Exploring South Africa's National Climate Change Response White Paper, 2011

Challenges and Prospects for Public Policy

M Madondo*
School of Public Management and Administration
University of Pretoria

H M Nkwana
School of Public Management and Administration
University of Pretoria

ABSTRACT

The *Constitution of the Republic of South Africa, 1996* enshrines the right of all citizens to an environment that is not detrimental to their health and well-being. Furthermore, the Constitution places an obligation on the South African government to protect this right through reasonable legislative and other measures. Climate change threatens the environmental right which everyone is entitled to and South Africa has been experiencing the effects caused by changes in the climatic conditions. Therefore, one of the actions adopted by South Africa, to protect the environment as stipulated in Section 24(b) of the Constitution, was the National Climate Change Response White Paper, 2011 (NCCR-WP). The Department of Environment, Forestry and Fisheries (DEFF), formerly known as the Department of Environmental Affairs (DEA) is the facilitating department whose role is to ensure the successful implementation of the NCCR-WP. A qualitative research approach in terms of a document analysis was used to acquire rich and detailed information for the research.

The article examines the state of climate change in South Africa, the role of the NCCR-WP as one of South Africa's climate change responses including the two primary objectives of the NCCR-WP, namely: climate change mitigation and climate change adaptation and the mitigation strategies outlined in the NCCR-WP. It discusses the DEFF's implementation of the NCCR-WP as well as the factors that negatively influence the implementation of the

NCCR-WP. The article also provides recommendations that may improve the overall implementation of the NCCR-WP.

INTRODUCTION

For more than a century, climate change has dominated the global agenda. By definition, climate change refers to the gradual change in expected weather patterns, this includes rainfall, temperature and wind (Riedy 2016:1). Climate change can also be defined as the slow and long-term change of the weather due to global warming – the continuous rise in the earth's temperature as a result of greenhouse gas emissions, for example, methane and carbon dioxide (CO_2) (Ho 2015:1). In general, the climate changes naturally over extended periods of time. However, the climate change referred to in this article is caused by human activities. May (2014:1) notes the following contribution of human activities: the burning of fossil fuel, oil and gas for energy, as one of the major causes which accelerates the process of a changing climate.

Planet earth is facing drastic weather changes, for example, increased temperatures (extreme hot and cold weather) as well as unpredictable rainfall patterns. Such changes to the climate threaten, among others, biodiversity, food and water security. The United Nations, through the United Nations Framework Convention on Climate Change (UNFCCC) is the cornerstone of the response to climate change at the global level. The UNFCCC, established in 1992, aims to inhibit human interference on climate change by encouraging countries to reduce greenhouse gas (GHG) emissions (UNFCCC 2020:1). South Africa is an active member of the UNFCCC and is also a signatory to international climate change agreements, namely, the Kyoto Protocol and the Paris Agreement – both operational accords to the UNFCCC. The Kyoto Protocol is a binding agreement which sets targets to reduce GHG emission to its signatories. The protocol acknowledges the role played by developed countries such as Russia, the United States of America (USA) and France during the industrialisation period. Therefore, targets are set based on the level of industrialisation of its signatories (United Nations Climate Change 2014:1). South Africa ratified the Kyoto Protocol as an acknowledgement of the seriousness of climate change, its threat to sustainable development and to curb the emission of GHGs (South Africa 2011:9).

The Paris Agreement, which South Africa signed in 2016, expands on signatories' commitments to reduce GHG emissions and further underscores the significance of capacity building, especially for developing countries to achieve their climate change objectives. Both these agreements provide a pathway for South

Africa to implement its own climate change mitigation and adaptation strategies. Hence, South Africa's response to climate change, through the NCCR-WP, is not only based on the Constitution, but is majorly influenced by the principles of the UNFCCC (South Africa 2011:5).

South Africa's energy production and economy are heavily reliant on coal, due to abundant coal reserves in the country. Thus, it is important for the country to have a sound strategy on transitioning from a high to a low carbon economy. It is for this reason that the introduction of the NCCR-WP in 2011 was another commitment made by the South African government to reduce its impact on the environment as well as protect the health and well-being of its citizenry.

As noted above a qualitative research approach was followed in terms of a document analysis. This unobtrusive method relates to the examination and exploration of existing texts and documents to find meaning and deeper understanding (Braun and Clarke 2013:42). Such documentation may include, among others, scholarly and newspaper articles, published and unpublished books, online or internet sources, journals and case study reports (Braun and Clarke 2013:151–153). In addition to the above, this study utilised the following official documents: departmental reports, strategic documents, action plans, policies and legislation. Furthermore, the study examined the NCCR-WP, and conducted a situational analysis of the mandate of this White Paper. For this research, an analysis of pre-existing documents granted the researcher an opportunity to scrutinise, interpret and understand matters related to the topic in question (Braun and Clarke 2013:153).

The data collected from, *inter alia*, government gazettes, legislation, reports, and articles was scrutinised and relevant information from the text was highlighted and notes were taken. The information collected was informed and guided by the research questions. Similar trends between the collected information were highlighted while meaningful information identified from the documents analysed was categorised based on and guided by the research questions of the study. For this study, document analysis was advantageous in interpreting texts and it provided insight into patterns and trends of the information found (Colorado State University 2019:1).

This article explores the overall implementation of the NCCR-WP. In this regard, the factors that affect the NCCR-WP's implementation are delved into and potential strategies that may contribute towards the implementation of the NCCR-WP are outlined. The article firstly contextualises the state of climate change in South Africa. It then discusses the context of the NCCR-WP as one of South Africa's climate change responses and explains the two primary objectives of the NCCR-WP, namely: climate change mitigation and climate change adaptation and highlights the mitigation strategies outlined in the NCCR-WP. It also highlights the role of the Department of Environment, Forestry and Fisheries (DEFF). This is followed by a discussion of several challenges which impeded the effective implementation of the

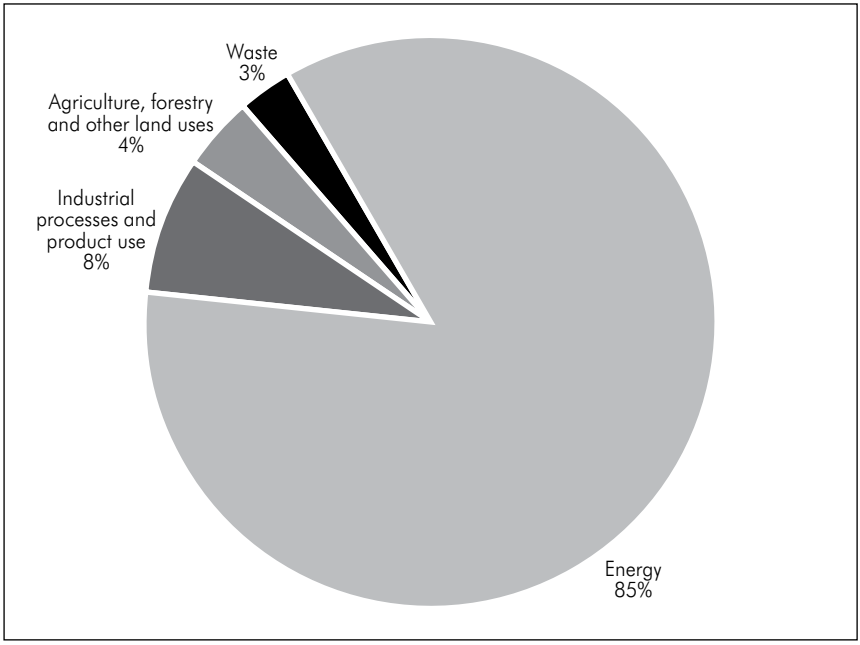
NCCR-WP. The article then discusses recommended strategies and the legislative framework to enhance policy implementation in terms of the NCCR-WP.

THE STATE OF CLIMATE CHANGE IN SOUTH AFRICA

The main driver of climate change is GHGs. As defined above, climate change is the increase in earth's temperatures due to global warming. The temperature increase occurs when there is excess GHGs trapped in the atmosphere, consequently reducing the amount of the sun's heat that returns back to space (Republic of South Africa 2011:8). The role of human activities such as fossil fuel burning and deforestation, has exacerbated the amount of GHG emissions in the air and has further reduced the otherwise natural absorption of GHGs by the ecosystem. At a global level, South Africa contributes 1% of the carbon dioxide emissions (Du Toit 2010:47). At a domestic level, the GHG emissions emitted based on the sectors are illustrated in Figure 1:

Given the above, South Africa has been experiencing the effects of a changing climate, recording extreme weather temperatures and rainfall. According to the

Figure 1: South Africa's (SA's) estimated greenhouse gas emissions by sector



Source: (Adapted from Botes 2013:1)

Long-Term Adaptation Scenarios, between 1960 and 2010, hot and cold extreme temperatures were recorded in the country annually (Department of Environmental Affairs 2013:2). Rainfall patterns were recorded as extreme trends, where there are intense rainfall patterns in some parts of the country and dry spells in other parts of the country, depending on the climate of each region. South Africa's first Annual Climate Change Report supports these findings and adds that increased temperatures were recorded in the 1970s, 80s and late 90s, the temperatures rose once again from 2011 (Department of Environmental Affairs 2016:15).

In 2015, four provinces, namely: KwaZulu-Natal, North-West, Mpumalanga, and Limpopo were pronounced drought disaster areas (Smillie, Wagner and Hoske 2016:1). The South African Weather Services (2019:2) notes that 2018 was the fourth warmest year recorded between 1981 and 2018. South Africa's second Climate Change Report states that the drought and limited rainfall experienced since 2015 led to water scarcity and crop losses (Department of Environmental Affairs 2017:7). Evidently, increasing heatwaves and extremely hot weather results in droughts while high and low rainfalls result in either floods or water scarcity. Given such unpredictable weather patterns, South Africa faces insecurities within its health, food, water and biodiversity sectors.

According to the DEA (2018:4), the Draft National Climate Change Response Strategy stipulates that South Africa's economy is dependent on the agriculture and mining sectors. Both these sectors require natural resources and energy production to thrive. Given this, climate change has a direct negative impact on these two sectors. The increasing temperatures as well as unpredictable rainfall patterns impede food production and water provision in the country. In terms of energy production, 90% of South Africa's energy is generated through coal (Cock 2019:1). South Africa is forced to diversify its energy mix by including renewable energy sources, in order to reduce the country's carbon footprint and transition to a low carbon economy. Further, it should be noted that while South Africa is a developing country, experiencing the intense impact of climate change, the country is also considered a significant contributor of GHG emissions (Van der Bank and Karsten 2019:2).

Climate change in South Africa has an adverse impact on a number of socio-economic areas. Table 1 depicts some of the socio-economic areas affected by climate change:

The DEA's (2016:29) first Annual Climate Change Report states that since 2000, there has been no evidence proving that climate change trends will improve. South Africa is expected to experience little rainfall, drought and high rainfalls in different parts of the country depending on regional climate. Unfortunately developing countries, such as South Africa, are the most vulnerable to the effects of climate change and yet they contributed the least to climate change compared to industrialised and most developed countries such as Russia and France. For developing

Table 1: Socio-economic areas affected by climate change

Sector	Climate trends	Consequences
Agriculture	Decreased rainfall Extreme rainfalls Heatwaves leading to dry spells/ drought	Decrease in crop production, water scarcity Extreme rainfall leading to soil erosion and impact other high water-sensitive crops Reduced water supply
Water	Extreme/high rainfalls in some parts of South Africa Reduced water quality and quantity in rivers, dams Increased weather temperatures	Increased rainfalls resulting in flooding Increased demand of water for commercial, industrial and residential use High temperatures resulting in evaporation of water from dams/rivers – leading to water scarcity
Health	The health sector is sensitive to both extreme weather temperatures and increased or decrease in rainfall patterns	High risk of diseases such as malaria, cholera, malnutrition and respiratory related illnesses Risk of new diseases arising due to water shortages
Human Settlements	Extreme high rainfalls, increased temperatures and low rainfalls	The coastal settlements are at risk of floods, rise in sea levels and hailstorms – leading to the displacement of residents Urban and rural settlements also risk facing drought and/or air pollution

Source: (Adapted from the Department of Environmental Affairs 2018:20)

countries, the lack of adequate resources (human, technology and financial) impedes the countries' strategies to effectively adapt to climate change, while domestic issues such as addressing poverty and inequality make it almost difficult for developing countries to transition from a high to a low carbon economy.

South Africa has a history of inequality that dates back to the era of apartheid and with almost 30 years of independence, this inequality is yet to be adequately managed. However, the DEA's third Annual Climate Change Report records that pending domestic issues such as poverty, lack of housing and high unemployment rates will only worsen with climate change (Department of Environmental Affairs 2018:17). The main victims in this regard will be the poor, who, for example, rely on the agriculture and mining sector for employment and food security and reside in squatter camps – where there are water and energy shortages.

Given the above background, climate change is evidently not only an environmental issue but a developmental issue as well, capable of undoing the progress made in built infrastructure, food, health, environmental and water sectors.

However, this article concedes that tackling climate change will not completely address the domestic issues currently faced by South Africa. There is still a long way to go in terms of managing the political-economic factors such as corruption, which are also obstacles to dealing with poverty and unemployment.

As much as it is important for political leaders to advocate for climate change, it may be difficult to do so if the population is not well-informed on what climate change is and its impact on their everyday livelihood. The agenda of climate change is not well-politicised as the focus is placed largely on "bread and butter issues" (Obradovich and Zimmerman 2016:296). Therefore, both the leadership and the public need to realise the significance of ensuring that domestic issues are addressed concurrently and simultaneously with the climate change issue.

THE NCCR-WP AS ONE OF SOUTH AFRICA'S CLIMATE CHANGE RESPONSES

Climate change is a reality in South Africa and the endorsement of the NCCR-WP was a much-needed response to act against this phenomenon. The NCCR-WP was established based on the stipulations of the *Constitution of the Republic of South Africa, 1996;* the National Environmental Management Act; the Millennium Declaration and the UNFCCC (Republic of South Africa 2011:12). The NCCR-WP outlines two primary objectives namely: climate change adaptation and climate change mitigation. The former is aimed at inhibiting the adverse effects of climate change, while the latter endeavours to limit GHG emissions. Adapting to and mitigating climate change will allow South Africa to transition towards a low-carbon economy and society as well as build a climate resilient thereto (Republic South Africa 2011:11).

Additionally, South Africa aims to contribute towards mitigating its GHG emissions as a responsible citizenry in the global community. In this regard, a fair contribution by South Africa, as well as the African continent, is based on the least GHG emissions (Republic of South Africa 2011:8). However, the South African government recognises that the effects of a changing climate have the potential of regressing the developmental progress that the country has made thus far. Therefore, as a developing country, with limited financial and technological resources, the need to adapt to climate change remains vital.

NCCR-WP's climate change objectives

The NCCR-WP has two primary objectives of the NCCR-WP, namely: climate change mitigation and climate change adaptation.

Climate change mitigation

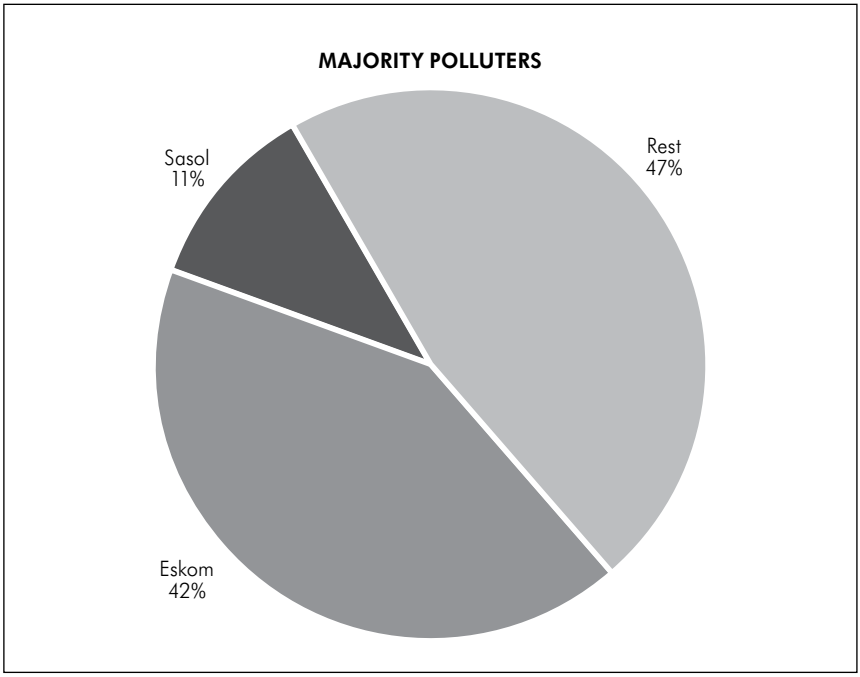
As mentioned previously, climate change mitigation refers to efforts taken to limit GHG emissions. The mitigation approach is based on two primary factors: first, making a fair contribution to limiting GHG emissions and second, considering South Africa's developmental and domestic priorities such as job creation and poverty reduction (Republic of South Africa 2011:25).

South Africa's economy is energy and emissions intensive, as its economy thrives on energy production as well as mining and minerals (Republic of South Africa 2011:26). In this regard, South Africa is ranked the 14th largest emitter of GHG emissions on a global scale. This ranking is due to the significant reliance on coal as a source of energy (McSweeney and Timperley 2018:1). Cock (2019:1) highlights the dependency on coal by asserting that 90% of South Africa's energy is produced through coal. Furthermore, the NCCR-WP (Republic of South Africa 2011:26) as well as Climate Transparency (2017:35) acknowledge that South Africa is the largest GHG emitter compared to other fast-growing economies such as China and India.

In addition to the above, South Africa is ranked the fifth largest coal producer as well as the third largest coal exporting country. Eskom, South Africa's largest energy generator, is ranked the seventh largest electricity producer in the world, while Sasol is considered the largest coal to chemicals producer (Eskom 2020:1). Given the above, Eskom (2020:1) provides a view that the dominance of coal over the energy industry is likely to remain for the forthcoming decades. The dependency on coal in South Africa is expected to remain unchanged because coal reserves are abundant, cost-effective and the infrastructure for coal-based electricity is well-established. Hence, it is difficult to find an equally competitive alternative to replace coal.

Though Eskom is South Africa's largest energy producer, the entity has also been embattled in mismanagement of state funds and corruption deals ranging from coal supply deals, coal mines purchasing deals and unlawful payments to contractors (Businesstech 2020:1). The success of South Africa's GHG emissions reduction rests mostly on Eskom and until the ongoing corrupt activities are resolved, it will be difficult for South Africa to fully realise its climate change objective. The transition to a low carbon economy requires the effective and efficient use of the state's already limited resources and equally important, requires openness to change and innovation. The introduction of renewable resources (and gradual reduction of coal use) into South Africa's energy mix will only be possible if the relevant actors (for example, the government, state entities, private sector, unions, employees) are willing to cooperate, compromise and accept the need for the shift. Figure 2 illustrates the top GHG emitting entities in South Africa.

Figure 2: GHG emitters in South Africa



Source: (Adapted from Burkhardt 2019)

MITIGATION STRATEGIES OUTLINED IN THE NCCR-WP

In an effort to shift from a high to a low carbon economy and society, South Africa needs to focus on reducing its emissions specifically from the energy sector, by managing energy supply and demand, promoting energy efficiency and introducing renewable energy sources. The mitigation strategies outlined in the NCCR-WP (South Africa 2011:27–29) include, inter alia:

National GHG Emissions Trajectory Range as benchmark

The National GHG Emissions Trajectory Range is a target period that South Africa set to measure the effectiveness of its mitigation strategy. This benchmark is utilised to monitor the country's GHG emissions according to the anticipated peak (from 2020–2025), plateau (2025–2035) and decline (from 2036 onwards) periods of GHG emissions. This benchmark further reveals the contribution and effort that South Africa is making towards reducing its carbon footprint.

The introduction of carbon budgets

According to the World-Wide Fund South Africa (2014:2), a carbon budget is an acceptable amount of GHG that can be emitted during a given period. The carbon budget approach requires energy consumers, for example, the mining and transport sectors including energy suppliers such as electricity and fuel sectors, to adhere to a set GHG emissions limit. The adherence to these carbon budgets will further assist in maintaining the National GHG Emissions Trajectory Range.

Establishing a GHG inventory

The introduction of a GHG Inventory allows the DEFF and the South African Weather Service (SAWS) to maintain an accurate, complete and updated record of the country's GHG emissions. The inventory provides a system of checks and balances to monitor and evaluate mitigation outcomes.

Climate change adaptation

The South African National Biodiversity Institute (SANBI) (2020:1) defines climate change adaptation as "looking for ways to live with the consequences of a turbulent climate". Unlike climate change mitigation, climate change adaptation focuses primarily on the local level, that is, adaptation strategies accentuate both the economy and society (Republic of South Africa 2011:16). Adaptation strategies in South Africa are mainstreamed in the following sectors: water, agriculture and commercial forestry, human settlements – including coastal, rural and urban areas, health, biodiversity and ecosystems as well as disaster risk reduction and management (Republic of South Africa 2011:17–24). Although this list of sectors is not exclusive, it focuses on the most vulnerable sectors to the effects of climate change. The aim of adaptation is to ensure that all sectors mainstream and plan climate change to create a climate resilient society.

Table 2 summarises climate change adaptation strategies in place thus far.

The Draft National Climate Change Adaptation Strategy (Draft NAS), guided by the NCCR-WP, was published for public comment in 2019. Upon endorsement, the Draft NAS will guide South Africa towards a common vision of creating a climate resilient economy and society. Astoundingly, the DEA's Draft NAS (2018:1) adopts a multi-sectorial and intergovernmental approach to climate change adaptation. In this regard, the Draft NAS acknowledges the significance of a bottom-up approach in adaptation interventions, the role of the local government as a leading body, and the inclusion and cooperation of businesses, civil societies, academia and technological organisations in building a

Table 2: Climate change adaptation plans by prioritised sector

Key sector	Plan	Responsible department
Water	National Climate Change Response Strategy for the Water Sector 2015 [Department of Water Services (DWS) 2015]	Department of Water and Sanitation
Health	National Climate Change and Health Adaptation Plan 2014–2019	Department of Health
Biodiversity	Climate Change Adaptation Plans for South Africa's Nine Major Biomes 2015a	DEFF
Human Settlements	Draft Climate Change Adaption Sector Strategy for Rural Human Settlements 2013b	Department of Human Settlements

Source: (Adapted from Department of Environmental Affairs 2016:13)

climate resilient economy and society (Department of Environmental Affairs 2017:10, 23–30).

THE ROLE OF THE DEPARTMENT OF ENVIRONMENT, FORESTRY AND FISHERIES (DEFF)

The reconfiguration of government departments in 2019 led to a change in the functions of departments responsible for climate change as well as food security. Prior to this reconfiguration, climate change was under the leadership of the DEA. Currently, the responsibility for climate change is vested in the DEFF. The DEFF facilitates, coordinates and implements the NCCR-WP in South Africa. In doing so, the DEFF upholds and promotes Section 24 of the *Constitution of the Republic of South Africa, 1996*. The DEFF's vision statement is to create "a prosperous and equitable society living in harmony with our natural resources". The mission of the department is to play a leading role in the management, conservation and protection of the environment for the benefit of the South African citizenry and the global community. Furthermore, the DEFF's mandate is to ensure an environment that is not harmful to the citizens' health and the protection of the environment for the benefit of present and future generations (Department of Environmental Affairs 2020:1). In order to achieve the above, the DEFF has a Branch: Climate Change, Air Quality and Sustainable Development, which focuses on climate change and any environmental related matters. The branch monitors, reports and leads all climate change responses at an international level as well as in the three spheres of government (National, Provincial and Local) in South Africa.

CHALLENGES IN CLIMATE CHANGE POLICY IMPLEMENTATION

According to Anderson (2015:225), policy implementation refers to "what is done to carry a law into effect, apply to the targeted population and achieve set goals". Furthermore, policy implementation focuses on the day-to-day activities undertaken by government officials. Cloete, de Coning, Wissink and Rabie (2018:197) postulate that policy implementation is the "conversion of physical and financial resources into service delivery outputs…aimed at achieving policy objectives".

Policy implementation, though a critical element of policymaking, has become overly complex, because the process involves too many actors, both at a domestic and international level (Cloete *et al.* 2018:205). Environmental policies such as the NCCR-WP, are influenced both by the national and international factors. The NCCR-WP functions at a domestic level to promote and safeguard the health and well-being of the public as well as protect the environment. At an international level, the NCCR-WP is a regulatory policy which seeks to uphold commitments stated under the UNFCCC to mitigate the effects of climate change. Below, several challenges which impeded the effective implementation of the NCCR-WP are discussed:

Policy misalignment, contradictions and indistinctness

The successful implementation of the NCCR-WP requires all policies to share one vision to achieve its objectives. However, there are issues of policy misalignment and contradictions between the NCCR-WP and other governmental policies. For example, the first objective of the National Energy Act (NEA), (34 of 2008:6) makes provision for an "uninterrupted supply of energy to the Republic". This NEA objective, in terms of energy supply, is ambiguous and is open to misinterpretation, because the country depends largely on coal for energy production. Furthermore, the National Planning Commission (2012) established the National Development Plan (NDP) 2030, which acknowledges the need to incorporate renewables such as solar and wind to the energy mix. However, the same NDP also states that renewable energy is too expensive, especially for mining industries, a crucial sector in uplifting the country's economy (National Planning Commission 2012:198). Nonetheless, the NDP still calls for renewables to be harnessed in parallel with fossil fuels.

Moreover, applications to postpone and be exempt from climate change mitigating strategies by the two largest GHG emitters, Eskom and Sasol diverts the implementation of the NCCR-WP. For example, according to the Centre for Environmental Rights (CER 2014:1), Eskom applied for postponement to comply with minimum air pollution emissions standards for 16 of its power stations in 2014.

Eskom was exempt from complying with the National Environment Management Air Quality Act (NEMAQA), (39 of 2004), following its application for an extension under Section 59 of the NEMAQA (Kings and Wild 2015:3). The utility has a history of postponing applications. Currently, it is on its fifth such application for postponement. The latest application in 2020, requests a delay in meeting the April 2020 pollution limits for its coal power plants (CER 2020:1). Furthermore, the government historically approved the construction of another Sasol coal-to-liquids (CTL) plant (Earthlife and Oxfam 2009:32). Given South Africa's struggle to limit its carbon footprint, the government's approval of these postponement requests, provides an avenue for the country's largest air polluters to use economic and social development as justification to delay compliance (Du Toit 2010:107).

Moreover, the issue of ambiguity in the NCCR-WP ought to be addressed. It has been nine years since the NCRR-WP was endorsed; however, there are aspects in the White Paper which remain pending and unclear. The issue of policy review and alignment was supposed to have been addressed within two years of the publication of the NCCR-WP (Republic of South Africa 2011:6) but to date, policies review and alignment challenges are still raised. Furthermore, the NCCR-WP (Republic of South Africa 2011:29) also states that for the purposes of keeping an updated and accurate GHG emissions inventory, reporting this data by emitters will become mandatory. However, to date, the inventory is incomplete owing to the unavailability of data and timeous submission of the emissions information from the relevant entities. Given the above challenges, the implementation of the NCCR-WP is delayed due to the lack of conformity in policies.

Inadequate climate change education and communication

The NCCR-WP is based on principles of equity, informed participation, behavioural change and communication (Republic of South Africa 2011:6). However, Smith (2013:49, 57) posits that the NCCR-WP does neither provide measures of how the government will incorporate climate change in training and education nor state ways through which it will raise awareness among the public. Furthermore, the NCCR-WP does not accentuate and address the role of the media in the provision and dissemination of information on climate change to address the behavioural mindset and promote awareness. Moreover, there is a need to address the tone, type and simplicity of language utilised to communicate matters pertaining to climate change. South Africa, although a leading developing country in Africa with the second-best economy has a mere 41% of its citizenry who have an idea of what "climate change" is (Selormey, Dome, Osse and Logan 2019:2). Furthermore, the inclusion of climate change in pre-school education has been neglected (Letheko 2014:79). There is also a lack of elaboration of how to enhance teaching climate change at tertiary and sector training level.

Compliance and enforcement challenges

Absolute compliance to climate change and environmental related regulations and legislation is vital to enhance the implementation of the NCCR-WP. However, there are several instances which reveal that NCCR-WP compliance and enforcement is a major concern. As mentioned above, there have been a number of instances of requests for postponements by Eskom to adhere to standards of air pollution. Furthermore, submission of information, for example, GHG emissions data is conducted primarily on a voluntary basis. This results in inaccurate and delayed climate change related reports. For example, compliance with the carbon budgets was voluntary until the end of 2020 (Szabo 2018:1). Unlike the Environmental Management Inspectorate formulated under the National Environmental Management Amendment Act, (62 of 2008), the NCCR-WP does not have an inspectorate to oversee its implementation measures (Department of Environmental Affairs 2019:1).

Other noteworthy challenges include the lack of adequate financial resources to execute projects related to achieving the identified climate change objectives. Most funding for climate change in South Africa is lobbied from bilateral relationships such as that with Germany. South Africa's political and economic environment is deemed unfavourable for investors, owning to the negative credit downgrades from the credit agency, Fitch (Mahlaka 2019:1). A negative credit worthiness increases borrowing, interest rates, and lowers economic growth. Moreover, there is a lack of climate change champions, a calibre of personnel who are academically qualified, adequately skilled and equally important, dedicated and committed to address climate change.

RECOMMENDED STRATEGIES TO ENHANCE POLICY IMPLEMENTATION IN TERMS OF THE NCCR-WP

There are several strategies which can be utilised to address the abovementioned challenges facing the overall implementation of the NCCR-WP.

Policy review and alignment

For proper policy implementation, it is imperative that the policy is clear on the what and how aspects of implementation. Bhuyan, Jorgensen and Sharma (2010:5) identify seven dimensions which influence the successful implementation of policies. One of these dimensions is: goals, objectives, strategies and the target population of the policy should be clear. The implementation of policies phase has to contend with several challenges, regardless of how the policy

content has been formulated. Therefore, to avoid the problems which the NCCR-WP is facing, there is a need to review the policy thoroughly based on the challenges mentioned above. Policy implementers rely on the clarity and unambiguity of the policy content. Therefore, any confusion or misunderstanding will lead to the incorrect or non-implementation of the NCCR-WP. Furthermore, during the policy review phase, it is important to clearly outline which as well as how the activities should be executed. This is especially concerning climate change education, communication and media.

Policy alignment at this stage is equally important. Climate change is a cross-cutting issue which stretches across various sectors and boundaries such as energy, health, agriculture, water and transport. Therefore, government departments' policies and regulations need to reflect a common goal and a shared vision. There is a need for coordination among government departments and state entities to implement the NCCR-WP effectively. This is possible once the policies which form the foundation and mandates of government departments and state entities are aligned properly to the NCCR-WP.

Sound education and communication system

The dissemination of climate change related information to the public plays a major role in explaining and informing the target population about matters that affect their daily lives. However, since only 41% of South Africans are knowledgeable about the term climate change, there is a need to rethink the simplicity of the language used to disseminate information. South Africa is a diverse, multicultural and multilingual country. Therefore, it is important that it considers the utilisation of its indigenous languages to reach its target population and explain the impact of climate change on everyday living. Furthermore, the climate change language needs to be simplified and exclude scientific terms which would disadvantage the population's understanding of the phenomenon.

In terms of the education system, the NCCR-WP acknowledges the need to incorporate aspects of climate change from pre-school level. In this way, values of the significance of the environment are taught at a young age and better decision-making will be fostered in adulthood. In this instance, laying a foundation that allows for climate change and environmental learning is equally important. Furthermore, South Africa should not only ensure mainstreaming climate change in Sector Educational Training Authorities (SETAs) but also consider establishing a SETA which focuses on the environment and climate change related matters. All of the above will work efficiently if the NCCR-WP reviews its policy to ensure the inclusion and elaboration of education, communication and media as tools of behavioural change, raise awareness and informed participation by the citizenry.

Legislative framework for climate change

The NCCR-WP is currently the pillar of South Africa's response to climate change. However, the NCCR-WP is a regulatory document, which lacks enforcement to implement its measures. The NCCR-WP has been in place since 2011, that is, almost a decade with certain noticeable progress. However, it is time South Africa provides a legal basis to expedite the country's climate change objectives and its implementation process. A legislative framework is required to guide the country's response to climate change. Once signed into law, the Climate Change Bill will enhance the implementation of climate change objectives. Furthermore, the establishment of a climate change enforcement body should be considered, namely: an Environmental Management Inspectorate responsible for overseeing, investigating and inspecting all climate change related measures.

Equally important the successful implementation of a policy depends substantially on the availability of resources, which may include: technology, finance as well as human resources. In terms of adequate personnel, the DEFF is responsible to ensure that implementing officials are adequately qualified, knowledgeable, skilled, and constantly trained on policies to inhibit any confusion when implementing the NCCR-WP. However, the implementation of the NCCR-WP also requires climate change champions, personnel who do not only possess the above qualities but bring with them qualities such as dedication and commitment to the cause. The policy implementers' own judgement of its requirements and understanding thereof plays a major role in which implementers' skills and practice are required. Financially, South Africa needs to maintain a conducive and stable political, social and economic environment to attract investors and lobby more funds to address the climate change related projects.

CONCLUSION

Climate change is evidently one of the fast-growing threats defining this century. The effects of climate change are felt by both developed and developing countries. However, more so the latter countries due to inadequate resources to respond to the impact of climate change proactively and reactively. South Africa, through the NCCR-WP has adopted measures to adapt to and mitigate the effects of a changing climate. This article examined the implementation of the NCCR-WP by the DEFF. The factors that influence the implementation of the NCCR-WP were outlined. The article further provided recommendations that may contribute to the overall improvement of the implementation of the NCCR-WP.

NOTE

* This article is based on an unpublished Master's dissertation by Martha Madondo under the supervision of Dr Hunadi Mapula Nkwana completed at the University of Pretoria. The dissertation is titled: *Analysing the Department of Environmental Affairs, Fisheries and Forestry's implementation of the National Climate Change White Paper, 2011.*

REFERENCES

Anderson, J.E. 2015. *Public Policy-Making: An Introduction.* 8th Edition. Boston, MA: Cengage Learning.

Bhuyan, A. Jorgensen, A. and Sharma, S. 2010. *Taking the Pulse of Policy: The Policy Implementation Assessment Tool.* Washington, DC: Futures Group, Health Policy Initiative.

Braun, V. and Clarke, V. 2013. *Successful Qualitative Research: A practical guide for beginners.* 1st Edition. Los Angeles, LA: Sage.

Bryman, A. and Bell, E. 2011. *Business research methods.* 3rd Edition. New York, NY: Oxford University Press.

Burkhardt, P. 2019. Eskom, Sasol Emit over Half of S. Africa's Greenhouse Gas. Available at: **https://www.bloomberg.com/news/articles/2019-07-30/eskom-sasol-emit-over-half-of-south-africa-s-greenhouse-gas**. (Accessed on 24 March 2020).

Businesstech. 2020. Special Investigating Unit picks at Eskom scabs to reveal the rot of corruption. Available at: **https://businesstech.co.za/news/energy/440827/special-investigating-unit-picks-at-eskom-scabs-to-reveal-the-rot-of-corruption**. (Accessed on 05 July 2021).

Botes, A. 2013. What is Carbon. Available at: **http://www.urbanearth.co.za/articles/what-carbon**. (Accessed on 29 April 2018).

Centre for Environmental Rights (CER). 2014. Eskom's applications to delay compliance with emissions standards opposed by civil society groups. Available at: **https://cer.org.za/news/eskoms-applications-to-delay-compliance-with-emissions-standards-opposed-by-civil-society-groups**. (Accessed on 24 March 2020).

Centre for Environmental Rights (CER). 2020. NGOs challenge Eskom's latest application to escape compliance with air pollution laws. Available at: **https://cer.org.za/news/ngos-challenge-eskoms-latest-application-to-escape-compliance-with-air-pollution-laws**. (Accessed on 24 March 2020).

Climate Transparency. 2017. Brown to Green: The G20 Transition to a Low-Carbon Economy, Climate Transparency. Available at: **https://www.climate-transparency.org/wp-content/uploads/2017/07/Brown-to-Green-Report-2017_web.pdf**. (Accessed on 24 March 2020).

Cloete, F., De Coning, C., Wissink, H. and Rabie, B. 2018. *Improving Public Policy for Good Governance.* 4th Edition. Pretoria: Van Schaik.

Cock, J. 2019. South Africa must end its coal habit. But it's at odds about when and how. Available at: **https://www.wits.ac.za/news/latest-news/opinion/2019/2019-03/south-africa-must-end-its-coal-habit-but-its-at-odds-about-when-and-how.html**. (Accessed on 14 March 2020).

Colorado State University. 2019. Advantages of content analysis. Available at: **https://writing.colostate.edu/guides/page.cfm?pageid=1318&guideid=61**. (Accessed on 01 May 2019).

Department of Energy. 2008. National Energy Act, 2008 (Act 34 of 2008). Pretoria: Government Printer.

Department of Environmental Affairs. 2004. National Environment Management Air Quality Act, 2004 (Act 39 of 2004). Pretoria: Government Printer.

Department of Environmental Affairs. 2013. Long-Term Adaptation Scenarios Flagship Research Programme (LTAS) for South Africa. Summary for Policy-Makers. Pretoria: South Africa.

Department of Environmental Affairs. 2016. South Africa's 1st Annual Climate Change Report. Pretoria: Department of Environmental Affairs. Available at: **https://www.environment.gov.za/sites/default/files/reports/themeC_vulnerabilities_risks.pdf** (Accessed on 22 June 2021).

Department of Environmental Affairs. 2017. South Africa's 2nd Annual Climate Change Report. Pretoria: Department of Environmental Affairs. Available at: **https://www.environment.gov.za/sites/default/files/reports/southafrica_secondnational_climatechnage_report2017.pdf**. (Accessed on 14 March 2020).

Department of Environmental Affairs. 2017. Draft National Climate Change Adaptation Strategy. Pretoria. Available at: **https://www.environment.gov.za/sites/default/files/legislations/session2_draftnational_adaptationstrategy.pdf**. (Accessed on 09 February 2020).

Department of Environmental Affairs, 2018. Draft National Climate Change Adaptation Strategy. Pretoria. Government Printers. Available at: **https://cer.org.za/wp-content/uploads/2019/05/DEA-Draft-climate-change-adaptation-strategy.pdf**. (Accessed on 09 February 2020).

Department of Environmental Affairs. 2018. South Africa's 3rd Annual Climate Change Report. Pretoria: Department of Environmental Affairs. Available at: **https://www.environment.gov.za/sites/default/files/reports/SouthAfricas-3rd-climate-change-report2017.pdf**. (Accessed 02 July 2021).

Department of Environmental Affairs. 2019. About Environmental Management Inspectorate (EMI). Available at: **https://www.environment.gov.za/projectsprogrammes/ emi/about**. (Accessed on 24 March 2020).

Department of Environmental Affairs. 2020. Overview of the Department. Available at: **https://www.environment.gov.za/aboutus/department**. (Accessed on 24 March 2020).

Department of Environment, Forestry and Fisheries. 2020. National GHG Inventory Report South Africa 2000–2017. Available at: **https://cer.org.za/wp-content/uploads/2020/09/Draft-7th-National-Greenhouse-Gas-Inventory-Report-for-the-Republic-of-South-Africa-for-public-comment.pdf**. (Accessed on 22 June 2021).

Du Toit, L. 2010. Towards an Effective Climate Change Regime in South Africa: Policy and Legal Developments. Thesis. LLM. University of Cape Town.

Eskom, 2020. Coal Power. Available at: **http://www.eskom.co.za/AboutElectricity/ElectricityTechnologies/Pages/Coal_Power.aspx**. (Accessed on 24 March 2020).

Earthlife and Oxfam International. 2009. Climate Change, Development and Energy Problems in South Africa: Another World is Possible. Available at: **https://d1tn3vj7xz9fdh.cloudfront.net/s3fs-public/file_attachments/oi_climate_change _ south_africa_3.pdf**. (Accessed on 26 October 2018).

Eskom. 2020. Coal Power. Available at: **https://www.eskom.co.za/AboutElectricity/ElectricityTechnologies/Pages/Coal_Power.aspx**. (Accessed on 16 November 2020).

Ho, U. 2015. The future is in our hands. *The Star: Advertising Feature*. November 2015.

Kings, S. and Wild, S. 2015. Eight ways to turn before we burn. *Mail and Guardian*. 15/12/04.

Letheko, M. 2014. Children and Youth as Agents of Climate Change Impact in South Africa. *Commonwealth Youth and Development*. 12(1):74–91.

Mahlaka, R. 2019. Fitch downgrade of South Africa's credit rating outlook could be a wake-up call for Moody's. Available at: **https://www.dailymaverick.co.za/article/2019-07-28-fitch-downgrade-of-south-africas-credit-rating-outlook-could-be-a-wake-up-call-for-moodys**. (Accessed on 15 October 2019).

May, S. 2014. What is Climate Change. Available at: **https://www.nasa.gov/audience/forstudents/k-4/stories/nasa-knows/what-is-climate-change-k4.html**. (Accessed on 14 March 2020).

McSweeny, R. and Timperley, J. 2018. The Carbon Brief Profile: South Africa. Available at: **https://www.carbonbrief.org/the-carbon-brief-profile-south-africa**. (Accessed on 24 March 2020).

National Planning Commission. 2012. National Development Plan 2030. Our Future Make it Work. ISBN 978-0-621-41180-5. Available at: **https://www.gov.za/sites/default/files/gcis_document/201409/ndp-2030-our-future-make-it-workr.pdf**. (Accessed on 29 December 2018).

Obradovich, N. and Zimmerman, B. 2016. African voters indicate lack of support for climate change policies. *Journal of Environmental Science & Policy*. Available at: **https://doi.org/10.1016/j.envsci.2016.06.013**. (Accessed on 26 October 2018).

Republic of South Africa. 1996. *Constitution of the Republic of South Africa, 1996*. Pretoria: Government Printers.

Republic of South Africa. 2011. *National Climate Response White Paper, 2011*. Pretoria: Government Printers. South African Weather Service. 2019. *Annual Climate Summary for South Africa 2018*. Pretoria: Government Printer. Available: **https://www.weathersa.co.za/Documents/Corporate/Annual%20Climate%20Summary%202018%20FINAL.pdf**. (Accessed 02 July 2021).

Riedy, C. 2016. Climate Change. Available at: **https://www.researchgate.net/publication/311301385_Climate_Change**. (Accessed on 14 March 2020).

Selormey, E.E., Dome, M.Z., Osse, L. and Logan. C. 2019. Change Ahead: Experience and Awareness of Climate Change in Africa. Available at: **https://africacenter.org /security-article/change-ahead-experience-and-awareness-of-climate-change-in-africa**. (Accessed on 24 March 2020).

Smillie, S., Wagner, L. and Hosken, G. 2016. SA Drought Disaster. Available at: **http://www.heraldlive.co.za/sa-drought-disaster**. (Accessed on 25 November 2015).

Smith, S. 2013. Climate Change and South Africa: A Critical Analysis of the National Climate Change Response White Paper and the Push for Tangible Practices and Media-Driven Initiatives. *Global Media Journal: African Edition*. 7(1):47–66.

South African National Biodiversity Institute (SANBI). 2020. What is Climate Change Adaptation? Available at: **https://www.sanbi.org/biodiversity/science-into-policy-action/nie-adaptation-fund/climate-change-adaptation**. (Accessed on 24 March 2020).

Szabo, M. 2018. South African Government Proposes Painful Penalties for Emitters that Exceed Carbon Budgets. Available at: **http://climateneutralgroup.co.za/south-african-govt-proposes-painful-penalties-emitters-exceed-carbon-budgets**. (Accessed on 20 January 2020).

United Nations Framework Convention on Climate Change (UNFCCC). 2020. What is the United Nations Framework Convention on Climate Change? Available at: **https://unfccc.int/process-and-meetings/the-convention/what-is-the-united-nations-framework-convention-on-climate-change**. (Accessed on 14 March 2020).

United Nations Climate Change. 2014. Kyoto Protocol. Available at: **http://unfccc.int/kyoto_protocol/items/2830.php** (Accessed on 07 April 2018).

Van der Bank, M. and Karsten, J. 2019. Climate Change and South Africa: A Critical Analysis of the Earthlife Africa Johannesburg and Another v Minister of Energy and Others 65662/16 (2017) Case and the Drive for Concrete Climate Practices. *Air, Soil and Water Research,* 13: 1–11. Available at: **https://journals.sagepub.com/doi/pdf/10.1177/1178622119885372**. (Accessed on 14 March 2020).

World-Wide Fund South Africa. 2014. Understanding Carbon Budgets. Available at: **http://awsassets.wwf.org.za/downloads/understanding_carbon_budgets_final.pdf**. (Accessed on 24 March 2020).

AUTHORS' CONTACT DETAILS

M Madondo
University of Pretoria
School of Public Management and Administration
Private Bag X20
Hatfield
0028
marthamadondo@gmail.com

Dr H M Nkwana
University of Pretoria
School of Public Management and Administration
Private Bag X20
Hatfield
0028
Mapula.nkwana@up.ac.za