would also erode its competitiveness and be devastating for the economy. As argued in the literature review, imposing tariffs on developing countries would be damaging because their manufacturing exports would be affected negatively.

Another perspective from Respondent 14 was that it would not be fair to have a one size fits all approach when it comes to response measures. This perspective advocated for a differentiated approach between developed and developing countries. For instance, it was suggested that developed countries appear to have more options, something which developing countries like South Africa do not have. The motive of introducing those measures would also count whether it is intended to stimulate more climate response or purely anti-competitive in approach.

The issue of differentiation can be traced back to the Convention and the Kyoto Protocol. There was an insinuation that some developed countries feel that the Kyoto Protocol was unfair to them as it imposed obligations that came at a tremendous cost to them and the pricing of their products. Even though the Kyoto Protocol may have had that effect, it was contended that it helped them to become greener in their production processes. Now those developed countries, it was argued that they are introducing these measures in order to try and recoup the costs that they incurred from the countries that were not obligated under the Kyoto Protocol. While this seems largely speculative and a far-fetched conspiracy, it cannot simply be dismissed as such.

The issue of imposing tariffs was also linked to the long-standing debate on subsidies between the developed and developing countries in the world trade arena. It was felt that tariffs could be a problem because there is a lot of hidden subsidies on a number of goods by other developed countries. If South Africa were to impose tariffs on imports from rich countries from a carbon content perspective, most likely there would be a commensurate subsidy to maintain their competitiveness and South Africa does not have such a scheme in place because of resource constraints (Respondent 19).

Therefore, Respondent 19 cautioned that it would be counterproductive for South Africa to engage in carbon labelling and tariffs because in the end, South Africa would be a net loser. While the numbers highlighted above suggest otherwise, the sentiment is clear that imposing tariffs based on carbon content on products would perhaps be undesirable and yet muddied by global politics and international trade. Given the above, what industry focused measured can be pursued domestically. The nest section interrogates this question.

5.5 Industry focused measures

The respondents were asked if government is doing enough to support sustainable consumption and production (SDG 12). Most respondents were of the view that South Africa is not ready for such a dispensation. Among the responses that were provided, it was indicated that South Africa's level of development does not even allow the country to entertain sustainable consumption because it is still grappling with peoples' basic needs and services. Therefore, it was contended that initiatives to influence consumption patterns and altering them would be appropriate for affluent nations where people have choices (Respondent 19). It was argued that the situation in South Africa is completely different because most of the population does not have choices.

For instance, a point was made that approximately, 17 million South Africans are reported to be dependent on social grants in South Africa. From the SDGs country report of 2019, the proportion of the population that is dependent on social protection (grants) increased from 28.9% to 30.3% between 2013 and 2018; making it 17.5 million people. That is a sizable number of people whose livelihood is dependent on government. In March 2020, following the announcement of the National State of Disaster under the National Disaster Management Act (2002), government decided to augment the social grants including by announcing an unemployment benefit for the unemployed (Social Relief of Distress Grant). This was done to minimize the impact of COVID-19 on the most vulnerable and the unemployed. Under these circumstances, it was argued that it then becomes difficult to influence the consumption patterns of indigent people. While this is the case in South Africa, Stevens (2010), argues in the literature review that for sustainable consumption and

production to be effective, consumers must take centre stage to ensure an integrated approach.

However, it was posited that there are opportunities that can be pursued in terms of reducing their footprint through public infrastructure system such as transport. Such interventions would indirectly change the pattern of consumption by the broader public. Accordingly, most respondents felt that government was not doing enough to support sustainable consumption and production as shown in Figure 5.5.

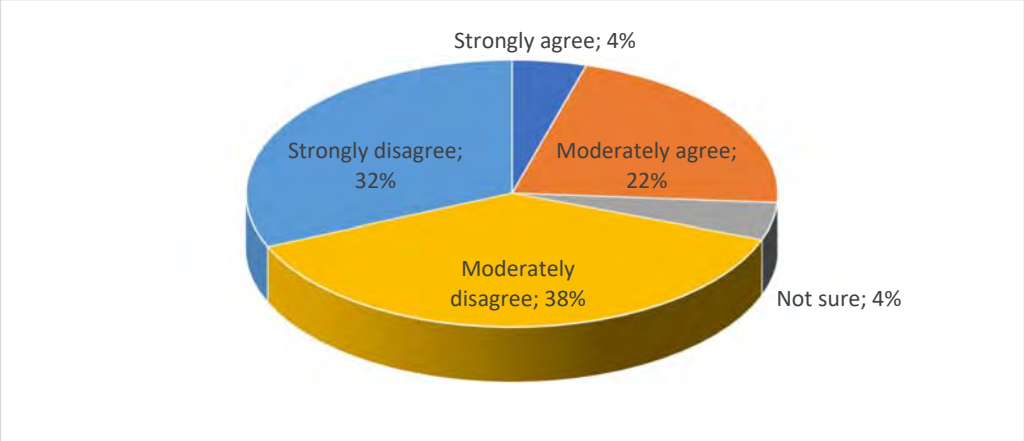

Figure 5.5: Government has measures to support sustainable consumption and production

Source: Author, Field Survey, 2019

Figure 5.5 demonstrates that 68% of the respondents were of the view that not enough is being done to support sustainable consumption and production. Respondent 4 attributed this to lack of strong policies to encourage it resulting in huge opportunity loss in this area. Furthermore, the respondents felt that its energy sector is not only energy-intensive but also expensive.

Government was criticized for its lack of appreciating the concept of scarcity. Hence it does not appear to be embedded in its policies (Respondent 13). The laxity of implementation was recurring; hence it was found troubling that even where preliminary work has been done that could be supportive of sustainable consumption and production, respondents felt that there is no follow through of that work. According to Respondent 4, even in instances where something is done, it was suggested that it

seems such actions are coincidental and cannot be traced to policies that government has put in place.

The business sector was not sparred of the criticisms by the respondents. They felt that the other challenge lay with the business sector itself that tend to be highly resistant to changes and policy intents that are introduced. It was suggested that the government must endeavour to demonstrate to industry that sustainable production makes a good business sense and could save industry sector resources (Respondent 18).

Despite the criticism of government, it was acknowledged that there are measures that are in place such as appliance labelling, energy efficiency and building code standards, even though it would seem that there is limited awareness about these measures. Furthermore, it was recognized that government has introduced initiatives such as plastic bags recycling, strategy on tyre recycling, building lighting and in the waste management sector, however, these measures are seen as pet projects rather than mainstream interventions (Respondent 15). Important to note though was that it was indicated that these interventions were as a result of external funding rather than being fully conceptualized in South Africa. However, the introduction of the carbon tax and other environment related incentives are the beginning endeavour to address this issue.

Similar sentiments were expressed when the respondents were asked if the climate change management policies have improved the production methods by the energy-intensive industries. Even though the sentiments were almost the same, but the question elicited mixed reaction from the respondents, 41% of respondents disagreeing with the statement, 38% agreeing, while 21% of respondents were not sure (Figure 5.6).

Again, there was criticism of the energy sector that is energy-intensive. The government was criticized for lack of legislation and lack of monitoring mechanisms. Fundamentally, there was also criticism that most measures are voluntary in nature. This was in reference to measures such as carbon budgets and pollution prevention plans that have not been fully implemented yet. Accordingly, even where progress had

been made, it was felt that such progress could not be attributed to climate change policies which had only begun to be implemented (Respondent 19). It was implied that the Air Quality Act (2004) was to be credited for such progress.

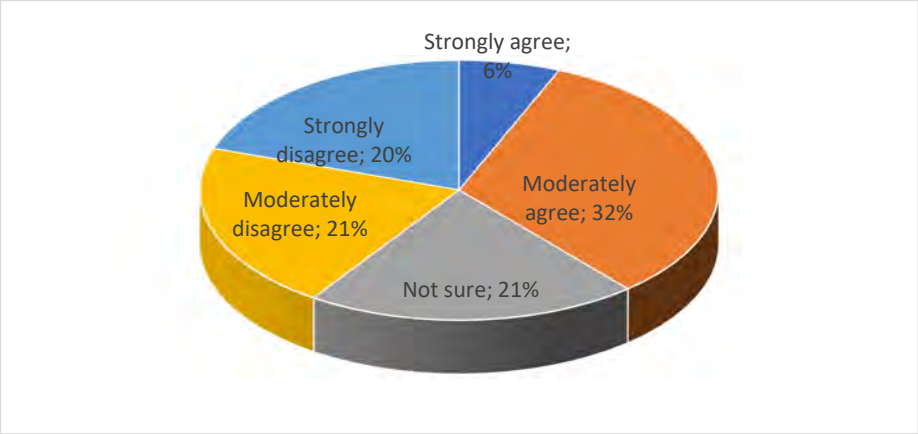

Figure 5.6: Climate change management policies have improved the production methods

Source: Author, Field Survey, 2019

The government was commended for the introduction of section 12L of the Income Tax Act (1962) which may have helped companies to be energy efficient (Respondent 12). From this instrument, companies must prove that their production is efficient through audits. The Carbon Tax Act that came into force in June 2019 was acknowledged in that it will further use tax instruments to promote cleaner production methods. It was indicated that the fuel levy has grown over the past years and may have forced logistics companies to rethink their operations and include efficiencies in their processes. As cautioned earlier in the literature review, policy instruments on incentives can only influence behaviour only if the financial incentives are strong enough to influence decision-making processes. For instance, tax instruments are generally known to be less effective if they are not set high enough to have a deterrent effect.

The respondents also felt that the industry itself is not as responsive as it should be due to the size of investment that it has to make to improve production methods and processes. It came as no surprise that when asked if the energy-intensive industry was complying with climate change management policies (Figure 5.7); 61% of the respondents felt that the energy-intensive industry is not complying with those policies.

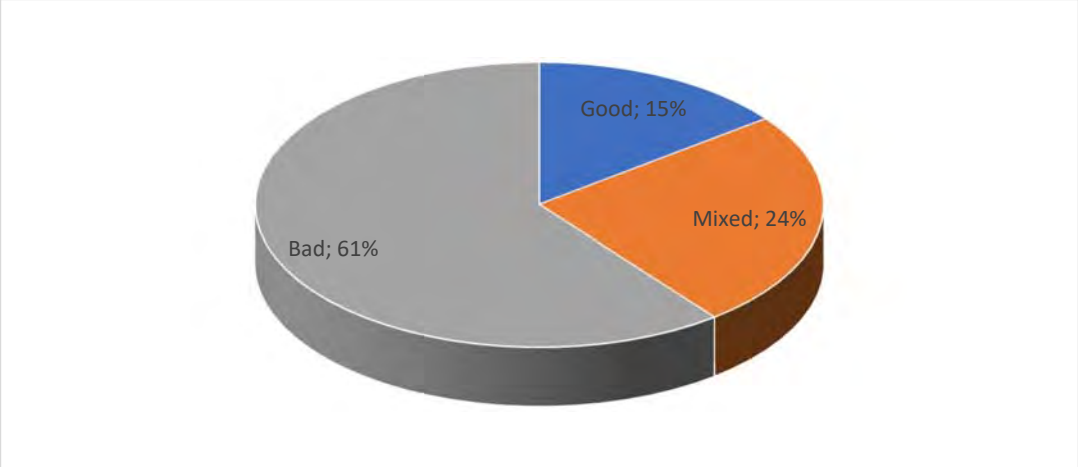

Figure 5.7: Energy-intensive industry complying with climate change management policies

Source: Author, Field Survey, 2019

The respondents felt that the big companies have continued to emit unabated due to lack of capacity to enforce emissions quotas. In emphasizing this point, Respondent 19 highlighted that this was a real problem because it would be naïve to ignore the fact that the industry is a very strong lobby group. Fischer-Smith (2018), notes that such powerful interest groups intervening in policy creation may at times prevent coordinated policy action. As such, it can influence a policy to the level where it is able to comply with. That way, the objectives are set in a bar that is within reach for them, low enough to be achieved (Respondent 19).

The respondents indicated that such a scenario then creates a false impression that the industry is complying. The respondents suggested that in some cases, the industry can push for the deferment of the implementation of the policy. This reduces the likelihood of them having compliance issues. It was suggested that the problem is that while the industry recognizes that they have to comply with policy provisions but they do not see them as something beneficial to their bottom line (Respondent 18). Hence the issue of incentives becomes relevant in policy development. It was also implied that government is complicit in that its own energy producer has also failed to comply with policies and measures such as Minimum Emissions Standards and has been found wanting on many occasions (Respondent 15). By implication, if the government is serious about climate change, then charity should begin at home with its own energy producer complying with its set standards, then perhaps industry-wide compliance

would also follow. Furthermore, government was criticized for the perception that good quality coal appears to be reserved for an export market while poor quality coal is used in the country (Respondent 6). It was argued that only an enforceable regulatory framework would remedy the situation that is largely voluntary.

The respondents were asked if South Africa has mechanisms to provide for incentives to encourage industry to adopt cleaner production practices. There was a mixed reaction from respondents with 46% feeling that there are incentives in place to encourage industry to adopt clear production practices. However, 40% of respondents disagreed while 15% were not sure. As indicated earlier, incentives must be designed in a manner that induces behaviour change.

Among the tax incentives, are the two incentives that were introduced in the Income Tax Act of 1962. The first one relates to section 11D of the Income Tax Act. This was introduced in 2006 by government to foster private sector Research and Development (R&D) investment to boost innovation in the private sector, develop and improve products and processes. The second one is Section 12L of the Income Tax Act. This incentive offers an allowance for businesses to execute energy efficiency savings. The energy efficiency savings allow for tax liability deduction of 95c per kilowatt hour saved on energy consumption. However, it has been criticized for giving very little money back to companies. This is in light of the technology investments that must be made vis-à-vis the amount of rebates provided, this may need to be reviewed to make it more effective.

Other noticeable incentives from the Income Tax Act are shown in Box 1:

Box 1: Incentives from the Income Tax Act

Section 12K permits a tax exemption on any amount earned as a result of the disposal of any certified emission reduction (CER) from programmes that are registered with the Clean Development Mechanism. This incentive is aligned with the Kyoto Protocol and will end on 31 December 2020.

Section 37B permits companies to subtract the costs from their taxable income expenses emanating from expenses on environmental abatement costs and monitoring equipment, recycling assets and waste disposal sites.

Source: Author, based on Income Tax Act, 2019

Respondent 19 highlighted the work done by the DTIC and a report by KPMG. The TDIC has some measures that it has put in place. Amongst them is the section 12i of the income tax which is designed to support companies for new industrial projects as well as the upgrades and expansion of industrial projects. This incentive also covers the costs related to training of personnel to improve the productivity. The DTCI also initiated the Manufacturing Competitiveness Enhancement Programme (MCEP) which includes resource efficiency as one of the criteria. Furthermore, the DTIC established the National Cleaner Production Centre to drive its strategy on Industrial Energy efficiency. The NCPC has made significant strides in assisting participating companies to reduce energy use and in turn save resources particularly from energy cost.

From a report by KPMG (2013), if South Africa were to use all its environment-based legislation and tax-based instruments, nothing would stand on its way from starting companies that are deemed to be clean. As a result, tax has been identified as one of the key drivers for South Africa's green policy. Accordingly, KPMG International ranked South Africa as the 13th most active country among the 21 big global economies that use tax as a tool to influence responsible corporate behaviour and achieve environmental sustainability objectives.

Despite this, it was felt by some respondents that South Africa is too tax intensive, hence its policies are seen to be more punitive in nature instead of balancing taxes and incentives (Respondent 15). The manner in which tax incentives must be structured has already been highlighted in previous sections. Be that as it may, it was felt that punitive measures should not be the first option and should be reserved for those who fail to use the incentives. It was felt that business is very heavily taxed but that tax revenue does not get used for environmental management and climate change. Hence, the respondents were somewhat divided when they were asked if South Africa has sufficient tax instruments in place to support its response to climate change. Figure 5.8 illustrate the sentiments from the respondents.

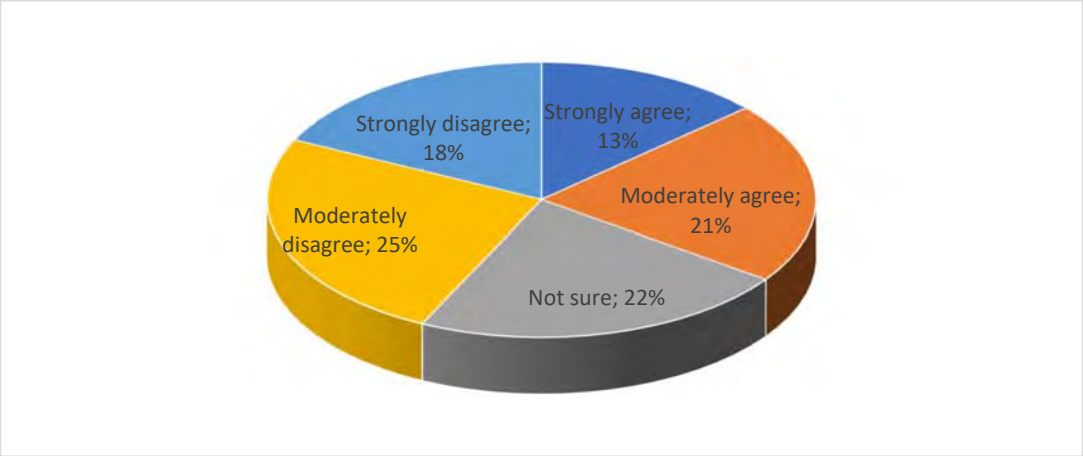

Figure 5.8: South Africa has adequate tax incentives to support its climate change response

Source: Author, Field Survey, 2019

The Carbon Tax Act that came into force in June 2019 was recognized even though it was criticized for having taken too long to be implemented and for not going far enough to deal with the climate mitigation issues decisively. Even though the Carbon Tax Act is in place, maybe it is ambitious to expect it to solve all the problems. The next section looks beyond climate mitigation by exploring the nexus with climate adaptation.

5.6 The mitigation adaptation nexus

As noted earlier in the literature review section, there are two approaches to climate change management, these are mitigation and adaptation, even though Faling *et al.* (2012), note that they have a bearing on each other. There is always a difficulty for countries on where they should put more emphasis and efforts between the two approaches. Accordingly, respondents were asked if mitigation efforts were being prioritized over adaptation efforts in South Africa. The response was unequivocal and clear as shown in figure 5.9.

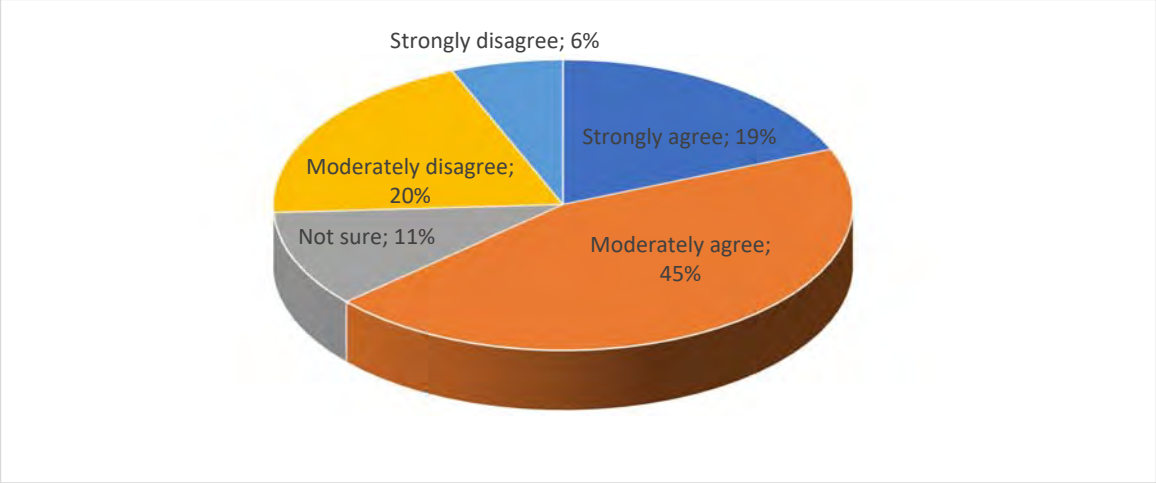

Figure 5.9: Prioritization of mitigation over adaptation efforts

Source: Author, Field Survey, 2019

Figure 5.9 clearly illustrates that most respondents felt that mitigation was being prioritized over adaptation. This perception is consistent with the observation that was made in the literature review. The respondents suggested that the prioritization of mitigation over adaptation should be seen from a context of a global perspective. According to Arndt *et al*. (2012), it is not surprising given that most of the research particularly the economics of climate change that has been undertaken at the global level has primarily focused on the consequences of mitigation policy. There was a feeling that the trend globally is that when it comes to climate change discourse the default position has always been mitigation (Respondent 19). It was argued that adaptation globally, not just in South Africa is still lagging behind. Hence most measures have largely been reactive (reactive adaptation) (Respondent 15).

Having said that, it must be noted that the NCCRWP of 2011 highlights that the overall approach of the policy is based on the understanding that, "climate change resilient development refers to all interventions – mitigation, adaptation or both – that contribute to a fair and effective global solution to the climate change challenge while simultaneously building and maintaining South Africa's international competitiveness…", perhaps, at least on paper (DEA, 2011: 13). Furthermore, Chapter five of the NCCRWP provides a much-detailed elaboration of the sectors that are supposed to be the focus of adaptation measures. This should be seen as a clear intention of the policy to address both adaptation and mitigation equitably. The

sentiments expressed herein show however that perhaps not much has been done in reality and a lot more deliberate focus on adaptation is needed.

The other important reason that was cited by the respondents was financial. It was argued that globally, there is more finance available for mitigation compared to adaptation. For instance, if one looks at the Multilateral Development Banks (MDBs), approximately 70% of their portfolio is for mitigation leaving approximately 30% for adaptation (Respondent 15). It was felt that it must be recognized that the compounding factor again is that a sizeable amount of funding from the MDBs are in the form of loans. Loans lends themselves better to mitigation rather than adaptation. Therefore, it was argued that it is not by design that countries choose mitigation over adaptation but because of circumstances that they find themselves in. Such factors include lack of bankability of adaptation projects, access to resources and the priorities of those institutions. The bankability of adaptation projects has been the biggest issue which makes financing adaptation difficult (Respondent 15).

From the South African perspective, it was indicated that part of the reason why the NDP tend to be more mitigation focused is that when it was developed, the only long-term study which had been conducted was the LTMS which was done in 2007 and the DEROs (Respondent 19). This provided the quick facts and figures that the NDP could use at that point and there was no information on adaptation at a comparable scale. It is envisaged that this bias will be corrected in the NDP as it gets reviewed, based on the Long-Term Adaptation Scenarios (LTAS) that is now in place. Whether too much should be read on the fact that the LTAS was only adopted in 2013, years later after the LTMS was adopted remains anybody's guess. Could this be construed to suggest that the adaptation agenda was not at the centre of government's response to climate change impacts? Trying to answer this could be nothing more than speculation.

When asked about the effect of over-emphasis of mitigation over adaptation efforts, there was a mixed reaction from the respondents as depicted in Figure 5.10.

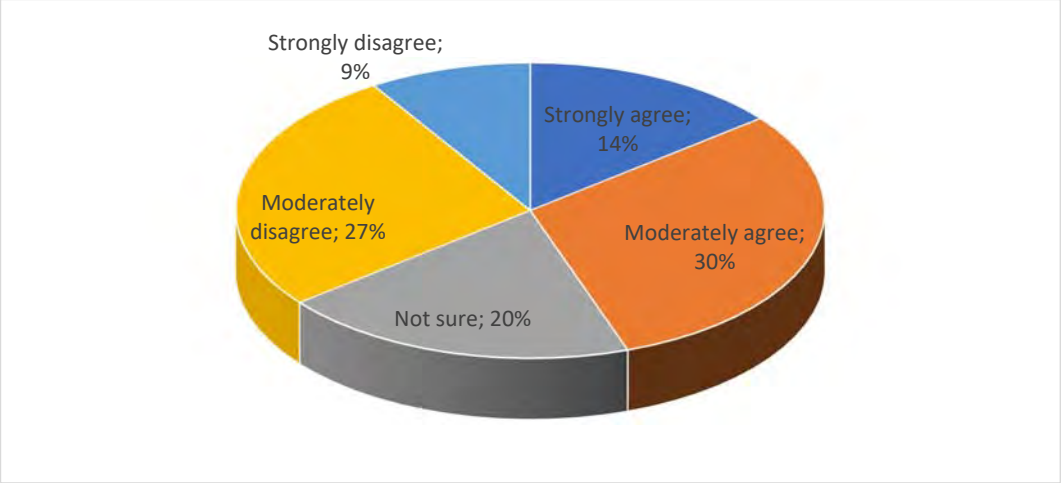

Figure 5.10: The effect of over emphasis of mitigation over adaptation

Source: Author, Field Survey, 2019

Those that felt that the effect would be negative on adaptation argued that the over-emphasis on mitigation over adaptation should been seen through the prioritization of budgeting (resource allocation). They contended that if mitigation was prioritized, the allocation of funds would be diverted to mitigation because of its over-emphasis. For example, it was suggested that in most economies particularly in developed economies, a lot of investment is put on infrastructure investments and project infrastructure-based mechanisms which are easy to execute with mitigation interventions (Respondent 19).

However, it was felt that such investments are not always possible with adaptation due to the long-term nature of adaptation measures. As such the respondents felt that adaptation measures do not lend themselves to project-based type of interventions. For example, a disaster relief fund in South Africa is not linked to any project whereas it would be easy for the government to allocate funds to build renewable energy plants (respondent 19). That makes it difficult to prioritize funds for adaptation intervention. Therefore, given the competing demands for resources, naturally money would go to mitigation.

There is also this prevailing notion that doing more mitigation diminishes the need for adaptation. Al Gore strongly argued for this globally and implied that adaptation was a waste of time that side-tracked focus and resources away from the actual issue, the

prevention of impacts through mitigation (Laves *et al.,* 2014). Given that climate change impacts are being felt now, there is a need to urgently adapt now. According to Respondent 15, there is also a new dynamic being advanced by countries like the UK. They are advocating for resilience in adaptation context rather than adaptation itself. They advocate for more mitigation, and in it, build in resilience measures that will counter the impacts that one may face in the future.

5.7 Conclusion

The purpose of this Chapter was to present the findings regarding policies and institutions that deal with climate change mitigation (including sustainable consumption and production). The study revealed that South Africa has put in place good policies and strategies to respond to climate change mitigation. However, some of the measures were found to be ineffective because they are voluntary but also because there is a lack of concrete actions to implement them; as well as inconsistencies in the broader policy framework.

Related to this, the study revealed that there is a lack of adequate institutions to implement the policies and the strategies that it has put in place. The institutional capacity was found to be concentrated at national level and the system was found to be fragile due to dependence to few experts. The study was not conclusive on how the policies affect economic growth because of mixed reactions from respondents. Similarly, it was not conclusive on response measures, save to say, South Africa would be a net loser if it engaged in such measures.

The Chapter concludes that not enough is being done to support sustainable consumption and production. Hence it also concluded that policies have not improved production methods by the industry and the energy-intensive industry is not complying with the policies. The study also revealed that South Africa is prioritizing mitigation over adaptation efforts in its measures to deal with climate change.

CHAPTER 6: CLIMATE CHANGE ADAPTATION POLICIES, STRATEGIES AND INSTITUTIONAL SETUP

6.1 Introduction

The focus of this Chapter is to present the findings of the study in relation to climate change policies, strategies and institutional setup with a focus on adaptation responses in South Africa. The Chapter will highlight wat policies and strategies are in place and what institutions support those policies. It will further discuss the importance of adaptation in South Africa and the barriers to adaptation. The respondents were asked questions to get their perspectives on how South Africa is dealing with adaptation related challenges.

6.2 Policies and strategies designed to respond to climate change adaptation

According to Arndt *et al*. (2012), climate change places a highly complex challenge for developing countries. Hence Boyd *et al.* (2009), explain that developing countries are particularly most susceptible to climate risks. South Africa as a developing country in Africa is no exception to this phenomenon. When asked if South Africa has policies in place to address climate change adaptation, there was a high degree of agreement among respondents that South Africa has policies and strategies in place designed to respond to climate change adaptation. Seventy-eight percent of respondents surveyed agreed that South Africa has developed good policies for climate change adaptation.

Given that climate change adaptation is largely seen as a local issue globally, it can be inferred that developing countries are able to exercise much more direct control in policy measures with respect to adaptation compared to mitigation. In addition to the policies and strategies that were identified in Chapter 5, the Draft National Adaptation Strategy that was published on 6 May 2019 for public comment was cited as the latest addition to a suite of strategies to deal with adaptation that has been developed. The Draft National Adaptation Strategy has since been approved for implementation by cabinet in August 2020. This Strategy is also intended to be the National Adaptation Plan under the Paris Agreement once it is finalized and approved. Figure 6.1 demonstrates graphically how the respondents reacted to this question.

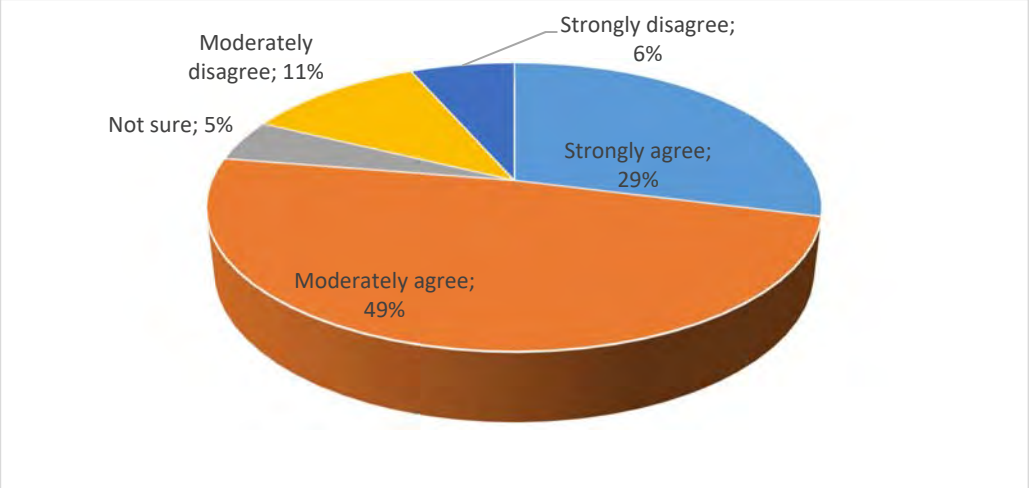

Figure 6.1: Availability of policies to respond to climate change adaptation

Source: Author, Field Survey, 2019

The respondents were asked if they thought the policies adequately address climate change adaptation challenges faced by the country. What was notable was that even though the respondents felt that the policies are in place, 39% of the respondents were of the view that such policies do not appear to have influenced climate change adaptation challenges that are faced by South Africa. Among other reasons, they perceived climate change as a moving target that requires strong implementation.

On the contrary, the respondents repeatedly asserted that the policies have not been translated into concrete actions. Failure to translate the policies into concrete action has seemingly resulted in the laxity of implementation in general which the respondents felt was necessary. It is also for this reason that the policies were found to be superficial and only good on paper with limited impact on the ground (Respondent 13). Fischer-Smith (2018), observes that in Ukraine, mechanisms were put in place on paper but they were not given adequate resources to attain its goals. The respondents also highlighted that the scale of adaptation is enormous, ironically, there seems to be little appreciation of the scale and enormity of the challenges that South Africa faces regarding adaptation (Respondent 1). Figure 6.2 shows how the respondents expressed their views on whether or not the policies adequately address climate change adaptation challenges.

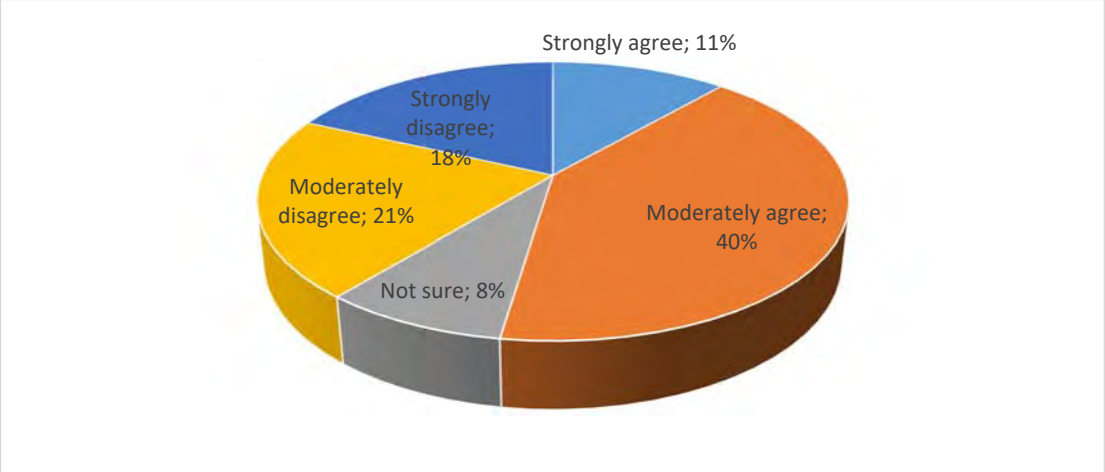

Figure 6.2: Policies adequately address climate change adaptation challenges.

Source: Author, Field Survey, 2019

Another perspective that emerged from Respondent 19 that is linked to poor implementation relates to what was termed as “gaping holes in knowledge base”. This did not necessarily mean new knowledge but rather critical knowledge that would complement existing knowledge for example on predictions. This came as a result of a recognition that South Africa has the ability to make good projections. However, it was contended that very little if any appears to have come out in terms of the second-tier applications where such projections are applied to a specific sector domain such as water, agriculture and others.

It was suggested that such analysis of projections to those domain levels would provide South Africa with empirical evidence on how the respective sector domains would be affected in the short-term, medium-term and long-term. This would also assist the country in determining exactly what it needs to be adapting to. Laves *et al*. (2014), appear to share this sentiment. According to the authors, despite the growth in adaptation research, there is still a knowledge gap in understanding the information necessary and that is utilized by policy makers to inform decision-making.

Furthermore, Laves *et al*. (2014), contend that even though the first and second generation of adaptation research has provided significant understanding of adaptation processes, however, they have proven to be unsuitable to help decision makers to select types of adaptations that might best suit particular circumstances.

Hence the authors have advocated for a third-generation research that mainstream theory, policy and practice. Due to the knowledge gap, as illustrated in the literature review, it was suggested that South Africa has been found wanting on many fronts. Respondent 19 decried the lack of a clear sense of where the country wants to go when it comes to adaptation. It was argued that this has resulted in a weak and ill-informed vision that does not correlate to the development objectives of government. Fischer-Smith (2018), has highlighted the impact of leadership on policy processes as a critical element for successful implementation.

The respondents indicated that the lack of vision also manifests itself in government departments that are critical for adaptation that do not appear to be fully engaged with adaptation issues and challenges (Respondent 15). As acknowledged in the literature review, adaptation to climate change is an emerging area and it is likely that this may have delayed the evolution of practice in adaptation. Hence, 54% of the respondents felt that while policies are in place, they have not translated to real change on the ground and therefore have not enabled South Africa to have adequate climate change resilience. This was raised partly because Respondent 6 felt that South Africa still experience incidents that have happened in the past and with similar consequences as if there are no adaptation measures in place. Similarly, it was felt that past experiences do not seem to have influenced how things are done when it comes to adaptation responses.

Having said that, the respondents felt that, the following sectors should be given more attention when it comes to adaptation interventions (Table 6.1).

Table 6.1 indicating sectors that must be prioritized for adaptation

Sectors that must be prioritized to meet the desired policy objectives for adaptation		
Water and catchment management services	Biodiversity	Ecological infrastructure and services
Ecosystem management services	Agriculture	Early warning systems
Human safety	Transport sector / infrastructure	Fisheries
Methodologies for estimating the adaptation costs	Institutional capacity to deliver on actions	Processes that define adaptation objectives

Source: Author, Field Work, 2019

One of the areas raised above that need urgent attention relates to agriculture. According to Arndt *et al*. (2012), when considering the consequences of climate change, a logical place to begin is the agricultural sector. The authors contend that this is true especially where (i) agriculture remains a critical contributor to the economy, (ii) agriculture is a key driver for employment, (iii) and food represents a high share of household consumption. Similarly, they concur with previous studies that suggests that climate change can have major consequences for long-term infrastructure planning, which may result in the escalation of maintenance and construction costs. Such escalation of costs could in turn hinder the development of key economic infrastructure (Ibid).

Although these sectors came up, Respondent 19 was of a view that South Africa needs to first and foremost define its economic and development interest. It must also understand how it is impacted by climate change and how those economic interests affect the socio-economic priorities. Based on that, it would then be easy to define what needs to be prioritized and funded. While it was felt that funding could be an issue, it was suggested that it could easily be sourced provided a compelling case was made for resources to be made available.

6.3 Institutional capacity to implement the different climate change adaptation across sectors

The challenges discussed earlier about the laxity of implementation may be attributed to the issue of capacity to implement policies and programmes. This is a serious issue that cannot be ignored to effectively implement policies and strategies. Fischer-Smith (2018), suggests that the health of a delivery institution is closely associated with the efficiency and effectiveness of execution. Furthermore, the author cautions that even well-conceived policies can only do so much if institutional conditions are not conducive. Hence, the author argues that policies are less durable than institutions.

Put differently, it does not help to have good policies when there are no institutional mechanisms or weak institutional capacity to derive value from those policies. When asked if they thought that South Africa has the institutional capacity to implement the different climate change adaptation sectors identified in the policy; there was a mixed

reaction to that question as shown in Figure 6.3. Forty-six percent of the respondents surveyed felt that institutional capacity to implement policies was lacking while 40% felt that South Africa has requisite institutional capacity needed to implement its climate change policies.

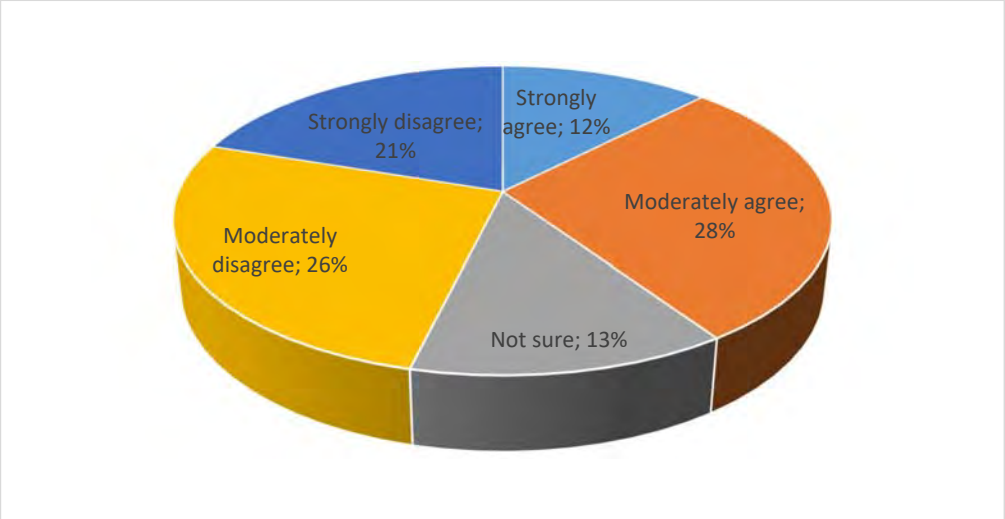

Figure 6.3: Availability of institutional capacity to implement adaptation measures

Source: Author, Field Survey, 2019

The 46% that disagreed felt that despite the best intentions and good-will that South Africa has shown; the reality is that South Africa does not appear to have built adequate institutional capacity. They argued that even where capacity exists, it appears to be scattered and uneven across sectors and different spheres of government. This is something that Marquardt (2017), cautions against because of the recognition that issues like regulatory proficiencies, financial capacities and even inter-jurisdictional conflicts may ultimately influence environmental governance.

Worryingly, there was a concern that there appears to be a complete lack of capacity at the municipal government level. The lack of capacity was attributed in part to adaptation being a "poor cousin and a late comer" compared to mitigation (Respondent 8). Faling *et al*. (2012), have written extensively about the wide range of capacity constraints that are faced by local government, including lack of understanding by officials of climate change science and its implications at the local level. While capacity and resources may be a hindrance in fostering policy implementation, Marquardt (2017), argues that actors must be able to utilize the

resources at their disposal including financial and knowledge resources. Among the institutions that were cited include the department responsible for environmental affairs, sector departments that are required to have sector adaptation plans, SANBI, CSIR, SAWS, ARC and WRC.

It was recommended that as South Africa strengthen its institutional capacity, it would also have to define the roles of different players. Even though that may be necessary, it must be acknowledged that climate change cuts across. Even though different institutions may have distinct mandates, it must be expected that their work on climate change will always overlap. Probably, there is also a necessity to clarify for the entities where the focus should be, so that resources can be channelled to those areas deemed to be the priority. Fischer-Smith (2018), has cited among others the unclear chain of command and multiple actors as possible barrier points to effective implementation. This somewhat confirms what was highlighted in the literature review, that institutional crowdedness and institutional voids may present challenges of their own; hence the imperative to ensure that they are well thought through, managed and coordinated. The respondents also cautioned that while the department responsible for environmental affairs is critical to provide leadership, implementation should not be left to it alone as this would not be effective. The respondents emphasised that other sectoral departments should play their rightful role at a sector level to monitor and enforce implementation. That would require government as a whole and its departments to view climate change as a developmental issue that is given urgency across government.

Clearly, implementation cannot happen in a vacuum unless there is effective coordination. When asked about the effectiveness of the coordination of various institutions that are involved in climate change adaptation, the respondents viewed the institutional coordination as being largely ineffective and uneven across sectors and spheres of government. Exceptional pockets of excellence at national level, KwaZulu-Natal and the Western Cape provinces were highlighted (Respondent 6). According to Galvani (2018), uneven implementation can be attributed to varying socio-economic characteristics which often result in a disparity in implementation performance. Figure 6.4 depicts how the respondents felt about this issue.

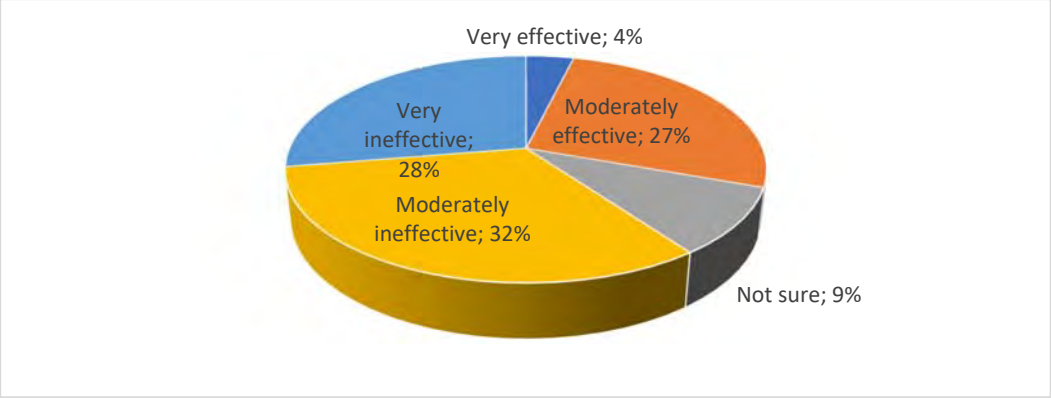

Figure 6.4: Effectiveness of coordination of various institutions involved in adaptation

Source: Author, Field Survey, 2019

Among the coordination mechanisms that were cited included the MINMEC[5] and the MINTEC[6] that are supported by various technical working groups and committees, government cluster coordination, IGCCC, National Climate Change Committee (NCCC) at national level. Respondent 7 indicated that in provinces, they now have provincial climate change forums including in some local municipalities. Outside government, civil society and NGOs are also doing a lot of work which calls for collaboration with government and within the government to break the silos.

The respondents decried the inherent disjuncture and lack of coherence at what happens at the different spheres of government. Hence each sphere of government appears to be doing its own thing with limited communication and collaboration with other spheres and or sectors. Marquardt (2017), has highlighted coordination across jurisdictional levels as a crucial necessity. While the respondents attributed poor coordination to lack of leadership and effective coordination; Kennedy and Chen (2018), attribute that to the tension that emanates from the administrative tug of war between national and local spheres of government.

[5] This is a structure consisting of the Minister and the nine provincial Members of Executive Council (MECs) who deal with the same portfolio.

[6] MINTEC is a structure consisting of senior government officials that was established to facilitate coordination between the national department and the provincial authorities particularly on environmental affairs. It supports MINMEC and is chaired by the Director-General

With this in mind, Respondent 19 argued that what seems to be the real problem is not necessarily lack of ability to convene different sector players, but rather the thought leadership that is lacking to ensure that these structures can be used much more effectively. Therefore, it was insinuated that ineffective coordination is not because of the lack of structures but rather it is because of the lack knowledge and thought leadership to achieve it, hence coordination largely remains reactive and not proactive.

6.4 The importance of climate change adaptation in South Africa

The respondents were requested to express their perception on the importance of adaptation in South Africa. The sizeable number of respondents felt that climate change adaptation is important in South Africa for several reasons (Figure 6.5). They felt that South Africa is in a region that is known to be hard hit by climate change impacts and is already faced by this reality and hence adaptation becomes key. They also felt that South Africa is a developing country whose economy is reliant on natural resources that are more impacted by climate change. Arndt *et al*. (2012), observes that developing countries like South Africa are individually climate takers even though they are responsible for a relatively small percentage of all emissions. Even though most respondents indicated that climate adaptation is important, however, the literature review highlighted that bias to mitigation is an old phenomenon; and climate adaptation only became prominent in 2007 when the IPCC released its fourth assessment report. As shown earlier, the LTAS adopted in 2013 was the first serious attempt by government to focus on climate change adaptation in a more substantive way.

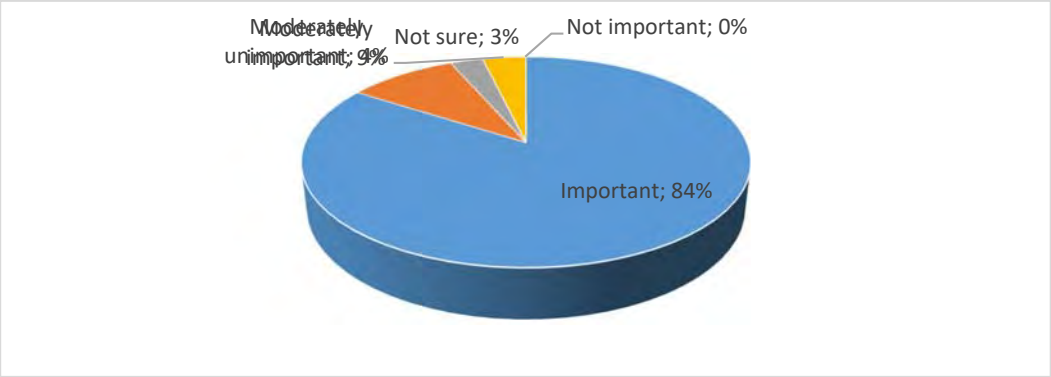

Figure 6.5: Importance of climate change adaptation in South Africa

Source: Author, Field Survey, 2019

Therefore, Respondent 19 argued that the economic prospects of South Africa also depend on how well it adapts. This raises legitimate questions when it comes to adaptation such as exposure, sensitivity and vulnerability of South Africa to climate change. The AR4 released in 2007 characterize vulnerability as an extent to which a system is susceptible to, and incapable to withstand the adverse effects of climate change, including climate variability and extreme weather events such as droughts and floods (IPCC, 2007).

Hence, it was further argued by Respondent 19 that the very fact that Article 2 of the UNFCCC Convention envisages the stabilization of greenhouse gas emissions in the atmosphere that should be, "*achieved within a time frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner*" means that South Africa should adapt. (United Nations, 1992: 4)

This Article in a way was also intended to reflect on climate change sensitivity given its reference to food production. According to IPCC (2007), sensitivity is the extent to which a system is hindered by climate variability or climate change; this may include among others, economic system, geographic and agro-ecological characteristics, and natural and environmental resources. These are the same issues it seems that South Africa continues to grapple with. The scholars posit that from an economic development perspective, countries may be more susceptible to climate change when agriculture is a significant contributor to national and household revenues; a scenario that is very familiar in South Africa. Based on the Article 2 of the Convention, Respondent 19 argued that the fundamentals of adaptation should be the driver of the entire climate change discourse.

It was reiterated that politically, South Africa together with the African continent have adopted a common position on adaptation that seeks to prioritize adaptation (Respondent 2). However, even though the role of adaptation is recognized at a political level, it was felt that South Africa tends to underestimate the implications of climate change to it. This was demonstrated by how they responded when they were asked if there is lack of adequate emphasis on adaptation efforts in the country as

portrayed in Figure 6.6. Most respondents surveyed felt that there is a clear lack of adequate emphasis when it comes to adaptation efforts in the country.

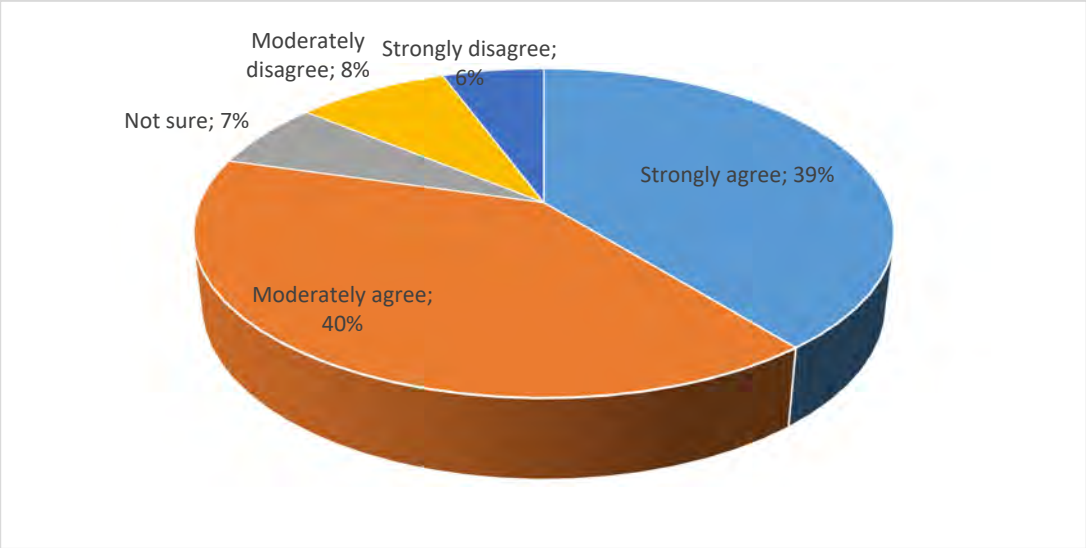

Figure 6.6: Lack of adequate emphasis on adaptation efforts

Source: Author, Field Survey, 2019

According to Respondent 19, this perception was attributed to a number of factors: (i) underdeveloped knowledge base, (ii) the nature of responses of adaptation which are not always project-based, (iii) the adaptation actions that are usually at the level of common good such as the provision of the public infrastructure, (iv) limited private sector investment, and (v) resource constraints which have not allowed South Africa to implement adaptation measures at the same scale as mitigation. Because of these constraints, the respondents indicated that some measures that have already been undertaken in mitigation are yet to be implemented for adaptation.

Given the perceived lack of adequate emphasis discussed earlier, it came as no surprise that 63% of the respondents surveyed also felt that climate change adaptation is being neglected in South Africa. This is consistent with the long-standing view that there is bias towards mitigation as discussed earlier. Some respondents tried to justify this on the basis that this was consistent with the global trend when it comes to adaptation. Even though there was a feeling of apparent neglect of adaptation, it was recognized that there is a lot of work in the adaptation area that has been done such as work on LTAS, National Adaptation Strategy, Framework Climate Services,

National Disaster Risk Management Centre, SANBI is an accredited implementer for the GCF and the Adaptation Fund.

The respondents indicated that the LTAS provide a clear map of where South Africa should focus its efforts. They felt that the next critical step would be to make sure that there is funding to implement and harness capacity constraints particularly at local government level. They contended that these measures demonstrate political-will albeit with lack of urgency.

Given the sentiments expressed herein, it would seem that they are a clear indictment of the satisfaction with the adaptation efforts that have been undertaken in practice so far. Overall, 52% of the respondents surveyed were not satisfied with the adaptation efforts that have been undertaken in practice so far, while 37% were moderately satisfied. Those that were satisfied cited the existence of a good policy framework and some big adaptation projects that have been carried out in South Africa such as Umzimvubu water supply scheme (Respondent 8). However, it must be indicated that an article that was published by the City Press on 14 February 2019 headlined as, “R15bn Umzimvubu Water Project on ice”, suggested that there was uncertainty whether the project would continue despite the assurance attributed to President Ramaphosa that it would if the African National Congress won the elections in May 2019.

6.5 Key barriers to adaptation in South Africa

The respondents were requested to identify the five most barriers they thought present the most challenges for South Africa in responding to climate change adaptation. Figure 6.7 depicts how the respondents reacted to the question. Figure 6.7 shows that: (i) financial / costs (15%), (ii) lack of awareness/ poor communication (10%), (iii) poor understanding of possible effects of climate change (10%), (iv) lack of national attention to climate change (9%), and (v) social (9%) were perceived to be the most critical barriers. Even though these were highlighted, it is worth noting that the literature review highlighted that barriers differ from project to project, are highly context-specific and may be influenced by underlying causes.

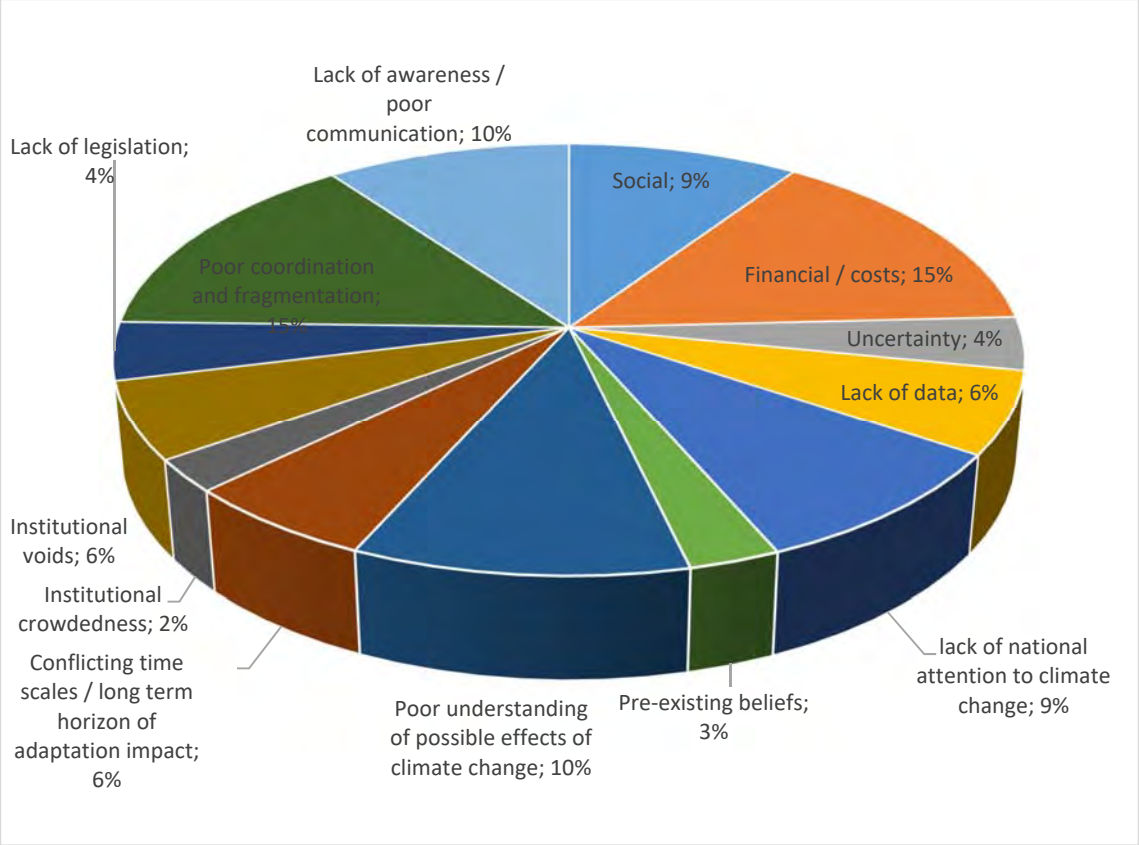

Figure 6.7: Barriers that present most challenges to adaptation

Source: Author, Field Survey, 2019

Among the reasons that were cited were that in an environment where resources are limited, there will always be competition for resources. The long-term nature of adaptation projects or effects presents problems in that adaptation is not prioritized now because its effects may only be felt much later. Accordingly, Ekins and Specks (2014), have stressed the need to reduce uncertainty of climate change outcomes because this makes it challenging to justify substantial expenditure today to gain undefined benefits, perhaps in the distant future. Furthermore, some of the benefits of adaptation policies are not easily recognizable because they may be realized in the form of co-benefits. Hence, the authors argue that it is crucial for policy makers when they make decisions which have long-term consequences, to understand as much as possible the full spectrum of associated links between their current actions and future outcomes. The respondents felt that climate change is seen largely as the preserve of intellectuals and has not been simplified for ordinary people on the ground (Respondent 16).

Even with that, it was contended that it seems that the understanding is largely limited to physical science and not full appreciation of what it means for specific sectors (Respondent 19). The respondents noted the fact that adaptation is viewed as costly, generally not bankable and profit oriented is not helpful. They decried the lack of national attention to adaptation simply because it is not being taken seriously hence there is no robust public awareness campaigns on it. It is through such campaigns that attitudes and behaviours of people can begin to be changed. Chapter 5 addresses climate change and awareness in more detail.

Figure 6.7 also shows that conflicting time scales was highlighted as a barrier. Especially when one considers the fact that climate change competes with other important socio-economic issues for an already inadequate amount of political and economic attention, that are more pressing in nature, whose impacts are more certain and more visible-short-results compared to adaptation that requires a long-term horizon. Faling *et al*. (2012), correctly acknowledge that government is torn between attending to pressing socio-economic development priorities.

As a result, Faling *et al*. (2012), argue, issues of sustainable development are only given limited attention because they are difficult to reconcile with more immediate needs that are barely being met. When asked if there is balance between the short-term adaptation benefits while at the same time addressing long-term adaptation scenarios, 66% of the respondents surveyed felt there is a balance between short-term and long-term adaptation scenarios (Figure 6.8).

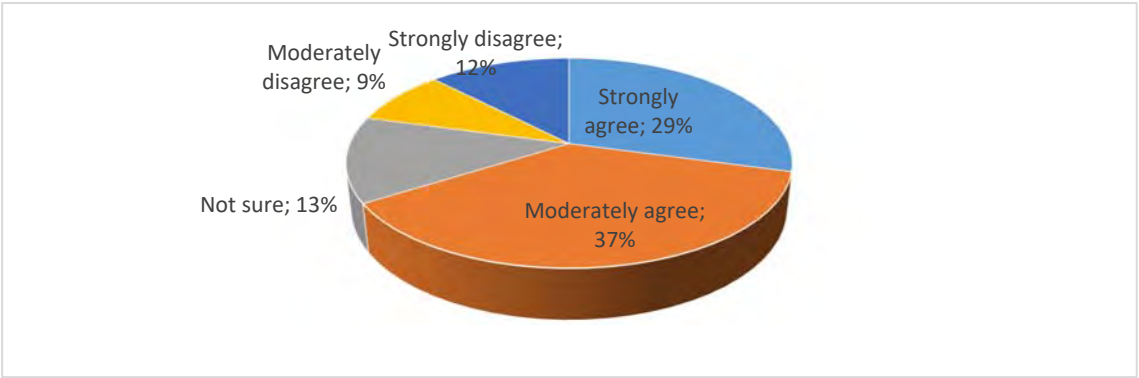

Figure 6.8: Balance between short-term and long-term adaptation scenarios

Source: Author, Field Survey, 2019

The respondents indicated that the effect of a political-term of office cannot be ignored when it comes to issues that get political attention, because inevitably, there will always be competition for priorities. Hence Galvani (2018), correctly asserts that the extent of support or disapproval to a policy also depends on the perceived electoral gains provided by a given policy. For instance, Respondent 2 suggested that even internationally, climate change is not prioritized at the level of the United Nations Security Council's issues which leaves climate change at the fringes.

Some respondents observed that President Ramaphosa made no mention on climate change in his maiden speech in 2018 in parliament as President of the Republic. Whether too much can be read on that omission by the President should be left to the realm of speculation. The omission by the President of climate change was justified by the urgent need to address other pressing issues of corruption and failing SOEs that needed urgent attention of which ESKOM is part of those Entities (Respondent 15). It was argued that if the problems at ESKOM were addressed, theoretically, the solutions that could come up out of that process, embedded in them would be climate related solutions.

Perhaps, it was for this reason that when asked if adaptation should be addressed purely in the context of other programmes such as disaster risk management, sustainable development and not as a standalone measure, 59% felt that it should not be addressed in isolation (Figure 6.9). This view is consistent with the observation in the literature review, even though such an approach may unintentionally diminish the role of adaptation in policy and broader political discourse. The respondents argued that climate change needs a holistic process that is effective, efficient and not myopic taking into account resource constraints.

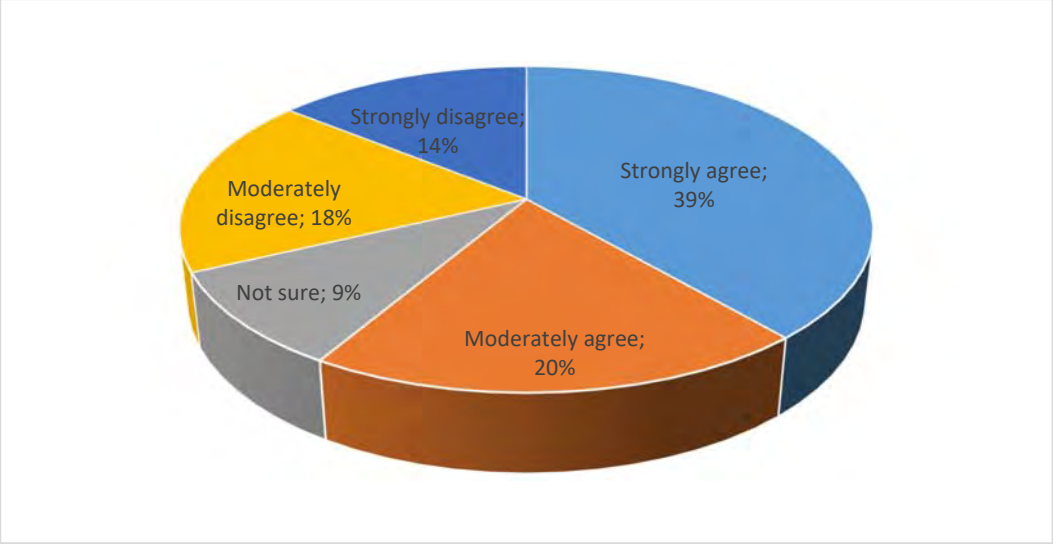

Figure 6.9: Adaptation should be addressed purely in the context of other programmes

Source: Author, Field Survey, 2019

In supporting the notion that adaptation should be integrated into other programmes, it was argued that one cannot dissociate climate change from things like disaster risk management, sustainable development and other issues were seen as two sides of the same coin (Respondent 19). Ekins and Speck (2014), expressed the same sentiment by suggesting that interventions to adapt to climate change may include among others early warning systems for storms and flood defences. Furthermore, the authors advocate for the changes to construction or infrastructure to ensure that they are able to cope with harsher impacts from changes in weather. For that reason, it was implied that it does not really matter whether the intervention is within the context of the SDGs or climate change. All that matters is the contribution to the broader good and how each of those actions are making progress in various matrixes that are used by the different international instruments (Respondent 19). Inevitably, whatever actions that are undertaken would have a common central nexus which is sustainable development within which there is human wellbeing.

6.6 Conclusion

The purpose of this Chapter was to present the findings relating to policy coverage and institutional spread that are in place to address climate change adaptation and adaptive capacity. The study revealed that South Africa has policies and strategies in place even though it was inferred that they are superficial, unimplementable and not

supported by resources. The study indicated that part of the problem is the lack of leadership and a clear vision for adaptation. Because of this, the study concluded that policies have not assisted to make South Africa to build climate change resilience.

The study was not conclusive on the institutional arrangements that are in place. However, there was a concern about poor coordination. The study revealed that climate change adaptation is regarded as important in South Africa, but there is a lack of emphasis on adaptation in general. Hence it concluded that adaptation is neglected. The study identified financial/ costs, lack of awareness about climate change and poor understanding about climate change impacts as amongst the barriers to adaptation. The study concluded that adaptation should be addressed within the context of other programmes such as disaster risk management and sustainable development.

CHAPTER 7: CLIMATE CHANGE FUNDING, INSTITUTIONS, EDUCATION AND AWARENESS RAISING

7.1 Introduction

The purpose of this Chapter is to present the findings of the study relating to funding and institutional arrangements that are in place in support of climate change policies. It will also present findings regarding the stakeholder engagements, education and awareness for climate change and further highlight early warning systems that are in place and South Africa's preparedness in that regard.

7.2 Climate change institutions and funding

It is common and a reasonable expectation for government to have the capacity to implement its policies and programmes. One of the outcomes of the NDP is to build a strong and a capable state (NPC, 2012). This is an implicit acknowledgement by government that there are challenges with regard to the capacity of the state to implement its programmes. The successful implementation of policies and government programmes is largely dependent on strong institutions and various other actors and networks that support policy implementation.

The respondents were asked if they thought South Africa has adequate institutions in place to implement its climate change policies and strategies. In their response, the respondents appeared to distinguish between the existence of the institutions and their capacity to do what they are supposed to do. The sentiments from the respondents were that institutions are in place but the effectiveness of implementation by those institutions is something else. The discussion in the literature review highlighted the critical role of institutions in solving difficult problems the government might be facing; including government agencies in supporting government policy initiatives. However, it is imperative that those institutions must have required and adequate collaborative capacities. Figure 7.1 shows that 55% of the respondents surveyed were of the view that there are adequate institutions in place to implement climate change policies and strategies.

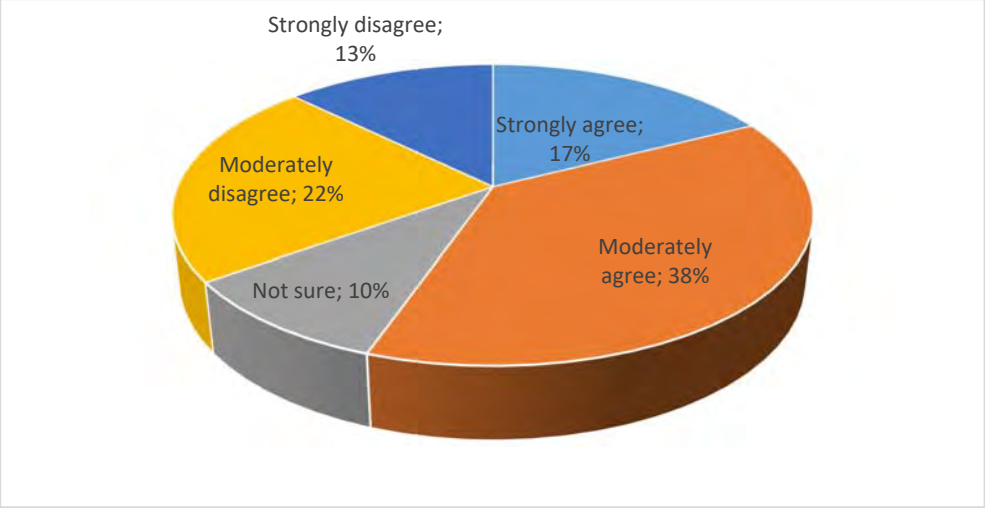

Figure 7.1: South Africa has Institutions to implement climate change policies

Source: Author, Field Survey, 2019

However, respondents indicated that there is a need to review the institutions to make sure that they do what they are supposed to do. Another issue that was raised was the fragility of the institutions that relies on very few key experts in few departments. The respondents raised a concern that the limited pool of experts may cripple the effectiveness of those institutions should they leave the system.

The respondents applauded the science councils such as Council for Scientific and Industrial Research, South African Weather Service, Agricultural Research Council, and Water Research Commission for providing the necessary scientific evidence for decision-making and implementation. The respondents further acknowledged the role of SANBI, NDMC, Development Bank of Southern Africa (DBSA), Department responsible for cooperative governance and traditional affairs (COGTA), sector departments and the department responsible for environmental affairs. Be that as it may, Respondent 8 decried the lack of coordination that must be enhanced; while noting the coordinating interventions through IGCCC and NCCC.

Another perspective on the issue of institutions that was advanced by Respondent 19 was that they must be viewed holistically in terms of structures, systems and their ability to drive strategy. While the respondents felt that structures are in place and systems in terms of how information and decision-making and related processes are

made, however, it was suggested that there seems to be challenges with regard to driving and implementing the strategy. Hence, it was questioned if the institutions are doing what they are supposed to do. Furthermore, the disparity between national and local government level in terms of capacity to implement programmes was raised as a concern. Hence Galvani (2018), highlights the socio-economic context as an important variable for effective implementation.

Regarding climate change funding, it is common cause that it is a contentious issue in the negotiations between the developed and developing countries as has been demonstrated earlier in Chapter 2. This is partly attributed to the historical contributions of developed countries to the climate problem and the argument that those that contributed the most in environmental degradation have a moral responsibility to take the lead in addressing the problem. Hence the principle of common but differentiated responsibility (CBDR) which recognizes that all countries have a common responsibility to the environment, however, the responsibilities should be differentiated taking into account the ability of countries, technically, financially and otherwise to solve the environmental problems.

In addition to recognizing the historical differences in the contributions of developed and developing countries to global environmental problems, the CBDR further recognize differences in the country's respective economic and technical capacity to tackle these problems. The CBDR advocates that as much as countries have common responsibilities, the responsibilities of developed and developing countries remain different. Given the perception that the developed countries have superior ability to address environmental problems, and therefore, it is fair to expect them to take the lead in resolving those environmental problems.

When questioned about the funding arrangements for climate change, 62% of the respondents surveyed felt that South Africa has not put in place adequate funding arrangements for climate change implementation (Figure 7.2). Whether this reflects the political-will that government has to deal with climate change issues remains speculative and to be seen. The respondents felt that because of this, funding for climate change remains inadequate, even though there are instruments such as taxes and levies that have been put in place to generate revenue to support climate change

measures. Be that as it may, these measures clearly do not appear to go far enough. Unlike in the UK, as was shown in the literature review, South Africa does not seem to have put in place adequate institutional funding mechanisms to support climate change policy interventions.

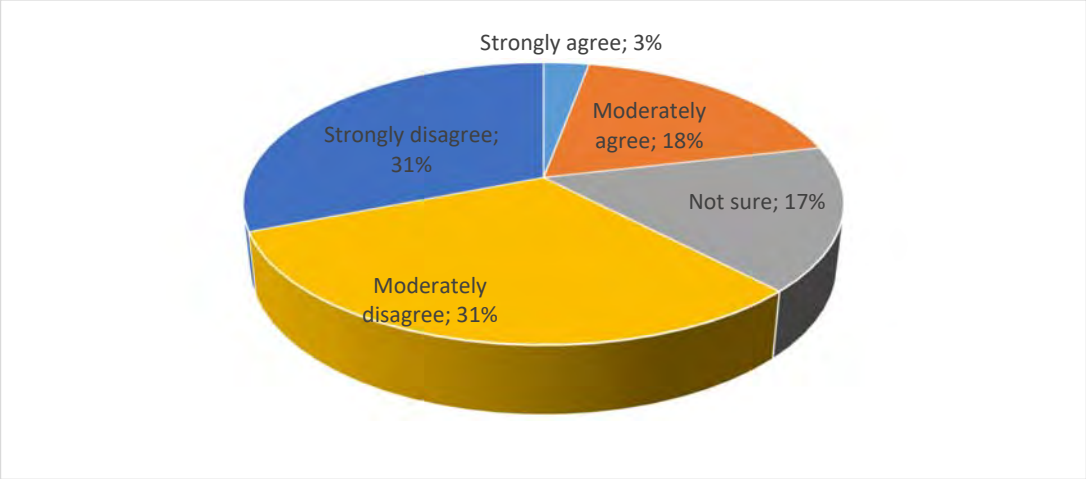

Figure 7.2: South Africa has funding arrangements for climate change measures

Source: Author, Field Survey, 2019

Due to the limited funding, the respondents highlighted that South Africa largely depends on international donor funding to implement its climate change policies and strategies. These include bilateral funding, Official Development Assistance, funding from philanthropic organizations and MDBs, as well as UNFCCC Financial Mechanisms such as the Adaptation Fund, GEF and the GCF. Germany in particular emerged as the main country that provides a lot of climate change funding support to South Africa.

According to DEA (2018b), since 2000, South Africa received $294.7 million funding in bilateral and multilateral grants from different countries including Germany, Norway, Switzerland and the UK. Similarly, international development organizations such as the European Investment Bank and the World Bank, and including France have advanced bilateral and multilateral loans to the tune of $3 billion to South Africa.

As highlighted earlier, dependence on international aid has its own unintended consequences. For instance, Jusufi (2017), observed that the EU financial assistance

in Macedonia did not only lead to a change in policies, it also changed the police structures, strategic, operational and tactical level at central and local levels. According to the author, the structures began to resemble those of EU countries. Such wholesale changes may not always be good especially for some countries particularly if they are not prepared for such changes due to their level of development. Hence, one may end up with good policies and structures that are not necessarily implementable or effective given local conditions.

The other challenge that was raised by the respondents was the perception that climate change is seen as an add-on in government and therefore is far down the line from the priority list of the government. Even though there is dependence on international donors, South Africa appears not have innovative ways or capacity to develop good proposals to attract funding and make a case for funding. Despite this, some respondents felt that the national fiscus is doing the best it can under difficult circumstances to allocate funding for climate change. The Green Fund administered by DBSA was cited as an example which was initially capitalized to the tune of 850 million and later to 1.2 billion Rands respectively (Respondent 15). In addition to the Green Fund, South Africa also established the Green Industries Fund that is managed by the Industrial Development Corporation.

On the other hand, there was a view that suggested that there is a need to recognize that South Africa does budget on climate change. Whether this is adequate or not is a debate on its own. When confronted with this question on the adequacy of budget allocation for climate change, 74% of the respondents as depicted in Figure 7.3 indicated that not enough money was being budgeted to address climate change issues. Reports from the government shows that between 2008 and 2014, the government made huge investments to support climate change programmes, approximately $11.7 billion in grants and $71.8 in loans (DEA, 2018b). These interventions were targeted at energy efficiency, green economy projects and capacitating municipalities to be prepared for disasters and infrastructure expansion initiatives.

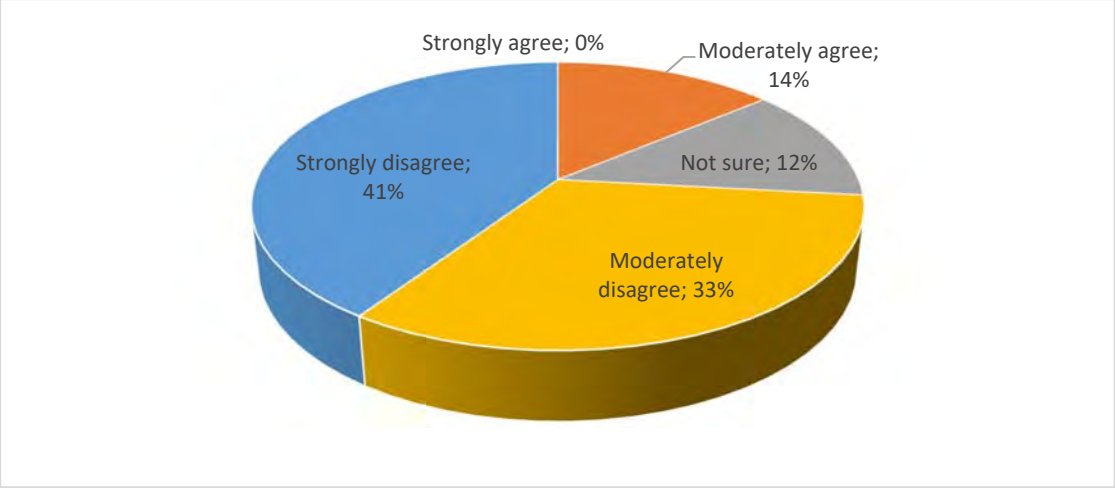

Figure 7.3: There is Adequate budget allocation for climate change measures

Source: Author, Field Survey, 2019

The respondents felt that, it was necessary to distinguish between budget allocation for policy development and response measures and implementation. There was a perception from the respondents that a lot more money is set aside for policy development while less is set aside to implement the policies. The respondents also expressed the reality that the National Treasury is fiscally constrained and has to balance all other pressing developmental needs of the country including climate change.

The respondents acknowledged that climate change cuts across government programmes, hence they felt that the issue of budget allocation for climate change must not focus on one department responsible for environmental affairs, other sector departments must mainstream climate change budget in their budget allocation (Respondent 18). While this is sensible, Respondent 19 cautioned that this may present some challenges with regard to accounting for funding for climate change. For instance, it was argued that if money is set aside for food security, it cannot always be accounted as climate change funding even though it may have climate change or SDGs co-benefits.

Hence Respondents 19 insisted that this would require climate finance to be defined properly as to what it entails. It was felt that the absence of this definition can result in both under-counting and double counting in some instances. It must be noted that the

respondents clarified that this is not a South African phenomenon as there has been no agreement on the definition of climate finance at a global level. It was indicated that the lack of this definition globally has had unintended consequences for the funding of the SDGs. This is because there are SDGs that have co-benefits with climate change finance, this is being used by developed countries as the justification for not having SDGs dedicated funds at a global level.

A question was raised as to whether South Africa should be putting money at all given that climate change is a global agenda (Respondent 19). This was further based on the argument that while South Africa has a responsibility, but it is not its full responsibility because climate change requires a global response. Be that as it may, Ekins and Speck (2014), argue that climate change measures have fiscal implications that must be calculated and taken into account, including how they affect the economy. Hence, the authors have advocated that countries should engage in long-term fiscal planning in relation to climate change in order to invest wisely in climate change response measures.

On the issue of where most of the funding is spent (spending pattern), while the majority of respondents (34%) were not sure whether more money was spent on mitigation measures or adaptation, 29% felt that more than 50% of funding was spent on mitigation measures (Figure 7.4). The literature review showed that despite increasing pressure to allocate funds equitably between adaptation and mitigation; the current trends of international finance still show a strong bias towards mitigation efforts.

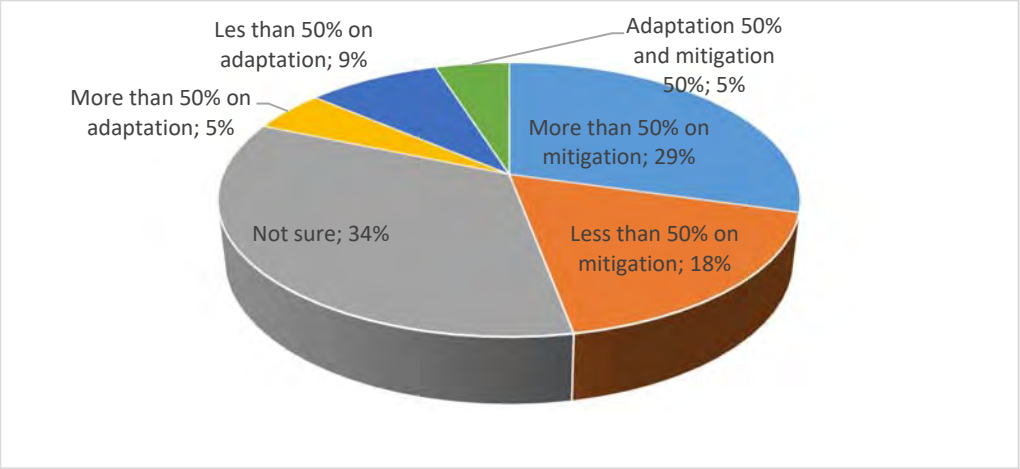

Figure 7.4: Comparison of expenditure pattern between mitigation and adaption

Source: Author, Field Survey, 2019

It was explained that funding from donors is about projects irrespective of whether those projects are mitigation or adaptation focused. However, Respondent 15 felt that mitigation funding is different in that it is easy to provide seed funding that can attract investment. This makes it easy to make revenue generating investments to service loans while it is difficult to make such investments with adaptation projects. It was cautioned that loans for adaptation have the potential to worsen the government debt burden which is undesirable due to an already strained sovereign guarantees for the country.

It emerged that most of South Africa's mitigation programmes are dependent on blended finance from multilateral institutions. Respondent 15 reported that globally, there appears to be more resource mobilization for mitigation compared to adaptation. This respondent further indicated that in 2018 for example, in the department responsible for environmental affairs, approximately 700 million dollars were mobilized mainly through concessional finance and most of it was largely for mitigation. The nexus of the mitigation and adaptation debate appears to be far from over, in the midst, other climate change initiatives such as stakeholder engagement, education and awareness must also be supported. The next section looks at these issues closely.

7.3 Stakeholder engagement, education and awareness

With regard to stakeholder engagement, respondents were questioned if South Africa has mechanisms to ensure stakeholder support and buy-in for climate change policies and programmes. The respondents remained divided on this issue with 48% lamenting the lack of mechanisms to ensure stakeholder support while an equal number of respondents felt that South Africa has mechanisms in place (Figure 7.5).

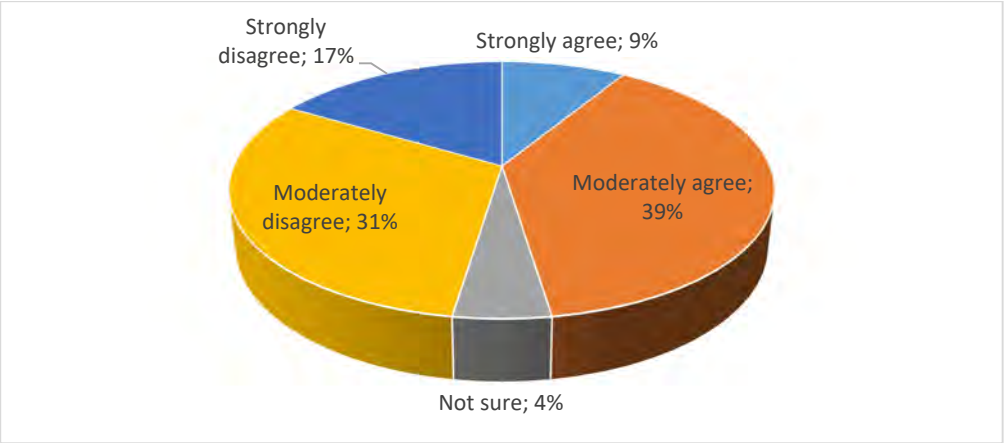

Figure 7.5: There are mechanisms to ensure stakeholder support

Source: Author, Field Survey, 2019

However, the mechanisms were found to be ineffective by some respondents because it was felt that they are largely used as reporting platforms rather than to solicit input and agree on contentious issues with civil society, government and business (Respondent 11). They were also criticized for being elitist in that they do not appear to include the broader general public in engagement processes. The respondents were of the view that they tend to reach out to professionals, the educated, environmental sector lobbyists, and the elite.

When asked about the adequacy of civil society mobilization, the respondents felt that there is a lack of adequate civil society mobilization and engagement in climate change management (Figure 7.6). This is somewhat disturbing given that it was shown earlier that climate policy efforts will largely depend on fostering public support and ensuring that climate change is treated at the same level as other pressing and tangible issues. It was argued that there is a tendency to call stakeholders only when there are imminent international meetings. The engagement process was criticized for its top-

down approach and that it does not allow stakeholders to come up with proposals. It was inferred that because it is used as a once-off engagement for a particular purpose, most people do not have an understanding of climate change issues (Respondent 15). According to Respondent 2, this perceived lack of understanding includes the political elite and churches who hardly raise climate change issues in their discussions and policies.

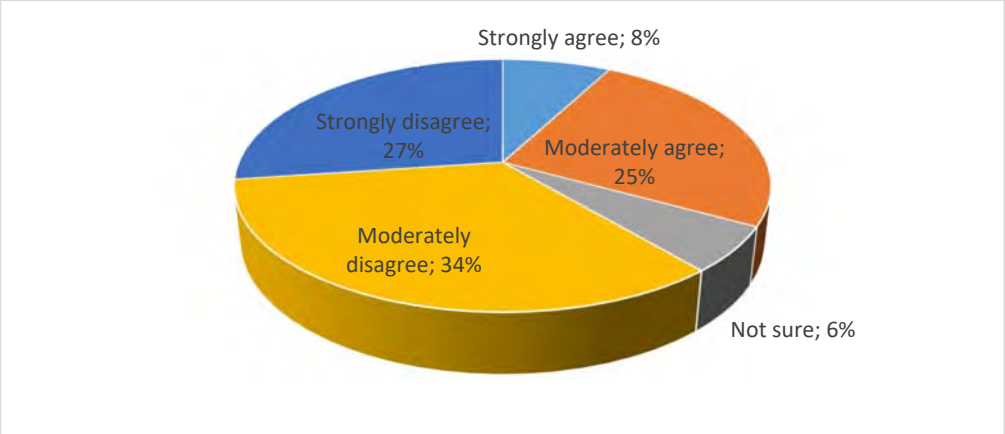

Figure 7.6: There is adequate civil society mobilization

Source: Author, Field Survey, 2019

Having said that, Respondent 1 felt that the voice of the civil society appears to be strong especially those that are well resourced. It was noted that such lobby groups also tend to have funding to participate in the UNFCCC Conference of the Parties. There is a perception that these large civil society organizations are more interested in lobbying government rather than implementation. It was further suggested that civil society organizations also appear to have a different agenda that may not necessarily represent the views of the ordinary people on the ground (Respondent 20). Furthermore, there was a feeling that civil society has unjustified expectations, because they tend to prioritize climate change over other pillars of sustainable development, while businesses prioritize economy and nothing else (Respondent 18).

In addition to issues raised herein, Respondent 15 observed that there is a perception that the quasi international NGOs, some of which are from developed countries are driving the climate change debate and make a lot of noise excluding ordinary people that are most affected by the impacts of climate change. Policy makers must guard

against the undue influences from powerful lobby groups and networks that want to advance their common interests. The effect of lobby groups on policy formulation and implementation was elaborated earlier and hence it will not be repeated in this section.

Furthermore, on the issue of civil society, Respondent 18 felt that its representation is much better because of the NCCC processes where they are a key stakeholder. However, the diverse civil society groups that exist without a single representative body was found to be a problem for the government as it cannot intervene in circumstances where there is poor coordination amongst themselves. These dynamics, given competing interests, makes it difficult for the government to work with them.

Hence, the respondents felt that more work is needed to ensure the grassroots mobilization and communities who tends to be excluded because of their economic situation. In highlighting this point, Respondent 8 lamented the fact that ordinary people do not always have resources to attend meetings. There was also a complaint that even the location of meetings in urban areas tend to exclude ordinary people because of difficulty in accessing them.

It is perhaps for this reason that overwhelmingly, 73% of the respondents surveyed expressed dissatisfaction with the participation of the public in climate change management. Figure 7.7 illustrate this perception.

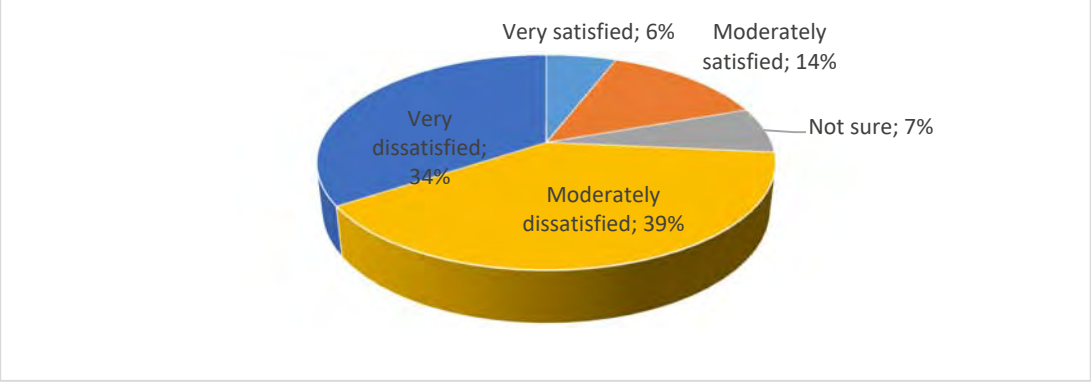

Figure 7.7: There is satisfaction with participation in climate change management by the public

Source: Author, Field Survey, 2019

When asked about the level of understanding of the public about climate change, the respondents were of the view that there is a poor understanding, with 60% of respondents expressing that sentiment. Respondent 2 raised another dynamic that suggests that if some professionals are grappling with the understanding of climate change, then it can be expected to be worse to ordinary citizens. Hence, it was argued that the public tends to confuse climate change and the natural phenomenon of climate variations such as heat waves because of the lack of adequate understanding. There was a perception that there is a problem with messaging because the science of climate change is complicated, specialized and clouded in science (Respondent 21).

It was suggested that the level of understanding may also be influenced by where one is located. The level of understanding of climate change issues was tested between urban and rural dwellers. Fifty-seven percent of the respondents surveyed indicated that climate change awareness and education tend to vary geographically. This is consistent with the observation that was made earlier, that climate change awareness and risk perception tend to be unevenly distributed. This perception assumed that urban dwellers are more exposed to things such as access to information than rural dwellers (Respondent 4). Furthermore, there was a feeling that the government tends to run its programmes in urban areas (Respondent 6). Having said that, there was a view that rural dwellers may have lived experiences of climate change impacts which may also influence their level of knowledge about climate change.

Given the rural-urban dichotomy, respondents were asked if climate change education and awareness should target certain sections of the society. Resoundingly, 95% of respondents surveyed expressed that such programmes should target both rich and poor (with inclination for poor people). This was based on the premise that climate change affects everybody irrespective of their economic standing, gender, sex, class or creed. Even though there was an acknowledgement that vulnerability may differ among different sections of society.

There was also a feeling that the nature of impacts varies between regions and people. Overall, 89% of respondents surveyed were of the view that the impact of climate change differs from region to region. For instance, Respondent 15 elaborated that rural people may be impacted in terms of their ability to grow crops while urban people may

simply buy their food from the market. However, urban dwellers may be affected by heat waves which may increase a demand for air conditioning systems. This is crucial information that can be used when developing an awareness programme especially where targeted interventions are necessary. The next section continues the discussion with a special focus of climate change education in school programmes.

7.4 Climate change education in school programmes

Given the perceived poor levels of understanding of climate change by the public discussed earlier, the respondents were asked if there is a need to integrate climate change aspects in education programmes. There was almost unanimous agreement amongst respondents with only 3% disagreeing with that proposition (Figure 7.8).

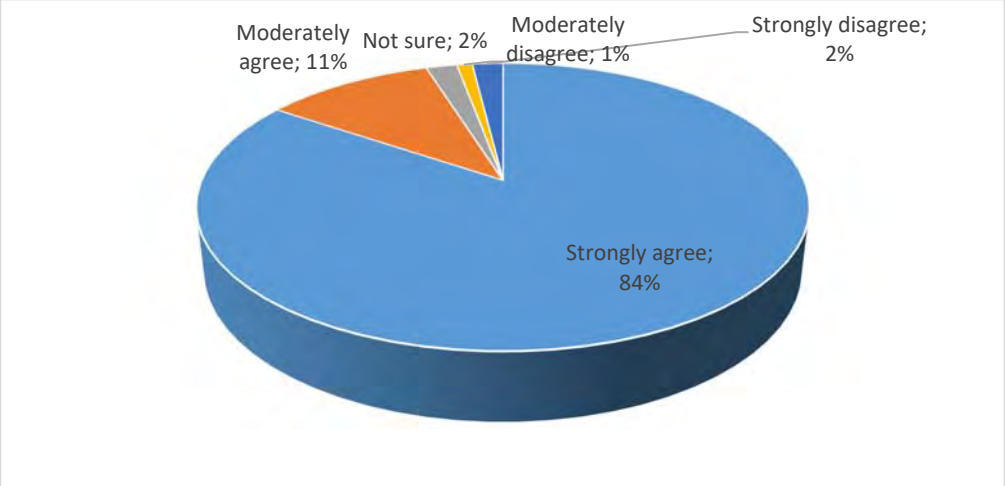

Figure 7.8: There is a need to integrate climate change aspects in education

Source: Author, Field Survey, 2019

The respondents felt that such interventions should begin at the foundation/ elementary phase to high school level, reaffirming what was discussed in the literature review. This would make sure that even those that did not follow environmental and science related careers would still have a fair understanding of environmental issues and thus make it a way of life (Respondent 11). That way, the kids would grow up with a full understanding of these issues. The respondents emphasized that the kids have an added advantage because of their potential to take the message back home to their parents.

Similarly, 98% of the respondents surveyed resoundingly agreed that climate change education and awareness have a potential to promote positive environmental values. This was attributed to the fact that climate change is seen as something that cuts across all environmental issues and thus would be an ideal entry point to understand them and instil sustainability ethic.

A similar trend was observed among respondents when it came to whether or not there is a link between climate change awareness and education with climate change action by the society. Figure 7.9 overwhelming show that 92% of respondents felt that there is correlation between awareness and action. While this may be true, the literature review cautioned that the attitude-behaviour gap must be borne in mind which often results in a tendency by some people in society to abdicate responsibility for their narrow interests and shift the burden to government. Where this happens, awareness and education does not always trigger voluntary action.

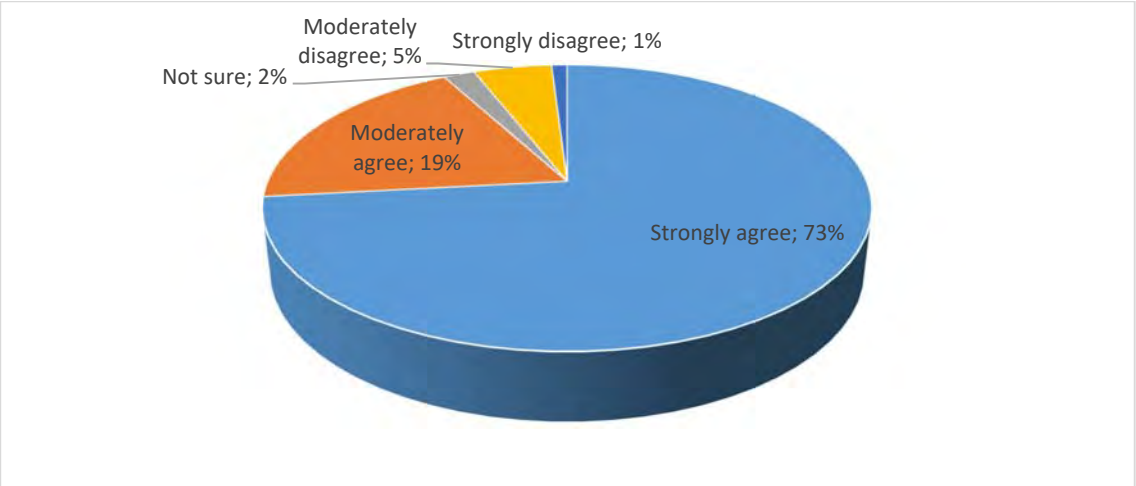

Figure 7.9: There is a link between climate change awareness and education with climate action

Source: Author, Field Survey, 2019

Consistent with this attitude-behaviour gap phenomenon, there was however a dissenting argument that implied that awareness and education do not always translate to action, citing the HIV/ AIDs pandemic in South Africa which has not been resolved despite extensive awareness programme for many years (Respondent 6).

However, this may be influenced by a different set of dynamics that may not necessarily be relevant to climate change.

With regard to human capital development, 52% of respondents indicated that South Africa has practitioners and the ability to do projections, scenarios and disaster management. One should not ignore the fact that 42% of respondents felt differently. It was suggested that this needed to be managed as some of the experts were few and already ageing.

Respondent 13 also raised the concern that some of these experts tend to do their own wonderful work in isolation and do not always bring their work together to share and inform policy and implementation. When probed on this issue if they thought that there is adequate science-policy interface to inform decision-making and policy options on climate change, 57% of the respondents felt that there appears to be coherence between science and policy choices (Figure 7.10). However, Respondent 3 criticized the tendency of scientist who sometimes fail to flag policy implications on their research and interpret their findings in a manner that is understood by policy makers. Iyalomhe *et al.* (2013), note that climate change warrants a successful science–policy interface in order to assist with the translation of climate scenarios to adaptation policies. However, the authors are concerned that the experience demonstrate it is difficult to implement this interface in practice.

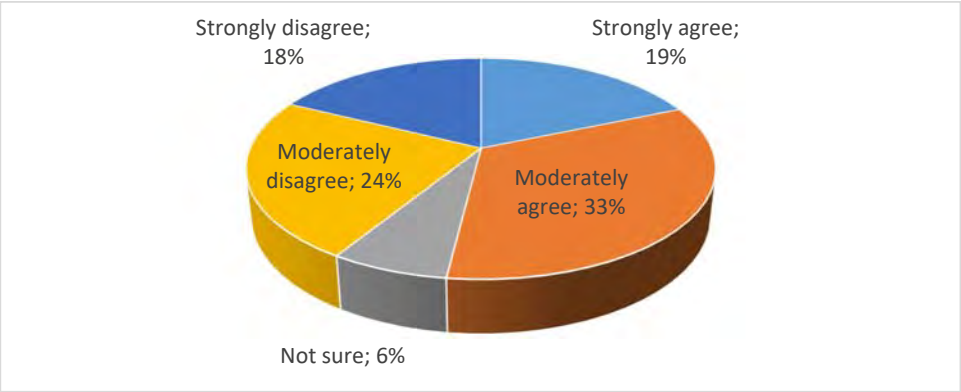

Figure 7.10: There is adequate human capital development to respond to climate change

Source: Author, Field Survey, 2019

It was suggested that in order to enhance implementation, more practitioners would be needed on the ground. Even though South Africa has good early warning systems,

respondents cautioned that they are not full proof. Akram (2012), has expressed a similar sentiment that projections remain just projections and even speculative; because they cannot be completely guaranteed even though they do provide a good sense of what is likely to happen. Hence Respondent 15 argued that even in developed countries with sophisticated systems and resources, they still experience disasters such as flooding in Louisiana and Washington in July 2019. More discussion follows in the next section on early warning systems.

7.5 Climate change early warning systems and preparedness

According to Hurlbert and Gupta (2016), climate change will result to variable weather with increased potential for extreme events. Expectedly, it is generally recognized that climate change related hazards and the resulting disasters are on the increase (Faling *et al*., 2012). South Africa is no exception to this. Hence the authors have observed increasing occurrences of extreme weather events such as floods, hailstorms, veld fires, snow and drought amongst others. Even Northrop (2017), has acknowledged the interrelated effects of climate change with these adverse events, with grave ramifications, particularly in Africa.

In November 2019, KwaZulu-Natal experienced heavy flooding including a tornado that surprised many. This resulted in the loss of lives, damage to infrastructure and human settlements. Hence, Faling *et al*. (2012), portray that the impact of climate change on human settlements ranges from insignificant to catastrophic. The November floods came shortly after devastating floods that occurred in April 2019 in KwaZulu-Natal and Eastern Cape which resulted in the deaths of approximately 80 people and infrastructure damage.

The question was posed to respondents regarding the adequacy of the early warning systems. Fifty-one percent of the respondents surveyed (Figure 7.11) felt that South Africa does not appear to have adequate early warning systems, with 29% of those strongly disagreeing. On the other hand, 36% of respondents were of the view that South Africa has adequate early warning systems, with 27% of those moderately holding that view. Having noted these divergent responses, without discounting the

role of government, it was highlighted earlier that being prepared for disaster should be the duty and responsibility of the individual.

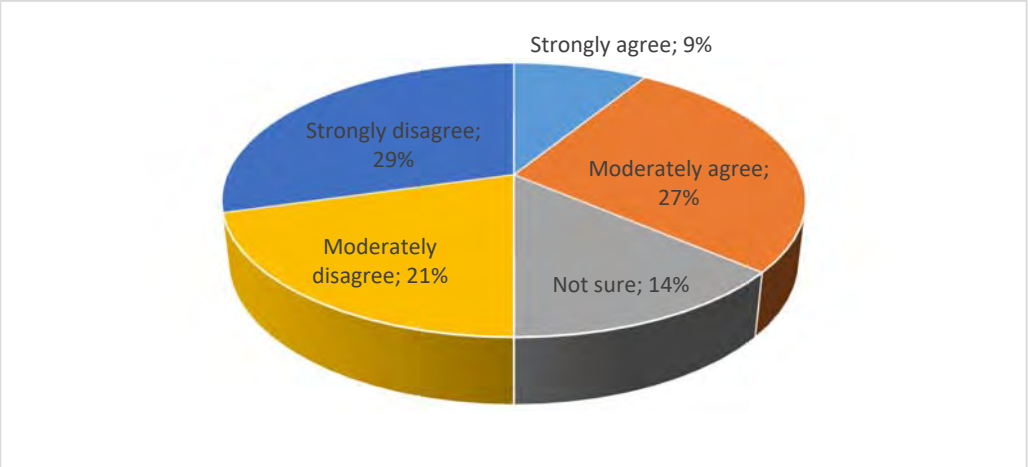

Figure 7.11: There is adequate early warning systems

Source: Author, Field Survey, 2019

The Disaster Management Forums in most provinces were welcomed as a positive development. However, in a study undertaken by Faling *et al*. (2012), in two of South Africa's provinces, they concluded that disaster risk reduction interventions in general and climate change adaptation and mitigation measures are not yet taken seriously. Hence the authors argue that they remain merely sophisticated rhetoric and are not yet institutionalized in the practice of decision-making. Whether this can be generalized in all other provinces is something else as the study was limited in the Western Cape and the Northern Cape. Respondent 1 felt that South Africa through SAWS has a highly sophisticated weather forecasting and early warning systems, however, the ability to communicate information and weather advisories remain poor.

According to Persson (2016b), one of the utmost challenges of accomplishing the goal of reducing losses using early warning systems lies in the link between the communication of warnings and response. Figure 7.12 shows that 45% of respondents were of the view that communication on early warning system is ineffective while 44% felt that communication on early warning system is effective.

Persson (2016b), cautions that besides a need for explicit messages that are transmitted on time to the groups at risk, it is imperative that those who respond should

be aware of the risks, prepared and capable to react to the message. One could not agree more with this, the videos that circulated on social media during such events including November 2019 floods demonstrate the lack of appreciation of the dangers of these events by the society. This was demonstrated by unbecoming behaviour and recklessness by citizens at times in very dangerous stormy rivers resulting in avoidable casualties by simply exercising common sense.

Another issue of concern that was raised is the lack of resources and infrastructure at lower levels. Despite the sophisticated systems, it was argued that the Western Cape drought could not be foreseen, implying a weakness in the system (Respondent 15). This was attributed to policy incoherence and political meddling.

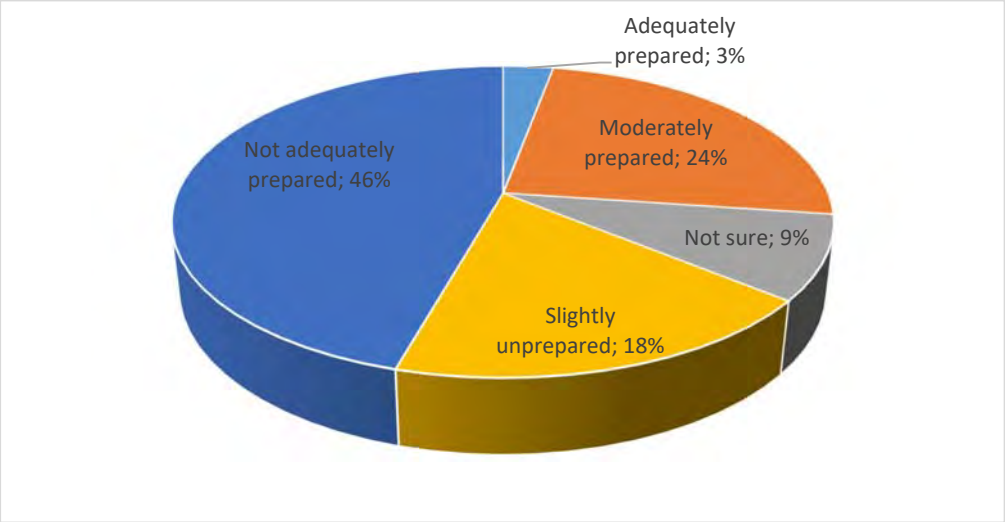

Figure 7.12: Preparedness to deal with extreme weather events

Source: Author, Field Survey, 2019

These issues demonstrate the complexity of dealing with extreme weather events by authorities but also by residents. Hence, it is critical that the government fulfil its duties and plan for extreme weather events to reduce the susceptibility and safeguard development gains. Because of the criticism outlined above, 64% of the respondents surveyed were of the view that South Africa is not prepared to deal with extreme weather events caused by climate change.

This sentiment was informed by the perception that South Africa has in the past been caught unprepared by things that can be seen such as flash floods in Durban, Johannesburg and the Eastern Cape. If that can happen unforeseen, how then can South Africa deal with slow onset events? (Respondent 3). Despite this, Respondent 5 inferred that perhaps one was asking too much of South Africa because one can never be too prepared for such events because even the intensity of the events differs.

7.6 Conclusion

This Chapter sought to address two research objectives; namely, an inventory of institutions and major financial arrangements that exist as means of implementing climate change policy in South Africa; and to establish measures that are in place to improve education, awareness-raising and human and institutional capacity development on climate mitigation and adaptation, impact reduction and early warning.

Regarding the institutions, while it revealed that there is institutional capacity, there is a need to review them to ensure that they do what they are supposed to do. There was a concern about the limited pool of experts, which made the system fragile. The study concluded that South Africa does not budget enough money for climate change and relies heavily on international donations. There was a concern that with the limited resources that are set aside for climate change, more of that goes to policy development and less for implementation.

The study was not conclusive on mechanisms for stakeholder engagement as respondents were divided on the issue. However, it indicated that stakeholder engagement is top-down, and is not inclusive of everybody, particularly grassroots level. Hence it was found to be ineffective. Accordingly, the study revealed that the public was not satisfied with its involvement in climate change management in South Africa.

The study concluded that there is a need to integrate climate change aspects in education particularly at a foundation level. It also revealed that climate change education and awareness have a potential to promote positive environmental values;

hence concluded that there is a clear link between awareness and taking action. The study concluded that South Africa does not have adequate early warning systems in place; hence the study also concluded that South Africa is not prepared to deal with extreme weather events.

CHAPTER 8: CONCLUSION AND RECOMMENDATION

8.1 Introduction

The purpose of this Chapter is to provide a summary of the study, including the findings as well as suggestions that include future research that may need to be undertaken.

8.2 Summary of study

The aim of the study was to investigate and analyse South Africa's policy response to climate change, taking into account the added dynamics and imperatives presented by the SDGs agenda. In order to accomplish this task, five research questions were developed; namely:

i. To what extent has the South African government localized the SDGs agenda (in general) since its birth in January 2016?
ii. Which policies and institutions are dealing with climate change mitigation (including sustainable consumption and production) and what are the provisions of such policies?
iii. Which policies and institutions are dealing with climate change adaptation and adaptive capacity and what are the provisions of such policies?
iv. What key institutions and major financial arrangements exist as means of implementing climate change policy in South Africa?
v. To what extent are measures in place to improve education, awareness-raising and human and institutional capacity development on climate mitigation and adaptation, impact reduction and early warning?

The study was underpinned by extensive literature review covering a variety of topics relevant to the study to ground it. Based on the research questions, five research objectives were then developed. To answer these questions, a mixed-research method approach was adopted that included an online survey, interviews and policy document reviews. This research approach is mostly used in large bureaucratic organizations such as government to determine the extent to which a programme or policy is effective. The research design followed a MMR, which combines qualitative and quantitative approaches. Primary data was collected from purposefully selected respondents.

The study employed the following techniques to collect data, namely: questionnaires, interviews, descriptive surveys and document analysis. These techniques were complemented by the observations of the researcher. A descriptive survey design was used to collect data from respondents by asking them a series of questions, summarized responses with percentages, frequency counts and statistical analysis with an aim of drawing extrapolations.

Through the descriptive survey, 103 respondents participated in the study. Interviews were held with 21 key informants from selected state institutions, based on pre-developed questionnaire. The interviews helped the researcher to obtain firsthand information from the key informants concerning the research objectives of the study. Embedded in the online survey and questionnaires were the rating scale techniques in order to obtain standardized information relating to the research objectives.

The analysis of data entailed the reduction and display of data. Data reduction and display made it possible to code data, create themes and concepts. In addition, it enabled the study to identify evolving stories, themes, and patterns that best depict a number of data chunks. It further made it easy and possible to make cogent inferences and rational conclusions. In addition, primary data was complemented by document analysis that scrutinized relevant documents to climate change and sustainable development.

Ethical considerations were observed, with the research ensuring that respondents were provided with adequate information about the study, including the risks so that they could make an informed decision regarding their participation in the study. The researcher ensured that the integrity and quality of the research is not compromised, while making sure that privacy and confidentiality is observed. Ethics approval was sought to ensure that the research adhere to highest ethical standards. Permissions were also sought from certain organizations to conduct the study and enable the participation of their employees. Respondents voluntarily consented to taking part in the study, informed by full understanding of their rights.

8.3 Summary of findings

8.3.1 Localization of the SDG agenda

The study concluded that South Africa has taken reasonable steps to achieve the SDGs. The study demonstrated that there are NDP initiatives that existed before the SDGs were put in place. The commonality of the NDP and SDG meant that South Africa had to continue with those initiatives and enhance alignment. The study also showed that South Africa has put in place institutional mechanisms to implement the SDGs. The study highlighted that it took quite some time for South Africa to put the institutional mechanisms in place, and were yet to be operationalized. As a result, this made them ineffective.

The study revealed that there is a lot of uncertainty regarding the funding of the SDGs in South Africa. This was because the SDGs were found to be complimentary to the NDP objectives. The study highlighted that the effect of climate change on SDGs is mixed and further showed that sustainable development place constraints on policy proposals for climate change. The study highlighted that climate change and sustainable development are multi-faceted and complicated phenomenon. As such, it is difficult to meet all of the pillars of sustainable development, and even where the pillars of sustainable development are addressed, in most cases, they are not addressed at the same level.

8.3.2 Policies and institutions dealing with climate change mitigation

The study concluded that South Africa has policies and strategies designed to respond to climate change mitigation. However, the study revealed a number of challenges inherent in the policies and strategies that make it ineffective. Among others, it revealed that: (i) South African policy on climate change is driven more by international pressures and expectations rather than domestic awareness and activism, hence it has a strong environmental bias. The study indicated that the implication of this was that climate change is not linked to national interests and therefore it just become another consideration and an add-on in decision-making processes; particularly in development trajectory, (ii) the policies and strategies are unenforceable (voluntary) due to lack of binding legal framework, (iii) policy implementation inertia; (iv) as well as inconsistencies in the broader policy framework.

The study also revealed that there are challenges with institutional capacity to implement policies and strategies. It indicated that most capacity is concentrated at the national level as opposed to the provincial and local government levels, and relies on few experts which makes the system vulnerable and fragile. The study concluded that not enough is being done to support sustainable consumption and production. Because of this, it also concluded that policies have not improved production methods by the industry.

The study further demonstrated that the energy-intensive industry is not complying with the policies and strategies that have been put in place. This is partly because industry was found to be a formidable lobby group in policy formulation and implementation. The study highlighted the need to fix the disjuncture between the energy policy and climate change in order to fully leverage the opportunities that may arise in the roll-out of renewable energy infrastructure by boosting manufacturing sector, create green jobs and boost the economy.

The study demonstrated that there are challenges with incentives necessary to incentivize the industry. The study also revealed that South Africa is prioritizing mitigation over adaptation efforts in its measures to deal with climate change, even though adaptation is regarded as important for South Africa.

8.3.3 Policies and institutions that deal with climate change adaptation

The study concluded that South Africa has policies and strategies designed to respond to climate change adaptation. The study revealed that while policies are in place, they have not translated to real change on the ground and therefore have not enabled South Africa to have adequate climate change resilience. However, the study revealed several challenges inherent in the policies and strategies that make it ineffective. Among others, it revealed that: (i) the policies have not been translated into concrete actions, (ii) highlighted existing knowledge gaps in adaptation, (iii) poor leadership and lack of clear vision for adaptation, and (iv) poor coordination.

The study revealed that there are challenges with institutional capacity, which is characterized by scattered and uneven capacity across sectors and different spheres

of government; and weakest at the local government level. The study concluded that climate change adaptation is important in South Africa. Even though that is the case, it revealed that there is a lack of adequate emphasis on adaptation in general. Hence it indicated that adaptation is neglected in South Africa. The study identified financial/ costs, lack of awareness about climate change and poor understanding about climate change impacts as amongst the barriers to adaptation. The study highlighted that adaptation measures should not be undertaken in isolation, instead, it should be addressed within the context of other programmes such as disaster risk management and sustainable development.

8.3.4 Institutions and financial arrangements

Regarding the institutions, while it revealed that there is institutional capacity, there is a need to review them to ensure that they do what they are supposed to do. The study identified lack of ability by institutions to drive the strategy which affects implementation. There was a concern about the limited pool of experts, which make the system fragile. The study indicated that there is disparity of capacity between different spheres of government when it comes to institutional capacity.

With regard to climate change funding, the study concluded that South Africa does not budget enough money for climate change and relies heavily on international donations. The study indicated that climate change is not receiving the necessary attention it deserves, hence it is far down the line when it comes to government priorities. There was a concern that with the limited resources that are set aside for climate change, more of that goes to policy development and less for implementation. While the study was not conclusive on where most of the money is spent, however, 29% felt that more than 50% of funding was spent on mitigation measures.

Funding for climate change raise serious questions about South Africa's commitment to deal with climate change related impacts. Climate change policies alone no matter how good, they may not solve the challenges of climate change unless they are supported by resources. This is because, as shown earlier, climate change measures have considerable fiscal implications that must be calculated and taken into account, including how they affect the economy. Hence, it is necessary for a country like South

Africa to engage in long-term fiscal planning in relation to climate change in order to invest wisely in climate change response measures.

8.3.5 Stakeholder engagements, education, awareness and early warning systems

The study was not conclusive on mechanisms for stakeholder engagement as respondents were divided on the issue. However, it indicated that stakeholder engagement is top-down, and is not inclusive of everybody particularly grassroots level. Hence it was found to be ineffective. Accordingly, the study revealed that the public was not satisfied with its involvement in climate change management in South Africa.

The study concluded that there is a need to integrate climate change aspects in education particularly at foundation level. It also revealed that climate change education and awareness have a potential to promote positive environmental values; hence, it further highlighted that there is a clear link between awareness and taking action. The study concluded that South Africa does not have adequate early warning systems in place; hence the study also concluded that South Africa is not prepared to deal with extreme weather events.

8.4 Emerging suggestions

Overall, the study revealed that South Africa has done enough to domesticate and attempt to localise the SDGs, notwithstanding the small pace of putting supporting institutional mechanism for implementation. With regard to climate change policies for both mitigation and adaptation, the study highlighted that the policies have been put in place even though there are challenges with implementation and institutional capacity. The study further revealed that there is a problem of climate change funding, resulting in over-reliance in international donations. On stakeholder engagements, the study found it to be ineffective and not inclusive, and highlighted the need to integrate climate change aspects in education programmes. Finally, the study revealed the need for South Africa to improve its early warning systems and preparedness to deal with extreme weather events.

Based on the key findings and conclusions, it is suggested that:

i. A new policy implementation model is imperative that takes into account the challenges that are presented by dynamic institutional mechanisms and policy frameworks that are delegated at different levels and spheres for implementation.
ii. The seriousness of climate change impacts for the country warrants an effective and efficient coordination, supported by a responsive leadership at the highest level, as well as requisite institutional capacity to facilitate a cohesive and a whole of government approach to dealing with challenges presented by climate change.
iii. A full assessment of the socio-economic impacts of climate change and the budgetary requirements for managing them be undertaken, to inform and influence long-term fiscal planning with an intention to highlight the need for climate change to be regarded as a critical budget item by National Treasury. This will not only reduce government over-reliance on international donor funding in implementing climate change response measures; but also assist the country to ensure that its adaptation measures receive the attention and urgency they deserve. This would also insulate the economy from the devastating effects of climate change.
iv. The over-lapping nature of climate change and the SDGs warrants that the two agendas be coordinated and synchronised to ensure coherent implementation and reduce duplication and over-burdening limited resources.
v. A consolidation of the industry support measures across government be undertaken to ensure that they are coherent in order to facilitate the industry's involvement and buy-in in climate change response. This will catalyse both government and industry to invest in cleaner production processes and renewable energy sources.
vi. There is a need to build capacity for improved stakeholder engagement, awareness and education in order to influence positive behavioural change underpinned by sustainable lifestyle.
vii. The increase incidences of extreme weather events attributed to climate change provide a compelling case for the enhancement of the early warning systems and disaster risk reduction mechanisms; better communicated to the

public, and ensure that vulnerable communities are prepared to respond and minimise the risk when disasters occur.

8.5 Contribution to knowledge

Although the SDGs emerged in 2015 following their adoption, they are increasingly gaining prominence among scholars and countries alike as they try to better understand this transformative and yet ambitious developmental agenda from all angles. Similarly, countries across the world will continue to grapple with better ways to implement the SDGs in a manner that is inclusive. The fact that there is a high-level monitoring and review mechanism globally for the SDGs place more responsibility on countries and stakeholders alike to ensure effective implementation. Hence, the interest in the SDGs is expected to increase for the next foreseeable future until 2030 when they are expected to come to an end. Similarly, countries across the globe will continue to find better ways to integrate the SDGs in national programmes and to implement them.

Furthermore, climate change and the SDGs are inherently intertwined with a potential to complement each other and in some cases work against each other. There is therefore a need to maintain an intricate balance between the SDGs and climate change, so that they can complement each other. Hence, there is a growing debate on the synergy between the SDGs and climate change. In April 2019, the United Nations Department of Economics and Social Affairs together with UNFCCC hosted the first Global Conference on Synergies between the 2030 Agenda and Paris Agreement. This was followed by a series of other expert group Conferences to look deeper in the synergies.

This study sought to interrogate how South Africa is responding to climate change, but also taking into account the relevance of the SDGs. As such, this study, in a modest way is beginning to contribute to this scholarly debate in this area of increasing importance. This is critical because as it has been shown, climate change impacts could reverse the development gains that have been made if they are not attended to. There is therefore a need to generate new evidence and knowledge to ensure that these two epic agendas are implemented in a manner that is mutually reinforcing.

Clearly, the study contributes meaningfully to our understanding and the body of knowledge on the importance of institutional and policy frameworks within the context of climate change and sustainable development. While it is recognised that a lot of work has been done on climate change science in general and the impacts thereof, very little work especially in South Africa has been done on the importance of understanding how institutional and policy frameworks can be adapted to climate change management. Institutions and their response to climate change shape and influence the nature and type of responses and interventions that government must pursue, including policy.

Thus, the current focus has contributed significantly to this understanding but presenting empirical data on the challenges and opportunities on how to structure and integrate institutional and policy frameworks in the overall climate change governance including SDGs. In this regard, this study will also inform practice, improve policy and decision-making. Improvement to practice has a potential to be applied in other areas of policy governance and institutional frameworks in government. Approach to the implementation of overlapping programmes such as the SDGs and climate change is a good lesson to be learnt. In an environment of limited resources, government can achieve more by ensuring coherence in the implementation of overlapping programmes to avoid duplication.

8.6 Prospects of Future Research

The study has shown that since 2007, South Africa has developed a myriad of policies and strategies to deal with climate change and economic challenges. This is manifested by a proliferation of strategies particularly at national level. It is also clear that such interventions have been replicated at sector level as well as at other spheres of government. However, the study revealed that there is a serious problem of coordination across levels and sectors. However, there was also a concern that there is lack of leadership to implement at a strategic level. Climate change policies do not operate in a vacuum because of other policy frameworks that are in place. Hence the disjuncture and inconsistencies at policy level was found to be problematic. The allocation of resources to implement the strategies was found to be inadequate and

the perception that more resources are allocated for policy development than for implementation.

While the study sought to analyse the policy framework and the strategies that are in place to respond to climate change, it did not interrogate deeply the extent to which the implementation has been successful. Given this, there is a need to undertake a detailed study on the impact of the implementation of the policies on the ground to ascertain if it has yielded the desired policy outcomes.

There is a need to assess the extent to which the policies and strategies have made South Africa climate resilient including the economy. This would assist South Africa to ensure that it achieves its policy outcomes but also its developmental goals. Furthermore, where there are challenges be it in policies or implementation, those challenges are identified and attended to. This would assist in ensuring that South Africa improve its policy implementation framework or adopt an implementation regime that is adaptable and tailor-made for South African conditions.

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LIST OF APENDICES

APPENDIX 1: ETHICS CLEARANCE CERTIFICATE

UNISA university of south africa

UNISA GENERAL RESEARCH ETHICS REVIEW COMMITTEE

Date: 19/03/2018

NHREC Registration # : REC-170616-051
ERC Reference # : 2018/CAES/049
Name : Mr DE Mthembu
Student #: 62150618

Dear Mr Mthembu

Decision: Ethics Approval from 16/03/2018 to 31/03/2019

Researcher(s): Mr DE Mthembu
dumisani.mthembu22@gmail.com

Supervisor (s): Prof G Nhamo
nhamog@unisa.ac.za; 012-433-4725

Working title of research:

An investigation of South Africa's policy response to climate change in the context of sustainable development goals

Qualification: PhD Environmental Management

Thank you for the application for research ethics clearance by the Unisa CAES General Research Ethics Review Committee for the above mentioned research. Ethics approval is granted for a one-year period, **subject to submission of the relevant permission letters**. After one year the researcher is required to submit a progress report, upon which the ethics clearance may be renewed for another year.

Due date for progress report: 31 March 2019

Please note the points below for further action:

1. The researcher has not yet obtained permission from all targeted departments and organisations. He is cautioned that he may not approach employees from any department or organisation to participate in the research before he has obtained the required permission and submitted it to the Committee for record purposes.

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2. Has the comments of the departmental reviewer of the research proposal been addressed? The researcher is requested to submit the corrected research proposal to the Committee for record purposes.

*The **low risk application** was **reviewed** by the CAES General Research Ethics Review Committee on 16 March 2018 in compliance with the Unisa Policy on Research Ethics and the Standard Operating Procedure on Research Ethics Risk Assessment.*

The proposed research may now commence with the provisions that:

1. The researcher(s) will ensure that the research project adheres to the values and principles expressed in the UNISA Policy on Research Ethics.
2. Any adverse circumstance arising in the undertaking of the research project that is relevant to the ethicality of the study should be communicated in writing to the Committee.
3. The researcher(s) will conduct the study according to the methods and procedures set out in the approved application.
4. Any changes that can affect the study-related risks for the research participants, particularly in terms of assurances made with regards to the protection of participants' privacy and the confidentiality of the data, should be reported to the Committee in writing, accompanied by a progress report.
5. The researcher will ensure that the research project adheres to any applicable national legislation, professional codes of conduct, institutional guidelines and scientific standards relevant to the specific field of study. Adherence to the following South African legislation is important, if applicable: Protection of Personal Information Act, no 4 of 2013; Children's act no 38 of 2005 and the National Health Act, no 61 of 2003.
6. Only de-identified research data may be used for secondary research purposes in future on condition that the research objectives are similar to those of the original research. Secondary use of identifiable human research data require additional ethics clearance.
7. No field work activities may continue after the expiry date. Submission of a completed research ethics progress report will constitute an application for renewal of Ethics Research Committee approval.

Note:

*The reference number **2018/CAES/049** should be clearly indicated on all forms of communication with the intended research participants, as well as with the Committee.*

Yours sincerely,

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APPENDIX 2: KEY INFORMANT INTERVIEW GUIDE

KEY STAKEHOLDER INTERVIEW QUESTIONNAIRE FOR A RESEARCH STUDY TO INVESTIGATE SOUTH AFRICA'S POLICY RESPONSE TO CLIMATE CHANGE WITHIN THE CONTEXT OF SUSTATAINABLE DEVELOPMENT GOALS

****STRICTLY CONFIDENTIAL****

This questionnaire was developed to guide the interview schedule with key informants to ensure that all respondents are asked the same set of questions, in the same sequence and manner.

SECTION 'A': BIOGRAPHICAL INFORMATION

SECTION B: LOCALIZATION OF THE SUSTAINABLE DEVELOPMENT GOALS IN SOUTH AFRICA

QB1: How familiar are you with climate change management policies in SA?

Very familiar [ ] Moderately familiar [ ] Not familiar [ ]

QB2: How familiar are you with the Sustainable Development Goals (SDGs)?

Very familiar [ ] Moderately familiar [ ] Not familiar [ ]

QB3: How familiar are you with climate change management strategies in South Africa

Very familiar [ ] Moderately familiar [ ] Not familiar [ ]

QB4: Do you think South Africa has made reasonable steps to ensure the realization of the Sustainable Development Goals (SDGs) within the South African context? Based on your answer, please explain what steps have been undertaken to implement the SDGs, if any-

---

QB5: Do you think South Africa has taken steps to ensure policy coherence in the implementation of the SDGs and climate change. Based on your answer, please explain what steps have been taken to enhance policy coherence-

---

QB6: In your view, are there institutional mechanisms in place in government to support the implementation of the SDGs?

Yes [ ] No [ ] don't know [ ]

Kindly elaborate on the institutional arrangements that are in place-

---

QB7: How effective do you think those institutional mechanisms are in implementing the SDGs? Please explain your answer.

QB8: Do you think South Africa has mechanisms in place to measure and monitor the progress on the implementation of the SDGs? Please explain how progress is measured-

---

QB9: Is there a dedicated funding exclusively for the implementation of the SDGs?

Please explain your answer.

QB10: Do you think South Africa has integrated the climate change goal in the localization process of the SDGs? If your answer is yes, please name South Africa specific indicators relating to this goal-

---

QB11: Do you think climate change interventions must be linked to sustainable development goals?

QD12: The effect of climate change on achieving the sustainable development goals is:

Positive [ ] Mixed [ ] Negative [ ]

QB13: To what extent do you think that sustainable development place constraints on policy proposals concerning climate change? Please explain your answer.

QB14: How would you rate your satisfaction with the domestication of the SDGs in South Africa? Explain why?

SECTION C: IDENTIFICATION OF POLICIES AND INSTITUTIONS THAT DEAL WITH CLIMATE CHANGE MITIGATION

QC1: Do you think South Africa has policie (s) in place designed to respond to climate change mitigation? If your answer is yes, please name those policies.

QC2: Do you think such policie (s) in QC1 adequately address climate mitigation challenges faced by South Africa. Please explain your answer-

---

QC3: In your view, which sectors do you think have been prioritized in the policy when it comes to climate change mitigation?

QC4: What in your view are the key intended policy outcomes for climate change mitigation in South Africa?

QC5 What in your view should be prioritized from a sector point of view in order to meet the desired policy objectives for mitigation?

QC6: Do you think South Africa has strategies in place to support climate change mitigation? Please name those strategies if any

---

QC7: In your view, do you think South Africa has institutional capacity to implement the different climate change mitigation measures identified in the policies? Please name those institutions if any-

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QC8: Climate change is known to have direct implications for trade relations and economic policies. Do you think South Africa's climate management policies are robust enough to be able to deal with response measures that may be imposed by other countries to South Africa's trade? Please explain your answer.

QC9 In your view, do you think the South African climate change management policy is sufficient to promote economic growth? Please explain why.

QC10: In your view, do you think it is an appropriate response to impose tariffs on energy-intensive imports by other countries based on carbon content of domestic production? Please explain why.

QC11: In your view, do you think government is doing enough to support sustainable consumption and production? Please explain your answer.

QC12: Do you think climate change management policies in South Africa have improved production methods by the energy-intensive industry? Please explain your answer.

QC13: In your view, to what extent is the South African energy-intensive industry complying with climate change management policies?

Good [ ] None [ ] Bad [ ]
Please explain why.

QC14: In your view, do you think South Africa has mechanisms to provide for incentives to encourage compliance / industry to adopt cleaner production practices? Please explain why?

QC15: The National Development Plan (NDP) places a lot of emphasis on mitigation efforts such as carbon pricing, renewable energy, zero emission standards for buildings and others. Based on this statement, do you think mitigation efforts are being prioritized above adaptation efforts? Please explain your answer.

QC16: Do you think the overemphasis on mitigation efforts has a negative effect on adaptation efforts? Please explain how.

QC17: Do you think South Africa has sufficient tax instruments in place to support South Africa's response to climate change? Please name those tax instruments if any.

SECTION D: IDENTIFICATION OF POLICIES AND INSTITUTIONS THAT DEAL WITH CLIMATE CHANGE ADAPTATION

QD1: Do you think South Africa has policie(s) in place designed to respond to climate change adaptation? If your answer is yes, please name those policies-

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QD2: Do you think such policie(s) adequately in QD1 above address climate adaptation challenges faced by South Africa? Please explain your answer.

QD3: In your view, which sectors do you think have been prioritized in the policy when it comes to adaptation?

QD4: What in your view are the key intended policy outcomes for climate change adaptation in South Africa?

QD5: What in your view should be prioritized from a sector point of view in order to meet the desired policy objectives for adaptation?

QD6: In your view, do you think South Africa has strategies in place to support climate change adaptation? Please name those strategies if any.

QD7: In your view, do you think South Africa has institutional capacity to implement the different climate change adaptation sectors identified in the policy? Please name those institutions if any.

QD8: How important is climate change adaptation in South Africa? Please explain your answer.

QD9: Do you think there is lack of adequate emphasis on adaptation efforts? Please provide an explanation for your answer.

QD10: How satisfied are you with adaptation efforts that have been undertaken in practice so far? Please explain your answer.

QD11: Which key sectors do you think are most vulnerable and require urgent attention in South Africa's policy response when it comes to adaptation?

QD12: In your view, how effective is the coordination of various institutions involved in climate change adaptation efforts? Please explain on the coordination mechanisms.

QD13: Do you think climate change management strategies have enabled South Africa to have adequate climate change resilience? Please explain how.

QD14: Which of the following (choose five) barriers do you think present the most challenge (s) for South Africa in responding to climate change adaptation?

a)	Social	[ ]
b)	Economic	[ ]
c)	Financial / costs	[ ]
d)	Uncertainty	[ ]
e)	Lack of data	[ ]
f)	Lack of national attention to climate change	[ ]
g)	Pre-existing beliefs	[ ]
h)	Poor understanding of possible effects of climate change	[ ]
i)	Conflicting time scales/ long-term horizon of adaptation impact	[ ]
j)	Institutional crowdessness	[ ]
k)	Institutional voids	[ ]
l)	Lack of legislation	[ ]
m)	Poor coordination and fragmentation	[ ]
n)	Lack of awareness / poor communication	[ ]

Please explain why did you pick these barriers-

QD15: In your view, do you think climate change adaptation has been neglected in South Africa? Please explain in what way.

QD16: Climate change competes with other issues for an already limited amount of political and economic attention, that are more pressing in nature, whose impacts are more certain and more visible-short-results compared to adaptation that requires a long-term horizon. In your view, do you think there is balance between the short-term adaptation benefits while at the same time addressing long-term adaptation scenarios? Please explain further.

QD17: In your view, do you think adaptation in South Africa should be addressed purely in the context of other programmes such as disaster risk management, sustainable development, and not as a stand alone measure? Please give reasons for your answer.

SECTION E: AUDIT OF INSTITUTIONS AND MAJOR FINANCIAL ARRANGEMENTS THAT THAT SUPPORT THE IMPLEMENTATION OF CLIMATE CHANGE POLICY IN SOUTH AFRICA

QE1: In your view, do you think South Africa has adequate institutions in place to implement its climate change management policies and strategies. Please list all institutions, if any.

QE2: In your view, do you think South Africa has put in place adequate funding arrangements to support its response to climate change? If your answer is yes, please name climate funds that you know of that have been put in place-

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QE3: In your view, of the funding that is available, what percentage on average do you think is spent on mitigation vis-a vis on adaptation? Please explain your answer.

QE4: Please indicate other additional sources of funding for climate change other than national allocation from government budget.

QE5: Overall, do you think South Africa budgets enough money to deal with climate change. Please explain your answer.

SECTION F: MEASURES TO IMPROVE EDUCATION, AWARENESS, HUMAN CAPITAL AND EARLY WARNING SYSTEMS

QF1: In your view, do you think South Africa has mechanisms to ensure stakeholder support and buy-in for climate change policies and programmes? Please explain.

QF2: Is there adequate civil society mobilization and participation in climate change management in South Africa? Please explain

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QF3: In your view, is there institutional capacity in place to raise awareness on climate change Impacts? Please explain your answer.

QF4: How satisfied are you with the participation of the public in climate change management? Please elaborate your answer.

QF5: What do you think is the level of understanding of the public about climate change? Please elaborate.

QF6: In your view, is there a need to integrate climate change aspects in education programmes? Please indicate at what level of education.

QF7: In your view, do you think climate change education has a potential to promote positive environmental values in society? Please explain why.

QF8: Do you think there is a link between climate change awareness and education with climate change action by the society? Please explain your answer.

QF9: In your view, do you think climate change education and awareness interventions should target certain sections of society? Please explain your answer.

Please explain your answer-

QF10: Do you agree that climate change awareness and education tends to vary geographically between urban and rural dwellers? Please explain your answer.

QF11: In your view, do you think South Africa has necessary human capital development to be able to respond adequately to climate change? If your answer is No, what areas need special focus-

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QF12: In your view, do you think that South Africa has adequate early warning systems in place to minimize negative impacts from climate change disasters? Please explain.

QF13: In your view, how prepared is South Africa to deal with extreme weather events caused by climate change? Please explain your answer.

QF14: Do you think South Africa has adequate early warning systems and preparedness in place to minimize risk from climate change disasters. Please explain your answer-

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QF15: How effective is communication to the public regarding the use and importance of early warning systems? Please elaborate on communication programmes-

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QF16: In your view, is there adequate science-policy interface to inform decision-making and policy options on climate change in South Africa? Please explain.

QF17: Overall, how important is climate change education and awareness in responding to climate change impacts? Please explain.

SECTION G: CROSS CUTTING QUESTIONS

QG1: Do you think the South African climate change management policy is flexible enough not to compromise socio-economic development of the country? Why do you think so?

QG2: Do you think South Africa's climate change management policy is effective? Please name some of the successes.

QG3: The following categories concerns you most about climate change policy response in South Africa.

Please tick five (5) as appropriate.

a) Bias towards mitigation [ ]
b) Bias towards adaptation [ ]
c) Lack of coordination [ ]
d) Poor implementation [ ]
e) Buy-in from civil society [ ]
f) Buy-in from business [ ]
g) Uncertainty of policy direction [ ]
h) Uncertainty of priorities [ ]
i) Unrealistic targets [ ]
j) Monitoring and evaluation [ ]
k) Lack of clarity on funding [ ]
l) Poor regulatory framework [ ]
m) None of the above [ ]

Please explain your answer-

QG4: In your view, do you think South Africa made significant trade-offs in developing South Africa's response to climate change? Please explain what trade-offs were made.

QG5: How satisfied are you with the implementation of climate change management policy in South Africa? Please explain your view.

QG6: How realistic do you think are the international commitments on Nationally Determined Contributions that South Africa has made on climate change? Please explain your answer.

QG7: In your view, do you think the implementation of South Africa's policy response to climate change has been successful? Please explain your answer.

QG8: Do you think the South African climate change management policy adequately identify short-term (5 years, medium terms (10 years) and long-term (above 10 years) priorities? Please provide reasons for your answer.

Additional comments

Thank you very much for taking part in this research. If necessary, further comments can be sent to dumi2001us@yahoo.com

Dumisani E. Mthembu

APPENDIX 3: ONLINE SURVEY QUESTIONAIRE

QUESTIONS TO BE USED IN THE ONLINE SURVEY TO INVESTIGATE SOUTH AFRICA'S POLICY RESPONSE TO CLIMATE CHANGE WITHIN THE CONTEXT OF SUSTAINABLE DEVELOPMENT GOALS

****STRICTLY CONFIDENTIAL****

The survey used the mainly the following rating scales, as deemed appropriate in different questions. These rating scales have been removed from the questionnaire.

Main rating scales that were used			
Strongly agree [ ] Moderately agree [ ] Not sure [ ] Moderately disagree [ ] Strongly disagree [ ]	Very effective [ ] Moderately effective [ ] Not sure [ ] Moderately ineffective [ ] Very ineffective [ ] Not applicable [ ]	Very satisfied [ ] Moderately satisfied [ ] Not sure [ ] Moderately dissatisfied [ ] Very dissatisfied [ ]	Important [ ] Moderately important [ ] Not sure [ ] Moderately unimportant [ ] Not important [ ]

SECTION 'A': DEMOGRAPHICS

Gender

a. Male [ ]
b. Female [ ]
c. Wish not to disclose [ ]

Race

a. Black [ ]
b. White [ ]
c. Indian [ ]
d. Asian [ ]
e. Coloured [ ]
f. Wish not to disclose [ ]

Age group

a. 20-29 [ ]
b. 30-39 [ ]
c. 40-49 [ ]
d. 50-59 [ ]
e. 60-65 [ ]
f. 66+ [ ]
g. Wish not to disclose [ ]

Position you hold in your organization

a. Executive Management [ ]
b. Senior Management [ ]
c. Middle Management [ ]
d. Supervisory [ ]
e. Officer [ ]
f. General Worker [ ]
g. Other [ ]

Status of Employment

a. Permanently employed [ ]
b. Contract Employment [ ]
c. Other [ ]

Completed Level of Education

a. None [ ]
b. Primary [ ]
c. Secondary [ ]
d. Diploma and/or Undergraduate Degree [ ]
e. Honours and Above [ ]

Number of years of experience in the field (Please indicate your choice with an "X")

0-5 **Climate Change**	**6-10** **Climate Change**	**11 and above** **Climate change**	**0-5** **Sustainable Development**	**6-10** **Sustainable Development**	**11 and above** **Sustainable Development**

Please specify other field and the number of years of experience

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SECTION B: EXTENT TO WHICH THE SUSTAINABLE DEVELOPMENT GOALS HAVE BEEN LOCALIZED IN SOUTH AFRICA

QB1: How familiar are you with climate change management policies in SA?

Very familiar [ ] Moderately familiar [ ] Not familiar [ ]

QB2: How familiar are you with the Sustainable Development Goals (SDGs)?

Very familiar [ ] Moderately familiar [ ] Not familiar [ ]

QB3: How familiar are you with climate change management strategies in South Africa

Very familiar [ ] Moderately familiar [ ] Not familiar [ ]

QB4: South Africa has made reasonable steps to ensure the realization of the Sustainable Development Goals (SDGs) within the South African context.

QB5: South Africa has taken steps to ensure policy coherence in the implementation of the SDGs and climate change

QB6: In your view, is there institutional mechanisms in place in government to support the implementation of the SDGs?

Yes [ ] No [ ] don't know [ ]

QB7: How effective do you think those institutional mechanisms are in implementing the SDGs?

QB8: South Africa has mechanisms in place to measure and monitor the progress on the implementation of the SDGs.

QB9: There is dedicated funding exclusively for the implementation of the SDGs.

QB10: South Africa has integrated the climate change goal in the localization process of the SDGs.

B11: Climate change interventions must be linked to sustainable development goals.

QD12: The effect of climate change on achieving the sustainable development goals is:

Positive [ ] Mixed [ ] Negative [ ]

QB13: To what extent do you think that sustainable development place constraints on policy proposals concerning climate change?

QB14: Rate your satisfaction with the domestication of the SDGs in South Africa.

SECTION C: IDENTIFICATION OF POLICIES AND INSTITUTIONS THAT DEAL WITH CLIMATE CHANGE MITIGATION INCLUDING SUSTAINABLE CONSUMPTION, PRODUCTION AND PROVISIONS OF SUCH POLICIES

QC1: South Africa has policie(s) in place designed to respond to climate change mitigation?

QC2: Such policie (s) in QC1 adequately address climate mitigation challenges faced by South Africa.

QC3: South Africa has strategies in place to support climate change mitigation.

QC4: South Africa has institutional capacity to implement the different climate change mitigation measures identified in the policies.

QC5: Climate change is known to have direct implications for trade relations and economic policies. South Africa's climate management policies are robust enough to be able to deal with response measures that may be imposed by other countries to South Africa's trade.

QC6: The South African climate change management policy is sufficient to promote economic growth.

QC7: It is an appropriate response to impose tariffs on energy-intensive imports by other countries based on carbon content of domestic production.

QC8: Government is doing enough to support sustainable consumption and production

QC9: Climate change management policies in South Africa have improved production methods by the energy-intensive industry.

QC10: In your view, to what extent is the South African energy-intensive industry complying with climate change management policies?

Good [ ] None [ ] Bad [ ]

QC11: South Africa has mechanisms to provide for incentives to encourage compliance / industry to adopt cleaner production practices.

QC12: The National Development Plan (NDP) places a lot of emphasis on mitigation efforts such as carbon pricing, renewable energy, zero emission standards for buildings and others. Based on this statement, mitigation efforts are being prioritized above adaptation.

QC13: The overemphasis on mitigation efforts has a negative effect on adaptation efforts.

QC14: South Africa has sufficient tax instruments in place to support South Africa's response to climate change.

SECTION D: DETERMINATION OF POLICIES AND INSTITUTIONS THAT DEAL WITH CLIMATE CHANGE RESILIENCE AND ADAPTIVE CAPACITY

QD1: South Africa has policie (s) in place designed to respond to climate change adaptation?
QD2: Such policie (s) adequately in QD1 above address climate adaptation challenges faced by South Africa?
QD3: South Africa has strategies in place to support climate change adaptation.

QD4: South Africa has institutional capacity to implement the different climate change adaptation sectors identified in the policy.

QD5: How important is climate change adaptation in South Africa?
QD6: There is lack of adequate emphasis on adaptation efforts.

QD7: How satisfied are you with adaptation efforts that have been undertaken in practice so far?

QD8: In your view, how effective is the coordination of various institutions involved in climate change adaptation efforts?

Q9: Climate change management strategies have enabled South Africa to have adequate climate change resilience.

QD10: Which of the following (choose five) barriers do you think present the most challenge (s) for South Africa in responding to climate change adaptation?

a) Social [ ]
b) Economic [ ]
c) Financial / costs [ ]
d) Uncertainty [ ]
e) Lack of data [ ]
f) Lack of national attention to climate change [ ]
g) Pre-existing beliefs [ ]
h) Poor understanding of possible effects of climate change [ ]
i) Conflicting time scales/ long-term horizon of adaptation impact [ ]
j) Institutional crowdessness [ ]
k) Institutional voids [ ]
l) Lack of legislation [ ]
m) Poor coordination and fragmentation [ ]
n) Lack of awareness / poor communication [ ]

QD11: Climate change adaptation has been neglected in South Africa.

QD12: Climate change competes with other issues for an already limited amount of political and economic attention, that are more pressing in nature, whose impacts are more certain and more visible-short-results compared to adaptation that requires a long-term horizon. However, there is balance between the short-term adaptation benefits while at the same time addressing long-term adaptation scenarios.

QD13: Adaptation in South Africa should be addressed purely in the context of other programmes such as disaster risk management, sustainable development, and not as a stand alone measure.

SECTION E: AUDIT AND INVENTORY OF INSTITUTIONS AND MAJOR FINANCIAL ARRANGEMENTS THAT EXISTS AS MEANS TO IMPLEMENT CLIMATE CHANGE POLICY IN SOUTH AFRICA

QE1: South Africa has adequate institutions in place to implement its climate change management policies and strategies.

QE2: South Africa has put in place adequate funding arrangements to support its response to climate change.

QE3: In your view, of the funding that is available, what percentage on average do you think is spent on mitigation vis-a vis on adaptation?

a) More than 50% on mitigation [ ]
b) Less than 50% on mitigation [ ]
c) Not sure [ ]
d) More than 50% on adaptation [ ]
e) Less than 50% on adaptation [ ]
f) Adaptation 50% and mitigation 50% [ ]

QE4: Overall, South Africa budgets enough money to deal with climate change.

SECTION F: IDENTIFICATION OF MEASURES TO IMPROVE EDUCATION, AWARENESS, HUMAN CAPITAL AND INSTITUTIONAL CAPACITY DEVELOPMENT ON CLIMATE CHANGE MITIGATION, ADAPTATION, IMPACT REDUCTION AND EARLY WARNING SYSTEMS

QF1: South Africa has mechanisms to ensure stakeholder support and buy-in for climate change policies and programmes.

QF2: There is adequate civil society mobilization and participation in climate change management in South Africa.

QF3: There is institutional capacity in place to raise awareness on climate change impacts.

QF4: How satisfied are you with the participation of the public in climate change management?

QF5: What do you think is the level of understanding of the public about climate change?

Good understanding [5] [4] [3] [2] [1] Poor understanding

QF6: There is a need to integrate climate change aspects in education programmes?

QF7: Climate change education has a potential to promote positive environmental values in society.

QF8: There is a link between climate change awareness and education with climate change action by the society.

QF9: Climate change education and awareness interventions should target certain sections of society.

1. The rich people [ ]
2. The poor people [ ]
3. Both rich and poor people [ ]
4. Not sure [ ]

QF10: Climate change awareness and education tends to vary geographically between urban and rural dwellers.

QF11: South Africa has necessary human capital development to be able to respond adequately to climate change.

QF12: South Africa has adequate early warning systems in place to minimize negative impacts from climate change disasters.

QF13: How prepared is South Africa to deal with extreme weather events caused by climate change?

QF14: South Africa has adequate early warning systems and preparedness in place to minimize risk from climate change disasters.

QF15: How effective is communication to the public regarding the use and importance of early warning systems?

QF16: There is adequate science-policy interface to inform decision-making and policy options on climate change in South Africa.

QF17: Overall, how important is climate change education and awareness in responding to climate change impacts?

SECTION G: CROSS CUTTING QUESTIONS

QG1: The South African climate change management policy is flexible enough not to compromise socio-economic development of the country.

QG2: South Africa's climate change management policy is effective.

QG3: The following categories concerns you most about climate change policy response in South Africa.

Please tick five (5) as appropriate.

a) Bias towards mitigation [ ]
b) Bias towards adaptation [ ]
c) Lack of coordination [ ]
d) Poor implementation [ ]
e) Buy-in from civil society [ ]
f) Buy-in from business [ ]
g) Uncertainty of policy direction [ ]
h) Uncertainty of priorities [ ]
i) Unrealistic targets [ ]
j) Monitoring and evaluation [ ]
k) Lack of clarity on funding [ ]
l) Poor regulatory framework [ ]
m) None of the above [ ]

QG4: South Africa made significant trade-offs in developing South Africa's response to climate change.

QG5: How satisfied are you with the implementation of climate change management policy in South Africa?

QG6: How realistic do you think are the international commitments on Nationally Determined Contributions that South Africa has made on climate change?

QG7: The implementation of South Africa's policy response to climate change has been successful.

QG8: The South African climate change management policy adequately identify short-term (5 years, medium terms (10 years) and long-term (above 10 years) priorities.

APPENDIX 4: LETTERS OF APPROVAL TO CONDUCT RESEARCH

environmental affairs
Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

Private Bag X447, Pretoria, 0001, Environment House, 473 Steve Biko Road, Pretoria, 0002 Tel: +27 12 399 9000, Fax: +86 625 1042

Enquiries: Mr Tlou Ramaru **Tel:** 012 399 9134 **Email:** Tramaru@environment.gov.za

Mr Dumisani Emmanuel Mthembu
Senior Specialist: Multilateral Environmental Agreements
Department of Science and Technology
Private Bag X 894
PRETORIA
0001

Dear Mr Mthembu

PERMISSION TO CONDUCT RESEARCH: MR DUMISANI MTHEMBU (STUDENT NUMBER 62150618

I refer to your letter dated 27 November 2017, requesting permission to undertake an academic research: "An investigation of South Africa's policy response to climate change in the context of Sustainable Development Goals".

I am pleased to inform you that permission has been granted to proceed with your research provided the following issues are observed:

- Ensure confidentiality and information security as required by government at all times;
- Ensure privacy and confidentiality of your respondents that will participate in your study;
- Obtain informed consent from prospective respondents before they participate in the study;
- Use the data collected for the sole purpose of achieving the research objectives of the study; and Observe all relevant ethical standards so as not to compromise the integrity and the quality of the research.

Yours sincerely,

Mr Tlou Ramaru
Deputy Director-General (Acting): Climate Change and Air Quality
Date: 29/11/2017

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energy

Department:
Energy
REPUBLIC OF SOUTH AFRICA

DE 10

Enquiries: Mr MS Ramogayana
Tel: 012 406 7406

Mr DE Mthembu
Senior Specialist: Multilateral Environmental Agreements
Department of Science and Technology
Private Bag X 894
Pretoria

Dear Mr Mthembu

PERMISSION TO CONDUCT RESEARCH: MR DUMISANI MTHEMBU (STUDENT NUMBER 62150618

I refer to your letter dated 25 May 2018, requesting permission to undertake an academic research: "An investigation of South Africa's policy response to climate change in the context of Sustainable Development Goals".

I am pleased to inform you that permission has been granted to proceed with your research provided the following issues are observed:

- Ensure confidentiality and information security as required by government at all times;
- Ensure privacy and confidentiality of your respondents that will participate in your study;
- Obtain informed consent from prospective respondents before they participate in the study;
- Use the data collected for the sole purpose of achieving the research objectives of the study; and
- Observe all relevant ethical standards so as not to compromise the integrity and the quality of the research.

We wish you every success with your studies.

Yours faithfully

MS MOKGADI MODISE
ADDG: CLEAN ENERGY
DATE: 19/07/2018