

**A Legal and Policy Framework
for Addressing Climate Change
in the Western Cape Province,
South Africa**

by

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DECLARATION

I declare that the mini-dissertation hereby submitted to the University of Limpopo, for the degree of Master of Philosophy in Environmental Law & Management, has not previously been submitted by me for a degree at this or any other university; that it is my work in design and in execution, and that all material contained herein has been duly acknowledged.

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Date

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COMMONLY USED ABBREVIATIONS

AEL	Atmospheric Emission License
APINA	Atmospheric Pollution Information Network for Africa
APPA	Atmospheric Pollution Prevention Act 45 of 1965
AQA	National Environmental Management: Air Quality Act 39 of 2004
AQM	Air Quality Management
AQMP	Air Quality Management Plan
AQO	AIR Quality Officer
BAT	Best Available Technology
BATNEEC	Best Available Technology Not Entailing Excessive Cost
CAPCO	Chief Air Pollution Control Officer
CDM	Clean Development Mechanism
DEADP	Department of Environmental Affairs and Development Planning
DEAT	Department of Environmental Affairs and Tourism
DME	Department of Minerals and Energy
DoA	Department of Agriculture
DoE	Department of Energy
DWAF	Department of Water Affairs and Forestry
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan as defined in the NEMA
GHGs	Greenhouse Gases
IDP	Integrated Development Plan
IP&WM	Integrated Pollution and Waste Management
MEC	Minister of the Executive Council
MINMEC	A standing intergovernmental body consisting of at least a Cabinet member and members of the provincial Executive Councils responsible for functional areas similar to those of the Cabinet member
NEAF	National Environmental Advisory Forum as defined in the NEMA.
NEMA	National Environmental Management Act 107 of 1998
NEPAD	New Partnership for Africa's Development
NGOs	Non-Governmental Organizations
PM	Particulate matter
SADC	Southern Africa Development Community
UNFCCC	United Nations Framework Convention on Climate Change, adopted in New York in 1997

ABSTRACT

In recent years, a lot has been said about global warming and climate change. Governments and Institutions have been congregating more frequently all over the world. The subject of global warming and climate change is believed to be a ticking time bomb, which can have catastrophic effects on the existence of the human race and other living organisms. This led me to think and ponder about all our coastal towns in South Africa. What would happen if the melting of the glaciers continues and the sea levels rise by over two meters? This surely is a recipe for disaster and hence a look at the Western Cape Province was really necessary to find out on the province and the country's preparedness.

Climate change has been scientifically proven to be occurring and is being aggravated by industrialisation¹. With South Africa being the 19th Green House Gas (GHG) emitter in the world, the government should definitely take action by either mitigating or adapting to these effects.² Rightly so, something is being done not only at national level, but at a regional and international level.

A number of treaties, conventions and protocols to do with climate change and its related effects have been passed and ratified by most countries. The most notable international protocol is the United Nations Framework Convention for Climate Change's (UNFCCC) Kyoto protocol. At a regional level, New Partnership for Africa's Development (NEPAD) and the Southern Africa Development Community (SADC), have come in support of environmental initiatives like the Atmospheric Pollution Information Network for Africa (APINA). The Western Cape Province, in line with most of these agreements and national strategies, have come up with their own policies in trying to mitigate and/or adapt to climate change.

¹ Glazewski, J. Environmental Law of South Africa, 2nd Edition, 2005 Butterworths, Durban page 586

² Petrie B, et al.2007, Climate Change Strategy and Action Plan: The Clean Development Mechanism and the Western Cape, 2007

The mini-dissertation will endeavour to discuss all these issues, principles and mechanisms that have been put in place at various levels followed by a discussion on the strategies in the Western Cape Pro

TABLE OF CONTENTS

1.	Chapter 1: Background	1
1.1	Overview	1
1.2	Study Area	3
1.3	Statement of the Problem	4
1.4	Purpose of Study	5
1.5	Justification of Study	6
1.6	Research Design and Methodology	7
2.	Chapter 2: International and Regional Policy Review	9
3.	Chapter 3: National Policy Review	17
4.	Chapter 4: Western Cape Policy Review	26
5.	Chapter 5: Conclusions, Recommendations and Proposals	33
6.	References	36
7.	Glossary of Terms	39

FIGURES

Figure 1:	Western Cape Province, South Africa	3
Figure 2:	Diagrammatic representation of adaptation and mitigation issue	17

CHAPTER 1: BACKGROUND

1.1 OVERVIEW

Climatic change and variability together with global warming has become a widely discussed topic the world over. A lot of books have been written, journals have been published, documentaries have been made and movies have been shot. This is mainly because it results in negative socio-economic effects on life, especially humans.

Climate change and variability is not a new phenomenon as it has always been occurring naturally. It however, has been aggravated by human activities for example, the burning of fossil fuels, uncontrolled veld fires, exhaust fumes from cars and trucks, burning and disposal of waste. These anthropogenic activities alter the composition of the global atmosphere and consequently contribute towards natural variability over a comparable period of time. These changes have socio-economic impacts on agriculture, water resources, energy demand and ecosystems³.

Global warming can be defined as the enhancement of the natural Green House Gas (GHG) effect, which is a process by which Green House Gases (GHGs) in the atmosphere absorb long wave radiation that is emitted by the earth's surface. This results in increasing the atmospheric energy as a result of the increase in the concentrations of the GHG leading to an increase in the global temperature and associated changes.⁴

Greenhouse gas control management has therefore become the most discussed issue internationally, nationally and even at provincial and local levels. The main drive for these discussions is the United Nations Framework Convention on Climate Change (UNFCCC)'s Kyoto Protocol⁵ of which South Africa has already ratified⁶. As part of international law, countries that ratify a certain law should abide by the "rules"⁷.

³ Glazewski, J. Environmental Law of South Africa, 2nd Edition, 2005 Butterworths, Durban page 586

⁴ Midgely GF, et al. A Status Quo, Vulnerability and Adaptation Assessment of the Physical and Socio-Economic Effects of Climate change in the Western Cape, 2005

⁵ United Nations Framework Convention on Climate Change (UNFCCC)'s Kyoto Protocol, 1997

⁶ National Framework for Air Quality Management in South Africa, 2007

⁷ UNFCCC Kyoto Protocol, 1997, Article 24

Briefly, the Kyoto Protocol propagates that developed countries (Annex 1) should reduce their GHG emissions by 5.2% compared to the 1990 levels between the period 2008 to 2012⁸. Three principle mechanisms have been proposed in the Kyoto Protocol which can be used to achieve these goals;

- The Cleaner Development Mechanism (CDM) Article 12⁹, which assists sustainable development and use of cleaner technology by developing nations (Non-Annex 1). This is being done through the support of GHG emission reduction projects in developing nations by the developed countries. This allows the investor to gain Certified Emissions Credits for themselves or they can also buy Certified Emission Reductions from someone who would have invested in such a project. The South African Department of Minerals and Energy (DME) has already set up the Designated National Authority (DNA) in line with the requirements of the Kyoto Protocol. This branch is involved with encouraging industry and the general public to use cleaner ways.
- Joint Implementation (JI)¹⁰, Article 6, mechanism involves the implementation of GHG emission reduction projects between a developed country and a so-called economy in transition. The developed country will then buy Certified Emission Reductions (CERs) from the economy in transition.
- The Emission Trading (ET)¹¹, Article 17, mechanism involves the trading of carbon credits. The principle being that a party with a legal obligation to limit emissions can pay another party with lower emissions so as to be allowed to emit the excess on their behalf.

Closely linked to the Kyoto Protocol is the Montreal Protocol¹² on substances that deplete the ozone layer which advocates for the elimination of chloroflorocarbons, halons, methyl bromide, hydrochloroflorocarbons and methyl chloroform.

South Africa (RSA) has already made strides towards addressing some of the issues related to climate change and global warming. Whatever commitments have been made at national level are also supposed to be implemented at a provincial level. In

⁸ United Nations Framework Convention on Climate Change, (UNFCCC) Kyoto Protocol, 1997, Article 3

⁹ UNFCCC Kyoto Protocol, 1997, Article 12

¹⁰ UNFCCC Kyoto Protocol, 1997, Article 6

¹¹ UNFCCC Kyoto Protocol, 1997, Article 17

¹² United Nations Montreal Protocol, 1987

this case South Africa's ratification of the Kyoto Protocol and associated international laws on climatic change implies that there is need to;

- (a) set up systems like the preparation and update of Emissions Inventory of GHG, Article 7¹³ read in conjunction with Article 4,
- (b) formulate and implement policies to mitigate and adapt to Climatic Change, Article 10¹⁴,
- (c) promote cooperative development in areas of technology and Cleaner Practices (Article 4.5)¹⁵ of the UNFCCC,
- (d) promote Sustainable Development, Article 12¹⁶, and
- (e) promote public participation processes (PPP), training and education, Article 10e¹⁷.

1.2 STUDY AREA

The Western Cape is one of the nine provinces of South Africa. It is situated on the south-western tip of the African continent. In total the Western Cape includes an area of 129, 386 km² and has an approximate population of 4.2 million people, living in the province, the majority of whom are Afrikaans-speaking. The other official languages are English and Xhosa.¹⁸

The Province is constituted of five Districts namely, Cape Winelands, Central Karoo, Eden, Overberg and the West Coast. There is also one metro *viz* Cape Town which harbours most of the manufacturing industries and very beautiful tourist attraction centres.

¹³ UNFCCC Kyoto Protocol, 1997, Article 7

¹⁴ UNFCCC Kyoto Protocol, 1997, Article 10

¹⁵ UNFCCC Kyoto Protocol, 1997, Article 4.5

¹⁶ UNFCCC Kyoto Protocol, 1997, Article 12

¹⁷ UNFCCC Kyoto Protocol, 1997, Article 10e

¹⁸ <<http://www.cape-town.net>>



Figure 1: Western Cape Province, South Africa (Adapted from <http://www.cape-town.net>)

1.3 STATEMENT OF THE PROBLEM

The world has been grappling with one disaster after another in the past few years. Such disasters include floods, heavy winds, drought melting of the glaciers and uncontrollable fires. What has come out from a review of most incidences has been linked to global warming and climate change by several scientists. These experts have suggested that anthropogenic activities are causing changes to the composition of the atmosphere. This in turn has resulted in atmospheric and ocean temperature increases, accelerated glacier and polar ice melt, induced shifts in the timing of growing seasons,

and even shifts in the geographic distribution of natural species¹⁹. This surely is a recipe for disaster. What are the current effects of climate change on our ecology, biodiversity, water resources, alien invasive species, coasts, our livelihood, rivers, estuaries and wetlands? Since most of the effects have dire consequences especially around coastal areas, a decision was made to focus on the Western Cape province of South Africa.

According to the Status Quo Report on Vulnerability and Adaptation of the Physical and Socio-Economic Effects of climate change in the Western Cape Province published in 2005, the Western Cape has already started experiencing some of the climate change effects. Scientists have projected that there will be a drying trend from the west towards the east. Rainfall patterns will be affected as they become more and more irregular, but will increase in intensity, with more summer rainfall and a decrease in the winter rainfall. Temperatures will also rise.²⁰

It is therefore important to determine if there are any policies and strategies in place that can be used in addressing climate change concerns. There is need to ascertain if the policies and strategies are adequate and aligned with the international conventions and protocols. Do they support the global picture and to what extent? What are the institutional structures in place in the Western Cape? Are there institutions and institutional arrangements in place that deal with climate change and global warming and are also in support of CDM project development?

1.4 PURPOSE OF STUDY

This study will focus on establishing whether;

1. the legislation, policies and strategies being implemented or generated in the Western Cape,
2. the institutions and institutional arrangements in place in the Western Cape, and

¹⁹ ¹⁹ Midgely GF, et al. A Status Quo, Vulnerability and Adaptation Assessment of the Physical and Socio-Economic Effects of Climate change in the Western Cape, 2005

²⁰ Midgely GF, et al. A Status Quo, Vulnerability and Adaptation Assessment of the Physical and Socio-Economic Effects of Climate change in the Western Cape, 2005

3. the effects of the above policies and institutions on Clean Development Mechanism (CDM) project implementation in the Western Cape, adequately address climate change concerns.

The paper will also be written in a way that will allow for further detailed research on the topic in other provinces.

1.5 JUSTIFICATION OF STUDY

The Western Cape and the Gauteng Provinces have been found to be in the forefront when it comes to implementing most of the strategies due to the current disturbing weather patterns and industrialisation. In the 2003/2004 season, a severe drought hit the Western Cape which resulted in the Province's Premier declaring a State of Emergency.²¹ A Specialist task team of Scientists was assembled and mandated to conduct Climatic Change Studies. The team confirmed that the Western Cape had a problem and faced challenges of climate change. The recent fire eruptions in the area have also increased in frequency and intensity. There are also further changes which have been identified along the coastal areas, for example, the biodiversity, wind speeds, wind direction, and the presence of alien invasive species²².

There are therefore a number of policy and framework documents that have been written and these will be reviewed so as to find out if they address all the legal requirements in line with international laws and protocols or conventions in place. There are institutions and institutional arrangements that have also been put in place or are being proposed. These will also be discussed briefly in the study.

A number of projects from the Western Cape have also been registered with the Department of Minerals and Energy's Designated National Authority (DNA) Wing.²³ The DNA is the custodian of all the projects to do with the Cleaner Development Mechanism

²¹ < <http://www.polity.org.za> >

²² Midgely GF, et al. A Status Quo, Vulnerability and Adaptation Assessment of the Physical and Socio-Economic Effects of Climate change in the Western Cape, 2005

²³ < <http://www.dme.gov.za/cdm> >

(CDM). It would be expedient to determine if the registration of these CDM projects is being driven by the implementation of the current existing policies and strategies or the implementation is being carried out independently from any policies or strategies.

1.6: RESEARCH DESIGN AND METHODOLOGY

A number of reports, policy documents and strategies have been compiled for the Western Cape Province and most of these documents will be used for the purposes of this research. International and regional policy documents will also be reviewed so as to determine the adequacy of the national policies. A review of these provincial documents will be used to gauge if they have an effect on CDM project implementation.

Most of the documents were obtained from government departments and the remainder from the library and internet. Comprehensive document analysis was done with the idea of capturing the most important information from the documents. Current affairs, for example, information from radio, television, newspapers and documentaries was also taken into consideration.

In as much as research based on literature review is dependable, it however has its own shortcomings (validity threat). For example, policy documents are normally interesting for what they include in as much as what they leave out. The issue here is more of political in nature. In support of this statement, Al Gore²⁴ in his movie "An Inconvenient Truth" quotes Mark Twain who says that;

"What gets us into trouble is not what we don't know; it's what we know for sure that just isn't so" (Mark Twain)

With all the research and information available, how is it interpreted and is that information really correct and trustworthy?

In this study however, the assumption is that the information that has been documented is authentic. Due to the number of documents that have been written by

²⁴ Movie: An Inconvenient Truth: A Global Warning, Paramount Pictures, 2007. Award winning

different people, this information will be taken as correct since it all points out to the same issue i.e. climate change in the Western Cape Province.

The international and regional policy documents review will give guidance in terms of fulfilling South Africa's international obligations and the policies of good neighbourhood. Review of the national policy documents, which are supposed to set the tone for all the local policies, is therefore important in that we can measure adequacy and how practical the implementation of international law is. Finally, all the policy documents on climate change and related issues in the Western Cape Province are reviewed.

CHAPTER 2: INTERNATIONAL AND REGIONAL POLICY REVIEW

Global warming, climatic change and variability have become a thorny issue for nature and its living creatures. The phenomenon has always been there but the degree of change was not as pronounced as is the case in recent years which has been attributed to an increase in anthropogenic activities²⁵. On realising this, Scientists from all over the world have done a lot of research and conducted studies to determine the extent of the impact of human activities on the environment. Since some of these activities like vehicular emissions, coal burning, wood burning and oil refining, cannot be eliminated because they support living organisms, there is therefore a need to come up with strategies that can address the impact of anthropogenic activities on the environment through adaptation and/or mitigation.

This led to several governments coming together in 1988²⁶ to discuss the impact of global warming and related effects. The meeting resulted in the formation of the Intergovernmental Panel on Climate Change (IPCC)²⁷ followed by the pencilling of the UNFCCC in 1992. The main objective of the UNFCCC was to come up with ways of stabilising GHG concentrations in the atmosphere at a particular level which prevents the interference of the Climate System.²⁸ Unfortunately at this stage, the objectives and commitments were not adequate in addressing and achieving the required outcomes. The Panel had to go back to the drawing board so as to come up with lasting solutions. It was only 5 years later when they met in Kyoto that after much international debate and negotiations, the UNFCCC's Kyoto Protocol was adopted²⁹.

The Kyoto Protocol³⁰ propagates that developed countries (Annex 1) should reduce their GHG emissions by 5.2% compared to the 1990 levels between the period 2008 to 2012. Article 10 of the Kyoto Protocol³¹ encourages countries i.e. Non-Annex 1 countries to develop and formulate, to the best of their abilities, programmes that

²⁵ Clark B.M. *et.al.* The Effects of Climate Change on Marine Biodiversity in South Africa, 2005

²⁶ A National Climate Change Response Strategy for South Africa, 2004

²⁷ Intergovernmental Panel on Climate Change (IPCC), 1988

²⁸ United Nations Climate system, 1997

²⁹ National Framework for Air Quality Management in South Africa, 2007

³⁰ United Nations Framework Convention on Climate Change, (UNFCCC) Kyoto Protocol, 1997

³¹ UNFCCC Kyoto Protocol, 1997 Article 10

improve air quality at national and regional level. Such programmes include data collection, training, awareness, research and the compilation of emission inventories periodically³².

The countries should cooperate at regional and international level in the promotion of effective modalities for the success of the protocol in various ways. Countries should promote environmental projects through the financing of various climate change initiatives and programmes. Sustainable environmental policies and strategies should be formulated and implemented. There should also be evidence of capacity building, education, training and public awareness programmes in place.³³

South Africa qualifies for the implementation of the Cleaner Development Mechanism (CDM) in Article 12 of the Kyoto Protocol, which assists sustainable development and use of cleaner technology by developing nations (Non-Annex 1). This is being done through the support of GHG emission reduction projects in developing nations by the developed countries. This allows the investor to gain Certified Emissions Credits for themselves or they can also buy Certified Emission Reductions from someone who would have invested in such a project. The Department of Minerals and Energy (DME) in South Africa, has already set up the Designated National Authority (DNA) under section 25(3) of the National Environmental Management Act 107 of 1998 (NEMA) and gazetted in regulations No R. 721 for the Establishment of the Designated National Authority for the Clean Development Mechanism. This branch is involved with encouraging industry and the general public to use cleaner ways like renewable energy and biofuels.³⁴

The projects under consideration should have a very strong sustainable development criterion which tries to balance the environmental issues with the economic benefits and social considerations. Such projects should have activities in line with Annex A³⁵ of the Kyoto Protocol which lists the following GHG;

- Carbon dioxide (CO₂),

³² UNFCCC Kyoto Protocol, 1997, Articles 7,8,9,10

³³ UNFCCC Kyoto Protocol, 1997

³⁴ <<http://www.dme.gov.za/dna>>

³⁵ UNFCCC Kyoto Protocol, 1997 Annex A

- Methane (CH₄),
- Nitrous Oxide (N₂O),
- Hydrofluorocarbons (HFCs),
- Perfluorocarbons (PFCs), and
- Sulphur hexafluoride (SF₆)

The sectors or source categories that qualify for consideration, according to the Kyoto Protocol are:³⁶

- a) Energy which includes; fuel combustion, energy industries, manufacturing industries and construction, transport, fugitive emissions from fuels, solid fuels, oil and natural gas, and other
- b) Industrial processes include; mineral products, chemical industry, metal production, other production, production of halocarbons and sulphur hexafluoride, Consumption of halocarbons and sulphur hexafluoride
- c) Solvent and other product use
- d) Agriculture which encompasses; enteric fermentation, manure management, rice cultivation, agricultural soils, prescribed burning of savannas, field burning of agricultural residues and other
- e) Waste sector includes; solid waste disposal on land, wastewater handling, waste incineration and other.

In terms of administrative issues stipulated in the Kyoto Protocol, the Conference of Parties (COP), serving as the Meeting of Parties (MOP) is the responsible body which among other things advises the 10 member Executive Board on the running of issues in line with the protocol. The COP/MOP makes recommendations and promotes transparent processes and procedures. They also approve Designated Operational Entities (DOEs) who verify all the CDM projects before submission and approval to the

³⁶ UNFCCC Kyoto Protocol, 1997 Annex A sectors/source categories

Executive Board in the various countries and regions so as to promote equitable distribution.³⁷

Some of the key players in the CDM system include project developers and the project investors. The project developers can either come from the developing country or from the developed country, but it is a must that the project investor comes from a developed country since they are the ones buying the CERs³⁸.

A recent Study conducted by over 1400 scientists from all over the world (Sunday Times, October 28, 2007) has concluded that environmental degradation and climate change have reached very high and risky levels for humanity. A lot of species are already facing extinction, the human population is ballooning, water sources are deteriorating, land and soil fertility is declining and our biodiversity and ecosystem has reached alarming levels. This therefore calls for drastic measures to be put in place by all nations and groups so as to curb and support not only the initiatives of the Kyoto Protocol, but other environmental initiatives as well.

Closely linked to the Kyoto Protocol is the Montreal protocol³⁹ on substances that deplete the ozone layer which advocates for the elimination of chloroflorocarbons, halons, methyl bromide, hydrochloroflorocarbons and methyl chloroform. A number of procedures have been put in place in trying to curb the ozone depleting substances. Moreover, some amendments have been done so as to tighten compliance to latest standards that were set in Beijing in 1999⁴⁰ and fortunately South Africa complies.

From a Regional perspective i.e. Southern Africa, there has been progress towards developing environmental management policies, including initiatives through the New Partnership for Africa's Development (NEPAD)⁴¹, the Southern Africa Development Community (SADC)⁴² and the Air Pollution Information Network for Africa (APINA)⁴³ which is currently concentrated in Southern Africa.

³⁷ <<http://www.dme.gov.za/dna>>

³⁸ <<http://www.dme.gov.za/dna>>

³⁹ United Nations Montreal Protocol, 1987

⁴⁰ National Framework for Air Quality Management in South Africa, 2007

⁴¹ New Partnership for Africa's Development (NEPAD), 2002

⁴² <<http://www.sadc.int>>

⁴³ APINA – Progress Towards a Regional Policy on Transboundary Air Pollution, van Tienhoven A.M., Banoo I, Chipindu B., Hicks W.K. and Simukanga S., 2002

The most successful gatherings in Southern Africa, in terms of global warming and climate change issues have come through APINA. These non-formal government meetings have already resulted in two agreements namely the Harare Resolution on the Prevention and Control of regional Air Pollution in Southern Africa and its likely Trans-Boundary Effects⁴⁴ and the Maputo Declaration on the Prevention and Control of Air Pollution in Southern Africa and its likely Trans-Boundary Effects⁴⁵, in 1998 and 2003 respectively.

The Harare Resolution on the Prevention and Control of Regional Air pollution in Southern Africa and its Likely Transboundary Effects calls on the SADC Council of Ministers to develop a Protocol on Regional Air Quality and Atmospheric Emissions to deal with the problem. The protocol should be developed through the SADC Environment and Land Management Sector (SADC-ELMS), which is currently being coordinated by Lesotho.⁴⁶

African leaders at their 37th summit of the then Organisation of African Unity (OAU) held in July, 2001 in Lusaka, adopted the New Partnership for Africa's Development (NEPAD).⁴⁷ The NEPAD strategy document is designed to address the current challenges facing the African continent of which placing African countries, both individually and collectively, on a path of sustainable growth and development is a key factor.

Sustainable development is one of the main attributes being advocated by the Kyoto protocol in article 12 (2) and also article 2a(iii). The countries that need to join in the CDM should make sure that they come up with clear criteria on sustainable development for their projects⁴⁸. NEPAD therefore seeks to establish the conditions for sustainable development by ensuring; peace and security, democracy and sound

⁴⁴ Harare Resolution on the Prevention and Control of regional Air Pollution in Southern Africa and its likely Trans-Boundary Effects, 1998

⁴⁵ Maputo Declaration on the Prevention and Control of Air Pollution in Southern Africa and its likely Trans-Boundary Effects, 2003

⁴⁶ <<http://www.sadc.int>>

⁴⁷ New Partnership for Africa's Development (NEPAD), 2002

⁴⁸ UNFCCC Kyoto Protocol, 1997, Article 12 and 10

political, economic and corporate governance as well as regional-cooperation and integration.⁴⁹

Policy reforms and increased investment is sought in the various sectors, of which the environmental sector is also key. NEPAD's environmental initiative targeted eight sub themes as a priority. These sub themes include combating desertification, wetland conservation, control of invasive alien species, coastal management and cross-border conservation areas. The remaining three sub themes are global warming, environmental governance and financing of these environmental initiatives.⁵⁰ These last three sub themes are in support of the Kyoto Protocol⁵¹. If well managed, CDM (Article 12 Kyoto Protocol) can become a tool for Africa to manage its beautiful environment and also a source of foreign investment.

Among some of the objectives of SADC as stated in Article 5 of the Treaty⁵², the objective which is in line with climate change and global warming is the achievement of sustainable utilisation of natural resources and effective protection of the environment. In general, most of the issues are similar to the ones discussed under NEPAD.

The Air Pollution Information Network for Africa (APINA)'s role is to form a strong link between the air pollution scientific community and policy makers at national and regional levels. It is hoped that a lot of scientific knowledge and data will be derived from these gatherings that can help decision-makers in matters related to air pollution.⁵³ A Memorandum of Understanding (MoU), between SADC- ELMS (Environment and Land Management Sector) and APINA states that APINA will participate as a stakeholder in the development of the Protocol on Environment and provide technical advice for the development of the Protocol Article on Transboundary air pollution. The programme elements of the MoU according to South Africa's Report to the 14th session of the UN Commission on Sustainable Development (CSD14)⁵⁴ are as follows;

⁴⁹ <<http://www.nepad.org>>

⁵⁰ <<http://www.nepad.org>>

⁵¹ UNFCCC Kyoto Protocol Articles 2-13

⁵² <<http://www.sadc.int>>

⁵³ APINA – Progress Towards a Regional Policy on Transboundary Air Pollution, van Tienhoven A.M., Banoo I, Chipindu B., Hicks W.K. and Simukanga S., 2002

⁵⁴ South Africa's Report to the 14th session of the UN Commission on Sustainable Development (CSD14). First session of the second implementation cycle, 2006/2007

- Assessment of air pollution and development of air pollution guidelines and standards in Southern Africa;
- Policy development and capacity building on monitoring and mitigation of transboundary pollution;
- General capacity development, public participation and promotion of national action programmes to combat air pollution;
- Information dissemination and networking of the relevant individuals, institutions and organisations at national, regional and international level.

The development of this protocol through the SADC-ELMS relationship has not been smooth sailing. Several constraints have been noted which include⁵⁵:

- Limited capacities in terms of funding, equipment and human resource to measure, assess, control and mitigate air pollution.
- Inadequate information on air pollution and its impacts.
- Inadequate concerted public pressure, action and participation to influence policy as a result of limited public awareness.

Faced with the constraints discussed above, the proposed protocol can only be successful if these hiccups are ironed out. For example, in terms of capacity challenges, pool funding from all the involved SADC member states can be introduced. All the funds raised can then be used to purchase equipment and getting the necessary qualified personnel.

More information can be collected in a well organised manner since all activities will be centralised. All the data collected can then be populated into the institution database which promotes understanding. In terms of stakeholder consultation and public participation or involvement, it then becomes easier to coordinate all the people and the various industrial sectors within the region thereby making policy documentation easier.

APINA has other related activities in the SADC region which include Cross-border Air Pollution Impact Assessment (CAPIA). This project addresses impacts of tropospheric

⁵⁵ www.unep.org/urban_environment/PDFs/SADC-LusakaAgreement.pdf Downloaded 10/08/2008

ozone on agriculture. The project is being funded by the Department of Arts, Culture, Science and Technology (DACST) of South Africa.⁵⁶

The other project is the Southern African Regional Science Initiative (SAFARI 2000)⁵⁷ which is a network in Southern Africa that is co-sponsored by NASA and regional governments. The project studies interactions in anthropological, biological and climatological phenomena. SAFARI 2000 recognises APINA as a means of transferring scientific information on air pollution issues to the policy process in the SADC region.

This discussion will not be complete without writing on Regional Air Pollution In Developing Countries (RAPIDC)⁵⁸. The programme is being funded by the Department of Infrastructure and Economic Cooperation (INEC) of Swedish International Development Cooperation Agency (Sida). It is co-ordinated by SEI and carried out in collaboration with Swedish universities and research organisations together with inter-governmental agencies and research organisations in Asia and Africa. The aim of RAPIDC is to carry out projects that facilitate cooperation at international level and also facilitate the development of agreements/ protocols to implement measures which prevent and control air pollution. Activities are carried out in Asia (mainly South Asia) and in Southern Africa.⁵⁹

⁵⁶ <<http://dbn.csir.co.za/capia/apina.html>>

⁵⁷ <http://daac.ornl.gov/S2K/historical_UVA_edited/abstract/index.html>

⁵⁸ <<http://www.rapidc.org>>

⁵⁹ APINA – Progress Towards a Regional Policy on Transboundary Air Pollution, van Tienhoven A.M., Banoo I, Chipindu B., Hicks W.K. and Simukanga S., 2002

CHAPTER 3: NATIONAL POLICY REVIEW

The South African government initially ratified the UNFCCC in August, 1997 and later on acceded to the UNFCCC's Kyoto Protocol in July 2002⁶⁰. An Initial National Communication in accordance with Article 12 of the Convention⁶¹ has already been prepared.

The National Climate Change Response Strategy⁶², September 2004 document was developed using reports from a number of sectors in South Africa and also information from the IPCC Third Report (IPCC,2001).⁶³

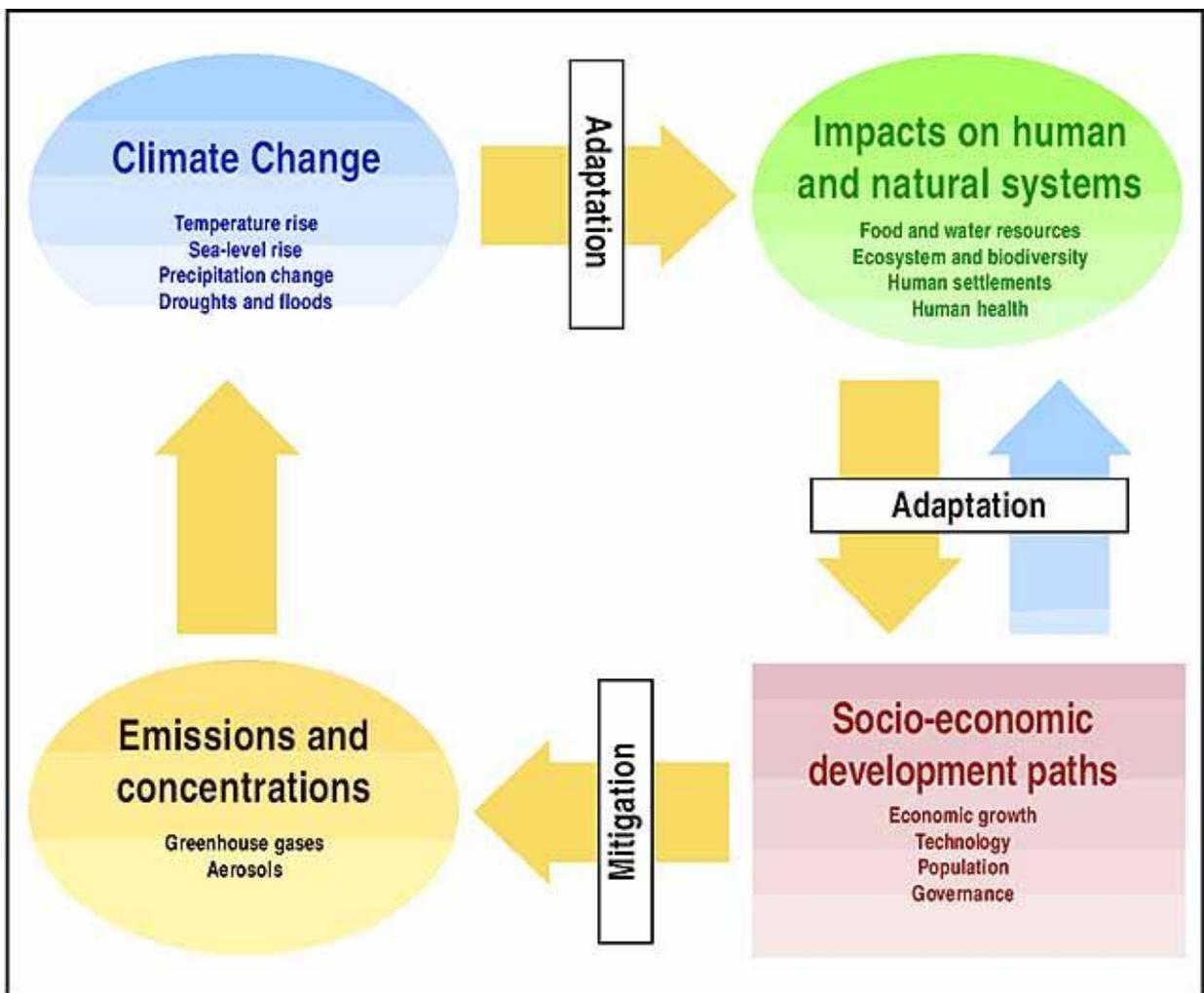


Figure 2: Diagrammatic representation of Adaptation and mitigation issues. Adapted from IPCC Climate Change, 2001 Synthesis Report⁶⁴

⁶⁰ A National Climate change Response Strategy for South Africa, DEAT, 2004

⁶¹ UNFCCC Kyoto Protocol, 1997 Article 12

⁶² A National Climate change Response Strategy for South Africa, DEAT, 2004

⁶³ Intergovernmental Panel for Climate Change (IPCC), 2001

⁶⁴ <http://www.grida.no/climate/ipcc_tar/vol4/english/index.htm>

Eleven Key issues were identified during the compilation of the National Climate Change Response Strategy⁶⁵ which is in line with the various articles of the Kyoto Protocol in propagating for the promotion and financing of research for sustainable environmental projects and energy programmes. The strategy is also adaptive and responsive towards climate change issues and concerns.

Other issues within the National Climate Change Response Strategy include:

- Meeting international obligations and maintaining appropriate attendance at UNFCCC and related meetings
- Government/Industry Partnerships
- Domestic Legal provisions
- Climate change related education, training, awareness and capacity building should also be implemented
- Inventories of greenhouse gases and air pollutants

In coming up with the above key issues, the National Climate Change Response Strategy document had to follow a number of national principles and also most principles as enshrined in the National Environmental Management Act 107 Of 1998 (hereafter NEMA).⁶⁶ Thorough consideration was given to the history of the country during the formulation of the strategy document since it had to be consistent with national priorities, including poverty alleviation, access to basic amenities which include infrastructure development, job creation, rural development, foreign investment, human resource development and improved health, leading to sustainable economic growth. Anything that excludes these underlying factors therefore becomes unsustainable and ceases to qualify under the sustainability criteria.

Consideration has to be taken on the use of local available resources which is not only economical but uplifts the locals. Climate change is recognised as a cross cutting issue that demands integration across the work programmes of several government departments and stakeholders, and across many sectors of industry, business and the community and hence it cannot be properly handled by an isolated group of

⁶⁵ A National Climate change Response Strategy for South Africa, DEAT, 2004

⁶⁶ The National Environmental Management Act 107 of 1998, (NEMA)

individuals or a single public sector unit. There is therefore a need for programmes that will build capacity, raise awareness, improve education and encouragement of programmes that will harness existing national technological competencies across various levels and sectors.

Due to the unavailability of a lot of information at present, as time goes by and as better equipment and systems are put in place, there will be need to review the strategy. Current international trends encourage that a document of national importance be reviewed from 2 to 5 year intervals.

The Strategy document goes on to chronicle to a very large extent some of the finer details on climate change, its effects, mitigation measures and how to adapt as a nation. One point which is being repeated in the document is sustainable development as a link between the national demands and the requirements of the international and regional community. There is a lot of support for the Kyoto protocol and most regional initiatives within the strategy even if as a non-annex 1 country, South Africa is not obliged or compelled to reduce its emissions⁶⁷.

The mere fact that it has been proven scientifically that South Africa is prone or vulnerable to climate change has resulted in the government taking proactive measures in trying to curb any negative impacts⁶⁸. Such negative impacts as discussed earlier in this study include the impact on the water resource, natural ecosystems, crop yields, plantations, biodiversity including marine biodiversity and directly or indirectly on the economic front which is being experienced, for example, in the Western Cape⁶⁹.

A number of issues that were raised in the Strategy document have or are already being addressed. Such issues include the formation of the DNA and putting functional structures in place to try and implement CDM activities. Research is already taking place through various bodies like Non-Governmental Organisations (NGOs), Universities and independent scientists. This can be observed from the documents under

⁶⁷ UNFCCC Kyoto Protocol, 1997 Articles 10 and 4

⁶⁸ A National Climate change Response Strategy for South Africa, DEAT, 2004

⁶⁹ Midgely GF, et al. A Status Quo, Vulnerability and Adaptation Assessment of the Physical and Socio-Economic Effects of Climate change in the Western Cape, 2005

consideration in this study. Municipalities are already in the process of compiling their Air Quality Management Plans (AQMPs) in line with the requirements of the National Environmental Management: Air Quality Act 39 of 2004 section 15. Metropolitans like Cape Town, Gauteng and district municipalities like Capricorn, Sekhukhune and Waterberg, all in the Limpopo province, are busy finalising their AQMPs.

Before embarking on the Strategies that are being generated in the Western Cape, below is a brief look at the various objectives and related intervention measures in line with the National Climate Change Response Strategy⁷⁰. The main objective is to create a synergy between national government objectives, sustainable development and climate change through the development of indicators and criteria that are required by the DNA for CDM projects. This will be a critical point to follow during the review of documents from the Western Cape since it has to be determined if the documents encourage CDM project implementation.

In order to have proper management of policy there is need for well planned institutional arrangements that have the capacity to address climate change issues. Such institutions should include not only the technical side of things but also the financial aspects. Financial institutions which come to mind include the Development Bank of South Africa (DBSA) and the Industrial Development Corporation (IDC).

Due to the vulnerability of South Africa to climate change, the country has taken a decision to adapt and /or mitigate climate change impact leading to the introduction of several measures which include proper water resource management, contingency planning, adaptation of rangeland practices and agriculture, protection of plant biodiversity, marine biodiversity and animal biodiversity.⁷¹

Mitigation in essence, involves the application of procedures or processes that can limit the impact (damage) of the observed activity in a sustainable way. Whenever sustainability is discussed, issues of stakeholder participation, public involvement, awareness and training, use of best available technology, financing of projects, proper

⁷⁰ A National Climate change Response Strategy for South Africa, DEAT, 2004

⁷¹ Clark B.M. *et.al.* The Effects of Climate Change on Marine Biodiversity in South Africa, 2005

legislative and law reforms, then have to be factored in order to strike a balance.

The government has documented its objectives in the White Paper on Renewable Energy⁷² and the Energy Efficiency Strategy⁷³, promoting a sustainable development path through coordinated government policy. The responsibility falls under the DME which has also been called to look into the coal-mining sector for further mitigation measures.

The national Department of Transport is also busy with the implementation strategy for the control of exhaust emissions from road-going vehicles⁷⁴ with the Department of Trade and Investment being mandated to implement sustainable industrial development through coordinated policies, strategies and incentives.

The Department of Agriculture should encourage farmers to reduce greenhouse gas emissions in the agricultural sector, and through the National Department of Agriculture (DoA) with the Department of Water Affairs and Forestry (DWAF) and the forestry industry being mandated to facilitate the establishment and extension of forest schemes.⁷⁵

Once again, the above issues are in line with Article 2 of the Kyoto Protocol which discusses briefly on policy documentation, energy efficiency in various sectors, promotion of sustainable forms of agriculture and progressive planning with the aim of reducing GHG emission⁷⁶.

Climatic change issues and global warming come at a price to pay especially in the areas of Research, development and demonstration. South Africa needs to ensure that there is an effective and integrated programme of climate change research, development and demonstration. A database of climate change related research, development and demonstration projects and integrate the research,

⁷² Department of Minerals and Energy, White Paper on Renewable Energy, 2003

⁷³ Department of Minerals and Energy, Energy Efficiency Strategy, 2003

⁷⁴ Department of Transport, Joint implementation strategy for the control of exhaust emissions from road-going vehicles

⁷⁵ A National Climate change Response Strategy for South Africa, DEAT, 2004

⁷⁶ UNFCCC Kyoto Protocol, 1997 Article 2

development and demonstration programme for South and Southern Africa needs to be set up.

South Africa has gone further to sign an MoU during the National Climate Change Conference held in October, 2005 in Midrand, Johannesburg. The MoU was signed between Business Unity South Africa (BUSA) and the Department of Environmental Affairs and Tourism (DEAT) hence it is dubbed the DEAT-BUSA Agreement. The purpose of the MoU is to provide an accurate source of reliable information on GHG for the various sectors within the economy as a component of the National Air Quality Information System (NAQIS).⁷⁷

In support of the above objectives and intervention measures South Africa's legal framework contains some of the key principles. Below is a pick on a few legal documents which include the Constitution of the Republic of South Africa No. 108 of 1996 (hereafter Constitution). The clause that is of importance in our discussion is the one on section 24 of the Constitution⁷⁸ which states:

Everyone has the right-

- (a) to an environment that is not harmful to their health and well-being; and*
- (b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that-*
 - (i) prevent pollution and ecological degradation*
 - (ii) promote conservation; and*
 - (iii) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development*

NEMA provides for co-operative environmental governance by establishing principles and procedures for decision making on matters affecting the environment. An important function of NEMA is to serve as an enabling Act for the promulgation of

⁷⁷ <www.environment.gov.za/HotIssues/2006/NAQIS/NAQIS.html - 9k>

⁷⁸ Constitution of the Republic of south Africa No. 108 of 1996

legislation to effectively address integrated environmental (including waste) management.

The White Paper on Integrated Pollution and Waste Management⁷⁹ is another document of importance. Whereas the Environmental Management Policy delineates government's broad policy on environmental management, the White Paper on Integrated Pollution and Waste Management (IP&WM) for South Africa, details government's policy on pollution and waste management and has formed the point of departure and framework for the NWMS.⁸⁰

The *over-arching goal* of the IP&WM policy is to move from a previously fragmented situation of uncoordinated waste management to that of integrated waste management. The White Paper on Integrated Pollution and Waste Management for South Africa defines government's approach to the management of waste (i.e. an holistic and integrated management approach extending over the entire waste cycle from 'cradle to grave' including the generation, storage, collection, transportation, treatment and final disposal of waste).

There is therefore a need to optimise waste management practices so as to minimise the emissions of greenhouse gases and develop a government position, through all relevant departments and all spheres of government and industry, to implement a waste sector mitigation programme⁸¹.

The Local Government Municipal Structures Act 117 of 1998 together with the Local Government Municipal Systems Act 32 of 2000 have firmly established Local Government as an autonomous sphere of government having specific functions defined by the Constitution.⁸² Local government functions explicitly stated or implied in the National Environmental Management: Air Quality Act 39 of 2004 are as follows:

- compilation and implementation of AQM policies, section 7

⁷⁹ Department of Environmental Affairs and Tourism, White Paper on Integrated Pollution and Waste Management (IP&WM) for South Africa

⁸⁰ Sithole TP, Baldwin D, Wiechers H, Development of a Hazardous Waste Management Plan: Limpopo Province, 2006

⁸¹ A National Climate change Response Strategy for South Africa, DEAT, 2004

⁸² Sithole TP, Ngoasheng DB, Greater Sekhukhune District Municipality Air Quality Management Plan, 2007, 23

- ambient air quality monitoring (in line with nationally prescribed methods which are *still to be developed*) - for the purpose of effective baseline air quality characterization (*purpose implied*), section 7
- maintenance of an emissions and air quality data base and forwarding of data to provincial and national departments (in line with nationally prescribed information storage, management and transfer procedures which are *still to be developed*), section 8
- development and implementation of local guidelines (*implied to include local air quality guidelines*) and by-laws (in line with national and provincial policy, legislation and regulations, *still to be developed*), section 11
- licensing and control of a certain category/categories of sources (*exact types of sources to fall under direct control of local authorities still to be confirmed*), section 36
- enforce compliance on all applicable legislation, section 20
- implement public awareness campaigns on air quality issues, sections 56 and 57

The National Environmental Management: Air Quality Act 39 of 2004 which is administered by the DEAT, regulates and controls air pollution. It essentially replaces the Atmospheric Pollution Prevention Act 45 of 1965, with the main objective of bringing the South African legislation into line with approaches that have been developed internationally for the control of air pollution.

The Act sets norms and standards relating to-

- Institutional frameworks, roles and responsibilities, sections 13,14
- Air quality management planning, section 15
- Air quality monitoring and information management, section 12
- General compliance and enforcement provisions, Section 20.

These norms and standards as set out in the Preamble of the Act⁸³, are set in order to-

- protect, restore and enhance the air quality in the Republic, having regard to the need to ensure sustainable development;

⁸³ National Environmental Management: Air Quality Act 39 of 2004

- provide increased opportunities for public involvement and participation in the protection of air quality;
- ensure that the public has access to relevant and meaningful information about air pollution;
- reduce risks to human health and prevent the degradation of air quality by the use of mechanisms that promote:
 - pollution prevention and cleaner production,
 - the reduction to harmless levels of the discharge of substances likely to impair air quality,
 - the making of progressive environmental improvements, including the reduction of pollution at source,
 - the monitoring and reporting of air quality on a regular basis;
 - strengthen the regulatory framework for management of air quality;
 - improve the efficiency of administration of air quality legislation; and
 - give effect to the Republic's international obligations.

The Act does not, at present, include any standards, e.g. for air emissions, but maintains the standards included in the Atmospheric Pollution Prevention Act 45 of 1965 until such time as new standards are regulated.

In line with other institutional arrangements, the DEAT has come up with four formal stakeholder committees which are (CSD14)⁸⁴;

- The Inter-ministerial Committee on Climate Change from DEAT, Department of Science and Technology, DWAF, DME and DoA
- The Inter-Departmental Committee on Climate Change. The group provides technical information to the Inter-ministerial Committee
- The Government Committee on Climate change; and
- The National Committee on Climate change.

⁸⁴ South Africa's Report to the 14th session of the UN Commission on Sustainable Development (CSD14). First session of the second implementation cycle, 2006/2007

CHAPTER 4: WESTERN CAPE POLICY REVIEW

Chapters 2 and 3 have given a detailed overview of the international, regional and national policy documents and their implementation on global warming and climate change issues so as to set the tone for the discussion of documents emanating from the Western Cape Province. The documents will now be analysed to determine if they are in compliance with the objectives of this study or not.

The Western Cape province is constituted of five districts namely, Cape Winelands, Central Karoo, Eden, Overberg and the West Coast. There is also one metro *viz* Cape Town which harbours most of the manufacturing industries and very beautiful tourist attraction centres.

A lot of information has been gathered over the past few years on Climate Change and Global Warming effects in the Western Cape Province. This resulted in the documentation of a number of strategy documents, policies and programmes. These documents will be discussed individually and those with critical issues will be discussed in more detail.

In June, 2005, The Department of Environmental Affairs and Development Planning Western Cape published A Status Quo, Vulnerability and Adaptation Assessment of the Physical and Socio-Economic Effects of Climate Change in the Western Cape.⁸⁵ The main aim of this study was to assess the impacts of climate change using a wide range of models. The document also identifies some key adaptive strategies that can be adopted thereby avoiding detrimental effects on some sectors.

It will be expedient to point out though that the document mainly deals with adaptation issues. The basis of such a move lies in the fact that climate change is here to stay due to the increase in anthropogenic activities and all nations directly or indirectly will

⁸⁵ A Status Quo, Vulnerability and Adaptation Assessment of the Physical and Socio-Economic Effects of Climate change in the Western Cape, 2005

benefit from adaptation measures⁸⁶. On the other hand investing in mitigation only pays off if all the major emitters come to the table and agree on the rules. This has been difficult with for example, countries like the USA⁸⁷.

The impacts and vulnerabilities identified include the water resources which have been increasingly diminished and the rivers, wetlands and estuaries that have deteriorated. Coastal impacts are also being noticed with sea levels already rising through ocean expansion, melting of glaciers and polar ice.⁸⁸ The biodiversity in the area is also being affected due to temperature increases. Fire danger and fire frequency is already on the increase.

Hence, in order to survive this catastrophe, adaptation to the climate change becomes imperative. The document suggests that for water resources, proper management at Municipal level through the review of rates, urban planning and an improved river management strategy can avert the situation. There is also a drive towards protection of the ecological water reserve for estuaries and their monitoring. An improved biodiversity management through coming up with assessment and monitoring tools is also on the table. One of the key points that keep on coming up is further research studies on various strategies so as to reduce uncertainties on the impacts.

A closer analysis that was observed during review is that the document tries to align itself with local and international policies which were discussed in Chapters 2 and 3. There is however a lack of alignment towards regional environmental initiatives. The report is also weak in terms of advocating for capacity building and public awareness opting for more work to be done by Specialists. In as much as the report seeks to give direction towards adaptation strategies, the proposed strategies are mostly of a generic and general nature. This makes the document appear to be more of a national policy document instead of a provincial document specific to the Western Cape. This may have been caused by a lack of detailed research studies on certain aspects of the status quo study.

⁸⁶ Glazewski, J. Environmental Law of South Africa, 2nd Edition, 2005 Butterworths, Durban page 586

⁸⁷ A draft Climate Change Strategy and Action Plan for the Western Cape: Responding to the challenge and sustainable development in the Western Cape, DEADP, 2007

⁸⁸ < http://www.capegateway.gov.za/other/2006/9/wcape_climate_change_impacts_sep06.pdf>

After the publishing of the Status Quo, Vulnerability and Adaptation Assessment of the Physical and Socio-Economic Effects of Climate Change in the Western Cape in 2005, a number of studies were carried out. Some of these studies were also conducted concurrently with the status quo.

A document on the Climate Change Strategy and Action Plan for the Western Cape was made public in 2007⁸⁹. This document focussed on adaptation and mitigation programmes in line with sustainable development. The adaptation aspect seeks to manage the risks and minimise negative impacts on climate change and these are in line with the national principles. On funding matters, three channels were identified, namely the private sector, the public sector and international donor funding.

The adaptation objectives seek to coordinate and integrate provincial strategies and processes through the pursuance of sustainable economic opportunities. Moreover, due to the location of the area under study, resources like water and biodiversity remain critical and therefore require protection. As is being propagated at all levels i.e. from international, regional and even at national level; stakeholder consultation, training and awareness still remain key to adaptation measures and response to climate change in the Western Cape.

Mitigating the impact of climate change, according to the document, also takes a similar route administratively e.g. in pursuing economic opportunities and the coordination of strategies. Further emphasis is then made on acquiring the best available technology which can be used to reduce the negative impact. This can be done by looking at alternative sources of energy and the efficient use of energy in order to reduce GHG emissions which in turn will keep the pollution levels low. Further research on other sustainable measures will continue.

One of the key concerns raised in the Climate Change Strategy and Action Plan document was the issue of institutional arrangements due to the cross-cutting of climate change issues. Such issues will always be there due to differences and

⁸⁹ A draft Climate Change Strategy and Action Plan for the Western Cape: Responding to the challenge and sustainable development in the Western Cape, DEADP, 2007

difficulties in coordinating individual municipalities. The formation of a Forum or action custodian can handle this so as to oversee the action plan across the province. Budgetary requirements then become a challenge that can be dealt with through various models. The Private sector, the public sector and/or the international community through Non-Governmental Organisations can join the party.

The Action Plan also takes over from the Status Quo, Vulnerability and Adaptation Assessment of the Physical and Socio-Economic Effects of Climate Change in the Western Cape and emphasises the need for a thorough community awareness programme. It is encouraging to note that by the time this document was written, a comprehensive integrated communications strategy had already been developed to support and communicate the various strategies and action plans to all stakeholders.

The City of Cape Town's Air Quality Management Plan⁹⁰ was also published in 2005. The objective of the plan was mainly to put air quality management systems and structures in place so as to reduce the impacts and health effects of "dirty air" on the residents. Various reports will be generated and communication channels would also be kept open with the public.

The City of Cape Town's Air Quality Management Plan propagates for the setting up of specialised teams in the implementation of the plan. This is in line with the recommendations of the Status Quo Report. The plan goes a step further and seeks for the inclusion of air quality issues in the municipality's Integrated Development Plan (IDP). In line with national objectives, the plan's policy principles have a strong allegiance towards capacity-building and education, Duty-of-care, environmental justice, public participation and public information sharing, and cost-benefit analysis which looks at cost-benefit techniques (Technology vs. financial implications).

A number of research initiatives were also outlined in the document which seeks to close the air quality gaps. If these studies take off, there will be definitely enough information to answer most of the issues identified by the city in line with their air quality objectives. Sustainable energy strategies and projects dealing with the use of

⁹⁰ City of Cape Town Environmental Planning Department, Cape Town Air Quality Management Plan, 2005₂₉

renewable energy were proposed for the Western Cape Province and documents have been published.

One of these documents was the City of Cape Town's Energy and Climate Change Strategy.⁹¹ This document proposes well defined sustainable socio-economic benefits and goals which are mainly aimed towards the use of renewable energy, improved energy efficiency, cleaner technology use and the reduction of carbon dioxide. This then results in the City managing to fulfil its constitutional obligations and international responsibilities.

Other documents that warrant reference include the Department of Environmental Affairs and Development Planning Western Cape, Towards the Development of an Integrated Energy Strategy for the Western Cape, 2005 which was the cornerstone for the documentation of the Sustainable Energy Strategy for the Western Cape, in 2007 and the City of Cape Town's Energy and Climate Change Strategy, 2006.

Examples of projects that reveal the seriousness of the Western Cape towards achieving their goals are highlighted in the climate change strategy and action plan which include the following⁹²;

- The Kuyasa project which entails retrofitting Solar Water Heaters (SWH) for low-income houses, energy efficiency measures such as light bulbs and insulated ceilings (CDM),
- PetroSA Biogas to energy project which utilises waste gas that is presently being flared to generate electricity (CDM),
- The Beaufort West wind farm,
- Kouga Wind Farm/Pumped Storage Hydro (CDM). Generation of electricity from wind and dammed water to supply the area
- The Bellville Landfill CDM project which seeks to increase the production and capture of methane gas for electricity generation,
- The completed energy efficient BP Building which was designed to double the efficiency of commercial building energy use,

⁹¹ City of Cape Town Environmental Planning Department, Cape Town Energy and Climate Change Strategy, First Edition, 2005

⁹² City of Cape Town Environmental Planning Department, Cape Town Energy and Climate Change Strategy, 2006

- Bulgaz LPG pilot transport project for the conversion of vehicles to LPG, e.t.c.

Some of the above projects have qualified for CDM consideration which shows the responsiveness of the Western Cape Province Strategies to International responsibilities. Awareness programmes have also been lined up for the general public.

All the above projects reveal the responsiveness of a collection of the Western Cape provincial strategies to all the objectives under study. For example, the Kuyasa project on the use of energy efficient bulbs reduces GHG emissions since less energy is being used. This falls in line with the Western Cape mitigation objectives as documented in the Draft Climate Change Strategy and Action Plan, 2007⁹³. The project is also in line with the national mitigation measures and responsibilities allocated to the DME as documented in the National Climate Change Response Strategy⁹⁴ and also Article 2a(i) of the Kyoto Protocol⁹⁵.

In more than one instance, a combination of two or more reports, strategy and policy documents can have objectives which suite the above CDM projects. For example the National Strategy documents call for the development of Sustainable Energy Programmes e.g. the BP building project in the Western Cape. The integration of climate change response in government can be observed through the inclusion of such issues in the province's IDP documents. In terms of capacity and stakeholder consultation, there seems to be a lot of research being done by the local universities i.e. University of Cape Town and Stellenbosch. These universities, in one way or the other, were involved during the documentation or research stages of all the documents. Private companies, individuals and NGOs have also contributed immensely to the strategies and policies as they are also being acknowledged in most of the documents.

The Department of Environmental Affairs and Development Planning Western Cape, State of the Environment Report Western Cape, 2004, gives a brief insight into air

⁹³ A draft Climate Change Strategy and Action Plan for the Western Cape: Responding to the challenge and sustainable development in the Western Cape, DEADP, 2007

⁹⁴ A National Climate change Response Strategy for South Africa, DEAT, 2004

⁹⁵ UNFCCC Kyoto Protocol, 1997 Article 2

quality issues on Chapter 3. The chapter briefly touches on international obligations and local legislation. Discussion is also invoked on the impacts of air pollution and the probable air pollutants in the area. However, the bulk of the information comes from the Cape Town area where there is monitoring in progress and very little information comes from some of the districts within the Province.

There are no By-laws dealing directly with climate change in the province. Cape Town Metro is the only one that has come up with a By-law on air pollution, 2001⁹⁶. The by-law is aligned towards the implementation of penaltative measures, for example on vehicle emissions, a method of which recent scholars are discouraging and aligning recommendations towards public/private sector partnerships and incentives.

Due to the number of documents coming out from the Western Cape, it can be concluded that the technical expertise is available within the province. What then lacks is firstly, the transmission of information from these intellectuals to the general man on the ground and secondly, the coordination of the various reports emanating from the province. Individuals, private companies, NGOs and government, are carrying out their own separate studies which reveal a lack of clear institutions or clear well organised bodies that can coordinate or integrate the various studies.

Coming up with effective institutional arrangements therefore remains a major challenge for the Western Cape Province due to the cross-cutting nature of climate change issues. This can however be overcome through good governance. Forums like the now defunct Bellville South Environmental Forum (2000-2005) (BELSEF)⁹⁷ are an important part of the Western Cape. Such Forums can provide information to a body or organisation selected from various forums.

⁹⁶ City of Cape Town Environmental Planning Department, Cape Town By-Laws on Air Pollution, 2001

⁹⁷ Clean Air Journal, Vol 15, No. 1, April 2006

CHAPTER 6: CONCLUSION, RECOMMENDATIONS AND PROPOSALS

Having gone through the various documents at various levels, the big question which remains is whether the objectives of this study and questions were answered. Recapping; the study was done so as to establish whether:

1. the legislation, policies and strategies being implemented or generated in the Western Cape adequately address climate change concerns,
2. the institutions and institutional arrangements in place in the Western Cape, adequately address climate change concerns, and
3. the effects of the above policies and institutions on Clean Development Mechanism (CDM) project implementation in the Western Cape, adequately addresses climate change concerns.

On consideration of the various legal tools that deal with climate change and global warming, there seems to be a flow of responsibilities from an international perspective, via the national perspective towards the provincial policies and strategies. Most of the Kyoto Protocol's objectives were taken up at national level through enacting various legal instruments as discussed in Chapter 3. The Western Cape provincial government has definitely aligned its various reports, policies and strategies to a very large extent with the national policies.

However, it appears currently that the province feels the need to continue with further investigations and studies in the area. This point is being supported by the fact that their strategy documents continue to talk about research initiatives and a search for sustainable economic opportunities. This is being done maybe to try and find the best adaptation and mitigation measures to climate change in the province.

A few weaknesses though exist in most documents which appear to be quite generic. They do not specifically address the effects that have been identified so far, choosing to cast blanket solutions. This might be caused by a lack of detailed information on the area and might also explain why further studies are still required. This then makes it a

bit difficult for the provincial government or even the Cape Town metro to enact any piece of legislation that may have to deal with the main perpetrators.

The main focus in the documents is Cape Town and its surrounding areas and not the province as a whole. This might be due to the fact that most activities occur around Cape Town including the changes in weather patterns. Besides Cape Town, the district of Eden is the only one with an Air Quality Management Plan.

As indicated earlier, these deficiencies are far less than the positive issues coming from the documents under review. One further recommendation might be the development of guidelines on the implementation of these policies which can be based on the Action Plan that the province has already developed.

In terms of institutional arrangements it appears that there are still big challenges. A closer review of most of the documents emanating from the area reflects some ad hoc research initiatives being done. The two main wings handling the studies in the area are the provincial Department of Environmental Affairs and Development Planning and the City of Cape Town Department of Environmental Planning. However, the Cape Town Metro conducts its own research, the provincial government its own, universities their own and even NGOs and the private sector. Here and there a duplication of certain research initiatives is noticed. What is required now is to come up with a coordinated institution or team that can then integrate all the information that has been gathered to date concerning climate change issues in the Western Cape.

The institutional arrangements on global warming and climate change seem to be driven mostly from the national level and not specifically at a provincial and local level. This however, is not a problem specifically for the Western Cape; it is actually a national problem being compounded by lack of skills and capacity within government institutions. An example of this lack of capacity can be noted in most documents since they all talk about implementing proper management of resources and the introduction of monitoring tools and systems. The strategy documents, however, seek to address the human resource issue with time.

There is also a weakness in terms of funding of projects since most documents discuss on financial requirements but then fail to give specific guidelines or direction as to where and how the funds can be accessed. The Action plan merely points out the three channels where they can find funding i.e. the private sector, the public sector and the international donor agencies.

This research has however, proven that if provinces priorities their environmental issues, they can produce informative reports that will contribute towards climate change and global warming. Other provinces can learn from the gaps and shortfalls in the Western Cape. One notable thing which is lacking and that can be invigorated in other provinces is the revival of effective and functional environmental forums. The strategy documents produced in the Western Cape can then be used as guidelines.

In as much as the policy and strategy documents seem disjointed and the province's administration level and institutional arrangements on climate change appear to be weak; it appears the province has managed to effect most of the recommendations and objectives by coming up with over 10 brilliant CDM projects so far. These projects address climate change issues in all ways. They conform to all the protocols, policies and strategies discussed in this study. Hence integrating these documents as discussed earlier will surely provide a very good basis for more projects and even a better understanding of climate change in the area which will definitely attract new entrants.

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GLOSSARY OF TERMS

(Adopted from the various papers used)

Adaptation	Adjustment in natural or human systems to a new or changing environment. Adaptation to climate change refers to adjustment in natural or human systems in response to climate stimuli and is instituted to moderate the effects climate change. Adaptation response depends on land use.
Anthropogenic	Human made. Usually used in the context of emissions that are produced as the result of human activities.
Biodiversity	The variety of organisms found within a specified geographic region.
Biofuel	Liquid fuel produced from plant material (biomass) e.g. agricultural waste, waste from municipal landfills, wood, etc. and ethanol mixed together to form an equivalent to petrol for motor vehicles
Carbon Dioxide (CO₂)	CO ₂ is a colorless, odorless, non poisonous gas that is a normal part of the ambient air. Of the six greenhouse gases normally targeted, CO ₂ contributes the most to human induced global warming. Human activities such as fossil fuel combustion and deforestation have increased atmospheric concentrations of CO ₂ by approximately 30 percent since the industrial revolution. CO ₂ is the standard used to determine the global warming potentials (GWPs) of other gases. CO ₂ has been assigned a 100 year GWP of 1 (i.e., the warming effects over a 100 year time frame relative to other greenhouse gases).
Carbon footprint	A measure of a person's or business's carbon dioxide impact, calculated by adding the various components that create carbon dioxide, for example use of fossil fuels in traveling, heating, etc.
Carbon sink	An area that acts as carbon reservoir where carbon is stored for the longer term, for example a forest, which absorbs more carbon dioxide than it gives out.
Clean Development Mechanism (CDM)	One of the three market mechanisms established by the Kyoto Protocol. The CDM is designed to promote sustainable development in developing countries and assist Annex I Parties in meeting their greenhouse gas emissions reduction commitments. It enables industrialized countries to invest in emission reduction projects in developing countries and to receive credits for reductions achieved .
Climate	The average course or condition of the weather over a period of years, as exhibited by temperature, humidity, wind velocity, and precipitation.
Climate Change	A change in climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural variability observed over comparable time periods

Desertification	Land degradation in arid, semi arid and dry sub humid areas resulting from various factors, including climate variations and human activities.
Ecosystem	The complex of plant, animal, fungal and micro organism communities and their associated non living environment interacting as an ecological unit. Ecosystems have no fixed boundaries; instead, their parameters are set according to the scientific, management, or policy question being examined. Depending on the purpose of analysis, a single lake, a watershed, or an entire region may be considered an ecosystem.
Emission taxes	Taxes levied on air or water emissions, usually on a per ton basis. Emission taxes provide incentives for firms and households to reduce their emissions and therefore are a means by which pollution can be controlled. The greater the level of the emissions tax, the greater the incentive to reduce emissions.
Emissions	Anthropogenic (human caused) releases of greenhouse gases to the atmosphere (e.g., the release of carbon dioxide during fuel combustion).
Estuaries	A somewhat restricted body of water where the flow of freshwater mixes with saltier water transported, by tide, from the ocean. Estuaries are the most productive water bodies in the world.
Fossil fuel	A naturally occurring organic fuel formed in the Earth's crust, such as petroleum, coal, or natural gas. Fossil fuels result from organic matter being laid down and compacted over very long periods of time (hence fossil). This means that stocks of these fuels are finite (compare to renewable energy). Those gases, such as water vapour, carbon dioxide, tropospheric ozone, nitrous oxide, and methane, that are transparent to solar radiation but opaque to longwave radiation, thus preventing longwave radiation energy from leaving the atmosphere. The net effect is a trapping of absorbed radiation and a tendency to warm the planet's surface. The three major greenhouse gases covered by the UNFCCC and Kyoto Protocol are carbon dioxide, methane, nitrous oxide and three trace gases (hydrofluorocarbons, perfluorocarbons and sulphur hexafluoride). Ozone falls under the Montreal Protocol. Greenhouse gas forcing is The relative effectiveness of greenhouse gases in restricting long wave radiation from escaping back into space, and the effects of changing concentrations of these gases on global climate.
Greenhouse gases/ radiatively active gases	

Intergovernmental Panel on Climate Change (IPCC)	A panel established jointly in 1988 by the World Meteorological Organization and the United Nations Environment Programme to assess the scientific information relating to climate change and to formulate realistic response strategies
Mitigation	An anthropogenic intervention to reduce the sources or enhance the sinks of greenhouse gases
Renewable energy (RE)	Energy obtained from sources that are essentially inexhaustible (unlike, for example, fossil fuels, of which there is a finite supply). Renewable sources of energy include wood, waste, geothermal, wind, photovoltaic, small hydro and solar thermal energy.
Sustainable development	Sustainable development A broad concept referring to a country's need to balance the satisfaction of near term interests with the protection of the interests of future generations.
Vulnerability	Defines the extent to which climate change may damage or harm a system. It depends not only on the sensitivity of a system but also on its ability to adapt to new climatic

conditions.