OFFICIAL VIEWS ON THE ENVIRONMENT AND SECURITY IN SOUTH AFRICA, 2007-2012: A CASE OF SECURITISATION?

by

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A mini-dissertation submitted in partial fulfilment of the requirements for the degree

Master of Security Studies (MSS)

In the Department of Political Sciences at the

UNIVERSITY OF PRETORIA

FACULTY OF HUMANITIES

SUPERVISOR: PROF A. DU PLESSIS

November 2014

ACKNOWLEDGEMENTS

I wish to acknowledge the following people and institutions for their support and opportunities granted:

My study leader, Professor Anton du Plessis, whose patient guidance, academic expertise, knowledge in the field of International Relations and Security, and countless personal inputs assisted me tremendously in the composition of this dissertation.

My editor, Mrs Sonja Shannon, who's linguistic and grammatical skills, facilitated the transformation of my English second-language paper into a sound dissertation.

The SANDF, for providing me with the opportunity of undergraduate studies and, in particular, the lecturers of the Military Academy (Security and Africa Studies) who enriched my life with the gift of knowledge.

Jitesh, Karel and Charl, for the hours we spent in thought-provoking conversations on the topic, and for their suggestions and proofreading related to the paper. I will forever be grateful for their personal input in this academic endeavour.

To special friends, who assisted and supported me during various phases of this undertaking. I thank you from my heart.

My family, to whom I am indebted for their unwavering support during the many hours devoured by the writing of the dissertation: my mother who, through her father's legacy, created in me a thirst for knowledge, and who continued throughout the years to light candles for my studies; my brother for being an anchor and a living example of a moral beacon on this earth; and my best friend and (soul) sister, for her dedication to sustainable living and for inspiring greatness in people around her. It is for the future of my nieces and nephew that we strive to create a sustainable future.

This dissertation is dedicated to the loving memory of **Charlotte** and **Johann Stoltz**, who passed on during the final stages of this academic endeavour. Together they lived sustainable lives and believed in protecting all of nature for tomorrow's generation. Dads, thank you for your shared enthusiasm for my dissertation theme, for collecting relevant newspaper articles, and for your continuous telephone calls of encouragement and support. Thank you also for always being proud of us, regardless. Your physical presence and gusto will be immensely missed at graduation.

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LIST OF ACRONYMS

ACPC	African Climate Policy Centre
AIDS	Acquired Immune Deficiency Syndrome
AMCEN	African Ministerial Conference on the Environment
AMD	Acid mine drainage
AMCOW	African Ministers' Council on Water
AMESD	African Monitoring of the Environment for Sustainable Development
AQA	Air Quality Act
AR4	IPCC Fourth Assessment Report
AR5	IPCC Fifth Assessment Report
AU	African Union
AUC	African Union Commission
BASIC	Brazil, South Africa, India and China
BaU	Business as Usual
BDF	Botswana Defence Force
BRICS	Brazil, the Russian Federation, India, China and South Africa
CAAPD	Comprehensive Africa Agriculture Development Programme
CAHOSCC	Conference of African Heads of State and Government on Climate Change
CO_2	Carbon dioxide
CCIS	Climate Change and International Security
CFSP	Common Foreign and Security Policy (EU)
CMP	Conference of Parties serving as the Meeting of the Parties to the Kyoto Protocol
CNN	Central News Network
COJ	City of Johannesburg
COMESA	Common Market for Eastern and Southern Africa
COP	Conference of the Parties
CSS	Critical Security Studies
DAFF	Department of Agriculture, Forestry and Fisheries
DEA	Department of Environmental Affairs
DEAT	Department of Environmental Affairs and Tourism
DFS	Department of Field Support (UN)
DIRCO	Department of International Relations and Cooperation
DME	Department of Minerals and Energy
DMR	Department of Mineral Resources
DoD	Department of Defence
DOH	Department of Health
DPKO	Department of Peacekeeping Operations (UN)
DRC	Democratic Republic of Congo
DTI	Department of Trade and Industry
DWA	Department of Water Affairs
ECA	Economic Commission for Africa (UN)
EIA	Energy Information Administration
EMI	Environmental Management Inspectorate
ESS	European Security Strategy
EU	European Union
G77	Group of 77

GCIS	Government Communication and Information System
GEO	Global Environmental Outlook
GHG	Greenhouse gas
GLG	Gaffney's Local Government
GWP	Global Water Partnership
HCB	*Hydroelectrica de CahoraBassa*
HDI	Human Development Index
HPA	Highveld Priority Area
HSRC	Human Sciences Research Council
IAC	InterAcademy Council
ICTS	International Cooperation, Trade and Security (Cluster)
IDPs	Internally displaced people
IEA	International Energy Agency
IEIA	International Energy Information Administrator
IISS	International Institute of Strategic Studies
IMCCC	Inter-Ministerial Committee on Climate Change
IOM	International Organization for Migration
IR	International Relations
IRP	Integrated Resource Plan
IPCC	Intergovernmental Panel on Climate Change
ISS	Institute for Security Studies
JAES	Joint Africa-EU Strategy
LHWP	Lesotho Highlands Water Project
LTMS	Long Term Mitigation Scenarios
MAB	Military Advisory Board
MDG	Millennium Development Goal
MONUSCO	United Nations Organization Stabilization Mission in the Democratic Republic of the Congo
MOU	Memorandum of Understanding
$MtCO_2e$	Million metric tons of carbon dioxide
NO_2	Nitrogen dioxide
NAM	Non-Aligned Movement
NDP	National Development Plan
NEMA	National Environmental Management Amendment Act
NEPAD	New Partnership for Africa's Development
NERSA	National Energy Regulator of South Africa
NPC	National Planning Commission
NSS	National Security Strategy
OAU	Organisation of African Unity
ODNI	Office of the Director of National Intelligence
POPs	Persistent organic pollutants
PSC	Peace and Security Council (AU)
REDD	Reducing Emissions from Deforestation and Forest Degradation
RSA	Republic of South Africa
QDR	Quadrennial Defense Review
SO_2	Sulphur dioxide
SADC	Southern African Development Community
SAMRC	South African Medical Research Council
SANDF	South African National Defence Force

SAPP	Southern Africa Power Pool
SARi	South African Renewables Initiative
Sasol	South African Synthetic Oil Liquid
SEMAs	Specific Environmental Management Acts
SIPRI	Stockholm International Peace Research Institute
TB	Tuberculosis
TAP	Toxic Air Pollutants
UK	United Kingdom
UN	United Nations
UNCCD	United Nations Convention to Combat Desertification
UNCED	United Nations Conference on Environment and Development
UNCHE	United Nations Conference on the Human Environment
UNDP	United Nations Development Programme
UNECA	United Nations Economic Commission for Africa
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNGA	United Nations General Assembly
UNHCR	United Nations High Commission for Refugees
UNHRC	United Nations Human Rights Council
UNIDO	United Nations Industrial Development Organization
UNISDR	United Nations International Strategy for Disaster Reduction
UNPKO	United Nations Peace Keeping Operations
UNCED	United Nations Conference on Environment and Development
UNCHE	United Nations Conference on the Human Environment
UNSC	United Nations Security Council
UNSG	United Nations Secretary-General
USA	United States of America
VTAPA	Vaal Triangle Airshed Priority Area
WACDEP	Water, Climate and Development Programme
WBPA	Waterberg-Bojanala Priority Area
WEF	World Economic Forum
WFP	World Food Programme
WHO	World Health Organisation
WMO	World Meteorological Organisation
WWF	World Wildlife Fund

"[C]hange in the Earth's climate and its adverse effects are a common concern of humankind".

(United Nations Framework Convention on Climate Change, 1992:1)

"[M]ake no mistake. The facts are clear: climate change is real; it is accelerating in a dangerous manner; and it not only exacerbates threats to international peace and security, it is a threat to international peace and security".

Ban Ki-moon, United Nations Secretary-General (UNSG, 2011)

"Scientists have long sounded the alarm. Top-ranking military commanders and security experts have now joined the chorus. Yet the political class seems far behind"

Ban Ki-moon, United Nations Secretary-General (UNSG, 2013)

"Too many leaders seem content to keep climate change at arm's length, and in its policy silo. Too few grasp the need to bring the threat to the centre of global security, economic and financial management".

Ban Ki-moon, United Nations Secretary-General (UNSG, 2010)

CHAPTER 1
INTRODUCTION

1. IDENTIFICATION OF THE RESEARCH THEME

The concept of security has evolved over the years to reflect contemporary conditions. According to the traditional conceptualisation, it is assumed, firstly, that security is state-centric – that the state is the referent object of security; and secondly, that most threats to national security are of an external military nature (Ayoob, 1995:4-5). The post-Cold War concept of security developed in response to conflict at levels other than that of the state, deepening the concept to include individuals, societies, regions and groups as the referent objects of security. In addition, as argued by Buzan (1991:19), the security of human collectivities is also affected by political, economic, societal and environmental aspects that contribute to human insecurity and that broaden the concept of security to include non-military spheres. Consequently, the post-Cold War changes in security include a range of inter-related dimensions that denote the emergence of new security issues, amongst others environmental concerns such as global warming, climate change and environmental degradation (Snyder, 1999:65; Thomas, 1987:1).

More specifically, the concept of environmental security includes the adverse effects of environmental risks such as pollution (of air, land and water), environmental degradation and resource depletion – conditions that may generate risks, which in turn could pose threats to security (United Nations Development Programme, 1994). For example, the United Nations (UN) Millennium Development Goals (MDGs) link international peace and prosperity to human security; hence, environmental degradation is listed as a threat (in particular to human security) by the UN Secretary-General (UNSG) *High Level Panel on Threats, Challenges and Change* (UN, 2004b).

The *Fourth Assessment Report* (AR4) (2007) of the Intergovernmental Panel on Climate Change (IPCC) warns that climate change could "cause water shortages and hunger for millions, which could bring migration and spread disease" (IPCC quoted in Doyle, 2007). In a historic move and in response to AR4, the United Nations Security Council (UNSC) held its first ever discussion on the relationship between energy, security and the climate in April 2007 (UN, 2007). The UNSC specifically debated the "security implications of climate change, including the impact of climate change as a potential driver of conflict involving energy, water, food and other scarce resources; population movements; and border disputes" (UN, 2007). By identifying the challenges climate change poses to all nations, the UNSG noted that climate change could have serious implications for the environment, society and the economy, as well as for peace and security, in particular.

The extent to which environmental challenges, issues and risks impact on South Africa's national security (both state and human security) is not self-evident. However, an analysis of the securitisation of the environment in South Africa and the subsequent inclusion of environmental issues on the country's security agenda, based on official perceptions of and policy responses to the impact of the environment on global, regional and national security, can provide some indication of the relationship between the environment and security. From a practical perspective, an analysis of environmental security can identify the environmental risks that pose an emerging security threat, not only globally and regionally, but also nationally, to the RSA as a developing country in a vulnerable region. Because environmental risks exert additional stress on limited and depleting natural resources, the spill-over of environmental security into other spheres such as food security, water security and energy security is also important. As such, the risks posed by environmental issues are potential drivers of conflict, in terms of both international relations (e.g. environmental diplomacy) and national security (e.g. their spill-over into the political, economic and social sectors).

Against this background, the aim of this study is to describe and explore the relationship between the environment and security in South Africa between 2007 and 2012, with particular emphasis on environmental risks as a potential source of insecurity and thus a threat to national security that also impacts on related security sectors. The analysis is specifically based on the South African government's views of environmental security and addresses the underlying question of whether or not the environment is securitised.

2. LITERATURE OVERVIEW

The overview of the literature, including both primary and secondary sources, covers the following themes: conceptual aspects; securitisation and securitisation theory; global and regional views; and official South African views, threat perceptions and policy responses.

(a) **Conceptual and theoretical aspects:** Since the end of the Cold War and mostly due to the so-called "Welsh School's 'new' security thinking" (Peoples &Vaughan-Williams, 2010:9-10), the concept of security has been broadened to include both military and non-military sectors of security and has been deepened to include referent objects of security other than the state and regime. For example, Buzan's (1991) identification of five sectors affecting the security of human collectivities provides the basis for the inclusion of non-military threats to security. Critical Security Studies (CSS) theorists such as Booth (1991) – who started out as a realist thinker – shifted the main referent object of security to the individual, while other CSS theorists (Wæver and De Wilde) considered a large range of possible referent objects of

environmental security to include both concrete phenomena (e.g. the survival of species or types of habitat) and larger-scale issues (e.g. the maintenance of the planetary climate and biosphere) (Buzan, 1991; Buzan, Wæver and De Wilde, 1998). As a result, defining security has become a contentious issue, with scholars such as Ayoob (1995) arguing in favour of a narrow definition and application of the concept, while others (Braun, 2003; Mathews, 1991; Ngubane & Solomon, 2002; Snyder, 1999; Thomas, 1987) prefer a more comprehensive definition that includes a range of new dimensions threatening human security, e.g. food, health, energy, migration and nuclear risks.

(b) **Securitisation and securitisation theory:** Wæver (1995) notes that the differences between normal challenges and threats to national security occur on a spectrum of issues that range from the trivial and routine (i.e. non-military), through the serious but routine (i.e. politicised), to the drastic and unprecedented (i.e. securitised). Accordingly, theorists of the so-called 'Copenhagen School' (Buzan *et al*., 1995; Peoples &Vaughan-Williams, 2010:9-10) provide a definition of securitisation that is based on the presentation of an issue as an existential threat, noting that it is seen and articulated in a securitised form that goes beyond mere politicisation. They contend that non-military issues become security issues if an authoritative actor (e.g. the state or its representative), through a securitising speech act, names or denotes a particular development to be a security problem on the basis that it is considered to pose an existential threat that requires extraordinary security measures to manage it (Braun, 2003; Buzan, 1991; Buzan *et al*., 1998). Similarly, attention is drawn to non-traditional threats to national security, since non-traditional global security threats are, according to Hough and Kruys (2009:3), "by definition also national security threats to all countries to a greater or lesser degree". As an extension of the securitisation of issues as security threats, Bernhardt (2004) provides a conceptual distinction between security risks and threats, as well as their linkage, by emphasising the similarities between security risks and potential (as opposed to real) threats.

From the perspective of environmentalists, environmental security has become relevant as a result of some scholars applying the environment-conflict thesis, which is based on the notion that environmental scarcity has the potential to produce violent conflict (Homer-Dixon, 1999; Mathews, 1991). In addition, since the publication of AR4, a wealth of literature on environmental security has become available. As a result, several scholars (Baylis, Smith & Owens, 2011; Brown, 2007; Brown, Hammill & McLeman, 2007; Eckersley, 2010; Vogler, 2008) focus on transnational non-military threats to security, green politics and the complexity of securitising the environment.

Several scholars (Abass, 2010; Barnett & Adger, 2007; Brown & Crawford, 2009a; Brown & Crawford, 2009b; Kimble, 2005; Klare, 2010; Renner, 2006; Stern, 2006), although not securitisation theorists as such, implicitly call for the securitisation of environmental issues and explore the range of connections between climate change and security, including national and human security considerations. Additionally, various scholars (Celliers, 2009a; Celliers, 2009b; Institute for Security Studies, 2010; Kruys, 2008; Mwebaza & Mateche, 2010; Van Wyk, 2010) highlight the effects of environmental issues and risks on regional security (e.g. in the African context) by linking climate change, resource scarcity and resource conflicts, and by focusing on the increase in the number of environmental refugees on the African continent.

The broader definitions of security, however, do not resonate with some scholars who are critical of securitising the environment (e.g. Deudney, 1999; Matthew, 2011), due to the fact that this linkage is imperfect. Some dismiss the core assumption that "ecological decay is likely to cause inter-state wars" (Deudney quoted in Peoples & Vaughan-Williams, 2010:99), while others reject the environment-security nexus (e.g. Ayoob, 1995; Barnett, 2001; Dalby, 2002; Hough, 2003; Peoples & Vaughan-Williams, 2010). Thus, with regard to environmental security, there are broadly two schools of thought: one that makes provision for the securitisation of environmental risks, and another that prefers to asecuritise or exclude such risks.

(c) **Global and regional views:** The United Nations Development Programme (UNDP) provides an indication of the nature and scope of human security, which includes environmental risks, and more specifically the threats of pollution, environmental degradation and the depletion of resources (UNDP, 1994). In addition to AR4, there is a wealth of literature, emanating from various international organisations such as the UN, that deals with environmental risks and specifically refers to climate change and its possible security implications (e.g. UN, 2007; UN, 2010; UN, 2011; UNDP, 2007; United Nations Environment Programme (UNEP), 2007a; UNEP, 2010d; UNEP, 2012a; United Nations Framework Convention on Climate Change (UNFCCC), 2009b; UNFCCC, 2010; UNFCCC 2011; United Nations General Assembly (UNGA), 2009a; UNGA, 2009b). Similarly, the primary European Union (EU) sources (EU-AUC), 2008; EU, 2008a; EU 2009a; EU, 2009b; EU, 2009c) subscribe to the core assumption that climate change is a threat multiplier that exacerbates existing trends, tensions and instability (e.g. European Commission-African Union Commission). Primary sources on the African continent originate mainly in the African Union (AU), which recognises the IPCC report indicating Africa's vulnerability to climate change (India-Africa Forum Summit, 2008). In turn, the AU's focus is on maintaining its common

position on global climate change negotiations and securing monetary compensation (e.g. AU, 2007; AU, 2008a; AU, 2009a; AU, 2009b; AU, 2009c; AU, 2010; AU, 2013a; AU, 2009f; African Union Commission (AUC), 2009a; AUC, 2010; AUC, 2013).

(d) **Official South African views and threat perceptions:** The policy framework encapsulating South African views on national security reflects the views of the Welsh and Copenhagen Schools by placing particular emphasis on the social aspects and implications of security, particularly human security. As such, the *Constitution of the Republic of South Africa* (RSA, 1996a) provides for individual human rights that arguably underpin human security. Similarly, the *South African White Paper on Intelligence* (RSA, 1995) and the *White Paper on National Defence for the Republic of South Africa* (RSA, 1996b) incorporate all sectors of security and link the issues of stability and development. In respect of national threat perception, some sources of information, e.g. intelligence estimates by the security community, such as the Department of State Security (DSS) and the South African National Defence Force (SANDF) are classified. However, in the public domain, official statements and policy documents refer to the interdependence of non-military threats in the contemporary world which encompass, among others, "environmental degradation, food insecurity and increased competition for scarce natural resources" (RSA-DSS, 2009a; RSA-DSS, 2009b; RSA, 2010). Thus, despite some sources being classified, there are a sufficient number of secondary literature sources and primary case-related sources to provide an indication of the official South African views on environmental security (e.g. the aforementioned white papers and the recent *South African Defence Review* (RSA-DOD, 2014) which specifically focuses on the relationships between security, defence and development. In terms of environmental policy, it is noted that the *National Climate Change Response White Paper* (RSA, 2011a) makes no explicit reference to the securitisation of environmental risks; rather, it focuses on the adverse environmental, social and economic impact of environmental risks. These aspects, however, are related to environmental security.

From this overview of the literature and related documents, it is evident that the relationship between the environment and security is complex and contested. Recent theoretical developments aligned with new security thinking do, however, make provision for the securitisation of the environment. The question also arises as to what the situation is in respect of South Africa, considering the existing ambiguity as far as current viewpoints are concerned. Thus, this study aims to investigate the official South African views on the environment and security, in order to determine whether the inclusive and holistic approach to security that includes environmental risks and threats is officially incorporated into South African security policy and strategy, and therefore whether there is a securitisation of the environment.

3. FORMULATION AND DEMARCATION OF THE RESEARCH PROBLEM

The primary research problem of this study is encapsulated by the following question: 'Considering the current international focus on the potential security effects of climate change, to what extent are environmental risks securitised in the South African context?' In response to this question, the study will argue that despite environmental security being mentioned in South African policy documents pertaining to national security and threat perceptions, as well as in the official rhetoric and statements of Members of the Executive (Cabinet), the risks associated with the environment and the policy responses to the environment are not reflected in extraordinary policy measures around security, and thus are not indicative of securitisation.

The following secondary questions are addressed:

- How is the notion of environmental security accommodated by the contemporary conceptualisation and theoretical framing of security?
- To what extent have environmental risks such as climate change been linked to security by global and regional organisations since 2007?
- What is the impact of environmental risks such as climate change on South African national security?
- To what extent do environmental risks affect the security of South Africa in terms of human security and national security?
- Considering the extent of real environmental risks that may pose perceived or existential threats to South Africa's national security (state and human security), what are South Africa's official perceptions of and responses to these environmental security risks, and do they point to the politicisation, asecuritisation, securitisation or desecuritisation thereof?

In response to these secondary questions, the following subsidiary assumptions are made:

- The concept of security has evolved to include non-military threats such as the environment, because these non-traditional threats affect humankind and the state, as a political institution and form of human organisation. Thus, in principle, environmental risks could pose security risks and could therefore be securitised.
- The outcomes of AR4, accepted in principle, create greater sensitivity towards transnational environmental risks including climate change, and lead to the linking of the environment and security at global and regional levels.

- Despite the views and pronouncements on environmental risks, including those on climate change as an emerging security risk and threat, these perceptions are not reflected in official South African policy measures around security.

As stated at the outset, the primary aim of this study is to explore, describe and analyse South Africa's securitisation (or lack of securitisation) of the environment between 2007 and 2012. To achieve this aim, the objectives of the study are as follows:

- Develop a conceptual framework that links the environment and security.
- Describe, as a background context, the global and regional link between security and the environment in principle.
- Indicate the impact of climate change on security in general and on South Africa's security in particular.
- Analyse South Africa's official views since 2007 on the effects of climate change, to establish whether or not the environment is securitised.

The study is demarcated as follows:

- At a conceptual-theoretical level, the emphasis is on the nature and scope of security and its links to the environment; and on the securitisation of the environment, i.e. environmental issues that generate risks, which in turn may threaten human and national security.
- In respect of the time frame, the study covers the period from 2007 to 2012. It commences with the publication of the IPCC's AR4 in February 2007 and culminates with the United Nations Framework Convention on Climate Change (UNFCCC) 18th Conference of Parties (COP18) held in Doha (Qatar) in December 2012. However, for background and prospective purposes, select references are made to significant events and developments that took place prior to or after this time-frame.
- South Africa is used as a case study, considering that Africa is a continent seriously affected by the adverse effects of environmental risks (including climate change); that Southern Africa – in the context of the Southern African Development Community (SADC) – is an area where poverty and the scarcity of resources (food, water and energy) may lead to conflict; and that South Africa is a continental and regional core state with both developed and developing features.
- Although related to environmental security, the issues of environmental crime and activism are excluded from this study.

4. RESEARCH DESIGN AND METHODOLOGY

Concerning the research design, this is a literature-documentary study that explores, describes and analyses the research theme and problem as demarcated. The theoretical approach of this study, although using Realism and traditional security thinking as points of departure, is embedded in Critical Security Studies and Securitisation Theory. The latter theoretical approaches accommodate and clarify the broadening of the concept of security and the increasing securitisation of non-military issues, risks and threats. These theories also provide a framework for determining the security impact (the scope and referent objects) of environmental risks and the extent to which the environment is asecuritised, securitised or desecuritised. As a literature and documentary study, the research is presented in the form of a descriptive-analytical case study on South Africa that includes historical and contemporary developments.

The research methods include a single state (non-comparative) case study (environmental security in South Africa); inductive, qualitative and critical assessment; and literature and document analysis. Adequate primary sources are available in the public domain, specifically on the websites of international and regional organisations (e.g. the UN, EU, AU, SADC and RSA). Primary sources of information about the South African government's security perceptions of and responses to environmental risks are available in the public domain. These sources include policy documents (Acts, White papers); official statements by the executive (president, cabinet ministers, in particular ministers of environmental affairs, state security, defence, and international relations and cooperation); and participation in public debate (press releases). Although some of these primary sources also add to the conceptual framework, they mainly support the exploration and analysis of official perceptions and Government responses to environmental security in South Africa. The primary sources are augmented by secondary sources including books, journals, articles, periodicals and monographs, in order to develop the theoretical framework and to supplement the analysis of official South African views on environmental security.

5. STRUCTURE OF THE DISSERTATION

The study is divided into three parts: the theoretical framework (chapters one and two), the main sections including the case study (chapters three to five), and the concluding evaluation (chapter six).

Chapter 1: Introduction

The first chapter serves as an introduction by identifying the research theme, providing a literature survey, formulating and demarcating the research problem, describing the research design and methodology, and indicating the structure of the research project.

Chapter 2: The environment and security: selected theoretical aspects

This chapter provides a conceptual explanation of the evolution of security; the theory of securitisation, desecuritisation and asecuritisation; the relation between environmental risks and both human and national security; the concept of environmental security and environmental risks; and the relationships among environmental risks and threats.

Chapter 3: The global and regional securitisation of the environment

This chapter provides the contextual background on environmental security, in particular the global (UN) and regional (AU) security responses to the risks associated with climate change, following the publication of AR4 (2007).

Chapter 4: Environmental risks to South Africa

This chapter focuses on the environmental risks to and its possible effects on South Africa's security in the wider context of Southern Africa; its likely contribution to existing drivers of insecurity; the stress such risks (in particular climate change) exert on human competition for basic resources; and the security impact of environmental risks on South Africa, in particular the ramifications of climate change.

Chapter 5: Official perceptions of and policy responses to the environment and security

This chapter analyses South Africa's official perception of and responses to environmental security, at the hand of policy and official views (both international and domestic) to determine whether, in terms of securitisation theory, environmental risks (comprising risks associated with climate change) are successfully securitised; and if so, to what extent they are integrated into national security policy and strategy.

Chapter 6: Evaluation and recommendations

The final chapter returns to the research questions and assumptions regarding the securitisation of the environment in South Africa. Firstly, based on an evaluation of the research and its key findings, it answers the primary research question. Secondly, it assesses the alignment of South Africa's perceptions of and policy responses to environmental security, and makes key findings. Lastly, it makes recommendations for policy changes.

CHAPTER 2

ENVIRONMENT AND SECURITY: SELECTED THEORETICAL ASPECTS

1. INTRODUCTION

The end of the Cold War brought about an end to bipolar interstate ideological conflict and ushered in a multi-polar international system with new and different security challenges. Against this background, this chapter provides a conceptual clarification of security and explains the relationship between security and the environment. Firstly, it describes national security and human security. With regard to national security, it considers the concept of security and its horizontal broadening to include non-traditional and non-military threats, as well as its vertical deepening to include objects of security beyond the state. Furthermore, it provides a framework for the analysis of the securitisation of non-traditional or non-military security issues, including the environment. Secondly, it clarifies the concept of environmental security by relating environmental risks to human security and national security. Thirdly, it discusses the relationship between the environment and security, with reference to environmental risks. This discussion includes the debate on whether or not environmental risks lead to instability and/or are drivers of conflict (i.e. evolve from issues, through risks, to security threats), providing a case for securitisation, desecuritisation, and/or asecuritisation of environmental risks.

2. NATIONAL SECURITY AND HUMAN SECURITY

This section outlines approaches to national security and explores the notions of individual and human security, in order to lay a foundation for the examination of environmental risks as a human security issue within the context of South African national security.

2.1 From traditional to critical security thinking

As an issue-area within the discipline of International Relations (IR), security is essentially a contested concept that has evolved over the years to match contemporary conditions. The concept of security, national security in particular, is open to diverse interpretations, as it is multi-faceted and deals with an array of risks (Buzan, 1991:16). Until the 1980s, two approaches dominated thinking about security, namely Realism and Idealism. Whereas realists view security as a derivative of power, idealists regard security as a consequence of peace (Buzan, 1991:2). As a result, disagreement exists about the narrow and broad applications of the concept of security.

The Cold War years (1945–1990) were dominated by traditional thinking concerning national security, or as Mutimer (1999:79) refers to it, "see[ing] security through missile tubes". Traditional security is centred on external threats, more specifically external military threats, and defined by Louw (1978:10) as the "condition of freedom from external physical threat which a nation-state enjoys" (see also Sachs, 2003). The traditional conceptualisation is based on two major assumptions, namely that threats to a state's security arise from outside its borders, and that such threats are military in nature. Thus, the focus is on the state-centric nature of the state, more specifically that the state (or government, regime or nation) is the referent object of security, and on the fact that most threats arise from external sources that are predominantly military in nature (Ayoob, 1995:4-5; Buzan*et al*., 1998:36; Mutimer, 1999:77). In this respect, the notion of security is equated with that of national security, and therefore mainly associated with the military and intelligence capabilities of the state necessary for preventing or winning a major war (Matthew, 2011).

The post-Cold War notion of security arose in response to conflict on other levels, highlighting the vulnerability of people (Baylis, Smith & Owens, 2011). During the 1990s, the traditional notion of security was challenged in various ways. Firstly, it was challenged by the changing nature of violent conflict, mainly the change from "short, brutal and decisive interstate wars to long, somewhat less brutal, and frequently inconclusive civil wars" (Matthew, 2011). Secondly, and especially after theend of the Cold War (1989/1990), the traditional approach was challenged by the so-called "Welsh School's 'new' security thinking" (Peoples &Vaughan-Williams, 2010:9-10). At this stage, it became fashionable to equate security with other values considered by some analysts, such as Ayoob (1995:10), to be "more important and morally superior" to the "traditional political-military phenomena". The supporters of this position were eventually associated with CSS, which is an unorthodox approach to theorising about security issues. CSS proponents reject the realist and statist approach of the traditional/mainstream notion of security thinking and aim to theoretically re-think the concept of security in a holistic manner (De Zamaroczy, 2007). The following two schools of thought, *inter alia,* stem from CSS theory: the "optimistic perception of security" by the so-called 'Welsh School' (e.g. Booth), which draws on "Marxism and Critical Theory to create a self-consciously activist approach" that underscores emancipation; and the "more pessimistic perception of security" associated with the so-called 'Copenhagen School' (Buzan, Wæver & De Wilde, 1998) which calls for a "broadening of the concept of 'security' and highlights the process of 'securitisation' of political issues" (Floyd, 2007; Robinson, 2010).

The 'Copenhagen School' is best exemplified by Buzan (1991:19) who identifies five sectors affecting the security of human collectivities and provides the basis for the inclusion of non-military threats to security, in addition to the traditional military-oriented (state security) sector. The security sectors identified by Buzan, which are also shaped by contemporary issues impacting on human insecurity, are the political, economic, social, technological and environmental sectors. This approach resulted in the horizontal broadening of the concept of security to include both military and non-military sectors of security. However, these sectors do not function independently; each characterises a central aim within the security problematique, but all are "woven together" in a mesh of connections (Buzan, 1991:20). Other proponents of the Copenhagen School, such as Wæver and de Wilde, consider a wider range of possible referent objects for different sectors of security. Wæver (1995) is also credited with coining the term 'securitisation'. However, proponents of the 'Copenhagen School' warns against setting the securitisation 'bar' too low, and rather to aim for desecuritisation and/or asecuritisation than securitisation.

Booth (1991), one of the pioneers of CSS, particularly from the Welsh School, and a self-confessed 'fallen realist', eventually shifted the main referent object of security to the individual by equating the notion of security with emancipation. Booth (1991:319) states that "emancipation, not power or order, produces true security". As the exponents of CCS, such as Krause and Williams (1997), agreed that the state could also threaten the security of its citizens, the conventional concept of security was vertically deepened to include referent objects of security beyond the state and regime. These included individuals, humanity as a whole, nations, societies, genders, regions and minority groups as referent objects of security (Mutimer, 1999:83).

The universally acknowledged definitions of security are: a state of being "free from danger, anxiety, and fear" (Ayoob, 1995:4); and the "pursuit of freedom from threat" (Buzan, 1991:18). The post-Cold War concept of security, particularly national security, is broader and deeper than the narrow definition, which is limited to state security only. As a result, the contemporary concept of national security comprises the broad application of its definition to include aspects impacting on both human security (all five sectors of security) and state security. This shift in thinking focuses on a variant of global security and human security, which includes both tangible and at times intangible values such as life, health, wealth and freedom (Buzan, 1991:36; Matthew, 2011).

The post-Cold War changes include the emergence of new, transnational security issues such as weapons of mass destruction, environmental degradation (including climate change) and mass migration (Snyder, 1999:65). Sachs (2003) argues that although these security concerns may "employ non-traditional *means*, they do so in order to achieve traditional *ends.*" With reference to attempts to rethink security, Mutimer

(1999:86) concludes that they draw attention to the political nature of arguments about securityand to the conservative nature of most arguments for security.

To conclude, the evolution of the concept of security resulted in its horizontal broadening to include both military and non-military sectors of security and its vertical deepening to include referent objects of security other than the state and regime.

2.2 National security and the threat spectrum

The post-Cold War concept of security is broader and deeper than the traditional narrow definition, which is limited to state security only. The contemporary conceptualisation of security includes aspects impacting on both human security (also referred to as individual security), such as political, economic, social and environmental aspects, and on state security. Thus, attention is also drawn to non-traditional threats to national security, since (non-traditional) global security threats are "by definition also national security threats to all countries to a greater or lesser degree" (Hough & Kruys, 2009:3). Defining national security has nevertheless become a contentious issue, with some scholars (e.g. Ayoob, 1995) arguing in favour of a narrow definition and application of the concept, while others (e.g.Braun, 2003; Mathews, 1991; Ngubane & Solomon, 2002; Snyder, 1999; Thomas, 1987) prefer a more comprehensive definition that includes a range of new dimensions threatening human security, such as food, health, energy, migration and nuclear risks.

Security threats range through the spectrum of military, political, societal, economic and environmental threats. In each sector, the threat can be domestic or external. Since the focus of this study is on environmental security, the environmental/ecological sector will be discussed in depth at a later stage. Like military and economic threats, ecological threats to national security can damage the physical base of the state. The array of military, political, societal, economic and environmental threats does not constitute a static agenda for national security. Rather, the dramatic changes in the priorities among them are the main driving force behind the shift from the narrow military agenda of Strategic Studies to the broader agenda of International Security Studies (Buzan, 1991:133). The advent of the September 11, 2001 terrorist attacks on the World Trade Centre and the Pentagon in the United States of America (USA) prompted the need to assess the seriousness and size of new threats to societies in order to be able to establish an adequate national security strategy. All fields of human activity are associated with risks and challenges, and developments in all five sectors have the potential to pose security risks. Following a comprehensive risk analysis, Braun (2003:38) identifies nine risks on the non-military threat spectrum, of which the following four risks are related to environmental security:

- **Natural disasters**: As the modern world faces the effects of climate change, the likelihood of natural disasters increases.
- **Destabilisation of the ecological system**: Since the projected consequences of environmental risks will occur over the longer term, efforts to protect the environment run the risk of being deferred for the sake of short-term development and growth. Braun's (2003:38) notion to include environmental risks on the global security agenda is based on the multi-dimensional nature and transnational scope of environmental risks.
- **Supply problems**: Renewable resources are being consumed faster than they can be generated, and non-renewable resources, for instance food, water and energy, are being used at a rate that disregards the needs of future generations. Just as an interruption of the energy supply would affect entire societies, the inadequate supply of foodstuffs and water would render most African countries vulnerable.
- **Migration**: The fast-growing population and worsening ecological situation in many developing countries will add to the pressure of migration.

Against this backdrop, two schools of thought on national security emerged, namely the exclusive school, which views national security and human security as two separate but equal concepts; and the inclusive school, which considers national security as a holistic concept consisting of both state security and human security, in the process also alluding to and linking security to the developmental state (the security of and in the developmental state).

To conclude, diverse views on national security exist, following the identification of Buzan's five sectors of security and the range of non-military threats.

2.3 Securitisation

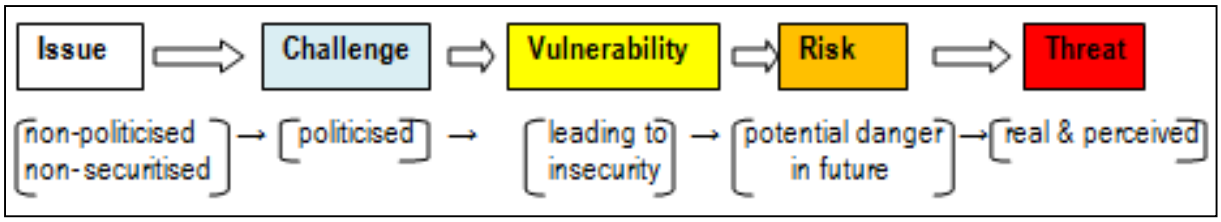
This section discusses securitisation and provides a framework for the analysis of the securitisation of non-traditional (non-military) security issues, including the environment. The process whereby issues are recognised as posing a security threat is referred to as the 'securitisation of issues'. Securitisation refers to the move of an issue "out of the realm of 'normal' political debate into the realm of emergency politics by presenting it as an existential threat" (Peoples & Vaughan-Williams, 2010:76).

2.3.1 *Securitisation theory*

Securitisation theory is an analytical tool to examine the transformation of a certain issue by an actor into a matter of security, and is associated with the Copenhagen School. The term 'securitisation' was coined by Wæver (1995:5-6), who noted that the "difference between normal challenges and threats to national security" occurs on a spectrum of threats which range from the trivial and routine (i.e. non-military), through the serious but routine (i.e. politicised), to the drastic and unprecedented (i.e. securitised). Accordingly, Copenhagen School theorists (such as Buzan*et al.*, Wæver & De Wilde, 1998:23) provide a definition of securitisation that is based on the presentation of an issue as an existential threat (a "more extreme version of politicization"), noting that it is seen and articulated in a securitised form that goes beyond mere politicisation. Such scholars contend that non-military issues become security issues when an authoritative actor (e.g. the state or its representative), through a securitising speech act and secuitisation move, labels or denotes a particular development to be a security problem (Buzan, 1991:17; Buzan, Wæver & De Wilde, 1998:24; Wæver, 1995:47).

In theory, any public issues, including non-military issues, can be located on a spectrum of threats ranging from the non-politicised, through the politicised (meaning the issue is part of public policy, requiring governmental decision and resource allocation), to the securitised (meaning the issue is presented as an existential threat, requiring emergency measures and justifying extraordinary political procedures) (Buzan, 1991:115; Buzan *et al*., 1998:23-24). Securitisation Theory maintains that once an issue is treated as a security issue, it is reasonble to use extraordinary political measures to deal with it. The difference between normal challenges and threats to national security – the theoretical progression from issues to threats – is illustrated in Figure 1.

Figure 1: Linear Spectrum of Threats



2.3.2 *Features on the spectrum of threats*

In pointing out the two 'sides' of security, Wolfers (in Brauch, 2011:61) refers to security as an "*absence of objective dangers*, i.e. of security 'threats', 'challenges', 'vulnerabilities' and 'risks', and of *subjective fears or concerns*, and to the *perception thereof*". The threat spectrum exhibits the following features that have to be identified and explained for the purposes of securitisation analysis:

- **Issue**: A non-politicised, non-securitised matter that is a cause for concern, but is not made an issue of public discussion and resolution, and therefore does not require action by the state.

- **Challenge**: Referred to as a demanding situation or issue that, upon recognition and articulation by political actors, becomes politicised. Because the concept entails less pressing and occasionally 'soft security' problems, it is mainly framed as internal security and dealt with by national governments, amongst others (Brauch, 2011:67). For instance, Bailes (2003) notes human security issues relating to the EU's 'new security challenges', for example the "collapse of the environment, pollution of food and natural resources …".

- **Vulnerability**: Defined as a "human condition or process resulting from physical, social, economic and environmental factors, which determine the likelihood and scale of damage from the impact of a given hazard" (UNDP, 2004). The concept denotes an awareness of the detrimental impact of issues causing want, fear and indignity, and therefore leading to insecurity; it pertains to both the internal (social vulnerability) and external (or environmental) aspects; and is context-dependent (Nathan, 2009:1126). AR4 uses the concept of vulnerability extensively, e.g. referring to Africa as a "vulnerability hotspot" (IPCC, 2007a:223).

- **Risk**: Defined as "hazard + vulnerability" (R=H+V) (Wisner, Blaikie, Cannon & Davis, 2004). The speculative term indicates uncertain consequences, and refers to the assessment of potential or future danger. Furthermore, risk estimates entail potential estimates based on the "probability, frequency and intensity of damages" (Brauch, 2011:79). Based on the similarities between security risks and potential threats, Bernhardt (2004) asserts that risks can also be viewed as potential threats.

- **Threat**: Defined as "capabilities multiplied by intentions, probability, consequences and time-span", T=C(I+P+C+T) (Hough, 2003:7). Threats are principally of an interconnected nature, emerge on a global scale, require international responses; and can be real or perceived. For instance, the UNSG (UN, 2004b) distinguishes among six clusters of threats comprising, *inter alia,* poverty; infectious disease and environmental degradation; and interstate and internal conflict.

In a further analysis of the spectrum of threats, Wæver (1995:56) argues that security and insecurity are not theoretical opposites: security denotes the "presence of a security problem *and* some measure taken in response", whereas insecurity suggests "the presence of a security problem and *no* response". As such, insecurity reflects a combination of threats and vulnerabilities. Futhermore, the distinction between threats and vulnerabilities points to a key divide in security policy, namely that states can either seek to reduce their insecurities by reducing their vulnerability (focusing inward), or by preventing or lessening threats (focusing outward/externally) (Buzan, 1991:112). While vulnerabilities are concrete (for instance, a land-locked country without a natural water source is vulnerable to water scarcity); threats are hard to determine, due to human subjectivity and the difficulty in distinguishing between serious threats to national security androutine threats as a result of global competitiveness (Buzan, 1991:114-115). A security threat becomes an existential threat when it requires special measures; threatens any level of security (state, national, or human security); and has national security implications. Threats to African national security include, *inter alia,* scarcity of natural resources and distress migration due to natural and/or man-made calamities.

Exactly where on this spectrum of threats issues are legitimately classified as national security problems is a matter of political choice rather than objective fact: setting the security threshold too low risks paranoia, and wastes resources and aggressive policies; while setting it too high risks failure to prepare for major assaults until it is too late (Buzan, 1991:115; Wæver, 1995:54).

2.3.3 *The securitsation process*

An issue becomes a security issue when an authoritative actor, through a securitising speech act – saying 'security' in relation to an issue – labels it as a security problem (Peoples & Vaughan-Williams, 2010:76). The 'felicity conditions' in Speech Act Theory – conditions to increase the probability of successful securitisation – require that the speech act must be performed by an authoritative person, in the true context, and in accordance with pre-establised conventions (Peoples & Vaughan-Williams, 2010:77). In addition, a securitising speech act is generally followed by a securitising move – an "attempt to securitise an issue by labelling it as a security issue" (Peoples & Vaughan-Williams, 2010:77). Successful

securitisation requires a degree of consent from both the speaker and the relevant audience; in the absence of consent, the securitising move is imperfect. Finally, the securitisation modality requires the framing of an issue as an "existential threat to a referent object by a securiti[s]ing actor" who, subsequently, authorises extraordinary measures (Buzan *et al*., 1998:5). An existential threat can, *inter alia*, be distinguished by the level of response it produces, and by two effects that indicate the significance of the security problem, namely a sense of urgency and the implementation of extraordinary measures (Peoples & Vaughan-Williams, 2010:77). Equally, items related to the issue, which has historic inferences of risk, damage or aggression, will likely facilitate the casting of that issue as an existential threat.

Buzan, Wæver and De Wilde (1998:35) assert that the securitising speech act distinguishes among three types of unit of security analysis, namely referent objects ("things that are seen to be existentially threatened" and that have to survive); securitising actors ("actors who securitise issues by declaring something... existentially threatened"); and functional actors ("actors who affect the dynamics of a sector"). Furthermore, they assert that a successful securitisation has three steps, namely identifying existential threats; taking emergency action; and affecting inter-unit relations by breaking free of rules (Buzan *et al*., 1998:6). Therefore, the initial step to a successful securitisation is a securitising move, which is open to any unit following an actor's successful persuasion of an audience (the 'target' of the securitisation act) to accept the issue as a security threat. Subsequently, a security move that is accepted by an audience implies resonance, the 'politics of consent'.

In addition, the state derives tremendous power from its claim to be the guardian of national security (Mutimer, 1999:97). By labelling an issue a security problem, the government automatically legitimises the use of exceptional means to maintain security. Wæver (1995:57) proposes that leaders often mask their interests as 'national security', and that "security is articulated only from a specific place … by elites". The state is thus privileged in the process and has a tendency to militarise issues when it securitises them. However, this dissertation supports Salter's (2008) notion that Wæver's statist model of securitisation does not "match the complexity of contemporary social dimensions of security". Thus, it proposes that securitising actors should be inclusive of "politial leaders, bureaucrats, governments … lobbyists, and various pressure groups" to reflect society (Biswas, 2011:4).

However, securitisation is not fulfilled only by the adoption of extraordinary measures or by framing it as an existential threats; rather, it simply has to appear to be likely to happen (Buzan *et al*., 1998:25). In addition, extraordinary measures do not necessarily imply the "use of force or military means", but rather the use of "exeptional forms of politics" (Wæver, 1995:53). Against this backdrop, some scholars (i.e. Hough & Kruys,

2009; Peoples &Vaughan-Williams, 2010; Wæver, 1995) caution against elites setting the securitisation threshold too low, and thus propose desecuritisation.

2.3.4 *Desecuritisation*

Critical of framing issues in terms of security, Wæver (1995:29) equates the successful securitisation of an issue with a failure to resolve the matter by means of 'normal' politics. Similary, Hough and Kruys (2009:preface) assert that threats and challenges are not equally serious, and that strictly speaking, "some may (at least initially) have more implications for societal security than for state security". Furthermore, Hough (2003:10) argues that threats to human security (i.e. climate change) can exist without automatically "manifesting (or even potentially manifesting) ... a threat to national security"; and that only if a specific situation "leads to violence, unacceptable conflict, or state instability", or has the potential to do so, does it constitute a threat to national security. In reference to the securitising speech act, in particular the securitising actor, Hough (2003:10) holds that "a threat is a threat to national security [only] when a government says it is". Accordingly, Mutimer (1999:90) opposes the extention of the scope of security, and instead proposes working towards desecuritisation – a process of, after securitisation, "shifting an issue out of the realm of securitisation and emergency politics back into the realm of 'normal' politics or technical debate" (Peoples & Vaughan-Williams, 2010:77).

Proponents of desecuritisation assert that an existential threat does not exist, and that the problem/issue can be dealt with by means of normal politics. The desecuritisation process entails a reversal of the external and internal conditions for securitisation and the removal of issues from the 'threat-defence' cycle to the routine public sphere where the political system is able to deal with such issues accordingly (Buzan *et al*., 1998:29). This dissertation supports Floyd's (2007:349) assertion that desecuritisation is absolutely "issue-dependent rather than static", thus it asserts that the success or futility of securitisation (and desecuritisation) can vary in "different settings within the same issue and across issues" (Salter, 2008).

Wæver (1998:71) proposes 'asecurity' – a "condition in which issues tend to remain unsecuritised, and are dealt with primarily as political issues or considered as non-political" – rather than security as the ideal. Asecurity denotes a state where "actors who do not feel insecure, do not self-consciously feel (or work on being) secure", and are probably involved in other matters (Peoples & Vaughan-Williams, 2010:84). Asecurity thus describes a condition where the occurrence of securitisation (and any consequent requirement for desecuritisation) is minimal or absent, and issues are not conceptualised in terms of security.

To conclude, securitisation refers to a spectrum of threats along which an issue is presented as a real or perceived existential threat, with no two countries using the same criteria.

2.4 Security and development

This section explores the concept of human security with a view to developing a coherent definition and relating it to environmental risks. Human security is broadly defined by the UNDP (1994:24) as "freedom from fear and freedom from want", with the emphasis on food, water, social security and health security. The concept is related to individual security, but is distinct from it. Whereas human security relates to a collective of individuals, individual security considers the safety and security of individual persons.

2.4.1 *Human security and individual security*

The concept of human security originated in the UNDP *Human Development Report* (UNDP, 1994) (hereafter referred to as 'the Report'), which criticised the narrow application of the concept of security and its correlation to nation-states rather than to people. The Report underscored the need for a more people-orientated concept of security, a "concern with human life and dignity", and identified the essential characteristics of human security, namely that it is a "universal concern", "people centred", and "easier to ensure through early prevention than later intervention"; and that its "components are interdependent" (UNDP, 1994:22-23). Furthermore, the Report distinguished between human development (defined as a "process of widening the range of people's choices") and human security (meaning that "people can exercise these choices safely and freely" with relative certainty that the "opportunities they have today are not totally lost tomorrow") (UNDP, 1994:23). Threats to human security are subdivided into seven main categories, namely "economic, food, health, environmental, personal, community and political" security (UNDP, 1994:24-25).

The *Bonn Declaration* (1991) defines human security as the "absence of threat to human life, lifestyle and culture through the fulfilment of basic needs" (Omari, 1995:4). Similarly, Sachs (2003) defines human security as the "need of individuals for safety in other arenas of basic need", including access to water and food, health, environmental security and energy security. Along similar lines, Kaldor (2007) argues that violence has become more structural and when violence exists, old responses are not appropriate. In reference to the 'security gap' in the contemporary world, she states that 'new wars' are intertwined with other global risks such as the spread of disease, vulnerability to natural disasters, poverty and homelessness. Yet, security conceptions do not reduce such insecurities; rather, they make them worse. Her solution to global insecurity is human security – "the security of individuals rather than the security of

states" (Kaldor, 2007). She presents human security as the new security paradigm, which should include both development and security.

Environmental security is of particular relevance to the study of environmental risks (including climate change) as a human security issue. The Report (UNDP, 1994:28) states that environmental threats are a combination of the "degradation of local ecosystems" (referred to as 'pollution and degradation' in this study) and that of the "global system". It cites water scarcity, water pollution and land degradation (including accelerated deforestation and desertification) as the most significant environmental threats in developing countries, whereas pollution (of air, water and land) is a major environmental threat within industrialised countries, and recently also the emerging economies (UNDP, 1994:28). Environmental threats differ in nature, as some are chronic and long-lasting (for example climate change due to human-induced greenhouse gas[1] (GHG) emissions), while others are sudden and violent (for example the Chernobyl nuclear disaster). Such environmental threats have resulted in more frequent and more significant disasters, which are exacerbated by population growth that forces people to live on the periphery of society. Similarly, environmental degradation is also attributed to population increases and industrialised development. Furthermore, the Report points out the linkages between environmental threats, economic threats and food insecurity. In conclusion, it finds that poor people, being more exposed and having fewer coping mechanisms, are more susceptible and vulnerable to environmental threats.

In describing the state as a potential source of insecurity for the individual, Buzan (1991:44) uses the term 'individual security'. He nevertheless criticises individual security by arguing that it is "subordinate to the higher-level political structures of the state and international system" (Buzan, 1991:45). Although Hough (2003:81) concurs with the UNEP definition of human security, he cautions that the "alleviation of human security does not necessarily mean greater peace and security". Similar to Buzan who criticises the open-endedness of individual security, he distinguishes between the 'high' politics of state security (relating to national security) and the 'low' politics related to human security. As a result, he downplays many human security issues as 'service delivery issues'.

[1] "Those gaseous constituents of the atmosphere, both neutral and anthropogenic, that absorb and re-emit infrared radiation". (UNFCCC, n.d.). This process is the fundamental origin of the greenhouse effect. The most abundant greenhouse gases in the earth's atmosphere are: water vapour (H_2O), carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O) and ozone (O_3) (UNFCCC, n.d.).

Some scholars such as Barnett, Matthew and O'Brien (quoted in Scheffran *et al*.,2012:195) claim that human security offers a form of securitisation without the "counterproductive outcome that [stems] from securitisation by the state; indeed it points to a role for the state in mitigating the drivers of environmental change and in facilitating responses to minimise insecurities". This dissertation accepts the notion of people-centred human security, as it relates directly to environmental security, more specifically to aspects affected by environmental risks, such as food, water, energy and health security. Furthermore, and as will be pointed out, the concept of human security is entrenched in South Africa's notion of security (see *Chapter 5*).

2.4.2 *Security and the developmental state*

The Western definition of security during the Cold War years had three dimensions, namely its "external orientation, positive links with systematic security, and the correspondence of state security with alliance security" (Ayoob, 1995:8). In a critique of the mainstream definition of security of both the traditional and post-Cold War approaches, Ayoob (1995:9) argued that such dimensions are not pertinent to the so-called 'Third World' notion of national security, which emphasises both internal and external vulnerabilities. Thomas (1987:1) advanced a stong, early argument for a much broader meaning of security than that found in conventional literature, by including a "whole range of dimensions of a state's existence", for example food, money and health. Ayoob criticised Thomas's definition as being excessively open-ended, thereby reducing its analytical value.

In conclusion, the contemporary concept of national security includes both formal state security and societal security (Hough &Kruys, 2009:preface). Accordingly, it is argued in this dissertation that human security is not only an element of national security, but that it is indeed the cornerstone of national security, specifically in the context of South African security, and based on its link with environmental risks. This linkage is analysed in the following section.

3. ENVIRONMENTAL SECURITY: THE CONCEPTUAL DIMENSION

This section aims, firstly, to clarify the concept of environmental security by introducing it as an emerging security issue, providing a conceptual definition thereof and identifying facets of environmental risks (air, water and land pollution, environmental degradation and resource depletion). Secondly, it aims to relate environmental risks to national security and human security, by identifying schools of thought on environmental security and pointing to its links with other security sectors. Lastly, it aims to present arguments/evidence for both the securitisation and desecuritisation of environmental risks.

3.1 The environment as an emerging security issue

Traditionally, ecological issues and threats were regarded as random, part of the natural conditions of life and therefore "more a matter of fate than an issue for the national security agenda" (Buzan, 1991:131). Although earthquakes, floods and droughts might inflict the same scale of damage as wars, these were traditionally regarded as part of the human struggle against nature, whereas national security issues signified the struggle of humans among each another. The growing concern over environmental degradation and stress, challenges the traditional concept of security (Matthew, 2011). CSS theorists (such as Buzan, 1991:131) recognised that the environment was no longer simply a background factor, as increased anthropogenic[2] activity visibly had an adverse effect on planetary life. The cause-effect relationship forced environmental issues increasingly into the human arena and therefore into the political arena. Matthew (2011:3) holds that the 1992 UN Conference on Environment and Development (also known as the 'Rio Summit' or 'Earth Summit') "catalyzed global attention around climate change, biodiversity loss, and deforestation". Some of the smaller-scale ecological threats (for example trans-frontier pollution between neighbouring states) link activities within one state to specific environmental effects in another. Larger-scale environmental threats (for example the global impact of climate change) are more difficult to accommodate within the conventional national security framework.

Should these threats materialise, some states would bear the brunt of them; for example, rising sea-levels would be detrimental to low-lying countries and islands, while significant warming could alter the distribution of rainfall, thus affecting agriculture while threatening food security. Substantial climate change – either warming or cooling – would totally change the geography of human habitation and, in doing so, would sweep away many of the existing social and political structures of the international system (Buzan, 1991:132). Very few states have the capability to control these macro-developments of a transnational and global nature by themselves, thus they follow a collective and cooperative security approach; this raises deep political questions of its own. If the ecosystem becomes a variable that is subject to human manipulation, then the distribution of costs and benefits becomes an intensely political matter (i.e. green politics).

[2]Designates an effect "resulting from or produced by human beings" and their activities – in this case, human-induced environmental change (UNEP, n.d.). Carbon dioxide is the most significant anthropogenic GHG.

Based on the rapid rate at which life-giving eco-systems (water, food and clean air) are being neglected, environmentally induced changes will increasingly confront humanity. The Institute for Environmental Security (n.d.:1) emphasises the significance of environmental security in the fields of both IR and international development. Inevitably, these events (environmental risks) will test the traditional concepts of national security, possibly leading to conflict on various levels. It can therefore be concluded that environmental security in a broad sense affects humanity in various ways; this is a notion that is accommodated and advanced by the new thinking on security and CSS, due to the inclusion of environmental concerns.

3.2 **Defining environmental security**

Due to its contested nature, there is no agreed-upon definition of the concept of environmental security and even less consensus on the meaning of environmental insecurity (Barnett, 2007:5). As a point of departure, Swatuk (2004:1) argues that environmental security "revolves around a central idea that environmental [risks] – in particular [air, water and land pollution], resource scarcity and environmental degradation – may lead to violent conflict between and among states and societies". However, this notion is qualified by the fact that environmental risks are not regarded as the only causal factors in violent conflict, but that they certainly interact with other challenges to augment conflict.

Buzan (1991:19) defines environmental security as the "maintenance of the local and the planetary biosphere as the essential support system on which all other human enterprises depend." This definition is rather broad and unspecific. Barnett (2007:5), in contrast, starts out by defining environmental *insecurity* as the "vulnerability of individuals and groups to critical adverse effects caused directly or indirectly by environmental change" – a state realised when "individuals and groups are unable to avoid or adapt to environmental change". Accordingly, Barnett (2007:5) defines environmental security as the "ability of individuals to avoid or adapt to environmental change so that things that are important to their wellbeing are not substantially negatively affected". Barnett's definition is more comprehensive, because it focuses on environmental (in)security, which relates to environmental risks. Lastly, the definition by US Legal (2012) describes environmental security as "the proportional public safety from environmental dangers that results from natural or human processes due to ignorance, accident, mismanagement or design". It furthermore holds that the concept "examines the threat posed by environmental events and trends to national security and elements of national power", thereby conceptually linking environmental risks and national security.

To conclude, the following stipulative definition of environmental security is used in this study: The ability of societies to avoid or adapt to environmental risks – including air, land and water pollution; environmental degradation; and resource depletion – that interact with other threats to exacerbate conflict, thereby affecting security.

3.3 Aspects related to environmental security

Considering the above definitions and as an extension of them, aspects related to environmental security may – in the medium to long term – have potentially devastating effects on planetary survival. These aspects include the following:

- **Environmental risks**: Environmental risks include air, land and water pollution, environmental degradation and resource depletion.

- **Environmental degradation**: Environmental degradation is defined as "the erosion of the natural environment through the depletion of resources [such as air, water and soil], the destruction of ecosystems and the extinction of plant and animal species. It is caused by direct or indirect human activity" and has increased considerably since industrialisation (FWR Group, n.d.). Ranked among the UNSG's top ten high level threats facing the planet, the degradation of one of the environmental elements causes the degradation of others, creating a global ripple effect. For example, global climate change, loss of habitat, pollution and exploitation cause coastal and marine degradation.

- **Environmental stress**: Environmental stress is defined as "pressure on the environment caused by human activities (such as generation of pollution) or by natural events (such as occurrence of a drought)" (Business Dictionary, n.d.).

- **Environmental scarcity**: Environmental scarcity "incorporates several sources of scarcity into one term: natural resource scarcity, population growth (which leads to a reduction in *per capita* availability of a resource) and unequal resource distribution (such as unequal land holdings) …" (Rotberg, 2006).

- **Climate change**: Climate change is defined as a "change of 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 climate variability observed over comparable time periods" (UNFCCC, 1992). As a source of environmental degradation, climate change is a causal factor of environmental risks.

- **Climate security:** Climate security can be defined as the "broad range of foreign policy actions aimed at addressing the strategic and political impacts of climate change" (Youngs, 2014:3). The concept, thus, represents a more comprehensive conceptualisation of environment-related issues. More specifically, it "addresses and implements measures to reduce the impact of [GHG] emissions on humans and the environment and to achieve sustainable development" (Van Wyk, 2010:18). As a result, the lack or absence of climate security, i.e. climate insecurity, is considered to be an additional stress factor and threat multiplier (Van Wyk, 2010:18).

- **Adverse effects of climate change**: Adverse effects of climate change are defined as "[c]hanges in the physical environment or biota resulting from climate change which have significant deleterious effects on the composition, resilience or productivity of natural and managed ecosystems or on the operation of socio-economic systems or on human health and welfare" (UNFCCC, 1992).

- **Climate variability**: Climate variability is defined as a "change in climate that alters the composition of the global atmosphere" (UNFCCC, 1992). The UNFCCC thus differentiates between climate change, which is attributed to human activity, and climate variability, which is attributed to natural causes.

- **Global warming**: Global warming is defined as the "increase of the average temperature on Earth. As the Earth gets hotter, disasters like hurricanes, droughts and floods become more frequent." (Lindinger & Kunzemann, 2010).

From the above, it is evident that the concept of environmental risks, when linked to related aspects, provides an all-encompassing description that includes all three elements listed among the UN's top ten high level threats faced by the planet.

4. ENVIRONMENTAL SECURITY: THE CONTEXTUAL DIMENSION

By virtue of the environment being a sector of security, it is believed that at least some of its aspects have security implications. This section relates the environment to security, with particular reference to environmental risks. It explores the premise that environmental issues, more specifically risks, can lead to instability and/or are drivers of conflict that my subsequently impact on national security.

4.1 The relationship between the environment and security

The Institute for Environmental Security (n.d.:1) holds that the environment is the 'most transnational' issue and that its security is a vital factor for peace and national security; that it is central to national security (including natural resources), to the social fabric of the state and to the financial instruments of stability; and that "while the precise roles of the environment in peace, conflict, destabilisation and human insecurity" may be varied, there are signs that it is "increasingly an underlying cause of instability, conflict and unrest".

In turn, Biswas (2011:6) argues that the environment is of strategic importance to states building "power through natural resources like water, oil, gas, and various other minerals". He furthermore criticises the control over the environment and natural resources by the state, due to the ostensible spill-over effects such as environmental degradation, with subsequent disasters including "uncontrolled migration, high population growth, and human casualties", and concludes that such disasters develop into "real security concerns" for the affected state.

Contemporary scholars such as Matthew (2011:3) – although he is not in favour of securitising the environment – explore the associations between "environmental risks and two national security challenges, [namely] violent conflict and state failure". He argues that certain natural resources can become central issues affecting government performance, growth projections, population movements and types of rivalry, particularly when such resources become scarce (e.g. water or arable land) or increase in worth (e.g. diamonds, copper, cobalt, oil or uranium). He concludes that under certain circumstances, these challenges are likely to contribute to violent conflict and additional forms of insecurity. Similarly, in analysing the environment's link with conflict and security, Renner (2006:I-C/1-2) broadly categorises the effect of environmental change on conflict formation as follows:

- **Conflicts arising from resource and environmental scarcity**: These are conflicts "mediated and sometimes exacerbated by the social and economic repercussions of environmental degradation", for example the conflict in Darfur.
- **Conflicts arising from contested resource wealth**: These conflicts relate to the "access to and control over lucrative resources" as well as the unequal distribution of the profits and "burdens of extractive projects", for example the earlier protracted Angolan civil war over the control of oil resources.

- **Impact of war on the environment**: This impact includes "armed conflicts, arms production, maintaining military forces, and preparations for warfare", for example the recent incidence of 'Gulf War Syndrome' among some populations in Iraq and Afghanistan, after exposure to US military weapons containing depleted uranium.
- **Environmental peacemaking**: Environmental peacemaking arises from "common interests among different countries or communities in safeguarding resources and ecosystems".

To conclude, as a transnational issue, the environment is of strategic importance to states and societies, to the extent that environmental risks can pose challenges to both national and human security. The next section focuses on specific associations between the environment and security, by exploring the different approaches to environmental security.

4.2 Approaches to environmental security

Various schools of thought exist on the interaction between environmental risks and peace and security concerns, more specifically on the "link between environmental degradation, resource scarcity and violent conflict", generally referred to as 'environmental security' (Swatuk, 2004:6). Writers have varied focus areas within the spectrum of connections.

As a point of departure, Dalby (2002:96) contends that the concept of environmental security has evolved through four stages, namely the "broader understanding of security; linkage exploration between environment and insecurity; empirical verification or refutation of identified linkages; and synthesis and re-conceptualisation". Furthermore, he concludes that environmental security has already progressed to its third and fourth stages, as fears of direct "large-scale (nation-state) warfare over renewable resources" have receded (Dalby, 2002:95).

In turn, Swatuk (2004) distinguishes between two competing schools of thought, namely 'environmental security studies' and 'critical environmental security studies'. Environmental security studies emphasise the causal relationships between violent conflict and renewable resource degradation; maldevelopment; and governance. Critical environmental studies, in contrast, focus on the problem of the state, and the need for a new language to provide a new understanding of this relationship.

Some scholars, Homer-Dixon (1999) in particular, have a narrow focus and they restrict their analysis to links between the environment and the occurrence of violent conflict, while others, such as Westing (in Smith, 2001) have developed a comprehensive approach (Renner, 2006:I-C/1). In addition, some scholars (e.g. Biswas, 2011) focus on the national security impact of environmental change, whereas others, such as Tuchman-Mathews (cited in Smith, 2001), emphasise its global impact (Renner, 2006,I-C/1). With reference to the environment-security nexus, and considering the manner in which the referent threat is constructed, Smith (2001) identifies the following three approaches to environmental security:

- **Traditional environmental security**: This approach is characterised by a narrow definition of security that focuses on conflict arising from environmental degradation, population pressures or access to natural resources. This category links the environment and violence by emphasising degradation as a result of war and as a contributory factor to war (by exacerbating manifest conflict or adding new dimensions to it); it also identifies environmental determinants as sources of conflict. Homer-Dixon (1999:2), a proponent of the so-called 'Toronto School', explores the "relationship between environmental change and potentially violent conflict", both globally and nationally. Although he does not challenge the traditional notion of security, he presents environmental risks as a new source of threat (Mutimer, 1999:87). Critics of this viewpoint, such as Dyer (1991:25), discard the link between security and the environment, and question the assumption that war results in environmental degradation. Similarly, Deudney (1999:461-476) challenges the link between violence and environmental degradation, and rejects the claim that environmental degradation leads to changes in the balance of power, and to conflict.

- **Global environmental security**: This approach questions the value of a narrow definition of national security. Tuchman-Mathews (cited in Smith, 2001) proposes that, in response to contemporary realities, national security be broadened to include resource, environmental and demographic issues. Furthermore, this approach views environmental degradation (and related aspects such as climate change) as the threat itself, having multidimensional non-military sources that are economic, political and social in nature (Smith, 2001:9). Despite its more holistic vision, this approach is criticised because it encompasses too many issues and risks. In this respect, Deudney (1999:469) deems the link between environmental issues and national security to be analytically weak and redundant.

- **Comprehensive or human security**: These interrelated approaches involve a multifaceted conception of security that recognises the interconnectedness of various sources of insecurity (Smith, 2001). Westing (cited in Smith, 2001) notes that political security and environmental security, as inextricably linked components of comprehensive human security, should both be served and ensured. Accordingly, this viewpoint advances a human-centred approach to security, thereby discarding the narrow focus on the state, by asserting that the "forces affecting human security are interrelated and mutually reinforcing" (Smith, 2001). Nevertheless, Smith (2001) criticises the analytical ambiguity and utilisation of these approaches, and the fact that they enable the militarisation of the environment (Smith, 2001).

For the purposes of this study, the comprehensive or human security approach to environmental security is subscribed to, albeit with the qualification that the human security approach has also become part of foreign policy.

4.3 Environmental security and other sectors of security

Based on the definition of environmental security, environmental stress may be both a *cause* of conflict and a *result* of conflict (Kirchner, 2012). Scholars advancing the securitisation of environmental issues contend that environmental risks (specifically climate change) has ramifications for all sectors of national security, namely the political, economic and social security sectors:

- **Political security**: Political security refers to the organisational stability of social order, and the notion encompass features such as state sovereignty amongst others. The indirect political threat from environmental risks include environmental migrants, resource wars, and the security impact of climate change (Levy, 1995:36). Such environmental threats will require the political sector/systemto adapt to a 'new' global rubrics requiring responsesto 'green theory', environmental diplomacy, and a global GHG emission regime; and which also impact on international relations.

- **Economic security**: Economic security denotes access to resources, investments and markets essential to sustain adequate levels of prosperity and state power (Buzan, 1991:19). The impact of environmental risks (such as degradation) on the economic sector stems from its effect on infrastructure (e.g. costs of coastal erosion); and involves the debate whether to immediately introduce the cost of mitigating measures to slow down the rapid pace of the adverse effects of climate change, or to deal with adverse effects later when they emerge.

- **Energy security**: The concept energy security encompass features such as reliable/uninterrupted supply, accessible/available supply, and affordable/ competitive supply; as well as the ability to react to the supply-demand changes (IEA, n.d.). As a sub-facet of the economic sector, energy security forms an integral part of national security and is affected by the stress that climate change exerts on conventional sources of energy (e.g. the ecological costs of using fossil fuels), as well as by the pressure to adjust to renewable energy.

- **Social security**: Social security represents the sustainability, within acceptable conditions for development, of national identify and traditional practises. Environmental risks may produce population movement when environmental refugees migrate from environmentally stressed regions to less stressed regions and the metropolis, in the hope of finding improved access to further resources. The ensuing environmental migration has the potential to spark or increase tension both within states and between sending and receiving state (including their citizens).

Climate change can also potentially place additional stress on human competition for food, water, health, an unpolluted environment, and energy. Firstly, food insecurity within states can result in food riots and competition. An example of this is where starving nations' governments (e.g. the Zimbabwean government) refuse to utilise genetically modified crops, or where citizens and foreigners compete for the same food resources. Secondly, with reference to water security, the scarcity of and competition for water in a region will impact on water security both within and between states. Thirdly, health security is also affected by environmental degradation, since it exerts additional strain on depleted water resources that are essential for health. For example, if less water is available for sanitation purposes, it can further the spread of disease. Fourthly, the requirement that climate change places on countries to convert to cleaner technology for power generation puts additional stress on the development and use of renewable energies, as well as the phasing out of fossil-fuel power stations. Lastly, environmental risks can lead to environmental crimes such as nuclear waste dumping, as in the practice where rich developed countries provide financial incentives to poorer developing countries to provide dumping facilities for nuclear waste. (Refer to *Chapter 4, Section 4* for more detail on the impacts of environmental risks on other sectors of security).

Considering the above, note is taken of Sachs's (2003) finding that environmental risks rarely become the direct causes of conflict (as in the case of war over scarce resources such as water), but that they "could easily produce conflicts through the mechanisms of economic decline and political instability". To conclude, by linking environmental risks and human security, the impact of climate change on the food, water and health sectors becomes evident. However, the link between environmental risks and national security are

less evident, as the impact on the political, economic and social security sectors are initially not as apparent.

5. ENVIRONMENTAL SECURITY: THE OPERATIONAL DIMENSION

Although Buzan, Wæver and De Wilde (1998) consent to the expansion of the security outline, they do warn against the ever-widening range of issues included in the word 'security'. Securitisation theory assumes that non-military threats do not essentially need to be as hazardous as warfare, but that they should "follow a logic (existential threat to a referent object) and have effects (the use of emergency powers)" that match the traditional military-political concept of security (Peoples & Vaughan-Williams, 2010:80). A wider application of securitisation theory with regard to the environmental sector includes both concrete things, for example the survival of species or types of habitat; and larger-scale issues, such as the maintenance of the planetary climate and biosphere (Buzan, 1991:19; Buzan *et al*., 1998:23). However, they caution that successful securitisation of the environmental demands approval from the applicable audience, and that indigenous societies buy in to the scientific agenda. It is interesting to note that they emphasise this specific aspect (approval by the relevant audience) for the environmental sector *per se*, considering that it applies throughout all sectors, as do all the other requirements for successful securitisation.

As previously indicated, the broader definition of the concept of security was not accepted everywhere, and this resulted in two contending schools of thought on environmental security, namely that of the Idealists who make provision for the securitisation of environmental risks, and that of the Realists who prefer to desecuritise or exclude such risks.

5.1 The case for securitising the environment

The securitisation of the environment involves the notion that environmental risks evolve on the spectrum of threats from being an issue, to being a risk, to posing a security threat. To this end, Biswas (2011:10) recognises the environment as a "cross-border issue" requiring collective effort, and supports the linkage of environmental degradation and international security, based on the transnational nature and scope of the environment. In an apparent attempt to partially securitise the environment, Buzan (1992:1:24) states that the concept of national security is powerful as an "instrument of social and political mobilization", and therefore the motivation for including environmental issues on the security agenda is likely to be the "magnitude of the threats posed, and the need to mobilize urgent and unprecedented response to them". Furthermore, Buzan (1992:15) argues that the 'security label' (securitisation move) is useful for indicating danger and setting priorities, and for this reason solely, its use will continue in environmental discourse.

However, this argument of Buzan is contradicted by his later work with Wæver and De Wilde (Buzan *et al*., 1998), which calls for the asecuritisation of the environment (see Section 3.8).

The issue of environmental security became prominent when scholars like Homer-Dixon (1999), Renner (2006) and Mathews (1991) presented the 'environment-conflict' thesis, which assumes that environmental scarcity can produce violent conflict. Furthermore, following the publication of AR4, several scholars (e.g.Brown, 2007; Brown, Hammill & McLeman, 2007; Eckersley, 2010; Vogler, 2008) focused on transnational non-military threats to security, green politics and the complexity of securitising the environment. Despite not being securitisation theorists *per se*, various scholars (e.g. Abass, 2010; Barnett & Adger, 2007; Brown & Crawford,2009a; Kimble, 2005; Klare, 2010; Renner, 2006; Stern,2006) implicitly call for the securitisation of environmental risks and explore the range of connections between climate change and security, including national and human security. Content matter experts such as Jeffrey Mazo (2009:12) present climate change as a key factor in the rise and fall of societies and states. Correspondingly, Brown and Crawford (2009:1; see also Brown, 2010) identify the following main dimensions to environmental risks: reduced water supply; increasing competition for water; reductions in crop yields triggering food crises; and environmentally induced population movements. They conclude that in the future, the speed and scope of climate change could undercut the economic and political stability of vast portions of the world, thus becoming a threat multiplier that makes existing fundamental problems such as water scarcity and food insecurity more multifaceted and persistent (Brown &Crawford, 2009:1). Moreover, Alan Dupont (2007:2) refers to the phenomenon where climate variability leads to possible internal destabilisation, interstate tension and human insecurity.

Matthew (2011) contends that proponents of environmental securitisation (such as Homer-Dixon, 1999; Kahl, 2006) classify challenges to national security in three distinct categories, namely "anything that weakens the elements of national power; contributes to state failure; or leads to, supports, or amplifies the causes of violent conflict". Matthew (2011) concludes that climate change can only potentially affect these domains. Some scholars (e.g. Celliers, 2009a; Mwebaza &Mateche, 2010; Van Wyk, 2010) highlight the effects of environmental risks on African regional security by linking climate change to resource scarcity and resource conflicts, while others such as Kruys (2008) focus on the increasing number of environmental refugees on the African continent, brought about by climate change.

Renner (2006:I-C:23) specifically argues that the main aspects in the environment-security-conflict nexus are: "energy, water availability, food security, and infectious disease". According to him, anthropogenic environmental changes produce threats to environmental security that include the depletion and pollution of fresh water supplies; the overexploitation of fisheries; the degradation and disappearance of biodiversity; and the degradation and loss of agricultural lands. Accordingly, he predicts that stratospheric ozone depletion and global warming will increasingly affect human security in the coming fifty years.

With specific reference to climate change, the Centre for Naval Analyses (CNA) Report assumes that "climate change acts as a threat multiplier for instability in some of the most volatile regions of the world; [that] projected climate change will add to tensions even in stable regions of the world; [and that] climate change, national security and energy dependence are a related set of global challenges" (Military Advisory Board, 2007:3). Furthermore, the Report concludes that "projected climate change poses a serious threat to American national security". Spokespersons for the USA, the EU, military institutions and small island states are concerned about the national security implications of climate change on developing countries, whereas the IPCC and various UN resolutions focus on the sustainable development and human security aspects of climate change (Oels, in Scheffran *et al.*, 2012:192).

Oels (in Scheffran *et al.,* 2012:191) proposes that despite the use of the words 'existential threat', most scholars who label climate change as a security issue do not invoke extraordinary measures, but rather underscore the significance of the "'normal' political process of international negotiations" under the UNFCCC. However, this study subscribes to Biswas's (2011) conclusion that securitisation does not always "satisfy all requirements to link the environment and security", and thus proposes the synthesis of various notions of the environment and security in order to identify environmental changes as threats to security. Furthermore, it aligns with Wæver's (1995:53) notion that securitisation does not necessarily invoke military action as an extraordinary measure to respond to environmental risks; rather, it proposes the use of non-military extraordinary measures such as 'exceptional forms of politics'.

With regard to the re-conceptualisation of security, the referent object of environmental security is the ecosystem; the value at risk is sustainability; and the source of the threat is humankind. Successful securitisation of the environmental sector, requires the presence of the following dynamic: relationships between human activity and the planetary biosphere, which serves as the type of interaction: and the existential threat to the biosphere/species/natural environment, which serves as the dynamic of securitisation.

5.2 The case for desecuritising or asecuritising the environment

Three main strands of criticism are levelled at the securitisation of the environment (Matthew, 2011). Firstly, Realist scholars reject the findings of the CNA Report and argue that climate change does not constitute a national security issue. They equate national security with state survival and threats of military aggression (Matthew, 2011). Similarly, critical scholars (such as Buzan *et al*., 1998; Deudney, 1999; Wæver, 1995) raise concerns about militarising or securitising environmental risks such as climate change. Despite recognising climate change as a significant 'matter', they question the way in which it is framed as a national security issue, in the process linking it to military and intelligence tools. Furthermore, some UN member states – such as the Group of 77 (G77) and China – have expressed concern about the attempts of the UNSG and countries like the United Kingdom (UK) and Germany to present climate change as an issue that should be dealt with by the UN Security Council. On the one hand, this could provide the five permanent members of the Security Council with enormous leverage over the issue of climate change. On the other hand, some countries (specifically the G77 and China) argue in favour of viewing climate change as a developmental issue rather than a security issue (Matthew, 2011).

Secondly, some critics (e.g. Gleditsch, 1998; Levy, 1995) point to the practical and critical flaws in linking environmental stress to violent conflict and state failure. Similarly, some IR scholars (e.g.Deudney, 1999; Matthew, 2011) are critical of securitising the environment. They deem the environment-security link to be imperfect, dismissing the assumption that ecological decay can cause inter-state wars, and therefore rejecting the environment-security nexus (Barnett, 2001; Peoples &Vaughan-Williams, 2010).

Thirdly, self-proclaimed 'sceptical environmentalist' Lomborg (2001) contests the climate change-national security fusion as entrenched in AR4. Lomborg (in Matthew, 2011) bases his argument on the apparent lack of recognition the so-called 'environmental/climate security societies' have for human ingenuity to ease adaptation; a notion based on his assertion that several publicised predictions on environmental issues have been proven to be incorrect. Furthermore, he opposes the *Kyoto Protocol* and similar measures for mitigating GHG, based on their financial burden yielding unsatisfactory results. However, he revised his position on the mitigation of man-made climate change by, *inter alia,* acknowledging the Stern (2006) Report on Climate Change's financial assessment on the cost of mitigation.

Renner (2006) cautions against likening the term 'environmental security' to the notion that environmental change sets off conflicts or other security issues independently; or that it is necessarily a direct trigger of conflict. Renner thereby rejects the suggestion that conflicts are 'mono-causal'. Instead, he suggests that environmental degradation may be amplified by other factors such as social inequality, societal rivalries and political dynamics.

In conclusion, proponents of the asecuritisation and desecuritisation of the environment, question the link between environmental stress and violent conflict by rejecting the environment-security-nexus; rejecting the relationship between the nexus and national security; and questioning the accuracy of climate change reports that purport to verify this relationship.

6. CONCLUSION

The purpose of this chapter was to provide a conceptual clarification of security and to describe the relationship between security and the environment. Accordingly, it focused on the concepts of national and human security, as well as the conceptual, contextual and operational dimensions of environmental security.

In summary, the evolution of the concept of security resulted in the inclusion of non-military sectors and non-state referent objects of security, which paved the way for the development of the theory and practice of environmental security and human security. As such, the contemporary notion of national security includes both formal state security and human security. The concept of securitisation assumes that individual countries set their 'security bar' according to societal perceptions of what consitute existential threats (be they real or perceived). CSS accommodates the emergence of the environment, more particularly the issue of environmental risks, as an issue of security, of which the climate change debate is currently the most pertinent. As issues of a transnational nature, environmental risks interact with other threats to exacerbate conflict, thereby affecting both national security (in terms of politics, economics and energy) and human security (in terms of food, water, health and human migration). The securitisation of the environment is thus premised on the linkage of environmental risks and conflict (the environment-conflict nexus), resulting in the relationship between the environment and national security. Conversely, the desecuritisation and asecuritisation of the environment are based on the narrow definition of security, questioning climate change reports, contesting such links and rejecting the existence of the relationship between the environment and security.

In conclusion, environmental security is one of the sectors of security described by the Copenhagen School. In this study, the broad definition of security is used as a point of departure. Accordingly, the debate on the securitisation of the environment constitutes the core of the research question, namely: 'To what extent are environmental risks securitised in the South African context?' As pointed out, scholars such as Oels and Biswas provide the most precise and comprehensive arguments in support of the securitisation of the environment. They underscore the transnational nature of environmental security and emphasise that the securitisation of the environment does not necessarily require military action as an extraordinary measure, but rather requires an escalation and intensification of the political process. Furthermore, this study is based on the notion of people-centred human security, due to the direct impact of environmental risks on food, water, energy and health security. However, before this framework can be applied to the South African case study, it is necessary to contextualise the effects of environmental risks on food, water, energy and health security, and on the global and regional framework of environmental security.

CHAPTER 3

THE GLOBAL AND REGIONAL CONTEXT OF ENVIRONMENTAL SECURITY

1. INTRODUCTION

The aim of this chapter is to provide a descriptive background of the multi-dimensional nature and transnational scope of environmental security at global and regional levels. Firstly, it provides the contextual background of environmental security as an emerging issue, by tracing its development in the UN, with particular reference to the milestones of the IPCC. Secondly, it relates environmental security to global security, specifically documenting the securitisation of environmental risks such as climate change by the UN, the EU and leading developed Western countries, following the publication of AR4. Thirdly, it describes environmental security in Africa and the responses of the AU to environmental risks.

2. THE DEVELOPMENT OF ENVIRONMENTAL SECURITY AS A GLOBAL ISSUE BY THE UNITED NATIONS

As early as the 1970s and 1980s, a series of environmental drivers of human conflict were identified. These include the degradation and scarcity of land (desertification and deforestation), water (drought, dwindling water supplies and depletion of fisheries), and air (ozone depletion), which contribute to food and water shortages (Brown, Hammill & McLeman, 2007:1141). More recently, climate change has become the environmental issue that has received the most security attention since gaining political momentum from 2005 to 2006, spurred on by, amongst others, the acclaimed documentary and book *An Inconvenient Truth* by Al Gore (2006) (Mazo, 2010:31). In discussing the junctures in the securitisation of climate change, Brown, Hammill and McLeman (2007:1141) refer to the 1970s and 1980s when policy-makers initially viewed global warming as an environmental issue of marginal concern; the 1990s when climate change rapidly developed into an economic and energy policy issue by necessitating changes in the use of fossil fuels; and more recently the recasting of climate change as a threat to international peace and security, with Africa being the region most likely to suffer its worst affects. In summary, climate change evolved froman environmental issue through an energy problem to a security threat.

The United Nations in particular played a prominent role in the development of the global notion of environmental security. Following the increasing awareness that environmental degradation is a key global issue, the UN organised the Conference on the Human Environment (UNCHE) in 1972 in Stockholm (Ghadar, 2006:13). One of the outcomes of the conference was the recommendation to create a UN environmental organisation, which culminated in the establishment of the UNEP. As such, the conference was the starting point of a new way for business and industry to interact with the environment. In addition,

the conference paved the way for various national and global decrees and treaties on environmental safety to be passed. In 1992, the United Nations Conference on Environment and Development (UNCED) – Rio Summit – addressed, *inter alia,* the growing scarcity of water and the use of alternative sources of energy to replace the fossil fuels that are linked to global climate change (UNEP, 1992). A notable achievement of the Rio Summit was the agreement on the *Convention on Climate Change*, 1994, which in turn led to the *Kyoto Protocol*, 1997 (UNFCCC, 1997). Another significant agreement was opened for signature, namely the UN *Framework Convention on Climate Change* (UNFCCC, 1992). The UN introduced a range of initiatives to address the issue of environmental security.

2.1 United Nations Environmental Programme

The UNEP has been championing the environment since its inception in 1972, and seeks to minimise the environmental threats to human well-being and the detrimental consequences of conflicts and disasters (UNEP).Theprogramme is credited with promoting various international environmental agreements and initiatives in order to minimise environmental threats. Its most significant milestone was the establishment in 1988 of the IPCC, in conjunction with the World Meteorological Organization (WMO). In terms of linking the environment and security, two additional highlights are the Programme on Environment, Peace and Security, and the UN General Assembly Resolution A/63/281 on *Climate Change and its Possible Security Implications*. Thus, the UNEP has played a key role in the UN's politicisation and securitisation of the environment.

2.2 Intergovernmental Panel on Climate Change

The IPCC produces the principal scientific and technological risk assessment on climate change, with its most pertinent contribution being the establishment of the UNFCCC and the promotion of the subsequent ratification of the *Kyoto Protocol* by 192 Parties (*Appendix 1*). The IPCC Assessment Reports have highlighted both the human drivers and the human ramifications of climate change. AR4, in particular, serves as the most important global mobilisation mechanism in support of the contemporary securitisation of the environment.

2.3 United Nations Development Programme

Following the holistic approach to security and the publication of the 1994 UNDP report (UNDP, 1994:25), the UN added human security to its range of security views, which also explicitly list environmental security as one as the seven main threats to human security. More specifically, the environmental threats (or environmental risks) include pollution, environmental degradation and the depletion of resources (UNDP, 1994:28-30). In terms of Resolution A/59/565, the UN High-level Panel on Threats similarly placed

environmental degradation on its list of the top ten threats faced by the planet (UN, 2004; FWR Group, n.d.).

2.4 United Nations Millennium Development Goal 7

Goal 7 of the MDGs is to ensure environmental sustainability, which strengthens the achievement of the bulk of the other goals. This goal, *inter alia*, set the following targets, namely to integrate the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources; to reduce biodiversity loss; and to halve, by 2015, the proportion of the population without sustainable acces to safe drinking water and basic sanitation.

2.5 Other United Nations responses

Apart from the above, there are many other initiatives emanating from the UN with regard to environmental risks in general, and climate control and its possible security implications in particular (see *Appendix 2*). The UN's focus on human security is evident in the MDGs, which include environmental sustainability. Also, UNHRC Resolution 7/23 on *Human Rights and Climate Change* serves as a continuation of the securitisation of the environment by the UN (UNHRC, 2008).

To conclude, it is clear that the UN, in terms of the UNEP, IPCC, UNDP and its other responses, has played a leading role in creating and mobilising global awareness of environmental security matters. In doing so, the UN has championed the emergence of environmental security, based on its transnational scope, in particular the contemporary issue of climate security. Furthermore, the UN has played a pivotal role in the global securitisation of the environment (see Section 3.1).

3. THE GLOBAL SECURITISATION OF THE ENVIRONMENT

The aim of this section is to relate environmental security to global security, by exploring the global securitisation of environmental risks, particularly climate change, in response to the publication of AR4. In order to fully comprehend the global securitisation of the environment, it is necessary to explore the securitised responses of international organisations such as the UN, regional organisations such as the European Union (EU), and selected developed Western nations. This exploration is informed by the implications of environmental risks over the next few decades, primarily for global security and secondarily for international relations (Mazo, 2010:15).

3.1 The securitisation of the environment by the United Nations

Besides developing the notion of environmental security, the UN played a leading role in providing the organs and associated organisations for dealing with environmental security, specifically environmental risks and climate change, including climate security and climate diplomacy. The following activities were pivotal in the development of a securitised UN approach to the environment: the publication of AR4; the three UNSC debates on the impact of climate on peace and security; and the UNSG securitising speech act.

3.1.1 *Fourth Assessment Report of the Intergovernmental Panel on Climate Change, 2007*

The inclusion of environmental challenges on the global security agenda gained momentum with the publication of AR4 in February 2007; which the UNSG deemed to be the "authoritative source for the science of climate change and its impacts" (UNSG, 2009:8). This report warns that the global climate system is changing mainly because of man-made GHG emissions, and exposes, amongst others, Africa as one of the continents most vulnerable to the impact of climate variability and change (IPCC, 2007a:13, 48). Findings of the report include the following: it is highly likely that humans are responsible for climate change; warming of the climate system is unequivocal; temperatures are rising; severe weather patterns (storms, precipitation and drought) are increasing; melting and thawing is taking place; and sea-levels are rising (IPCC, 2007b:30). However, AR4 was criticised for errors and its use of 'grey literature', and subsequently an independent review of the IPCC was conducted, which recommended organisational and procedural changes. Following this, the IPCC (2010) reformed by adopting most of the proposals of the InterAcademy Council (IAC).

Steiner (UNEP, 2011:2) asserts that there is clear evidence that the "climate is changing and that the pace and scale of that change is accelerating in many areas" (see also UNSG, 2009:8). Scientists contributing to the IPCC's Fifth Assessment Report (AR5) – scheduled for release late in 2014 – assert that AR4's predictions and scenarios are already being exceeded; for example, arise of one meter in sea level could engulf coastal cities such as Cape Town (UNEP, 2011:2). The *Copenhagen Diagnosis* (2009) – a revision of AR4 – warns of a temperature increase of up to 7°C by 2100, without mitigation (UNEP, 2011:2).

In addition, the IPCC Working Group II to AR5 (WGII AR5) released their report entitled *Climate Change 2014: Impacts Adaptation, and* Vulnerability in March 2014 in Yokohama. WGII AR5 maintains a human security perspective on climate change and addresses the human security implications of climate change (IPCC, 2009:4; Scheffran *et al.*, 2012:195). The report's summary for policy makers was approved and underlying scientific and technical assessment were accepted (IPCC. 2014).

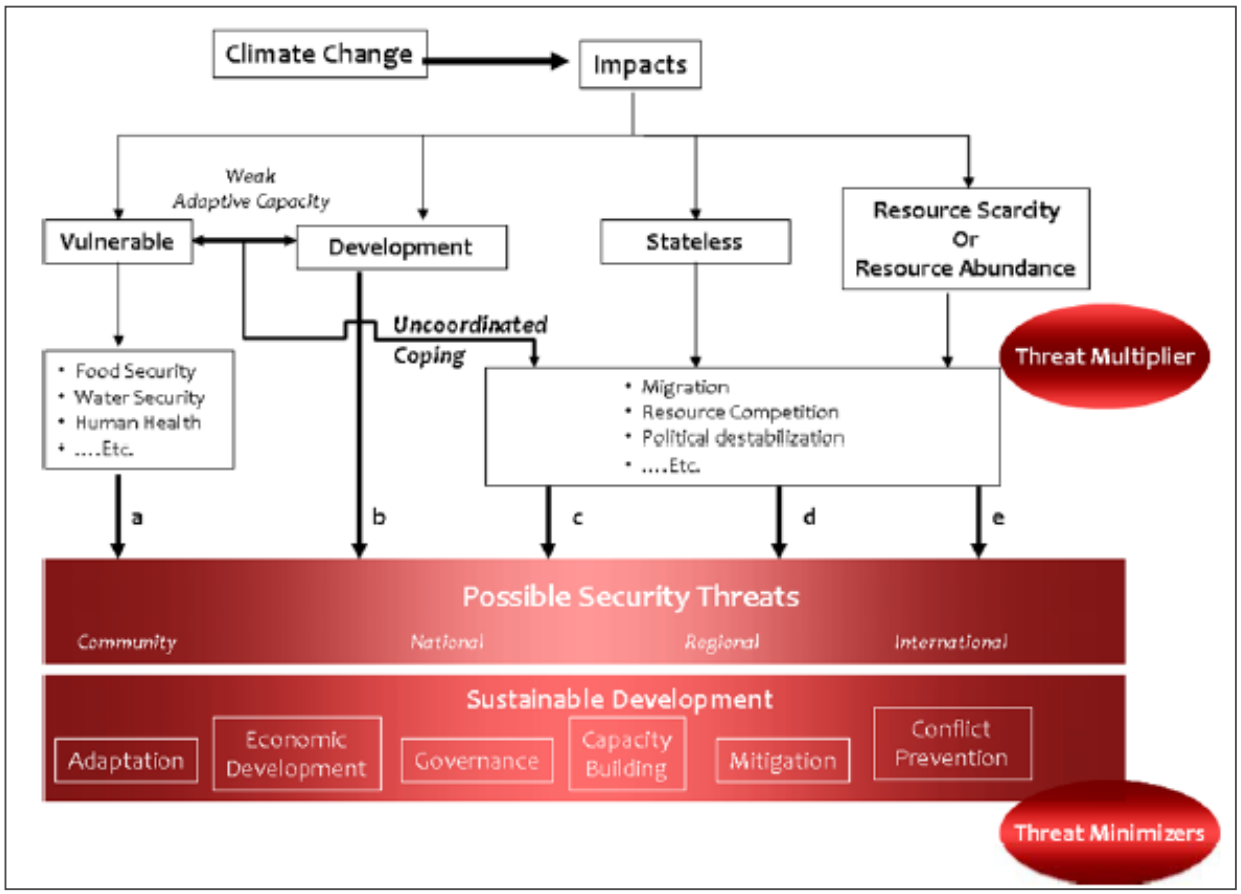
The outcomes of AR4 created greater sensitivity towards transnational environmental risks such as climate change, and led to the linkage of the environment and security on global and regional levels. Thus, AR4 served as the catalyst for the popular global movement towards securitising climate change.

3.1.2 *Securitising speech act*

In direct response to AR4, UNSG, Ban Ki-moon, prioritised the issue of climate change and reframed it from an environmental issue to a developmental and security issue in March 2007 (Mazo, 2010:33). He has made consistent utterances to confirm his securitised stance in relation to environmental risks. As such, he pronouncedglobal environmental risks in general and climate change in particular, to be the greatest challenge facing the world and humankind; that it undermines current human advances; that it weakens the fight against poverty; and that it could threaten international peace and security (UNEP, 2009:1). In addition, he cautioned that the world should mitigate GHG emissions within a decade, or face disastrous consequences for people and the planet (UNEP, 2009:1). In a reiteration of his securitised stance on climate change specifically, Ban Ki-moon concluded unequivocally that the “threat posed by climate change is real" (UNSG, 2010). Emanating from the first Security Council debate and The United Nations General Assembly (UNGA) Resolution 63/281, is UNGA A/64/350 *Climate Change and its Possible Security Implications: Report by Secretary-General* (UNGA, 2009b:1), which identified the following channels (as illustrated in Figure 2) through which climate change could affect security:

- **Vulnerability**: Food security, water security and human security are threatened by climate change, and human exposure to extreme events is increased by climate change.
- **Development:** If climate change causes the development process to slow down or reverse (as stipulated in the MDGs), vulnerability will be exacerbated and the capacity of states to maintain stability could be undermined.
- **Coping and security**: The risk of domestic conflict could be increased by the coping responses (such as migration and competition over natural resources) of communities faced with climate-related threats. These coping responses could also have international repercussions.
- **Statelessness**: The disappearance of territory impacts upon rights, security, and sovereignty, due to the loss of statehood.
- **International conflict**: The impact of climate change on shared or un-demarcated international resources may have implications for international cooperation.

Figure 2: Threat Multipliers and Threat Minimisers: The Five Channels



(UNGA, 2009b:6)

The UNSG makes further reference to environmental refugees, redesigning the social geography of the planet (UNSG, 2009:16). Thereby, continuous challenges to environmental sustainability are compounded by climate change (UN, 2010:1). The report also recognises the inter-linkages of the challenges of poverty, food, energy, global recession and climate change (UN, 2010:1). In relation to energy security, the UNSG's Advisory Group on Energy and Climate Change provides advice and plans for energy requirements, taking into consideration the demands of climate change, while providing advanced energy sources, sustainable development and the achievement of the MDGs (UNIDO, 2010a:1; UNIDO, 2010b:1).

Accordingly, the UNSG acknowledges the effect of climate change and other environmental risks on socio-economic conditions and international peace and security. These include the availability of scarce resources such as food, water, and energy, as well as the phenomenon of environmental refugees, which will likely fuel instability and conflicts. In he's opening address to the UNSC's second debate on the issue of climate change and security, the UNSG urged all states to "join the dots" between food security (including food and nutrition security), water security, energy security, climate security and development (UNSG,

2011). Thus, the UNSG unequivocally uses authoritative securitising speech act and a securitization move (the term 'climate security') by placing environmental risks on the global security agenda, thereby linking global security to climate change, and resulting in the securitisation of environmental risks.

Also, UNGA Resolution A/63/281 on climate change (as referred to ealier), is a further case in point of authoritative securitising speech act on the part of the UN. The UNGA expresses its deep concern "that the adverse impacts of climate change, including sea-level rise, could have possible security implications" (UNGA, 2009a:2).

In addition to the securitising speech act by the UNSG and UNGA, the Executive Director of the UNEP, Achim Steiner, argues that climate change has "profound economic and social – indeed security – implications", thereby also indicating an authoritative securitising speech act and a subsequent securitisation move (UNEP, 2007b). He affirms that climate change – a 'threat multiplier' – would have deep-seated implications, not only for weather, settlements and infrastructure, but also for food insecurity, incomes and development (UNEP, 2011). In addition, Steiner (UNEP, 2007b:1) highlights Africa's vulnerability to climate change, which could threaten continental peace and security, by citing the conflict in Darfur, the Central African Republic, Chad and northern Kenya as contemporary case studies of the environment-security nexus, exacerbated by climate change (Steiner, 2011:6). Due to the fact that climate change drives instability, conflict and collapse, climate change contributes to the phenomenon of climate refugees, resulting in the migration of people both within Africa and into Europe (UNEP, 2007b:1). Based on the security-environment nexus, Steiner (UNEP, 2007b:1) favours the consideration of 'global warming' as a security issue, due to water and land shortages in coming decades, which may lead to conflicts. In a critique, Dan Smith (in Rowling, 2007:2) states that the "links from climate change to violent conflict" are different and that climate change is not likely to be the sole or most important cause of conflict.

Similar to Steiner, the Executive Director of the UN World Food Programme (WFP), Amir Mahmoud Abdullah, cautions against the soaring food prices, and asserts that hunger also poses a threat to economic and political stability (BBC, 2008). The sharp increase in the price of staples and the shortage of food in certain countries triggered food riots in 2008 in Yemen, Egypt, Tunisia, Mauritania, Morocco, Senegal, Cote d'Ivoire, Niger, Burkina Faso, Guinea, Mozambique, Madagascar, Zimbabwe, Uzbekistan, Mexico, Haiti and Bangladesh (African Action, 2008; BBC, 2008). It is also commonly held that the hyper-inflation of food prices was one of the many contributing factors sparking the Arab Spring in 2011.

3.1.3 *United Nations Security Council debates on the security implications of climate change*

The first ever UNSC debate on the impact of climate change on peace and security was held in April 2007 under the formal title *Energy, Security and Climate* (UN, 2007). The debate was prompted by intensive petitioning by the UK as rotary President of the UNSC. Even though broadly welcomed by European nations, the supposed deliberation was strongly opposed and even resisted by countries such as the USA, the Russian Federation (commonly referred to as Russia), China, South Africa and Egypt, who argued that 'systematic issues', such as GHG emissions, do not resort within the mandate of the Council. In turn, in June 2009, the UNGA debated the issue of climate change and its possible security implications; this debate culminated in General Assembly Resolution 63/281, which expanded the UNGA's mandate to include the possible security implications of climate change.

In July 2011, the UN Security Council – under the Presidency of Germany – held its second debate on the issue, entitled the *Maintenance of International Peace and Security: The Impact of Climate Change* (UNSC, 2011:1). The UNSC expressed concern that the:

> possible adverse effects of climate change could, in the long-run, aggravate certain existing threats to international peace and security and that the loss of territory in some States due to sea-level rise ... could have possible security implications. [Furthermore, it noted] that in matters relating to the maintenance, conflict analysis and contextual information on, among others, the possible security implications of climate change, was important when climate issues drove conflict, challenged implementation of Council mandates or endangered peace processes.
>
> (UNSC, 2011:1)

The third UNSC discussion on the issue, in February 2013, was an 'Arria Formula' meeting (informal gathering) – convened by the Presidency of Pakistan and the UK – to discuss the impact of climate change on the Marshall Islands in particular (UN, 2013a). Again, China, Russia and more than 100 developing countries (including the G77) objected to climate change being the prerogative of the UNSC rather than that of the UNFCCC. This group of nations' apprehension on securitising the issue stems from a notion that the securitisation would increase the burden on poorer countries with higher GHG emissions levels (King, 2013). Their apprehension further indicates that, in terms of securitisation theory, the group accedes to the climate change securitising speech act, but the speech act does not necessarily progress into a securitising move (the labelling of climate change as a security issue).

In relation to the opposing views on whether it is appropriate for the UNSC to debate the impact of climate change, the UNSG argued that "it is not only appropriate – it is essential" (UNSG, 2011). In addition, the UNSG welcomed discussions of climate change by the UNSC as a "move forward" and the "right debate ... to confront the double-barrelled challenge of climate change and international security" (UN, 2011). The outcomes of these UNSC debates set the tone for linking environmental risks and security. In terms of securitisation theory, the mere fact that the UNSC debated a systemic issue such as the impact of climate change on three occasions constitutes an extraordinary measure, thereby confirming the process of securitisation.

3.1.4 *Transformation of Peacekeeping*

A recent development in UN Peacekeeping includes the adoption of an environmental policy (in 2009) by the Department of Peacekeeping Operations (DPKO) and the Field Support Services (FSS) with the aim of reducing environmental implications of peacekeeping operations (UNEP, 2013c). This lead to the UNEP – in partnership with the DPKO and Department of Field Support (DFS) – report entitled *Greening the Blue Helmets: Environmental, Natural Resources and UN Peacekeeping Operations* that paved the way for the possible transformation of certain UN 'blue helmets' peacekeepers to 'green helmet' peace builders.

In July 2011, the UNSC considered a Concept Note by the United Nations Peace Keeping Operations (UNPKO) to expand the mission of its forces ('blue helmets') to include a new environmental peacekeeping force ('green helmets'), in order to de-escalate environmental conflicts caused, *inter alia,* by diminishing resources (Goldenberg, 2011; Kelly, 2011). This serves as another extraordinary measure by the UN to securitise the environment. However, not all countries supported the proposed mandate expansion and, amongst others, China once again questioned whether the UNSC was the appropriate body for handling specialist matters such as climate change.

3.1.5 *Analysis*

In terms of securitisation theory, in the context of environmental security, the general threats are the environmental risks with their multi-causal natures and transnational scope. With regard to climate change in particular, the threat is posed by the security implications of the adverse impacts of natural and human-induced climate change. This threat involves the rise in sea levels, the variation in rainfall, the increase in temperatures, and the increase in extreme weather incidents. In reference to the types of unit relevant to the UN's securitisation speech act, the referent objects of security are: ecosystems, planetary survival, human security aspects (such as food, water, health and migration) and national security aspects (such as politics, economies, energy and societies). The securitising actors of the UN are certain members of the

UNSC (in terms of maintaining international peace and security), the UNGA (primarily the UNEP initiatives) and the Economic and Social Council (in terms of sustainable development, including the issue of climate change). The UN's functional actors are the UK and Germany, as they initiated and led the UNSC debates.

To summarise, the IPCC's AR4 represented a watershed moment for the UN in terms of providing the momentum to recognise the security implications of climate change around the world. The first UNSC debate on the impact of climate change on peace and security, culminated in two important resolutions relating to climate change and its possible security implications. This signifies the presence of authoritative securitising speech act, a securitisation move, and extraordinary measures on behalf of the UN in general, and the UNSG, UNEP, DPKO and DFS in particular, which is indicative of securitisation.

3.2 The securitisation of the environment by the European Union

Various EU member states, in particular France, Germany and the UK, support the premise that unmitigated climate change will have profound consequences for global security. The EU is regarded as an appropriate and representative regional example, due to its leading role in placing environmental risks, particularly climate change, on the global security agenda. The EU as a whole ratified the *Kyoto Protocol* (the only regional organisation to do so), thus committing itself to an eight percent reduction in emissions. In 2003, the former UNSG, Kofi Annan, commended European ministers for their efforts to keep environmental issues high on the international agenda. These efforts took place despite the refusal of major economic actors (such as the US and China) to ratify the *Kyoto Protocol*. Over a decade ago, the European Security Strategy (ESS) recognised the security implications of climate change, and its 2008 report on the implementation of the ESS – *Providing Security in a Changing World* – lists climate change and energy security as global challenges and key threats. More specifically, the EU (2008c:5) stated that "[n]atural disasters, environmental degradation and competition for resources exacerbate conflict, especially in situations of poverty and population growth, with humanitarian, health, political and security consequences, including greater migration." The EU played a leading role in negotiations to achieve the ambitious new international agreement known as the *Copenhagen Accord* during COP15 (Copenhagen, 2009), which includes the goal to limit the maximum global average temperature increase to less than 2°C above pre-industrial levels.

The EU's 2008 report on *Climate Change and International Security* (CCIS) addressed the impact of climate change on international security, and concluded that climate change is a "threat multiplier which exacerbates existing trends, tensions and instability"; it will likely over-stress already weak and "conflict prone states and regions"; and it is an issue that requires a multilateral response (EU, 2008b:2). As such, climate change is regarded as having a "dual function: as a threat multiplier as well as a threat creator" (EU, 2009b:1). Furthermore, the report identified the following forms of conflict driven by climate change: conflict over resources; economic damage and risk to coastal cities and critical infrastructure; territory loss and border disputes; environmentally induced migration; situations of fragility and radicalisation; tension over energy supply; and pressure on international governance (EU, 2008b:3). As such, the EU recognised the impact of climate change not only on human security, but also on the spheres of politics, economy and security. The report concluded that the ESS should include the security dimension of climate change and that EU multilateral leadership should promote global climate security (EU, 2008b:10).

Similarly, the EU High Representative (EUHR) for the Common Foreign and Security Policy proposed that climate change should be mainstreamed in EU foreign and security policies and institutions (EU, 2008c:1). The EU is consistent in its securitised stance, both in its contribution to the UNSG's Report on Climate Change and International Security (EU, 2009a:1-2; EU, 2009d) and its CCIS Report on the High-Level Panel Debate (2009), which warns of the "potentially large-scale security consequences of climate change". This indicates the EU's mainstreaming of climate change to form an integral part of the ESS and IR.

In addition to escalating effects such as increased water and food scarcity, natural disasters, land clashes and the movement of people, the EU (2009b:1-2) also considers broader CCIS aspects such as the effect of climate change on main powers; the lethargic reaction of existing international 'politics as usual' towards climate change; and the effects of 'tipping points' (sudden climate change occurring much earlier than anticipated) on security. The Council of the EU (2009c:1) concluded that the global security consequences of climate change form part of its broader strategy for "climate, energy and its Foreign and Security Policy", and are therefore essential to the body's activities. The conclusion of the International Institute for Strategic Studies' (IISS) *Transatlantic Dialogue on Climate Change and Security* concurs with those of the UN, the EU and the UK, by highlighting the following aspects: the significance of climate change for both national and collective security; the unequivocal warming of the earth; and the role of security planners in planning for a 'warmer climate', to prevent the effects of climate change spurring conflict (Hollard, 2011).

In a recent development the European External Action Service (EEAS) – the EU's diplomatic body – was given the mandate in December 2013 to draw up a new security strategy (Youngs, 2014:3). The two policy tracks – security and climate change – converge and the subsequent agenda is one of "climate security" (Youngs, 2014:3).

It is clear from the above that the EU views climate change to be both a threat multiplier and a threat creator, and consequently, in terms of securitisation theory, climate change has successfully undergone an authoritative securitising speech act and a securitisation move, and it has been framed as a potential existential threat. As such, the regional body has taken a leadership role in advancing the climate security agenda globally by, for example, initiating two of the discussions at the UNSC regarding the impact of climate change on peace and security; and critiquing the time-consuming and ineffective responses of the current global 'politics as usual'. These two aspects are indicative of the use of extraordinary measures and the subsequent successful securitisation of the issue. In addition, CCIS plays a central part in the EU's Common Foreign and Security Policy (CFSP).

3.3 The securitisation of the environment by leading developed Western countries

In addition to the EU, the UK and the USA have introduced and prioritised the issue of climate change on their national security agendas. The UK in particular has played a pivotal role by advancing the climate security agenda in not only Europe, but also the UN. The British Foreign Secretary of 2007, Margaret Beckett, regarded the impact of climate change (as per AR4) to be a threat to the UK's prosperity and to international peace and security (Schaefer & Lieberman, 2007:1). In addition, the former Chief Scientific Adviser to the UK government, Sir David King, argued that the threat of global warming supersedes that of international terrorism, and that climate change is currently the most severe challenge (Brown, Hammill & McLeman, 2007:1142; Schaefer & Lieberman, 2007:1). Furthermore, in addressing the security sector's response to climate change, Mabey's, (2008:4) report entitled *Delivering Climate Security: International Security Responses to a Climate Changed World* Nick Mabey (2008:4) asserted that climate change, if "not slowed and critical environmental thresholds are exceeded … will become a primary driver of conflicts between and within states". In doing so, it will "exacerbate the problems with hundreds of millions of people displaced by droughts, floods and famines" (Lovell, 2008:1). Thus, climate change will not only demand essential changes in IR, but will also adjust the foci of global security policy (Mabey, 2008:5). The UK's initiative in holding the first ever UNSC discussions regarding the impact of climate change on peace and security is an example of an extraordinary measure taken, as is their resolve that climate change and climate diplomacy should play a central part in the country's common foreign and security policy. Thus,

based on the aforementioned examples of authoritative securitising speech act, securitisation move, and extraordinary measures, it is clear that the UK has a securitised view on climate change.

In turn, the USA's development of the securitisation of climate change was prompted by the CNA Corporation report and reinforced by an authoritative securitising speech act and a securitising move in the subsequent National Intelligence Estimate (USA-ODNI, 2008), National Security Strategy (NSS) (USA-Presidency, 2010: 46) and Quadrennial Defense Review (USA-QDR, 2010:84-88), which all recognise the national security implications of climate change. Furthermore, the CIA's establishment of a unit dedicated to climate change is illustrative of an extraordinary measure (USA-CIA, 2009).

To conclude, AR4 initiated the contemporary relevance of climate change and ultimately contributed significantly to the UN's securitisation of environmental risks. The three UNSC debates and subsequent resolutions on the security implications of climate change particularly, exemplify an authoritative securitising speech act, securitisation move, and extraordinary measures taken by the UN. Following the UN's responses, the EU not only played a primary role in recasting climate change as a global security threat, but it also developed a securitised notion on climate change evident in its CCIS and ESS strategies. Similar responses by the UK and USA amongst other are indicative of the evolution of climate change from an environmental issue to a security threat in leading developed Western countries.

4. AFRICAN VIEWS ON ENVIRONMENTAL SECURITY

This section emphasises the relationship between environmental security and the so-called 'developing world' at a regional (and more specifically, a continental) level. As previously noted, Africa is not only one of the regions that are most vulnerable to climate change and climate variability, but it also has the least adaptive capacity (IPCC, 2007a:791). Southern African, in particular, is vulnerable to climate change due to its semi-arid nature; its weak institutional capacity (resource capacity and political capacity) to cope with the adverse effects of climate change; and the presence of the region's existing drivers of conflict.

4.1 Africa's vulnerability to environmental risks

The UNEP (2007a:14; AUC, 2009d) asserts that Africa's land is under pressure from a growing population, competition for resources, natural disasters, desertification, poverty and the inappropriate use of technology (*Appendix 6*). In addition, land degradation has widespread effects on Africa, for example decreased access to land, and declining agricultural production. Due to the fact that water and sanitation are already the main concerns for most African countries, climate change and more extreme weather conditions will exacerbate land degradation on the continent (UNEP, 2007a:14). Citing data from 1980 to

2007, the Secretary-General (SG) of the WMO indicates that Africa's incidence of natural disasters and casualties related to hydro-meteorological hazards (96% and 98.5% respectively) is higher than the global incidence (Permanent Delegation of the AU in Geneva, 2009). Droughts and floods occur much more frequently than the other hazards in Africa; for example, western and southern Africa experienced unprecedented levels of flooding in 2007 (AU, 2008a:1). Furthermore, Africa remains at risk from the dumping of hazardous and electronic waste – by richer countries to a larger degree, and local countries to a lesser degree – due to insufficient monitoring capacities. The continent's vulnerability is partially due to its economic dependence on sectors that are susceptible to climate variability; these sectors include tourism, agriculture, fisheries and forestry (Brown & Crawford, 2009b:12).

4.2 Regional climate change vulnerability

As previously noted, Africa is not only one of the regions that are most susceptible to climate change and climate variability, but it also has the least adaptive capacity (IPCC, 2007a:791; Brown, Hammill & McLeman, 2007:1145). Africa's vulnerability is caused in part by its economic dependence on the above-mentioned sectors that are vulnerable to climate variability. The fourth Global Environmental Outlook (UNEP, 2007a:14) lists the following key priority issues for Africa: land degradation and its multifaceted effects on forest, freshwater, marine and coastal resources; and the stresses caused by drought, climate variability and change, and urban development. The IPCC projects the following impacts of climate change for Africa in particular: rising temperatures and sea levels; changing rainfall patterns affecting droughts and floods; and an increase in extreme weather events (storms, tropical cyclones, heavy rainfall and heatwaves).

The IPCC (2007:50) outlines the impact of climate change on Africa as follows: by 2020, hundreds of millions of people could face amplified water stress; and by 2080, the percentage of arid and semi-arid land will increase marginally. This will likely cause rain-fed agriculture to contract by up to 50 percent in certain countries, thereby severely compromising agricultural production which, in turn, could have an adverse effect on food security and intensify malnutrition. Furthermore, the estimated sea-level rise will affect densely populated low-lying coastal areas towards the end of the 21st century, while the financial costs of adaptation will amount to a minimum of five to ten percent of the gross domestic product (GDP).

In addition to the above-mentioned impact of climate change on Africa, the IPCC predicts a general increase in droughts and in flood frequency and scope. These will further affect agricultural production, especially in areas dominated by grain-fed production. The UNEP (2007:99) projects that by 2020, between 75 million and 250 million inhabitants of sub-Saharan Africa could "have their living compromised by a

combination of drought, rising [temperatures] and increased water stress". Moreover, coastal erosion will also affect various large coastal settlements and strategic harbours in the sub-region, including Dar es Salaam, Maputo, Durban, Port Elizabeth, Cape Town and Luanda (Davis, 2011:56). These indicate additional negative effects of climate change as projected for Africa.

In summary, increases in water stress, semi-arid land, and risk to low-lying coastal areas in the region have been projected, while agricultural production is predicted to decrease severely. Therefore, sub-Saharan Africa – as the "world's poorest and most rainfall-dependent region" – is at risk in terms of agricultural production and food security (UNDP, 2007:91). The sub-region in particular will become much hotter and drier; therefore droughts and floods will become more prevalent and severe (Swain & Krampe, 2011:18; UNDP 2007:92). As such, the impact of climate change will cause agricultural productivity to decrease drastically. In addition, urbanisation, rising sea levels and coastal erosion will make coastal areas more vulnerable (Maas & Tanzler, 2009:4). These environmental predictions inform the AU's perceptions of and responses to environmental risks.

4.3 The African Union's perceptions of environmental risks

The AU's perception of environmental risks, in particular climate change, is largely informed by AR4, and consequently, the body recognises Africa's high vulnerability to climate change; prioritises the issue of environmental risks, particularly climate change; acknowledges the detrimental impact of climate change on the continent; and identifies its spill-over effects on human security. As a result, over 90 percent of African states have ratified major environmental treaties, including the UNFCCC. However, some continental leaders are yet to recognise and comprehend the scale of the impact of climate change (Gogo, 2013). Equally, the AU's perception of environmental risks is shaped by the stance of multilateral and regional organisations that establish a limited link between security and climate change. However, the AU as such has not expressly recognised the correlation between environmental risks (for instance climate change) and regional or national security.

4.3.1 *Prioritising environmental security*

The severe environmental degradation facing the continent necessitated the establishment of the African Ministerial Conference on the Environment (AMCEN) in 1985. In turn, the AU's *Common African Defence and Security Policy* (CADSP, 2004) entails a multi-dimensional concept of security that comprises, *inter alia,* human security imperatives, for instance the "protection against natural disasters, as well as ecological and environmental degradation" (AU, 2004). Subsequently, African leaders have committed themselves to sustainable environmental management and protection, due to the link between the environment and the

continent's growth and development (AU, 2008a:2) (see *Appendix 3*). For instance, Prof Konare, former Chairperson of the AUC, regards environmental instabilities as significant barriers to the attainment of the MDGs, and pronounced climate change to be a "real challenge to Africa, considering the vulnerability of the continent to the negative impact" thereof (AU, 2008a:2-3). Hence, he calls for the 'mainstreaming' of environmental issues into national policy planning processes.

4.3.2 *Recognition of the impact of climate change on Africa*

Africa is responsible for less than a tenth of global carbon trading, notwithstanding its sequestration of tremendous amounts of global carbon and the fact that it contains indisputable carbon sinks (AUC, 2009a:3; AUC, 2009d). The following harmful effects of climate change on African economies and livelihoods are acknowledged in terms of extreme weather patterns: water scarcity and stress; deforestation at an alarming rate to satisfy the growing need for food, wood and wood fuel; climate-induced mass migration across national and international borders; sea-level rise (an estimated third of coastal structures and living areas will be flooded by 2080); and food insecurity (a 50% drop in rain-fed agriculture by 2020 will contribute to food insecurity) (AUC, 2009).

There is a wide spectrum of views within the AU structures on the effects of climate change on the continent. For instance, the AU Heads of State noted with "grave concern" the "vulnerability of Africa's socio-economic and productive systems to climate change and variability, and the continent's low mitigation and response capacities" (AU, 2009a:5). The AU acknowledged that "climate change could endanger [the] future well-being of the population [and] ecosystems of Africa" (AU, 2007:49). In addition, the AUC (2009b:2-3) accepts that climate change is globally regarded as "one of the most serious threats to the existence of humanity"; that its adverse effects spare no sectors (water, energy, transportation, infrastructure, agriculture and food security, forestry and tourism); and that most of Africa's rural population is dependent on climate-sensitive sectors. As a result of the above-mentioned adverse effects, the AU (2008a:1; AUC, 2009a:3) concluded that climate change threatens past developmental gains and undermines the continent's pursuit of the MDGs; and accordingly prompted member states to incorporate climate change into their development programmes.

Leading individual notions on the topic include that of the former Chairperson of the AU Commission, Dr Jean Ping, who pronounced climate change to be not only a threat to biodiversity, but also a threat that endangers the continent and human lives (AUC, 2009c:3). He underscored the influence exerted by atmospheric resources and climate systems on development opportunities, and the significant effects on economic activities, health, agriculture and energy (AUC, 2009b:4). Although he used strong language in

this statement, Dr Ping stopped short of classifying climate change as a continental, regional or national security threat. Similarly, the President of Rwanda, Paul Kagame, called for African governments to place the issue of climate change among their national priorities (AUC, 2009b:2). Furthermore, Prime Minister of Ethiopia, Ato Zenawi, recognised the threat of catastrophic climate change and concurred with projections for 2025 by US intelligence agencies; that suggest that it is improbable that Africa will adapt to the adverse effects of climate change, and that it will likely result in an increase in the number of failed states in Africa in future (AU, 2009h:4; AU, 2009i; IISS, 2007). The AU Commissioner for Rural Economy and Agriculture, Mrs Rhoda Peace Tumusiime, stated that the AU affords the highest political acknowledgement to climate-related issues (AUC, 2009g:3).

Even though the *SWOT Analyses* of the AUC *Strategic Plan 2009-2102* (AUC, 2009e:17) cite climate change and desertification to be general threats, the regional body does not regard these issues to be threats to security. However, some African leaders have added their individual support to the 'growing international climate-change-security nexus'. For instance, Ugandan president, Yoweri Museveni (quoted in Brown, Hammill & McLeman, 2007:1142), proclaimed climate change to be an "act of aggression by the developed world against the developing world" and subsequently demanded "compensation for the damage global warming would cause African nations". Similarly, the Namibian representative to the UN declared developed countries' GHG emissions tantamount to "low intensity biological or chemical warfare" (UNSG, 2007).

Despite the AU's acknowledgements, rhetoric and recognition that efforts are required to prioritise environmental security, the regional body has not securitised environmental risks. Based on the African governments' perceived disregard for the security implications of environmental threats, despite the continent's grave vulnerability, the Institute for Security Studies (ISS) has taken a leading role insofar as filling the current vacuum. In order to do so, it entered into a five year Memorandum of Understanding with the UNEP to implement joint programmes on Environmental Security in Africa (ISS, 2010:1). The UNEP is annually approached by several African countries seeking support on issues related to environmental security and, due to its partnership with the ISS, it is able to respond more effectively.

Thus, despite the AU's rhetoric on the risks and threats posed by climate change to ecosystems and socio-economic conditions, it fails to acknowledge the subsequent security implications; this amounts to partial securitisation, which includes a securitising speech act and securitisation move. This indicates that the AU lacks a clearly defined notion of the extent of environmental risks such as climate change. It is therefore

unlikely that the AU will develop a comprehensive strategy to respond to environmental risks, including climate change.

4.3.3 *The effect of climate change on other security sectors*

Environmental risks, such as the adverse effects of climate change, spill over into other areas of national and human security. As such, the AU, through the African Ministers' Council on Water (AU-AMCOW, 2012:4), acknowledges the inter-relatedness of food security, water security and energy security, and hence underscores cohesive organisation across the 'water, energy and food security nexus'. Furthermore, the Chair of the AU Assembly (AU, 2010) prioritises peace and security, food security, and energy and infrastructure due to the impact of climate change on them. Although briefly referred to in Chapter 4, the ramifications of climate change for Africa in particular, as proposed by the AU, is explored in this section.

(a) **Food security**: The AU (2009e:2) acknowledges agriculture to be the foundation of development in every region, since agricultural investment creates sustainable economic growth and increases food security. However, agriculture is affected by emerging continental and global issues such as global food security and climate change (AU, 2009f). As such, the AU (2009f:4; AUC, 2009f) links climate change, sustainable land and water management, and food security (increased agricultural production and reduced hunger), particularly in its efforts to attain the MDGs. Furthermore, the continent has experienced violent food riots as a result of spiking food prices; for instance, at least 13 people died in Mozambique in protests against planned increases in bread prices in 2010.

(b) **Water security**: Water resources are regarded to be critical success factors in sustaining continental economic growth and development, and are also essential for food and energy security (AU-AMCOW, 2012:1; AU, 2013b). The recognition of the threat posed by climate change and variability to the continent's water resources led to the *Sharm el-Sheikh Declaration on Water and Sanitation* (2008) (AU, 2008b:2), and AMCOW's (AU-AMCOW, 2012:vi) *Framework for Water Security and Climate Resilient Development*. The Framework forms part of the *Water, Climate and Development Programme* (WACDEP).

(c) **Energy security**: The continental energy strategy is based mainly on coal combustion, with some exceptions based on the availability of alternative resources. As such, coal-based energy production demands great volumes of water (AU-AMCOW, 2012:4). Similarly, the development of bio fuels' high demand for water resources (10,000–100,000 litres/GJ energy) can clash with additional pressures such as national food security (Gerbens-Leenes *et al.,* cited in AU-AMCOW, 2012:4). Despite this, Africa –

in contrast to other regions – has developed only a tenth of its hydropower potential (AU-AMCOW, 2012:4). The impact of environmental risks on sub-regional energy is further discussed in Chapter 4, Section 4.3.

(d) **Economic security**: The AU (2009j:5) firmly believes that it is justified for Western industrialised nations (who are historically responsible for climate change) to compensate Africa in order to mitigate the consequences of the problem. Furthermore, AMCEN (AU-AMCEN, 2009:7) holds that the financial costs of climate change will likely adversely affect African countries' GDPs by up to three percent by 2030.

(e) **Migration**: In addition to the above-mentioned adverse effects of climate change, Mrs Tumusiime underscores the climate-induced mass migration of Africans across domestic and global boundaries, which has a negative effect on the socio-economic growth of Africa and undercuts its peace and stability. This phenomenon is further discussed in Chapter 4, Section 4.5.

Thus, the AU recognises the spill-over effects of the impact of climate change on aspects of human security (such as food and water security, and migration) as well as on national security (such as energy and economic security).

4.3.4 *Multilateral perceptions*

African Heads of State, in collaboration with the New Partnership for Africa's Development (NEPAD), initiated the Comprehensive Africa Agriculture Development Programme (CAADP) to deal with Africa's grave 'livelihood' and environmental needs (COMESA, 2011). In addition, regional initiatives were developed as comprehensive approaches and programme initiatives to address climate change. As such, the East African Community (EAC), the Common Market for Eastern and Southern Africa (COMESA) and the SADC launched a joint five-year Programme on Climate Change Adaptation and Mitigation in 2011 (APO, 2011). The COMESA-EAC-SADC Tripartite programme aims to synergise the climate change plans of the three regional blocs and to tackle the impact of climate change on the respective regions as a whole (APO, 2011). The initiative focuses on attracting investment in 'climate-smart agriculture' and its associations with land use, forestry and energy practices (APO, 2011).

In reference to inter-continental affiliation, the Joint Africa-EU Strategy's (JAES) Peace and Security Cluster provides for eight thematic partnerships comprising, *inter alia,* Energy and Climate Change. The cluster agreed in 2009 to form a working group, chaired by the UNEP, which resolves to tackle the impact of climate change (AU-PSC, 2012; EU Delegation to the AU, 2010). This agreement represents the AU's

first recognition of the link between security and the impact of climate change, albeit in conjunction with another regional bloc, namely the EU.

4.3.5 *Linking security and environmental risks*

Within the African Peace and Security Architecture (APSA), the Peace and Security Council (PSC) has only recently started to focus on the link between climate change and security issues (OneWorld Sustainable Investments, 2011:4). Subsequent to the JAES's resolve and in a rare display of independent 'green progressiveness', the PSC (AU-PSC, 2012) acknowledged the link between human security and, *inter alia,* climate change and environmental degradation, albeit only in 2012 and to a very limited extent. As such, it noted that the Sahel region faces multiple challenges linked not only to transnational security threats such as terrorism and weapons proliferation, but also to "environmental degradation and climate change, food insecurity and nutritional crisis" (AU-PSC, 2012:1). Similarly, the AU Commission's (AUC, 2013:2) policy framework for Security Sector Reform (SSR) notes the "destructive effect on peace and security of natural disasters, environmental degradation [and] climate change". Likewise, the AUC Chairperson, Dr Nkosazana Dlamini Zuma, argues that "sustainable environmental management is [central to the quest for] food security, peace, security and stability" in the continent (AU, 2013c). This signifies the AU's first autonomous acknowledgement of the link between environmental risks and their security implications, representing a slow response in comparison to other regions.

4.4 **Institutional arrangements**

The continent's negotiating position on climate change is steered by the AU Assembly, which has put in place a cohesive multi-layered institutional arrangement to coordinate its responses (including negotiations). The Department for Rural Economy and Agriculture (DREA) is the AU structure tasked with climate change. The regional institutional arrangement consists of AMCEN, the Conference of African Heads of State and Government on Climate Change (CAHOSCC), and the African Group Negotiators (AGN). CAHOSCC was established to head the *African Common Position on Climate Change* (AU, 2009, while the AGN, as regional coalition, negotiates global climate change in concert with the G77 and China, thereby forming a larger coalition of developing countries. In addition, the African Climate Policy Centre (ACPC) serves as a hub for producing information on climate change.

To conclude, the AU views security through a human security lens and, as a result, links the environment to the attainment of developmental goals such as the MDGs. As the continental body approaches its 50-year anniversary and the 2015 MDGs deadline (UN, 2013b), it is evident that it has yet to come to terms with an escalating series of policy challenges. Therefore, in addition to the continent's existing 'internal' challenges

(political, economic and social), there are a number of 'external' challenges (such as climate change) that amplify the existing internal challenges (Gogo, 2013). Thus the AU presently finds itself at a crossroads where it is faced with emerging 'cross-cutting threats', such as environmental degradation and climate change, to which the PSC should respond (Astill-Brown, 2013; Dersso, 2013). Subsequently, the AU has prioritised environmental risks; recognised the impact of climate change on Africa, in particular on human security; and recently acknowledged the linkage of environmental risks and security, albeit to a limited extent, and as a result, has stopped short of proclaiming climate change to be a threat to African regional and/or national security.

5. CONCLUSION

Firstly, this chapter provided a contextual and historical basis for the global and regional framework of environmental security. Secondly, it indicated the multilateral management of a transnational issue that is global. Thirdly, it indicated a top-down development path and framework – from the UN, to the region, to the sub-region, and then to the state. Fourthly, based on theoretical components (such as securitising speech act, securitisation move and extraordinary measures), it indicates the securitisation of the environment.

To summarise, AR4 led to the recasting of the concept of climate change and this ultimately resulted in the successful securitisation of particularly climate change, by the UN, the EU and other leading Western developed countries (such as the UK and the USA), that are well geared towards responding to climate change. In turn, the AU has gained some impetus in responding to the impact of environmental risks – particularly climate change – by recognising its effects on factors of human security and of late, partially acknowledging its linkage with security. However, this limited reaction indicates the AU's slow security response to contemporary environmental issues facing the continent, in particular climate change. Furthermore, it implies that the appropriate policies will not be implemented by the AU, with the result that the issue will not be addressed adequately. This will result in Africa's being more vulnerable to climate change, bearing in mind the internal challenges it already faces. Thus, the adverse effect of climate change will amplify existing challenges to security, and ultimately result in the continent's MDGs not being reached.

Based on securitisation theory, an analysis of the speech act and securitisation move accepted by a relevant audience established that, despite general agreement to discussing the security implications of climate change in the UNGA, developing countries noticeably disagree that the UNSC is the correct forum. Nonetheless, most countries recognise the interdependence of human vulnerability and national security.

Subsequent to public concern evoked by AR4, it appears that audiences globally accept that human vulnerability to climate change necessitates political action.

Compared to the UN and Western regional organisations (EU) and countries (such as the EU, UK and USA), and despite the rhetoric used by the AU, the African response falls short of securitising climate change. Instead of focussing on the security implications of climate change, the AU seems to be more focussed on other aspects of climate change, such as a common stance; the principle of common but differentiated responsibilities; and receiving compensation from industrialised countries. In contrast, the process of climate change securitisation by Africa is less evident than in the UN and EU. Although the AU presented a unified continental stance at the Conference of the Parties (COP)15, COP16, COP17 and COP18, this was based more on securing compensation (financially and technically) from developed and highly industrialised nations to the developing world, than to address the security concerns of climate change (RSA-DEA, 2010a). Based on this global and regional contextualisation of environmental security, the emphasis of the next chapter shifts to the impact of environmental risks, on the sub-region and on South Africa in particular, being potential drivers of conflict.

CHAPTER 4

ENVIRONMENTAL RISKS TO SOUTH AFRICAN SECURITY

1. INTRODUCTION

Based on the assumptions of CSS, this chapter focuses on the environmental risks to South African security. Accordingly, the security implications of environmental risks – particularly climate change – are assessed, including their impact on potential drivers of conflict such as access to food, water and energy; and population movements. Due to their transnational scope and interdependent nature, such risks cannot be evaluated in strict national-geographic terms. Therefore, the impact of regional (Southern African) environmental risks on South African security is also considered. Firstly, an environmental risk analysis highlights the water-food-energy nexus as a prominent cluster of risks, and forecasts the risk factors associated with environmental risks. Secondly, this chapter provides an account of the intra-regional environmental risks that constitute challenges, risks, threats and drivers of insecurity. Thirdly, it explores the security impact of environmental risks on South Africa, pertaining to the ramifications of climate change for the current human competition for resources such as water, food, energy and health, as well as for population movement. Lastly, it describes the stress that climate change can exert on other sectors of South African security (namely the political, economic and social sectors) within the SADC context.

2. RISK ANALYSIS OF THE ENVIRONMENT

There is a high degree of certainty regarding the likelihood and impact of climate change.AR4 places the likelihood of global climate warming due to anthropogenic (human induced) activities – such as the burning of fossil fuels – at 90 percent or greater; this is an exceptionally high level of certainty in the scientific field. There is also certainty about the adverse impact of climate change, if left unattended. The IPCC is certain that sea levels will rise and that the rise in sea levels will present risks, especially considering that 27 percent of the earth's population will be living in coastal areas by 2025 (Femia &Werrell, 2011). It is also expected that floods and droughts will decrease agricultural production, thereby limiting the ability to feed the ever-increasing population. Climate change will also affect the availability of resources such as fresh water and access to agricultural land, thereby forcing people to migrate within and across national boundaries in order to survive. The *Stern Review on Climate Change* and the IPCC summarise the impact of climate change as follows: rising sea levels; destruction of habitat; increased disease transmission; changes in agricultural productivity; changes in water availability; and increased natural hazards (Stern, 2006:88-89). These dynamics can result in conflict and violence (Femia & Werrell, 2011). Furthermore, the

World Economic Forum's (WEF) (2012:11) global risk reports indicate the "perceived impact, likelihood and interconnectedness of 50 prevalent global risks*", inter alia,* environmental risks.

2.1 Global environmental risks

The *Global Risks 2011* analysis (WEF, 2011:45) underscores the link between climate change on the one hand and water security, food security and extreme energy price instability on the other, and subsequently identifies the water-food-energy nexus to be one of three main interconnected clusters of risks, which include three risk categories, namely environmental, societal and economic risks. It is common cause that unsustainable pressures are exerted on resources due to a fast-increasing global population and growing levels of affluence. Thus, the WEF (2011:28) asserts that water, food and energy security are persistent barriers to economic growth and social stability (see *Appendix4*); and that the demand for these resources will increase by 30 to 50 percent in the next 20 years, while supply will decrease, in part due to unsustainable consumption (WEF, 2011:7). The shortfall between the high demand for and decreasing supply of these resources could cause political and societal instability, as well as geopolitical conflict. Also, environmental pressures from climate variability and extreme weather events lead to changes in rainfall patterns and disturb harvest production, thereby driving resource insecurity (WEF, 2011:28).

2.2 The likelihood and impact of environmental risks

The Global Risks 2011 analysis (WEF, 2011) considers and ranks the environmental risks as follows according to their perceived likelihood and impact: climate change; storms and cyclones; flooding; biodiversity loss; earthquakes and volcanic eruptions; air pollution; and ocean governance. The report's 'top ten risks' include four other risks associated with environmental security, namely: storms and cyclones, extreme energy price volatility, flooding, and water security (WEF, 2011:44). Similarly, the *Global Risks 2012* top five risks include, *inter alia,* environmental risks, with increasing GHG emissions and water supply crises perceived to be very likely to occur, while the water supply and food shortage crises will be strongly impacted upon (WEF, 2012:11) (see *Appendix5*). The *Global Risk Report 2013* and *Outlook on the Global Agenda 2014* respectively rates rising GHG emissions to be the third most likely global risk; and 'inaction on climate change' to be among the top ten global trends (WEF, 2013:9). Furthermore, the *Survey on the Global Agenda 2013* indicated that the respondents were least satisfied (concerning the top ten risks) with the lack of global responsiveness towards 'inaction on climate change' (WEF, 2013:19b).

To conclude, there is a high degree of certainty regarding the perceived likelihood and impact of environmental risks in general and climate change in particular. This includes the associated socio-economic risks, for instance lack of access to fresh water and food.

3. ENVIRONMENTAL RISKS TO SOUTHERN AFRICA IN PARTICULAR SOUTH AFRICA

In general, the impact of climate change on the region will result in increased water stress, semi-arid land and risk to low-lying coastal areas, as well as decreased agricultural production, thereby putting the region – as the "world's poorest and most rainfall-dependent" region – at risk in terms of agricultural production and food security (UNDP, 2007:91). The IPCC (2007) indicates that Northern and Southern Africa will become much warmer (by a minimum of 4°C) and drier (with roughly 10-20% less rain); and that more regions will suffer from more frequent droughts and floods (Swain & Krampe, 2011:18). This suggests that agricultural productivity will decrease due to the increased heat and water stress brought on by climate change; droughts will increase in severity, particularly in Southern Africa; and coastal areas will be vulnerable due to a combination of sea-level rise and coastal erosion (Maas & Tanzler, 2009:4; UNDP 2007:92).

In addition to the impact of climate change, the continent is stressed by a rising number of inhabitants and natural disasters, by increased desertification and poverty, by the incorrect use of technology and chemicals, and by land degradation's severe impact on Africa's river catchment areas, woodlands and agrarian land (UNEP, 2007a:14). Accordingly, the higher incidence of droughts and floods, combined with climate change, is exacerbating land degradation (UNEP, 2007a:14). Furthermore, the region is vulnerable to the dumping of hazardous and electronic waste, due to its insufficient monitoring abilities.

South Africa, in particular, has never been rich in natural forests, due to its semi-desert and savannah climate, as well as the regular occurrence of veldfires (Van der Linde, 2006:175). Climate change predictions for the country indicate that the average temperature is likely to increase by 1-3°C by 2050, with the interior of the country warming the most (by 3-4°C) (COP17/CMP7, 2011). Thus, on average, there are expected to be a greater number of extremely hot days in summer, and by 2100, warming of 3-4°C and 6-7°C is expected along the coast and interior respectively (RSA, 2011a:9). Distribution of rain across the country will change significantly: summer rainfall is likely to commence later and to occur for a shorter period; this implies more severe downpours that will wash away topsoil, thus affecting agriculture. In the Western Cape, the net drying effect will result in shorter rainfall seasons; thus the region will become drier, with its eastern parts likely to experience late summer rains. In turn, the East Coast region is likely to become significantly wetter, with the risk of flooding increasing considerably. In addition, increased evaporation will significantly affect the availability of water, which will substantially decrease river currents along the western side of the country (COP17/CMP7, 2011).

Furthermore, climate change predication for South Africa indicate that the changes in temperature and rainfall will result in the increased occurrence and severity of extreme weather events such as floods, droughts, storms and fires (COP17, 2011). In addition, the rise in sea levels will likely have adverse effects on the coast and the coastal infrastructure, with the country's shoreline already being altered and 30 to 70 percent of the population living within 100km of the coast.

In summary, Southern Africa is most vulnerable to climate change, due to its already warm climate, inconsistent rains, cyclone-prone east, susceptibility of its predominantly rain-fed agriculture to drought, and limited coping capacities of its governments. Projected climatic changes for Southern Africa suggest an outlook of increasing fresh water scarcity, failing agricultural yields, encroaching deserts and damage to South Africa's already-altered shoreline. Should such impact occur, they could cause environmentally induced migration and exacerbate tensions over diminishing life-giving resources, thereby impacting on human security.

4. THE IMPACT OF ENVIRONMENTAL RISKS ON SCARCE RESOURCES AND HUMAN SECURITY

In general terms, the 2012 Living Planet Report (WWF, 2012) underscores the immense pressure that humankind exerts on the earth. The world population is consuming 50 percent more resources than the earth can supply. The report forecasts that at the current rate of resource consumption, by 2030, even two planets will not be sufficient. In reference to climate change implications in particular, the UNSG, Ban Ki-Moon (cited in Devon, 2011), identified the rise in sea levels to be a serious security threat to various small island states. These states face possible submergence within three decades, which could result in disputes over maritime territories. Similarly, the former UNSG, Kofi Annan, (cited in MacInnis, 2009; and in Maas & Tänzler, 2009:8), recognised the significant ecological dimension – particularly the aspects of degradation and resource scarcity – to be a contributing factor in the conflicts in Sudan and Darfur. In addition, these conditions are exacerbated by climate change.

Impacts of climate change can affect different African regions (IPCC, 2007a:450). The IPCC (2007a:451) has recognised patterns of current and likely future effects and vulnerabilities related to climate variability and climate change for Africa. Southern Africa is identified as a 'hotspot' for environmental risks, including: climate-induced changes in agriculture, health, water availability, rainfall and storms; a decrease in ecosystem range and location; and the shifting of desert dunes. These conditions could lead to a decline in food production; an increase in health risks; a scarcity of water; and the migration of people. Escalating pressures (such as population growth) and resource disparities will likely aggravate the existing social

tension. The 2008 xenophobic violence in South Africa demonstrated that human frustration can release violence even in stable states (Maas & Tänzler, 2009:8).

From the above, it is evident that environmental risks are likely to adversely affect sectors of human security in Southern Africa and are exacerbated by the effects of climate change and the already stressed resources in the region. Due to the impact of climate change on food security, water availability, disease prevalence and coastal borders, access to food and water is decreased, migration is increased, tensions are raised and new conflicts are triggered (Brown, 2010:39).

Climate change, which is a causal factor of environmental degradation and thus of environmental risks, is primarily regarded to be a challenge for human security and development, and could undo MDG achievements and threaten livelihoods (UNDP, 2007; Maas & Tänzler, 2009:3). The strategy of the World Bank (cited in Celliers *et al*., 2011:85) lists climate change as a challenge to African development, due to its effect on water availability and its subsequent threat to agricultural production in Africa. However, climate change also exacerbates drivers of insecurity such as existing armed conflicts and emerging conflicts. For example, the inadequate management of domestic and regional burdens has the potential to transform South Africa from a current stable state into an instable state (Maas & Tanzler, 2009:4). Consequently, climate change poses a threat to the stability and security of Southern Africa, due to its adverse effect on fresh water and food production. The region faces regular food shortages due to environmental degradation and climate-induced droughts and floods. As such, the adverse effect of environmental risks is likely to exacerbate food insecurity, water scarcity, energy insecurity and health insecurity in the following manner:

4.1 **Food insecurity**

The IPCC projects a decline in: the number of sub-Saharan African regions (land and water) appropriate for agriculture; the duration of growing seasons; and the crop potential of food staples (UNDP, 2007:99). Southern Africa in particular “faces ... acute threats, [with] yields from rainfed agriculture [likely to] be reduced by up to 50 percent between 2000 and 2020” (UNDP, 2010:91). Agricultural productivity is likely to decrease by between 15 and 50 percent for the most part of Southern Africa during the next seven decades. Food Bank South Africa reports that already an approximate ten million South Africans (20% of the population) are on the verge of starvation, due to the rising costs of staples (maize and wheat), which has resulted in a food crisis for the population (Galvão, 2012).

The spike in global food prices in 2008 resulted in riots – some violent – in several countries (see Chapter 3). For example, the Egyptian bread crises in 2008 and 2011 – brought on by sharp increases in the price of wheat, and a spike in inflation – contributed, *inter alia*, to the existing social unrest which, in turn, fuelled the Arab Spring and culminated in a regime change (Kruys, 2008:53). In the sub-region, Zambia has a similar history of vulnerability to public reaction concerning staple food price hikes: in 1991, a sharp increase in food prices sparked food riots that were a contributing factor to the toppling of Kenneth Kaunda. Moreover, the merit of using food yield for the production of biofuel, rather than for consumption by humans or animals, is also being questioned on moral grounds by developing countries where food insecurity is experienced on a regular basis, unlike in the developed North.

Due to the fact that the climates of vast areas of Namibia, Botswana, South Africa, Lesotho and smaller parts of Swaziland and Zimbabwe are now unsuitable for crop production, substantial decreases in the production of suitable crops are projected for these countries until 2080; the projected decreases range from 25 to 50 percent for the eastern coast, and 50 percent and more for the interior and for the southern and western Cape (Davis, 2011:54). The current situation in Zimbabwe compelled the UN humanitarian coordinator in Zimbabwe to launch a $31 million appeal in January 2013, of which the bulk of the funds (80%) went towards food security, in order to address ongoing food shortages (Mhofu, 2013).

Agriculture is a significant source of livelihood for many people living in South Africa's rural areas; however, under the effects of climate change, both the production of maize and the number of regions suitable for growing it will likely decline (Seal the Deal, 2009). Accordingly, subsistence and homestead farmers in arid lands are the most vulnerable to climate change, with forecasts suggesting a substantial decrease in "maize production in summer rainfall areas, and fruit and cereal production in winter rainfall areas" (COP17/CMP7, 2011). This decrease in agricultural production will compel a change to more drought-tolerant crops such as sorghum and new drought-tolerant maize (Seal the Deal, 2009). Furthermore, the low capacity of the South African agricultural sector to adapt to climate change will contribute to a decrease in agricultural production and result in food insecurity.

Likewise, fishing is a source of income for many coastal subsistence fishermen; however, expansions in industrial fishing and aqua farming, along with changes in habitats and increasing pollution, are already exerting high levels of strain on hydro-biological resources, leading to a decreased fish supply (Stats SA & UNDP, 2010:90). This situation is exacerbated by climate change and will likely lead to a loss of biodiversity and result in both environmental and economic consequences.

In conclusion, reductions in agricultural (land and water) output, along with increasingly random global weather patterns, will result in further food insecurity and increased food prices, and add to the risks regarding control over productive agricultural land and aquamarine reserves (Brown, 2010:42). Furthermore, reduced food production is a driver of malnutrition and infant mortality. Thus, the environment is a potential causal factor in food insecurity in South Africa.

4.2 Water insecurity

Water – as a renewable resource – is a critical sector for development, since it cuts across most other sectors in terms of its impact. The IPCC projects that climate patterns will have significant effects on the distribution and availability of water, due to warmer temperatures, fluctuations in runoff patterns and increased water evaporation (UNDP, 2007:95). Given that the country's water systems are already strained by the unsustainable 'mining' of several river basins and other water sources, climate change will exacerbate the existing water scarcity (UNDP, 2007:95).

In addition to the above-mentioned impact of climate change on water in general, water resources in the SADC region also face the risks of increased water pollution, reduced water quality and increased water temperature (Davis, 2011:60). Turton (2011) predicts that the sub-region's water sources will be under high stress by 2050, and, amplified by climate change, it will become one of the most vulnerable sub-regions, making the impact of environmental degradation on water security a regional issue. This indicates the high vulnerability of the Southern African region to further demands on its available fresh water, as well as the high likelihood of climate change impacting on the regions' water resources.

Southern Africa's economic development potential is defined by the availability of freshwater, of which the primary source is rainfall, a highly variable phenomenon due to climate change. Based on the mean annual rainfall (of 2009) in the sub-region, South Africa (at 497 mm/year), Botswana (at 400 mm/year) and Namibia (at 254 mm/year) all experienced levels of rainfall below the regional average, leaving them water scarce[3] (Turton & Claxton, 2009:2). The Southern African region is also unique in the sense that most of its main hubs of development are situated on watershed divides[4], instead of being located on waterways, lakes or the coastline (Celliers, 2009a:10). For example, major business centres and capitals in the sub-region (such as Windhoek, Gaborone, Harare and Pretoria) are all situated on or in close proximity to watershed divides. As such, water sources cannot be based on gravitational flow, thus water has to be transferred to main capitals to satisfy the demand and ensure economic development (Celliers, 2009a:10).

[3]Water *scarcity* is less than 1 000 m3/person/year, while water *stress* is 1000-1700 m3/person/year (UNEP, n.d.a).
[4]A watershed divide isthe line that separates neighbouring drainage basins (UNEP, n.d.b).

4.2.1 *Transboundary hydro-political risks*

The term 'hydropolitics' refers to the sanctioned distribution of water values to the public, and comprises the availability of water and water resources (Turton, 2002). Miguel (cited in Sachs, 2008:129) asserts that decreases in rainfall in Africa relate to considerable increases in conflict, and *vice versa*. As such, the UN cautions that five 'river basins' in Southern Africa are at risk of tension or conflict, namely: the Kunene, the Okavango, the Zambezi, the Limpopo and the Orange basin (UNISDR, 2004; Brown & Crawford, 2009b:15). Accordingly, the sub-region faces a number of transboundary hydro-political risks:

(i) **The Lesotho Highlands Water Project**: Based on its natural endowment of abundant and surplus water (its most significant and copious natural resource), Lesotho exports water to South Africa through the Lesotho Highlands Water Project (LHWP) (Mwangi, 2010:50). As this is one of the largest water transfer systems globally, the bilateral treaty of 1986 benefits both countries: it supplies high volumes of water to South Africa, particularly Gauteng, and in turn, it generates revenue and hydroelectric power for Lesotho (Mwangi, 2010:50). On completion (in 2020), the scheme will generate transference of more than 2 000 million cubic metres of water per year (Mwangi, 2010:50-51).

Although the LHWP epitomises good interstate political and economic cooperation, with a symbiotic relationship between water and security in both countries, climate change predictions for Lesotho's water sector indicate a reduction in surface and subsurface run-off due to the anticipated lower rainfall. Such freshwater stress in Lesotho will result in reduced run-off in the catchment area of the Orange River Basin, which is likely to affect the water sectors of South Africa and Namibia. Due to predicted dry spells, the yields of many of the storage dams in the LHWP are likely to be lower, leading to reduced water exports to South Africa, and lower royalty incomes for Lesotho. Hence, Mwangi (2010:51) concludes that, at a sub-regional level, a decline in water availability may lead to interstate conflict.

(ii) **Water scarcity in the Limpopo and Incomáti River basins**: Due to the over-allocation of water resources and localised water deficits, South Africa and Mozambique face constraints to their future economic growth potentials (Davis, 2011:77). Turton (2012:16) supposes that the Incomáti River Basin was already transitioning to a state of 'Absolute Water Scarcity' as early as 2000; and projects that the situation will worsen by 2025 when all four South African international river basins will have transitioned to 'Absolute Water Scarcity'. For instance, the Limpopo River Basin will exceed the universal standard for social cohesion by 250 percent, even without factoring in the impact of climate change, thereby causing South Africa to be water scarce.

4.2.2. *Water scarcity in South Africa*

Due to South Africa's fast-declining water resources, the country's water quality and availability face major risks, as the Orange and Limpopo rivers sustain 80 percent of the economic development nationally (Stats SA & UNDP, 2010a:91; Turton, 2011). The fourth Global Environmental Outlook (GEO-4) (UNEP, 2007a) explicitly stated that the country will experience 'serious water stress' due to its ground water being virtually exhausted and the fact that it had already allocated 98 percent of its national water resources by 2009. Thus, South Africa will be left without surplus water, and its economic development and social security will be inhibited (Turton, 2008:3; Celliers, 2009a:9). In addition, the country has lost its dilution capacity, thereby necessitating the costly treatment of all waste-product rivers, and thus concentrating pollution and increasing the costs of providing water to the economic hub (Gauteng) to maintain urban development (Celliers, 2009a:1; Turton, 2012:1). A World Wildlife Fund (WWF, 2008) report cautioned in 2008 already that, at the current consumption rate, the country's water demand would surpass its supply by 2013, but that given significant fiscal investment, this condition could be delayed until 2025 (Celliers, 2009a:10).

In addition to the existing stress on water resources, environmental degradation amplified by climate change will further reduce the available 'surface water resources', while socio-economic growth will escalate the demand for water, thereby leaving the country's water availability increasingly vulnerable to multiple stressors (Stats SA& UNDP, 2010a:91; Seal the Deal, 2009). In reference to the recent service protests, Turton (2011) argues that water, *inter alia,* can serve as a vehicle for protest and a driver of insecurity.

South Africa's main resource restrictions to development are water and energy. In relation to the water-energy nexus, the generation of one kilowatt-hour of electricity requires one kilogram of coal plus 1.5 kilograms of water; thus the country's energy constraints are defined by its water supply (Turton, 2011). The City of Johannesburg (COJ) concedes that exponential growth combined with climate change can likely result in a diminished water supply to Gauteng by 2014, with wide-ranging implications for the province that contributes the most to national economic growth (GLG Yearbook, 2009:676). Similarly, a lack of water preservation will increase the water crisis in the already-arid Western Cape.

Recycled or untreated water poses risks to the health of the population, particularly in Limpopo where chemical mosquito repellents are polluting untreated water, thereby causing human illnesses. Furthermore, Acid Mine Drainage (AMD)[5] is related to the flooding of mines in the Witwatersrand Gold Fields, the Mpumalanga and KwaZulu-Natal Coal Fields, and the O'Kiep Copper District (RSA-Expert Team of the Inter-Ministerial Committee, 2010). The pouring of AMD into the environment poses risks that include, *inter alia,* the presence of toxic heavy metals and radioactive particles in some of the water; thus endangering human health (Environment, 2011).

In conclusion, several countries in the sub-region are already water scarce or water stressed due to environmental risks exacerbated by climate change. Water is a critical resource for development; conversely, water scarcity is a key 'developmental constraint' to the whole SADC region. The future economic growth potential of 'economically developed' countries in the sub-region will be constrained due to the limited availability of water resources. As a result of the reduced water supply and the increased demand for water, the competition between diverse societies will likely increase, thereby generating the potential for conflict. Water stress will also result in the gradual loss of national food sources, thereby affecting food security, and toxic heavy metals in water, affecting health security.

4.3 Energy insecurity

Along with water, the uninterrupted provision of energy in future is imperative for development. The International Energy Agency (IEA) envisages that the global economy will increase its demand for energy by at least 40 percent by 2030. The generation of this energy is expected to seriously impact upon freshwater resources (WEF, 2011:29). The increased demand for water, food and energy necessitates a drastic adjustment in water usage, along with the need to develop innovative sources of food and energy generation (WEF, 2011:29). In addition, climate change will further add to the current stresses on energy security, thereby prompting debate on the utilisation of biofuel (see Section 4.1) and the feasibility of using nuclear energy as a 'cleaner source' of energy. The above-mentioned pressures on energy have the following implications for regional and national (South African) energy security:

[5]AMD is generated when sulphite-bearing minerals, often in the form of pyrite (which is iron sulphide found, *inter alia*, in reefs mined for gold), are exposed to oxygen and water. This process (pyrite oxidation) is characterised by the generation of sulphuric acid and dissolved iron.

4.3.1 *Regional energy security*

The sub-regional energy strategy is based mainly on coal combustion, with some exceptions depending on the availability of alternative resources. For example, Angola has hydrocarbon reserves and the riparians of the Congo and Zambezi River basins have viable hydropower reserves, specifically those of the Grand Inga Project (Turton &Claxton, 2009:4). As the largest producer of electricity in Africa, Eskom (in 2012) provided over 60 percent of Africa's electricity and represents South Africa in the Southern Africa Power Pool (SAPP). Despite increased strain on South Africa's electricity grid and an impending power deficit, Eskom still exports electricity to neighbouring states. Eskom's net sales between 2010 and 2012 indicated a slight downwards trend in cross-border electricity purchases, with the majority of purchases stemming from Mozambique's *Hydroelectrica de CahoraBassa* (HCB), while the bulk of exports went to Mozambique's BHP Billiton's Mozal aluminium smelter (Eskom, 2012). As mentioned previously (see *Section 4.2.2*) the location of coal and water resources is impacted upon by the the water-energy nexus.

Despite the fact that fossil-based energy sources will peak and then steadily decline, and that there will be a subsequent need to expand the continent's energy sources to varied, cleaner energy options, renewable sources of energy account for less than two percent of the continent's energy supply (Celliers *et al.*, 2011:45). However, the Greater Inga Hydroelectric Project in the Democratic Republic of Congo (DRC) has enormous potential to improve Africa's energy output by a third. On completion, the Grand Inga power station will generate 39 000 MW of power, which will enhance the provision of electricity in the SADC by means of clean technology, thus contributing to sustainable energy security in the sub-region (RSA-NPC, 2011:65).

4.3.2 *South African energy security*

South Africa's energy use is characterised by a high level of dependence on cheap and available coal, which is harmful to the environment (Stats SA& UNDP, 2010b:99). While providing 95 percent of the country's electricity, Eskom uses mostly coal-fired units (86%) and one nuclear plant, making it the country's largest polluter (Central News Network, 2011). The Department of Environmental Affairs (DEA) concedes that Eskom is the state-owned enterprise with the "highest rate of non-compliance with environmental legislation"; however, current South African legislation does not hold state-owned enterprises criminally liable for breaking environmental laws (RSA-DEA, 2012a:54).

South Africa faced a dire electricity shortage during 2007 and 2008, causing load shedding, which had an adverse effect on the economy. Subsequently, Eskom announced in January 2008 that it had ceased to export electricity to neighbouring countries; however, such exports were resumed as soon as the reserves were normalised, and are still on-going. Given Eskom's crumbling infrastructure, critical shortage in renewable energy sources, climate change and the challenges in the finalisation of the Medupi Power Plant, it is very likely that the country will face similar power shortages in future. In addition, sharp double-digit annual tariff hikes create the potential for public protest action and violence. Government asserts that it will require a further 29 000 MW of electricity by 2030, while 10 900 MW of the current capacity is to be retired; this implies the supply of an extra 40 000 MW, of which government stipulated that at least 50 percent must come from renewable sources (RSA-NPC, 2011:62, 144).

4.3.3 *Regional tension over energy security*

In comparison to the other African and Southern African countries, South Africa is the foremost contributor to global climate change, with the highest GHG emission levels (ranked 12th worldwide in 2012), due to its energy-intensive, coal-powered economy (IEA, 2012; RSA-DEA, 2014:ix). The country's carbon emissions are much higher than the emerging country average, and exceed even those of many industrialised countries (RSA-DEA, 2011d; Seal the Deal, 2009). Although data on AU member states' GHG emissions are infrequent, a comparative study of key emitters of carbon dioxide (CO_2) conducted in 2012 indicated that South Africa was responsible for over 40 percent[6] of continental CO_2 emissions and 1.49 percent of global CO_2 emissions (IEIA, 2012). However, South Africa's per capita CO_2 emissions are high relative to several countries, at 9.18 tonnes of CO_2 per capita; which, in relation to other BRICS countries (Brazil, Russia, India, China and South Africa) and the USA, is the third highest (after the USA and Russia respectively) (IEIA, 2009). More recent figures point to an increase in South Africa's emissions (from fuel combustion) to 346.8million metric tons of carbon dioxide ($MtCO_2e$)[7], whereas the other continental economic powerhouse, Nigeria, emitted 215 $MtCO_2e$ (IEA, 2010:49). In terms of the sub-region, SADC member states jointly contribute less than 50 percent of African emissions; however, it is important to note that South Africa's emissions accounted for 89.5 percent[8] of the SADC total in 2010 (Lesolle, 2012:12,27). In contrast to the generally low emission rate of the continent in general and the sub-region in particular, South Africa actively contributes significantly to climate change, and thus bears the bulk of responsibility. This has resulted in international pressure on South Africa and other high-emitting emerging economies,

[6]For further information see key emitters of CO_2 in Africa, 2002 (UNEP, 2005:2)
[7]See CO2 emission from fuel combustion (IEA, 2012:49)
[8]See 2010 Key World Energy Statistics (www.iea.org)

such as the other four BRICS countries, to commit to a 2nd Commitment Period of the *Kyoto Protocol* (Seal the Deal, 2009).

Increased rivalry over energy resources serves as a major potential source of conflict over resources (EU, 2008:5). As such, competition for hydroelectric control has already spurred tensions in some Zambezi River states. Although the sub-region is endowed with large coal reserves for generating electricity, the ecological cost of burning coal is very high and has already resulted in "localized pollution in Zimbabwe and large scale air pollution in South Africa's" Mpumalanga and Gauteng provinces (SADC, 1997). In contrast to fossil fuel, renewable energy is given modest attention and funding.

To conclude, the provision of power is a critical success factor for development, with Eskom playing a pivotal role in the region and in South Africa. However, this supply of energy using mainly fossil fuels comes at a high cost to the environment, as it is responsible for the highest emission of GHG in the region and locally. Due to the restriction that climate change places on fossil fuels, clean and renewable sources of energy need to be exploited in the region; this is a field that is receiving too little attention. In future, BRICS countries might receive opposition from developed countries, should they not commit to a 2nd Commitment Period of the *Kyoto Protocol*.

4.4 **Health insecurity**

Based on the direct correlation between human health and the immediate environment, environmental risks also have adverse effects on health security, due to the added strain on already-depleting water resources, which leads to a reduced water supply for sanitation, and can facilitate the spread of disease (Davis, 2011:60). The World Health Organisation (WHO) asserts that environmental "exposure to various physical, chemical and biological risk factors" has various health implications (WHO, 2009a:23). As such, the WHO lists the following as environmental risks to health: unsafe water, sanitation …; urban outdoor air pollution; indoor smoke from solid fuels; lead exposure; and climate change. Furthermore, the WHO attributes 23 percent of all child deaths to preventable ecological hazards such as the above-mentioned (WHO, 2009a:28). The IPCC projects that climate change will affect "human health through complex systems involving … exposure to extreme events, access to nutrition, air quality and other vectors" (UNDP, 2007:105). Environmental risks have the following effects on regional and national health security.

4.4.1 *Impact on regional health security*

As in the cases of food and water security, low-income countries will be the most negatively affected. As such, those with the least capability to respond to varying health threats are likely to suffer the burden of health setbacks. Public healthcare systems in most developing countries already lack the necessary resources to address the growing demand for health care; this will affect the poor and most vulnerable people.

The transmission season of malaria, which is changing due to climate change, is a cause of concern. The UNDP (2007:105) attributes the spread of new disease profiles such as Rift Valley Fever to the phenomena of extreme weather events, floods and droughts caused (in part) by climate change; and asserts that the main factors in the transmission of malaria (precipitation, temperature and humidity) are all affected by climate change. In addition, climate change will increase the range of dengue fever, meningitis and cholera, and cause indirect health effects such as the "spread and/or increase of the incidence of infectious and vector-borne diseases, water-borne pathogens, water quality, air quality, and food availability and quality" (Davis, 2011:60).

4.4.2 *Impact on South African health security*

The WHO (2009a:28) warns that South Africa strongly underestimates its own environmental burden of disease, and that 16 percent of all deaths are associated with the state of the environment (Wright & Godfrey, 2010:1). Prevailing pressures on South Africa's health security include a quadruple burden of disease[9], and high levels of communicable diseases (particularly TB and HIV/AIDS) resulting from poor sanitation and malnutrition, as well as rapid urbanisation, which causes over-crowded cities and urban slums (Motsoaledi, 2011; Kruys, 2008:55; SAMRC, 2010). Akin to the rest of the region, the parts of South Africa at risk for malaria and other vector-borne diseases will expand due to the effect of climate change. In addition to the existing stresses on South Africa's health security, environmental risks will contribute significantly to air and uranium pollution.

(i) Air Pollution: Major sources of GHG emission in Africa derive from fires in the domestic energy and land use sectors, and contribute approximately four percent to total global CO_2 emissions (UNEP, 2005:3). Open burning contributes to environmental and health effects, while indoor cooking with solid fuels leaves women and children highly exposed to particulate matter. The generation of electricity from coal is responsible for most of the CO_2 emissions in South Africa. Air pollution is particularly high in Gauteng and the Highveld; these areas are essentially wind-still for the majority of the year (Kruys, 2008:57). Many of the

[9]HIV and Tuberculosis; maternal and child mortality; non-communicable diseases; and violence, injuries and trauma.

country's urban areas have high concentrations of ambient sulphur dioxide ($SO_{2)}$ and fine particulates, with veldfires adding nitrous oxide during winter; these, together with the weather conditions and the change of seasons, play a distinct role in the increased levels of pollution and dust, resulting in the thick layers of smog found in Johannesburg and Pretoria (Momberg & Grant, 2008).

The use of coal to power South African development is a contentious issue, with some proponents (for instance Eskom) negating coal's higher pollution and carbon footprint (compared to those of alternative energy options), arguing that its inexpensive nature allows one to "spend quite a bit on pollution control and still maintain coal's competitive position" (Centre for Climate and Energy Solutions, n.d.). The South African emission challenge is further exacerbated by the fact that, in spite of prominent production, less than ten percent of South Africa's coal production is available to local industry, and the coal is of a lower grade. For example, South Africa supplies Europe, China and India with higher qualities of coal (around 14% and up to 23% ash content respectively), leaving domestic consumers with the lowest grade of coal (between 23% and 45% ash content). Notwithstanding this, good quality coal (with between 16% and 18% ash content) was earlier made available to Eskom and Sasol – the local power and polluter giants (Hancock, 2011). Components of coal, such as SO_2, nitrogen oxides (such as NO_2) and particulate matter, are air pollutants with urban public health effects that range from the aggravation of asthma to premature mortality; and air pollutants such as SO_2 and coal smoke have been indicated to be some of the triggering factors of asthma (Thambiran, n.d.; WHO, 2005). An alarming statistic shows that South Africa had the highest incidence of asthma globally in terms of the environmental burden by disease category[10] (WHO, 2009).

Government concedes that air quality remains a demanding environmental issue and that "many pollutant concentrations exceed recognised thresholds and have reached unacceptable levels in … suburban areas" (RSA-NPC, 2011:225). South Africa's air quality standard[11] in general allows for more than double the emissions standard set by the WHO[12], lowering the national standard decidedly. In some cases, particulate matter exposure exceeds WHO standards by "factors six to seven during winter, and two to three in summer"; and in other cases by factor 26 (RSA-NPC, 2011:200). As a result of the aforementioned non-compliance with world standards, Government's political will to afford citizens the right to clean air is questioned, in spite of the constitutional (RSA, 1996:11) provision thereof (see Chapter 5 Section 3.1).

[10]South Africa's environmental burden by disease category (WHO, 2009b).
[11]National Ambient Air Quality Standards for Particulate Matter with Aerodynamic Diameter less than 2.5 Micro Metres (PM2.5) are currently:25 µg/m3 – annual mean; and65 µg/m3 – 24-hr mean (RSA, 2012a:9).
[12]WHO guidelines (2005:9) for PM2.5 are: 10 µg/m3 – annual mean; and 25 µg/m3 – 24-hour mean.

In an attempt to somehow 'legitimise' the unacceptably high incidence of air pollution (pollutant concentrations) in certain areas, Government declared the following three areas as 'priority areas'; they will be the focus of obligatory standard air pollution classification and air quality control efforts:

- **Vaal Triangle Airshed Priority Area (VTAPA)**[13]: Vereeniging, Vanderbijlpark and Sasolburg form part of a decidedly industrialised area containing a coal-fired power station, a number of collieries and quarries, and several large industrial and commercial industries, which collectively produce toxic and offensive gases resulting in a high level of air pollution (RSA, 2006a; RSA, 2011b:7).

- **Highveld Priority Area (HPA)**[14]: Major towns in Gauteng and Mpumalanga – Witbank, Middelburg, Secunda, Standerton and Balfour – contribute significantly to national GHG emissions due to, *inter alia,* energy generation and other heavy industries that negatively affect local public health. The Witbank/Middelburg coalfields were the source of more than 80 percent of the overall national coal output, until they were depleted in 2008 (RSA-DEA, 2012c).

- **Waterberg-Bojanala Priority Area (WBPA)**[15]: Eskom's electricity crisis in 2008 warranted the substitution of the depleted Witbank/Middelburg coalfields with the unexploited coal reserves of the still-pristine Waterberg in 2012. This resulted in large-scale adverse effects on the local environment and health (RSA-DEA 2012d).

(ii) Uranium pollution: In reference to 'radioactive particles' affecting the quality of water in South Africa, uranium contamination associated with AMD poses serious health risks to citizens. Subsequent to a new study (Liefferink cited in Vermeulen, 2013), Government amended the guidelines for the amount of uranium permitted in drinking water from 0.07 mg/ℓ to 0.01 mg/ℓ, while the WHO's (2012:430) provisional guideline value is 0.03 mg/ℓ. A report by the Head of Department of Geography (North-West University), Professor Frank Winde, underscores the chemical toxicity and "radioactive health risks caused by uranium" which, in drinking water, is "statistically linked to high incidences of leukaemia" (Liefferink cited in Vermeulen, 2013). Furthermore, the latest findings indicate that such uranium has "endocrine-disrupting and genotoxic properties [causing] transgenderational health related impact, kidney failure and chronic kidney disease" (Liefferink cited in Vermeulen, 2013).

[13]VTAPA was declared in 2006 (RSA, 2006a).Also refer to VTAPA Implementation Report One (RSA, 2011b).
[14]HPA was declared in 2007 (RSA, 2007a).
[15]WBPA was declared in 2012 (RSAa, 2012).

In conclusion, based on the link between human health and welfare on the one hand and the environment on the other, developing countries have a large number of vulnerable people. Given South Africa's already stressed health system, its carrying capacity will be further stressed by environmental risks such as climate change. The country's high death toll attributed to asthma should be a clear warning that it is already paying a high premium for human health, due to environmental risks such as pollution caused by the over-reliance on fossil fuel-generated power. In addition, climate change will alter the range of some diseases, for instance malaria, which will have negative effects on the country's health security. South Africa is at a juncture where it must assess whether the use of cheap, 'dirty' coal to power the economy justifies the price it is paying – and will pay in future – for the irreparable damage done to the air quality in general, and the three priority areas in particular.

4.5 Environmentally induced migration and environmental refugees

Climate change causes the degradation of global ecosystems (which provide water, food and refuge), thus threatening the livelihoods of people who depend on them. One of the ramifications is what analysts refer to as the 'climate-induced mass migration' of African peoples across and between borders, or more specifically the 'environmentally induced migration'. The UNEP refers to the terms 'environmental refugees'[16] and 'environmental disruption'[17] to define the migration caused by environmental risks. Therefore, the impact of climate change on the movement of people in the region, and subsequently to South Africa, has to be considered.

4.5.1 *The impact of migration on Southern Africa*

The IPCC (cited in Brown, 2008:9) predicts that the 'carrying capacity' of vast areas globally will be compromised by climate change. The United Nations High Commissioner for Refugees (UNHCR) and the International Red Cross (IRC) recognise that climate change is one of the major foremost causes of the increase in global refugees and internally displaced people (IDPs); and that climate change disasters currently cause more population shifts than conflicts do (Celliers *et al*., 2011:42). Professor Norman Myers (cited in Brown, 2008:11; Stern, 2006; IPCC, 2007a) – a professor specialising in environmental economics at Oxford University – has estimated that there will be "200 million climate migrants by 2050"; this figure has become widely accepted.

[16]"[T]hose people who have been forced to leave their traditional habitat, temporarily or permanently, because of a marked environmental disruption (natural and/or triggered by people) that jeopardized their existence and/or seriously affected the quality of their life" (UNEP cited in Mwebaza, 2010).
[17]"[A]ny physical, chemical [or] biological changes in the ecosystem/resource base that render it temporarily/permanently unsuitable to support human life" (UNEP, 1985).

Both the UNEP and the International Organization for Migration (IOM) recognise the exacerbating effect of climate change on migration and on African development, in particular the current movement from rural to urban areas and the incessant movement away from drought-stricken areas (Mumba & Harding, 2009:13). Moreover, Celliers, Hughes and Moyer (2011:42&76) contend that climate-induced water stress and scarcity will affect continental agricultural schemes, as well as "migration patterns and socio-political stability"; and that by 2100, environmental degradation will have led to the desertification[18] of huge parts of Botswana, Angola, Zimbabwe and western Zambia. Forced migration has already aggravated resource-based conflicts, for example in pastoralist communities where livehoods depend on water availability and pasture. In addition, climate change has the potential to accelerate organised, militarised and sporadic violent competition for resources over the long term; for instance, the 2008 xenophobic attacks in South Africa were caused in part by 'relative deprivation' concerning the citizens' access to resources (HSRC, 2008:14; Mail & Guardian, 2008).

4.5.2 *The impact of migration on South Africa*

Barnet and Adger (2007) argue that 'climate change-induced' migration can fuel conflict in recipient states. Reuveney (2007:659) contends that the process leading from migration to conflict entails competition, ethnic tension, distrust and fault lines. Estimates of the current number of immigrants in South Africa range from three million to seven million, of which the majority are from other African countries. The 2011 Census indicated that almost three million people living in South Africa are foreign-born (Statistics South Africa, 2011:17). In addition, the country annually receives the most asylum applications globally (UNHCR, 2013). The accommodation of environmental migrants will likely further burden South Africa's economy and resource base, due to escalated competition and distrust among locals and immigrants, which will likely result in increased tension when migrants and locals are of different ethnic origins. A case in point is foreign Africans – in particular Zimbabweans, Somalis and Pakistanis – who bore the brunt of the xenophobic attacks in South Africa.

In conclusion, the decrease in scarce natural resources (particularly water and food) and state resources (particularly energy and health resources) are likely to turn peaceful competition into violence. Changes in environmental conditions, such as the adverse effects of climate change, could contribute to decreased food, water and health security, and increased tension over energy security. These ramifications of environmental stresses could cause large-scale and destabilising population movements with devastating impacts on the socio-economic development of the continent, thereby undermining peace and stability.

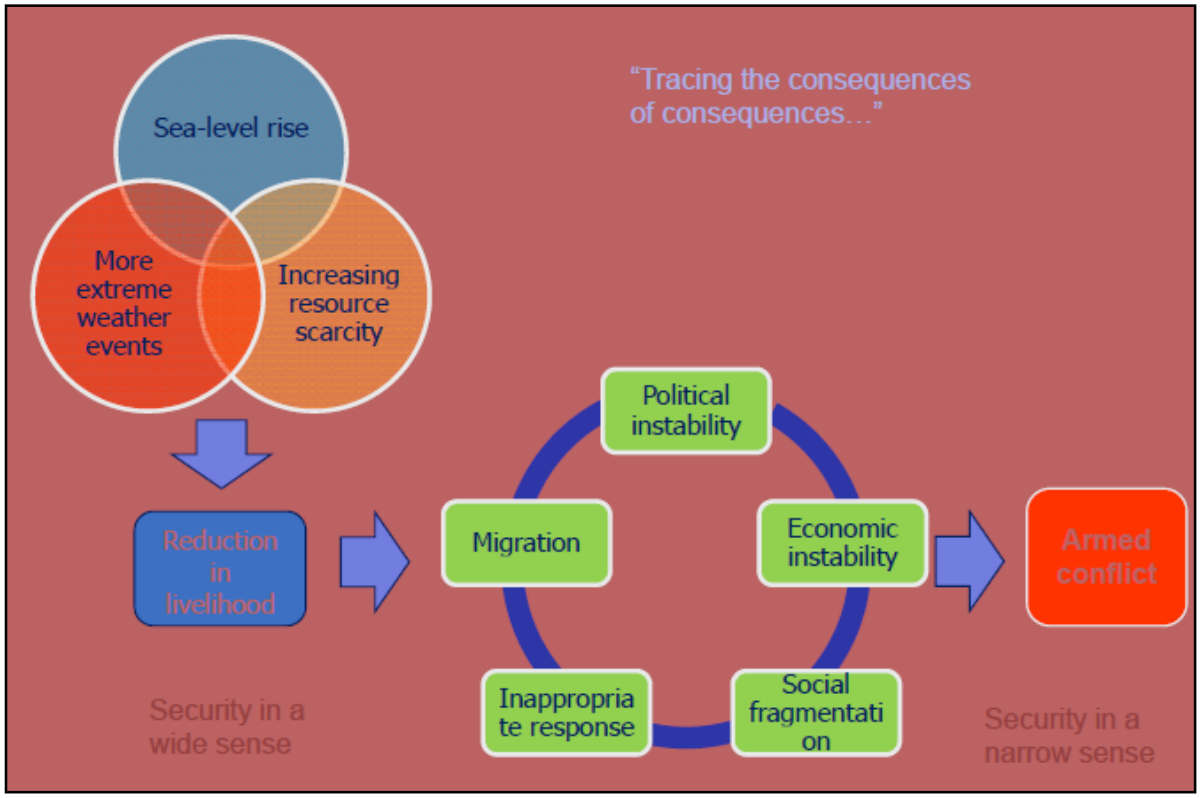
[18]The growth of deserts.

South Africa is particularly vulnerable to the effects of environmental refugees, caused *inter alia* by the following two factors: the country already accommodates a high number of immigrants and refugees largely from other African countries; and in particular, the country's recent (2008) history of xenophobic attacks during which locals and foreigners competed for the same resources, resulting in violence.

5. THE IMPACT OF ENVIRONMENTAL RISKS ON OTHER SECURITY SECTORS

With reference to the climate-security nexus, the UNSG pronounced that "projected climate changes could not only have serious environmental, social and economic implications, but implications for peace and security, as well", indicating the threat-multiplying capacity of climate change (UN, 2007:1). The ramifications of environmental risks, *inter alia,* resource scarcity – referred to as the 'wide sense' of security – are linked to the other sectors of security – the narrow sense of security (as illustrated in Figure 3). For instance, climate change might not necessarily cause conflict *per se,* but conflict would be a consequence of how states, international institutions and people react to climate changes and variation.

Figure 3: Synthesized Causal Chain between Security in the Wide and Narrow Sense



(Centre for the Study of Civil War, 2009:23)

In addition to their impact on aspects of human security, environmental risks also affect the following features of national security:

5.1 Political instability

If the global community does not successfully respond to environmental threats, it will jeopardise the multilateral international system. The EU (2008:5) asserts that the impact of climate change will "fuel the politics of resentment between those most responsible for climate change and those most affected by it"; and that climate change policies are likely to initiate political tension (both nationally and worldwide). Also, the EU foresees a likely split, not only dividing North and South but also adding a South-South element mainly due to the increasing Chinese and Indian portion of global emissions (EU, 2008:5). As such, additional stress will be exerted on the already fraught international security architecture. For instance, while South Africa and Egypt opposed the debate on climate change in the UNSC, other African countries participated in the debate (Brown, Hammill & McLeman, 2007:1143). On the one hand, Congo-Brazzaville referred to Africa's likely being the worst affected due to the defiance of the 'rich'; on the other hand, Ghana commended the UNSC for facilitating the debate, and highlighted the threats posed by climate change to areas already suffering from chronic instability" (Brown, Hammill & McLeman, 2007:1143). The SADC already includes some of the world's most fragile states – Zimbabwe and Malawi – withouth factoring in the additional affects of environmental risks (Smith & Vivekananda, 2007; Brown & Crawford, 2009:19).

5.2 Economic instability

Besides affecting non-market related aspects such as human health, climate change can also have economic costs. Stern (2006) found that under a 'business as usual' (BaU) scenario, the reaction to climate change could be more expensive for the global economy than effective concerted action would be (EU, 2008a:4). Other than through mitigation costs, the economic impact of climate change will be brought about by "damage and risk to coastal cities and critical infrastructure" (EU, 2008a:4). With one fifth of the world's population residing in 'coastal zones', "mega-cities and their supporting infrastructure" are regularly situated in river deltas or near the sea; these areas and their economic projections are threatened by sea-level rise and increased weather events (EU, 2008a:4). Besides mitigation and infrastructure costs, the financial impact of environmental risks also translates to other economic sectors. For instance, the impact of climate variability on Namibia's natural resources is expected to cause yearly losses of one to six percent of the GDP, with livestock production, fishing and traditional agriculture being severely affected, resulting in a projected collective loss of US$461–2,045 million annually by 2050 (Reid *et al.*, 2007 in IPCC, 2012:253). As such, the economic impact of climate change in terms of the GDP would be significant.

Locally, the *Official Yearbook* 2009 concedes that "exponential growth and climate change could [impede on] water supply to Gauteng" by 2014, which would have wide-ranging implications, as the COJ is the largest single metropolitan contributor to national economic growth (Gaffney, 2009:676). Similarly, the water-scarce region of the Greater Cape Town area needs to implement strategies to increase its water supply and decrease its consumption in order to sustain growth and development. Most other urban municipal areas also highlight, as one of the key development objectives, the need to understand and respond in an integral manner to environmental challenges.

5.3 **Social fragmentation**

The UNDP maintains that several countries have extremely vulnerable inhabitants who are facing a sharp rise in climate-related risks; and projects that climate change is likely to augment the profile of risk exposure in decades to come, and that the combination of growing climate risks and fading resilience could prove to be fatal for human development (UNDP, 2007:98). As such, the SADC is home to the only three countries worldwide that have a lower Human Development Index (HDI)[19] currently than in 1970; they are Zimbabwe, the DRC and Zambia (UNDP, 2010:3; Celliers *et al*., 2011:xiv). While Zimbabwe has featured prominently on the Failed States Index (FFP, 2011) since 2008, it is estimated (conservatively) that three million Zimbabwean immigrants are living in South Africa. Kruys (2008:51) attributed the 2008 xenophobic attacks in South Africa to, *inter alia,* "poverty and unemployment which has escalated to crisis proportions". These conditions were attributed to uncontrolled immigration, resulting in the influx of millions more people (mostly Africans) endeavouring to merge into the South African economy, which at the time was already unable to sustain the population dependent on it for their livelihoods. Securitisation theory assumes that issues related to the resource-conflict-nexus, which has historical inferences to aggression in particular – such as the 2008 xenophobic violence in this case – will facilitate the casting of that issue (resource-conflict-nexus) as an existential threat.

The causal relationship between socio-economic factors and xenophobic violence is extensively recognised, with the Human Sciences Research Council (HSRC, 2008:14) concluding that three broad factors have emerged as underlying causes of the xenophobic violence, namely "relative deprivation, South African exceptionalism, and exclusive nationalism". Relative deprivation[20], in turn, is likely to lead to feelings of resentment and revenge (HSRC, 2008:14). With some parts of the South African population already feeling relatively deprived – *inter alia,* by the large number of foreigners in the country and the

[19]UN method to measure development by combining indicators of life expectancy, educational attainment and income into a single statistic, to serve as a frame of reference for both social and economic development.
[20]General sense of feeling deprived of something to which a person or group feels entitled (HSRC, 2008:14).

perceived lower level of service delivery – the adverse effects of climate change and the ensuing possible migration could exacerbate such socio-economic sentiments.

5.4 **Military insecurity**

The interface between military security and environmental risks, can be held in two lights, namely:

(i) Impact of the military on environmental risks: Despite the attempt by the military to ensure 'mission sustainability'[21], its activities often affects the local civilian popultation; for example, pollution (noise, dust and smoke from weapons, vehicles and aircraft) (US-South Africa Defence Committee, 2010:2). Major sources of GHG emission in Africa derive from fires in the domestic energy and land use sectors, and contribute approximately four percent to total global CO_2 emissions (UNEP).

(ii) Impact of environmental risks on the military: With reference to the inter-related relationship between military needs, socio-economic development and environmental protection, global population growth has intensified 'clashes' between armed forces and civilian populations, thereby posing a challenge for militaries to sustain their levels of mission readiness (US-South Africa Defense Committee, n.d.). Social and environmental factors (such as the competition for land, sea and air use) encroach on military training and testing missions. 'Encroachment' denotes the "conflict between the...spatial requirements for [military] mission sustainability and various economic, socio-political or environmental imperatives" (US-RSA-Defense Committee, 2010:4).

With analysts having long acknowledged the rise of climate change-fuelled war, the UN has also transformed its peacekeeping operations to include environmental issues in peace building (see *Chapter 3 Section 3.1.*4). As such, DPKO has responded with projects that include the Billion Tree Campaign, during which most of its missions in 2009 took part in the reforestation effort. Further examples include the involvement of the United Nations Organization Stabilization Mission in the Democratic Republic of the Congo (MONUSCO) in planting trees; and the assistance of peacekeepers elsewhere in digging water wells to supply communities and refugee camps in Darfur with water (Gronewold, 2009).

Similarly, the application of military means in order to ensure environmental security is evident in Botswana's application of "military power to pursue environmental ends in anti-poaching"; in this case, the Botswana Defence Force (BDF) has been deployed effectively in its nature conservancies since 1987, in an effort to end "commercial megafauna poaching" (Henk, 2008:22-23). The effort is aimed at ensuring

[21] "Meeting … mission requirements while concurrently safeguarding human health, quality of life, and the natural environment" (US-RSA Defence Committee, 2010:3).

sustainable tourism in the country, and this in turn contributes to the national economy. South Africa is the only other Southern African country to have had "military involvement in environmentalism in 2008"; during that time, the South African National Defence Force (SANDF) maintained a small environmental office with a limited focus on "military installation and their immediate environs" (Henk, 2008:25). Currently, the South African Navy and Air Force are employed in 'routine coastal patrolling' to safeguard the country's marine resources by means of coastal law enforcement; and to counter mass poaching of wildlife, in particular rhino.

In conclusion, this section illustrated how environmental risks are able to impact upon other security sectors' political, economic, social and military dimensions. Security in a wide sense (including aspects such as the effects of climate change) can cause a reduction in livelihood, which in turn affects security in a narrow sense (including aspects such as political stability, economic security, social cohesion and military security), thereby acting as a precipitator or trigger of conflict.

6. CONCLUSION

Environmental factors are seldom the only causal factors in violent conflict. However, environmental degradation amplified by climate change threatens food, water and energy security, and creates an additional link between shortage and collapse; this undermines efforts to create long-term peace and human security. Climate change has the potential to produce several persistent conditions: the further deterioration of financial and ecological circumstances in already frail regions, due to decreased agricultural production; the scarcity of water; an increase in diseases; and the migration of large numbers of people to locate and exploit additional basic resources. The combined burden of climate change threatens the economic, social and political growth of developing countries; it isalso a potential 'tipping factor' in fragile states, which may trigger political and socio-economic collapse. Southern Africa is particularly vulnerable, as it is faced with concurrent multiple stresses – poverty, unequal access to resources, food insecurity, water scarcity and disease prevalence. The regional perspective is that peace and security entail not just the absence of war, but also human security. Regionally, the growing insecurity relating to food, water, health and energy, together with the impact of migration, will exhaust the vital resources; this may intensify existing ethnic and political tensions.

The medium- to long-term impact of climate change and variation on South Africa is considerable (under a BaU scenario) and will result in parts of the country becoming much drier and having decreased water accessibility. This will considerably impinge on food production (agriculture and fishing), water-demanding economic sectors (such as mining and power generation), water supply and human health. South Africa is particularly vulnerable to the effects of climate change, due to its ecological and socio-economic background: declining agricultural and fishing yields, spiking food prices, water scarcity, a coal-reliant economy, and subsequent health risks due to pollution. The threat-multiplying impact of all these environmental risks, augmented by the already high number of immigrants stressing its natural resources, will leave South Africa vulnerable, as the Government's ability to provide for the essential needs of its citizens may be over-stretched. In turn, environmentally induced migration could deepen tension and conflicts, while a scarcity of resources, especially food and water, could convert peaceful rivalry to hostility. Furthermore, climate change could affect energy, as limited or threatened access to energy drives conflict.

In conclusion, the thin margin between security and insecurity is affected by three factors, namely the scope and pace of climate change; the institutional capacity to adapt to such changes; and Government's receptiveness to the challenges. Thus, South Africa's official response to environmental risks will determine the vulnerability of the country to these risks, as well as the severity of the effects of such risks on the nation.

CHAPTER 5

OFFICIAL SOUTH AFRICAN PERCEPTIONS OF AND RESPONSES TO ENVIRONMENTAL SECURITY

1. INTRODUCTION

Through the application of securitisation theory, this chapter presents an analysis of the South African government's official perceptions of and responses to environmental security. It specifically poses the question as to whether the policy responses regard environmental risks as a matter of security (in terms of its being a regional and international threat), or primarily as a matter of environmental affairs. Firstly, the chapter considers South Africa's international (UN) and regional (AU and SADC) obligations and responsibilities in terms of environmental risks, in particular climate change treaties and conventions. Secondly, it outlines the framework of the South African official policy on environmental security (including climate change). Thirdly, it gauges Government's official perception of environmental security both in terms of its regional and strategic stance, and in terms of its domestic rhetoric. Fourthly, it considers the existing institutional arrangements within which this policy response takes place, i.e. the Cabinet's cluster approach to and inter-departmental consideration of environmental issues. Finally, it analyses official perceptions in order to determine whether, in terms of a securitisation theory, environmental risks (based on their nature and scope) are successfully securitised or not and, if so, to what extent they are incorporated into national security policy and strategy.

2. SOUTH AFRICA'S INTERNATIONAL ENVIRONMENTAL OBLIGATIONS

South Africa has certain obligations and responsibilities in terms of international (UN) and regional (AU and SADC) environmental treaties and conventions and therefore the country has been active in the international climate change arena. In 1992 it ratified the UN's Agenda 21 (see *Chapter 3*), a non-binding, voluntarily implemented action plan with regard to sustainable development, produced at what is commonly known as 'Earth Summit 1992' (the *Rio Declaration*). In 1997, the South African government ratified the UNFCCC and in 2002 acceded to the *Kyoto Protocol*, although as a developing country (a non-Annex I Party) it is currently not obliged to reduce its GHG emissions. These global commitments of South Africa address three major air quality issues, namely GHGs and related climate change; stratospheric ozone depletion; and persistent organic pollutants (POPs)" (RSA-DEAT, 2007:14). In addition to the *Rio Declaration*, the country also ratified the *Johannesburg Declaration* concluded at the World Summit on Sustainable Development (Rio+10, Johannesburg 2002) and approved the outcome document, *The Future We Want*, of the UN Conference on Sustainable Development (Rio+20, Rio de Janeiro 2012). While the UN's desired outcome for Rio+20 was the endorsement of a UN 'green economy roadmap' with

environmental goals, targets and deadlines, developing countries favoured the establishment of new 'sustainable development goals' to protect the environment, and the assurance of food and energy security for the poorest. In addition to the UNFCCC and the United Nations Convention to Combat Desertification (UNCCD), the SADC region has ratified major Multilateral Enviromental Agreements – amongst others, the *Africa Consensus Statement to Rio+10*, which stresses the goals of sustainable development (2011) and the *Bamako Convention,* which controls the movement of hazardous wastes within Africa.

South Africa has also ratified the following international environmental treaties: the *Convention on Biological Diversity* (1995); the *Vienna Convention for the Protection of the Ozone Layer* (1990); the *Montreal Protocol on Substances that Deplete the Ozone Layer* (1990); the *Stockholm Convention on Persistent Organic Pollutants* (2002); the *Convention of the Law of the Sea* (1997); and the *Convention to Combat Desertification* (1997). Thus, in contrast to the weak implementation of Agenda 21 by sub-Saharan and North African countries, South Africa has a good track record in relation to making environmental obligations; one that is equivalent to that of modern Europe.

In addition to GHGs conventions, of late, international concerns about mercury, lead and cadmium prompted the UNEP to develop a global, legally binding instrument on mercury; this culminated in the ratification of the *Minamata Convention on Mercury* in 2013, of which South Africa is a signatory (UNEP, 2013a). The treaty will phase out mercury – a toxic air pollutant[22] (TAP) and persistent bioacumulative[23] toxin – in many products in order to protect human health and the environment from its adverse effects. The convention will likely have significant implications for BRICS in general and South Africa in particular, as it bans new mercury mines, phases out existing mercury mines, regulates small-scale gold mining and implements control measures regarding air emissions. BRICS countries contribute to the bulk of global mercury emissions, with China being responsible for approximately one third of the global total (UNEP, 2013b:11). South Africa is the world's sixth largest emitter of mercury, and these emissions stem predominantly from coal-fired power stations and small-scale gold mining (RSA-DEAT, 2007:4; UNEP, 2013b:22).

Due to South Africa's heavy reliance on fossil fuels as the main source of energy (87% in 2010) – of which coal provided 74 percent – the country accounted for an astonishing 37 percent of CO_2 emissions from fuel combustion continentally in 2010 (IEA, 2012:25). South Africa relies almost exclusively on coal for

[22]TAPs refer to "substances that cause or may cause cancer or other serious health effects, such as reproductive or birth defects, and neurological, cardiovascular and respiratory disease" (Clean Air World, 2013).
[23]Bioaccumulative refers to *inter alia* toxins that are stored indefinitely in the body and increase over time.

electricity generation (94% in 2010). Although the electricity and heat sectors are responsible for the bulk (69%) of CO_2 emissions nationally, the country's growth remains modest in comparison to other BRICS countries (IEA, 2012:25-26). South Africa's foremost challenge in the mitigation of climate change is the need to reduce the electricity sector's GHG emissions, mainly by reducing the dependence on coal (IEA, 2012:26). Accordingly, Government's 20 year energy electricity plan (see *Chapter 4, Section 3.3.2*) indicates efforts to develop the use of renewable and nuclear energy (IEA, 2012:26). Also, the South African government's 'voluntary emissions reduction' pledge during COP15 (2009) aims to reduce GHG emissions to lower than a baseline of 34 percent below BaU by 2020, and 42 percent below BaU by 2025 (RSA-DEA, 2011a; RSA-DTI, 2011; IEA, 2012:26; RSA-NPC, 2011:179).

In summary, South Africa has ratified the most significant international environmental treaties, and voluntarily committed itself to reducing its exceptionally high GHG emissions within the next decade, despite the fact that the country is currently a non-Annex I (developed) country in terms of the *Kyoto Protocol*. It has also committed itself to reduce TAPs such as mercury, however, the convention will have significant implications for South Africa, due to the country's very high mercury emissions.

3. SOUTH AFRICAN LEGISLATION RELATING TO ENVIRONMENTAL SECURITY

The legislative framework encapsulating South Africa's views on national security reflects the assumptions of the Welsh and Copenhagen Schools by placing particular emphasis on the social aspects and implications of security, specifically human security. South Africa's comprehensive and integrated national security strategy – which has been in the making for some time, but has not been released as yet (August 2014) – indicates its analysis of amongst other environmental security. Despite the lack in the release/publication of the National Security Strategy, South Africa has responded in terms of its 'green' political framework by including environmental rights in the South African Constitution; developing a wide range of environmental management policies that underpin sustainable development; and increasing donor funding. These initiatives stem from both national and international determinants, and alter the re-routing of means from classic conservation to "people-centred sustainability management" (Grida, n.d.).

The significance of the interface between environmental law and sustainable development should not be underestimated. The most important environmental legislative measures at a national level include the *Constitution of South Africa* (1996) and the *National Environmental Management Amendment Act* (NEMA) of 2008. Supplementary legislation deals with topics such as conservation (of forests, water, agriculture, animals, fisheries and land); pollution (land, marine, atmospheric, noise and water pollution, as well as

waste management); energy (electricity); and energy resources (nuclear energy, gas, liquid fuel and mining) (Van der Merwe, 2006).

The following constitutional provisions, security policies relating to the environment, and environmental laws are the most significant in terms of South Africa's legal environmental framework.

3.1 Constitutional provisions

Chapter 2 of the *Constitution of South Africa* (RSA, 1996a) entrenches environmental protection as a human right. Section 24 of the Constitution further imposes a constitutional duty on the state to protect the environment through reasonable legislature and other means. It explicitly provides for every citizen to have the right

> (a) to an environment that is not harmful to their health or wellbeing; 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.
>
> (RSA, 1996a:1251-1253)

Furthermore, the right to food and water is explicitly provided for in Section 27 (RSA, 1996a:1255), which determines that the state must take "reasonable legislative and other measures" to ensure that all the people have access to health care, sufficient food and water, and social security. The constitutional recognition of the right to water has had a significant influence on legislation; for example, the *Water Services Act of 1997* Article 3 states that "everyone has a right of access to basic water supply and sanitation".

3.2 Security policy and the environment

South African security policy documents refer to and emphasise the broader security implications of the environment. Amongst others and as early as 1995, the *White Paper on Intelligence* (1995) encompassed South Africa's post-1994 security doctrine, in the process shifting away from the narrow application of the military-strategic approach to security towards a holistic philosophical outlook that includes non-military sectors of security, as well as threats to stability and development. In line with the assumptions of the Copenhagen School, South African security was defined "less in military terms and more in the broader and more complex questions" concerning the society's vulnerability (RSA, 1995:4). Thus, the notion of security includes issues from the political, economic, social, military and environmental spheres, and the security policy objectives extend further than merely attaining an absence of war; to include striving after

democracy, social justice and sustainable economic development (RSA, 1995:4). Thus, the country's national security objectives "encompass the basic principles and core values associated with a better quality of life, freedom, social justice, prosperity and development" (RSA, 1995:4).

Similarly, the *White Paper on National Defence for the Republic of South Africa* (RSA, 1996b) articulates the new philosophy of national defence, capturing one of the most expansive definitions of security on record and offering a clear environmental dimension (Henk, 2008). The White Paper (RSA, 1996b:22) refers to the "paramount concern with the security of people", stating that individual citizens should have freedom, safety, peace, access to resources and basic necessities, and "an environment which is not detrimental to their health and well-being". Furthermore, *Chapter 9: Land and Environmental Issues* explicitly provides for the Environmental Services of the South African National Defence Force (SANDF), tasked with "environmental planning and research; ecological and environmental management of military properties; … and environmental education" (RSA, 1996b:39). The SANDF policy on the environment is consistent with national policy and, *inter alia,* includes the following guidelines (RSA, 1996b:39): "the protection of species and habitats and the conservation of bio-diversity and natural resources; the protection of the environment against … deterioration, destruction as a result of human activity…; and the maintenance and improvement of environment which contribute to the quality of life of South African citizens" (RSA, 2006:39). Therefore, the planning and execution of military activities should take into account the environmental implications, and the activities should not jeopardise land or other natural resources.

In addition, the Human Security approach of the latest *South African Defence Review* 2014 (RSA-DOD, 2012; RSA-DOD, 2014) generally underscores 'commensurate security' as a prerequisite for development. It asserts that national security will be pursued in order to meet the national objectives and the environmental privileges and aspirations of its citizens (RSA-DOD, 2014:3-4). By perceiving environmental destruction as a non-military threat, the Defence Review identifies, amongst others, the following main sources and drivers of insecurity in the country and the region: poor access to resources, a scarcity of resources, low levels of food security and environmental insecurity, progressing climate change, and the knock-on effects of these factors on political, economic and social stability, and on levels of vulnerability (RSA-DOD, 2014:xvi,2). In response, one of the country's core objectives in addressing insecurity is to protect the planet and manage climate change in order to guarantee the sustainability of scarce resources such as food, water and energy (RSA-DOD, 2014:3-4).

Lastly, mention must be made of the Department of State Security's (DOSS) *National Security Strategy* which was approved by Cabinet in December 2013 (see *Section 4.2*) (RSA-DSS, 2014).

In summary, the South African legislative framework on security concurs that security policy must be dealt with effectively in terms of the broader and more complex questions relating to the vulnerability of society (human security), and must specifically include aspects such as the environment. Likewise, the Defence Review 2014 identifies environmental risks (including climate change) as drivers of insecurity, with ripple effects on other sectors of national security.

3.3 Environmental legislation

Environmental legislation in South Africa is aimed at protecting the natural resources and promoting their sustainable use; therefore, the legislation aims to afford equal prominence to investment and growth on the one hand, and environmental protection on the other (Beech *et al*., n.d.:452). Although environmental legislation does not constitute security legislation, it is undeniably part of the broader security context in terms of which the environment is officially perceived. With regard to legislation, the South African environment is mainly regulated by the *National Environmental Management Act*, 2008 (NEMA) and the following laws:

3.3.1 National Environmental Management Amendment Act

The National Environmental Management Amendment Act (62 of 2008) or NEMA as it is commonly known, creates the fundamental legal framework to ensures the concretisation of the environmental rights guaranteed in Section 24 of the Constitution (Van der Linde, 2006:31). The Act sets out to regulate environmental authorisations and provide for environmental management programmes (RSA, 2008:preface). Furthermore, the NEMA prescribes that global and international responsibilities relating to the environment must be discharged in the national interest (RSA, 2008).

3.3.2 National Environmental Management: Air Quality Act *and the* National Framework Amendment

The *National Environmental Management: Air Quality Act* (39 of 2004) or AQA as it is commonly known, *inter alia* "reform[s] the law regulating air quality in order to protect the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development while promoting justifiable economic and social development" (RSA, 2004:preface). It recognises that the quality of ambient air in many parts of the country is not conducive to a healthy environment; and that there is a high social, economic and environmental cost for air pollution,

which is seldom borne by the polluter (RSA, 2004:2). Thus, the Act provides for the establishment of ambient air quality and emission standards, and the monitoring of air quality by the DEA. The *National Framework for Air Quality Management in the Republic of South Africa* (2007, amended in 2013) aims to achieve the objectives of the AQA, and provides a medium- to long-term plan for the practical implementation of the AQA (RSA-DEAT, 2007:7).

A further development that affected air quality control came after the discovery of serious levels of mercury contamination in South Africa in the early 1990s (Fourie, 2008:3). However, the earliest compliance and enforcement provisions were only integrated into the NEMA in 2003. The subsequent 2005 amendment established the Environmental Management Inspectorate (EMI, commonly referred to as the 'Green Scorpions'), which is mandated to enforce the Specific Environmental Management Acts (SEMAs), and is tasked to monitor compliance and enforce specific environmental laws, including those relating to air quality (see *Section 5*).

3.3.3 National Environmental Laws Amendment Act

The *National Environmental Laws Amendment Act* (14 of 2009) amends the *Atmospheric Pollution Prevention Act* (1965); the *Environment Conservation Act* (1989), the *National Environmental Management Act* (1998); the *National Environmental Management: Protected Areas Act* (2003); the *National Environmental Management: Biodiversity Act* (2004); and the *National Environmental Management: Air Quality Act* (2004). The purpose of this amendment was, *inter alia, to*: increase the penalties for atmospheric pollution and environmental destruction; increase the powers and jurisdiction of courts in terms of maximum fines; and regulate genetically modified organisms (RSA, 2009:preface).

3.3.4 National Climate Change Response White Paper

Guided by the Constitution, NEMA, the Millennium Declaration and the UNFCCC, the *National Climate Change Response White Paper* (2011a) is an embodiment of South Africa's "commitment to a fair contribution to the stabilisation of [GHG] concentrations in the atmosphere and the protection of the country and [its] people from the impact of unavoidable climate change" (RSA, 2011a). In this White Paper, Government concedes that South Africa is both a relatively significant contributor to climate change and a potential victim of global climate change, given that it has an energy-intensive, fossil fuel-powered economy and is also highly vulnerable to the impact of climate variability and change (RSA, 2011a:8). Although Government accepts the findings of the IPCC's AR4 (2007), South Africa is a developmental state, dealing with the challenge of poverty and unemployment, and endeavouring to deliver basic services; additionally,

as an already water-stressed country, it faces upcoming dry spells and weather variability with phases of droughts and unexpected extreme showers (RSA, 2011a:9).

Against this backdrop, the South African government regards climate change to be one of the greatest threats to sustainable development which, if unmitigated, has the potential to undercut many of the MDGs and the constructive developments domestically (RSA, 2011a:9). Government also acknowledges that the country is committed to reducing its own GHG emissions; that South Africa will have to adapt to the unavoidable impact of climate change; and that there will be significant short- and long-term social and economic benefits to reducing GHG emissions. Government also commits to the *Kyoto Protocol* and to a binding multilateral international agreement that is inclusive, fair and effective, and has an appropriate development - climate response balance. However, the White Paper falls short of addressing the security implications of climate change *per se*.

3.3.5 **Electricity Regulation Act *and* Electricity Regulation Second Amendment Bill**

The *Electricity Regulation Act* (4 of 2006) and the *Electricity Regulation Second Amendment Bill* (2011) establish a national framework for regulating the electricity supply industry and make the National Energy Regulator of South Africa (NERSA) the custodian and enforcer of the national electricity regulatory framework (RSA, 2006). However, current legislation does not allow for state-owned enterprises to be held criminally liable for breaking environmental laws. Thus, the DEA will not be taking criminal action against Eskom for various transgressions concerning environmental law (Thaw, 2012). The *Energy Security Master Plan – Electricity 2007-2025* (RSA-DME, 2007) – refers to the increasing environmental performance expectations as an external driving force; these expectations include air quality, water management, energy efficiency, and climate change response strategies. Thus, Government recognises and considers the impact of climate change mitigation measures on energy supply.

3.3.6 **Water Services Act, National Water Act *and* Water Services Amendment Act**

The *Water Services Act* (108 of 1997), the *National Water Act* (36 of 1998) and the *Water Services Amendment Act* (30 of 2004) acknowledge that water is a scarce national resource. Government similarly recognises that, according to global criteria, South Africa is categorised as one of the driest countries (RSA-GCIS, 2010:554). Some of the challenges facing the former Department of Water Affairs (DWA)[24] include an increase in permeable and burdened sewerage works (highlighted in the *Green Drop Report*); a

[24]Initially called the Department of Water Affairs and Forestry (DWAF), until it was split to become the Department of Water Affairs (DWA) in May 2009, and renamed to the Department of Water and Sanitation in May 2014.

decline in the water quality of national waterways; and the risks posed to vital wetlands by pollution and mining (Mail & Guardian, 2010:7).

Mention should be made of the government and the sensitivity of its institutions to remarks related to the country's water crisis. For instance, the Council for Scientific and Industrial Research (NSIR) suspended Dr Anthony Turton in 2010 in a controversy that, amongst others, was linked to a presentation he was due to deliver on South Africa's water crisis (previously referred to in *Chapter 4*).

3.3.7 **The White Paper on Energy Policy – South Africa**

The *White Paper on Energy Policy* (1998) states the following as its objectives: increasing access to affordable energy services; improving energy governance; stimulating economic growth; managing energy-related environmental and health impacts; and securing supply through diversity.

In conclusion with regard to environmental legislation, since global responsibilities relating to the environment must be discharged in the national interest, it is noted that, in keeping with the AU approach, national environmental legislation, specifically the *National Climate Change Response White Paper*, does not make any reference to the security implications of environmental risks, thus it is not securitised. Instead, the general focus is on the adverse environmental, social and economic impacts of environmental degradation. These aspects, however, are not unrelated to environmental security. Despite the country's highly regulated environmental management, the implementation and enforcement of such laws and prohibitions has been mostly disjointed, especially in terms of the major polluters not being indicted.

3.4 **The South African government's programme of action**

Subsequent to AR4, the South African government recognised that most analysts are convinced that the climate is changing due to anthropogenic environmental changes, and that there is a pressing need to deal with these changes by taking the following action.

3.4.1 ***Long Term Mitigation Scenarios***

Despite South Africa's not being a *Kyoto Protocol* Annex I (developed) country, Government has acknowledged the need to plan for a future of lower carbon development, due to its large GHG emissions (*Appendix 7*). According to the possible scenarios, in the absence of a fundamental energy choice adjustment, the country's emissions could quadruple between 2003 and 2050; these emissions would be largely energy-related emissions from the industrial, transport and electricity sectors (IEA, 2012:25). As a result, the country would increase its carbon footprint even more drastically. In response to the need for

change, Government established the National Climate Change Committee (NCCC) and the Inter-Ministerial Committee on Climate Change (IMCCC) to consider the Long Term Mitigation Scenarios (LTMS) on Climate Change (RSA, 2009).

3.4.2 *Strategic priority areas*

The MDG 7: "Ensure environmental sustainability" forms an important basis for the achievement of most of the other UN MDGs (UNDP, 2000). The *MDG Country Report on South Africa* (UNEP, 2010a:84) categorically states that "environmental preservation is an essential foundation for sustainable development and poverty alleviation". Further, it states that failure to preserve the environment will affect food security and have a negative impact on social and economic development efforts (UNEP, 2010a:84). However, present indications suggest that South Africa will not successfully implement the MDG 7 indicators in time (Stats SA & UNDP, 2010:84). In response to the failure to implement the said MDG indicator, the Medium Term Strategic Framework (MTSF, 2009-2014) identified developmental challenges facing South Africa, and formulated Twelve Key Outcomes, including the protection and continued enhancement of environmental assets and natural resources (RSA-Presidency, 2009a). Similarly, Government identified ten strategic priority areas, among which the following are related to environmental risks: "[c]omprehensive rural development strategy linked to land and agrarian reform and food security"; "[b]uild cohesive, caring and sustainable communities"; and "[s]ustainable [r]esource [m]anagement and use", all of which refer to the country's vulnerability to the impacts of climate change and diminishing water resources (RSA-Presidency, 2009b:26; UNEP, 2010a:17). However, the Presidency's (2009b) seven key priorities – health, human settlements, rural development, education, employment, crime, local government and public services – do not include any references to a sustainable environment or environmental security.

3.4.3 *Integrated Resource Plan* and *South African Renewables Initiative*

The Integrated Resource Plan 2010–2030 (IRP) presents a revised balanced scenario proposing that, by 2030, South Africa's generation mix of installed gigawatts should be made up of 48 percent coal-powered energy, 14 percent nuclear energy, 16 percent renewable energy and nine percent peaking open-cycle gas turbine power (Hancock, 2011; RSA, 2011d). The South African Renewables Initiative (SARi) is a key element in ensuring that South Africa meets the emission targets set by Government at COP15. Government's key green industrial development priority is: assistance to match or exceed the IRP's targets for renewable energy, at a reasonable cost to the economy and to consumers.

3.4.4 *National Development Plan*

The National Development Plan (NDP) is a reflection of the ruling party's manifesto to stimulate development in the RSA, and as such has been incorporated into national policy by Government; it speaks to national interests which include access to water, energy and food (RSA-NPC, 2011:241). The NDP focuses, *inter alia*, on climate change, demographics, and food security, because of its anticipated impact on the 'long-term vision' for South Africa (Mail & Guardian, 2010:5). International and regional developments affect South Africa's fortune in many ways. For instance, climate change is perceived to be an external driver of change, as it can potentially reduce food production and lead to a greater scarcity of potable water, thereby affecting migration patterns and creating political conflict (RSA-NPC, 2011:9). Therefore, Government should ensure access to clean, potable water for all people, as well as adequate water for cultivation and commerce; it should also ensure the completion of Phase 2 of the Lesotho Highlands Water Project by 2020 (RSA-NPC, 2011:30). In an effort to transition to a low-carbon economy, an emission 'target' has been set to achieve a peak, then a plateau, and finally a decline trajectory for GHG emissions, with the peak being reached around 2025 (RSA-NPC, 2011:32).

With regard to social protection, the NDP provides for the enhancement of food security and nutrition; as well as the following desired measurable outcomes in the lives of South Africans: access to water; efficient and renewable energy; and adjustment to and management of climate change. Furthermore, it recognises that the effects of changing weather patterns on livelihoods will, *inter alia,* affect migration flow; and recognises that migration will continue to cause conflict and tension, leaving migrants increasingly vulnerable and exposed to discrimination, exploitation and abuse (RSA-NPC, 2011:82-83). In 2011, approximately 60 percent of the South African population was urbanised, and this level of urbanisation is projected to increase to approximately 70 percent by 2030; this will further burden the urban infrastructure and services (RSA-NPC, 2011:83).

One of South Africa's climate change adaptation and mitigation goals is to strengthen national resilience, while it transitions to a green economy; though, it is subject to achieving this goal without impeding the country's socioeconomic objectives (RSA-NPC, 2011:180). However, the country faces a particularly challenging transition to a resilient low-carbon economy and society. The NDP (RSA-NPC, 2011:179) concedes that the nation's ambitious GHG emissions target, set during COP15, presents challenges for the coal-reliant economy, and that this demands the planning of a development path that is more sustainable.

To conclude, by adopting the NDP, Government acknowledges the link between development and environmental sustainability. On the one hand, in respect of the water-food-energy nexus, South Africa's national interests are linked, amongst others, to food, water and energy. On the other hand, despite the inferences made to environmental risks in the strategic priorities, the Presidency's seven key priorities exclude any references to a sustainable environment or to environmental security (RSA-Presidency, 2009b). Given the demanding socio-economic context of the other priorities, the departments responding to developmental challenges may regard environmental risks such as 'climate policy' to be an added constraint, and not an issue requiring mainstreaming. This is indicative of a disconnect between environmental policy (including climate policy) and other policy sectors.

4. OFFICIAL PERCEPTION OF ENVIRONMENTAL SECURITY AND RISKS

From the aforementioned, it is evident that South Africa's official perception of environmental security is informed by both its multilateral developmental alignment and its national perceptions thereof. These will determine whether, in terms of securitisation theory, environmental risks are securitised or not, and if they are, to what extent they are incorporated into the national security policy and strategy.

4.1 Official multilateral perceptions

In the run-up to COP17, South Africa expressed its trust in the Non-Alignment Movement (NAM) to follow a united approach to climate change talks. The AU regards environmental degradation as, *inter alia*, a human rights issue, and in 2007 the body adopted a common view on climate change, namely that it could threaten the future welfare of the populace, ecologies and socio-economic growth of the continent (AU, 2007:1). Despite this, neither climate change nor climate security – a more inclusive definition of the issue – has been entrenched by the AU as a security issue (Van Wyk, 2010:17-18). In terms of securitisation theory, this indicates that South Africa's membership of various developmental organisations and alliances, influences, to an extent, the country's perception of and response to certain environmental issues, in particular climate change. The following regional, economic and ideological alliances influence South Africa's stance on environmental risks in general and climate change in particular:

4.1.1 *G77 and China*

As a developing and developmental state, South Africa's foreign policy (political and economic) is largely based on the principles guiding the loose coalition of developing nations, namely the Group of 77 (G77) developing countries and China. More specifically, its policies are closely aligned with those of Brazil, South Africa, India and China (BASIC) and of BRICS. In addition, the country forms part of the G8+5

Group, comprised of the G8 and other developing countries – Brazil, Mexico, China and India – with the mission of advancing deeper cooperation on climate change and trade.

Objection by the G77 and China to the first UNSC debates on "Energy, Security and Climate" (2007) was based on their notions that, firstly, the likely security implications of global warming are 'speculative', and that even if the AR4-predicted consequences were to occur, they would not be immediate security threats; and secondly, the credibility of the UNSC may be undermined by focusing on 'speculative threats' whose effects are not immediately tangible, while there are many immediate threats to attend to (Schaefer & Lieberman, 2007:1). Hence, the debate encountered stiff resistance from countries such as the USA, Russia, China, Egypt and South Africa. South Africa cautioned that the debate should in no way "elevate the issue of climate or environment" to feature on the UNSC agenda (UN, 2007:12). Like its developmental allies (the BASIC and BRICS countries), South Africa reaffirmed the fundamental principle of 'common but differentiated responsibility' (CBDR) as prerequisite to any debate on climate change.

During the second thematic UNSC debate on the "Maintenance of International Peace and Security: The Impact of Climate Change" (2011), the G77 and China stressed that the promotion of sustainable development must take place in accordance with the Rio Principles, and that the UNFCCC is the main global inter-governmental forum for negotiating the global responses to climate change (UNSC, 2011:13). Furthermore, the group strongly reiterated their expectation that the UNSC's second initiative to debate the issue "would not create a precedent that undermined the authority or mandate of relevant bodies, processes and instruments that already addressed climate change" (UNSC, 2011:13). South Africa again aligned with the G77 and NAM, and reaffirmed the relevance of UNGA Resolution 63/281 (2009) (UNSC, 2011:10). The South African representative indicated that while developing countries were working towards eradicating poverty, their lack of resources limited their ability to deal with the negative effects of climate change (UNSC, 2011:10). This group also snubbed the third attempt in 2013 by the developed Western countries (in conjunction with the UN) to discuss the security implications of climate change in the UNSC.

In terms of securitisation theory, the divergence of the G77 and China in general, and China, South Africa and Egypt in particular, is indicative of a resolute effort by the group to either asecuritise the issue of environmental risks (i.e. climate change) by keeping the issue regionally and/or domestically unsecuritised and dispensed of as a political issue; or to desecuritise the issue by attempting to move the issue back into the realm of 'normal' politics, subsequent to its 'global' securitisation, particularly on the part of the UN and leading Western countries.

4.1.2 *BASIC group*

The BASIC group – Brazil, South Africa, India and China – was formed by an agreement based on a common negotiation approach during COP15 (2009). The countries vowed to act jointly (including a possible walk-out), and negotiated a deal with the USA that dramatically altered the course of the talks. The summit almost ended in disarray with the non-adoption of the Copenhagen Accord (2009), drafted by the BASIC group and the USA, all of whom are countries with substantial and/or fast-growing GHG emissions (UNEP, 2010a; SEI, 2011). Subsequently, BASIC was criticised for being nothing but an 'obstructionist force' (SEI, 2011). Mention should be made that for the period 2004 to 2009, CO_2 emissions[25] by BASIC countries – in particular China and India – increased considerably. For instance, China registered a 44 percent increase in CO_2 emissions over the said period; with the country overtaking the USA in 2006 to become the largest emitter of pollution (GHG) in the world; and building approximately two new (coal-fired) power stations every week in 2007 (BBC, 2007; IEA, 2010).

The BASIC Ministerial Meeting on Climate Change works to achieve an inclusive and sensible Second Commitment Period of the *Kyoto Protocol* – also referred to as a 'post-2012 international climate change regime' (RSA-DEA, 2011b). Following the 'BASIC-plus' approach, these meetings comprise the chair of the G77 and China coalition, and promote a unified call to urge Annex I Parties to "fulfil their commitments under the Convention and the Kyoto Protocol" (RSA-DEA, 2011c:p). As BASIC countries also assemble in overlapping groups such as BRICS, BRICS countries are also referred to as the BASIC group in the climate context.

South Africa and China are in a strategic partnership, having signed an *Environmental Memorandum of Understanding* (2010) relating to the following issues: climate change; cleaner technology; water preservation; green economies; and sustainable development (RSA-DEA, 2010b). Since becoming a party to the UNFCCC (1994), China has made a name for itself as a 'recalcitrant player'. For example, China coordinated much of the procedural obstructionism led by the G77 at COP15 (SEI, 2011). In addition, from the time that China overtook the USA as the world's largest emitter of GHG in 2006, expectations have grown for it to increase its mitigation efforts by being more transparent and by committing its domestic efforts to an international regime (SEI, 2011). By tapping into its energy efficiency potential, China's twelfth Five-Year Plan (2011-2015) includes suggested caps on total energy and power consumption, and binding targets to cut its energy-intensive economy by 16 percent, and its CO_2 emissions (per unit of GDP) by 17 percent; signifying China's first CO_2 target (IEA, 2013:21).

[25] For more information, see Global CO_2 emissions 2004, SASI research group, 2008 (www.worldmapper.org).

4.1.3 *BRICS Countries*

BRICS, the economic integration of five large developing countries that do not belong to the Organisation for Economic Cooperation and Development (OECD), has significantly altered the regional balance (IEA, 2012:19). The latest figures on global energy-related CO_2 emissions (IEA, 2013:29) confirm the trend that the share of non-OECD countries (60%) has overtaken that of OECD countries (40%) in recent years. In particular, BRICS countries represent roughly 25 percent of the world GDP, 33 percent of the global energy use, and 37 percent of the global CO_2 emissions from fuel combustion in 2010 (IEA, 2012:19, 49). The four economies of the former-BRIC countries account for over 75 percent of the global carbon emissions produced by deforestation and land use (Ivans, 2013:11). The BRICS proportions are likely to increase in the short term; in fact, Russia, Indian and China are already three of the four countries with the highest CO_2 emissions globally (IEA, 2012:19). In line with the BRICS approach, its members – excluding Brazil – objected to all three UNSC discussions on the security impact of climate change. The BASIC group and BRICS countries unsecuritised notion of environmental risks stem from their prediction of a 'clash' between economic development and a sustainable environment; with such countries favouring the former.

Furthermore, mention should be made of the latest development in climate negotiations which is the establishment of Like-Minded Developing Countries (LMDC) in 2012, which includes, most notably (in terms of BRICS), China and India. Interestingly, the rest of the BRICS countries (Brazil, South Africa and Russia), were not invited to join the group, as the LMDC perceived their stance on the issue of climate change to be too 'moderate'.

In summary, it is perceived that South Africa has the self-assumed task in climate negotiation of 'bridging the divide' between industrialised and developing countries. However, South Africa aligns itself with its developing partners namely NAM, G77 & China, BASIC and BRICS, on issues of climate change, none of which has securitised the issue of environmental risks.

4.2 **Official domestic perceptions**

It should be noted that President Zuma's 'voluntary emissions reduction' pledge is deemed to be over-ambitious in the wake of the country's domestic challenges, as economic and political limitations complicate the implementation of sound domestic climate policy (SEI, 2011:3). While the expansion of access to energy has become a pressing political priority, the minerals-energy complex contributes to a situation where dominant business interests, and possibly the labour movement, challenge the ambitious GHG emissions target (SEI, 2011:3). Amongst others, this complex largely informs South Africa's official perception of the impact of environmental risks, which in turn indicates the following two dissimilar notions:

One the one hand, former South African President, Thabo Mbeki, in addressing environmental matters in general, acknowledged the significant linkage of ”poverty, the environment and the use of natural resources” (RSA-DFA, 2007). Based on the link between the aforementioned human security concerns, and with particular reference to environmental risks, Mbeki reiterated the need for adequate responses to climate change in order to achieve the MDGs. Thus, it was officially conceded that climate change is intrinsically linked to poverty alleviation and sustainable development (RSA, 2007b). Equally, by stressing Africa's particular vulnerability, President Zuma and other members of the cabinet declared climate change as “one of the biggest challenges facing humankind in the 21st century”; a serious and urgent challenge; and a “major potential threat to sustainable growth and development, and the attainment of the MDGs” (RSA-DIRCO, 2011a; RSA-GCIS, 2010:225; RSA-Parliament, 2011a, b; RSA-Presidency, 2011a, b). In agreement with AR4's predicted weather pattern changes resulting from climate change, the Presidency (RSA-Presidency, 2011b) and the Minister of Environmental Affairs, Edna Molewa, agree that the impact of climate change is already globally evident with, *inter alia*, floods and severe droughts that threaten human lives, disrupt agriculture, damage infrastructure, and lead to a loss of life (RSA-DEA, 2011e). This issue has led to an official conundrum: on the one hand, action on climate change is considered to be an investment in the future, as inaction would have serious global costs (RSA-DEA, 2009b); and on the other hand, despite the country's support of the UNFCCC objective to reduce human-induced GHG, the President (RSA-Presidency, 2011c) conditionally states that emission reduction should not work against the eradication of poverty (RSA, Presidency, 2011c). Hence, Molewa calls for a new global climate change system that will align the imperatives of both climate and development (RSA-DEA, 2011f).

The call to link climate change and development is further supported by other official viewpoints that perceive climate change as a challenge and/or threat to sustainable development. The Minister of Defence and Military Veterans, Nosiviwe Mapisa-Nqakula, confirms that national interest informs South Africa's engagement in several multilateral organisations and treaties, which comprise spheres such as the humanitarian, international peace and security, and environmental (RSA-DOD, 2011). The Minister concurs with the above linkage, citing the tragic situation in Somalia (RSA-DOD, 2011), and thus underscores urgent global action. Similarly, the former Deputy Minister of Water and Environmental Affairs, Ms Rejoice Mabudafhasi, in considering the adverse effects of climate change on the environment, society and economy, predicts that the poorest populations will be hardest hit, as they lack adequate resources for responding to the situation and combating it (RSA-DEA, 2011a:4). In a similar vein, the Department of Agriculture, Forestry and Fisheries (DAFF) acknowledges that the country has an extremely variable climate that is especially susceptible to climate change, as the farming sector depends greatly on the

quality of the precipitation (RSA-DAFF, 2011). The DAFF further states that the variable weather will have a grave impact on agricultural production with subsequent negative effects on food availability; and that, combined, the impact of climate change will undermine food security (RSA-DAFF, 2011).

In contrast with the above perceptions linking the environment and development, certain cabinet members recognise the linkage of the environment and security. As such, the former Minister of Environmental Affairs and Tourism, Marthinus van Schalkwyk, warned against the severe threats posed by climate change to the country's economy and to the people's livelihoods, health and food security (DEAT, 2007b). Similarly, the Department of International Relations and Cooperation (DIRCO) officially agrees that intensified international rivalry for natural resources, as well as the negative impact of environmental change on food, water and energy security, contributes to instability in sub-Saharan Africa, thereby gradually increasing the threat of looming conflicts (RSA-DIRCO, 2011b:15,20).

Moreover, although *National Intelligence Estimates* and *National Intelligence Priorities* are classified, and thus not released in the public domain, some inferences can be made about the rationale of the former Minister of State Security, Siyabonga Cwele, from his budget speeches (Duncan, 2011). In reference to the interconnected security threats of the contemporary world, Cwele (2009a, b) cited, *inter alia,* environmental degradation, food insecurity and increased competition for scarce natural resources as security threats. He further concluded that the realisation of such threats would "pose a danger to the survival of [the] constitutional order; the integrity of [the] state; the growth of [the] economy; and the well-being and livelihoods of [the] people" (RSA-DSS, 2009a, b). However, he distinguished between challenges and security threats, and accordingly referred to the continuing depletion of the ozone layer as a challenge which requires both a response and a change in Government priorities (RSA-DSS, 2009a). Although excluded from the time demarcation of this study, but worth noting, is a similar reference made by the current Minister of State Security, David Mahlobo. Although he addresses the response to causes of instability, by citing that *inter alia* "conditions conducive to advancement of energy, food, water and environmental security", should be fostered (RSA-DOSS, 2014:6), he makes no reference to climate change, climate politics, or climate security in particular.

Equally, the former Minister of Home Affairs, Nkosozana Dlamini-Zuma, acknowledged the UNSC's perception of the "threat of climate change to international peace and security"; and stated that unless effective action is taken to reverse global warming and climate change, the world could be faced with anarchy and the influx of climate refugees (RSA, 2010). Correspondingly, the former Minister of Water and Environmental Affairs, Buyelwa Sonjica (2009), concurred with the *National Climate Change Response*

White Paper, but went so far as to consider climate change a "threat to the stability of [the] country... [which] can cause serious damage not only to the environment but to the entire ecosystem".

The preceding statements signify the only official acknowledgement of the link between environmental risks and security. In terms of securitisation theory, a securitising speech act is denoted by referring to the following security implications of environmental risks: the threat of climate change to human health, livelihoods and the economy; and the resultant influx of climate refugees. Furthermore, a securitisation move is indicated by labelling the impact of environmental risks as a security issue by using the following words: food security, water security and energy security; food insecurity; international peace and security; stability of the country; and global anarchy; and referring to global security threats (environmental degradation and increased competition for natural resources) as endangering the constitutional order.

In terms of the three factors that determine the thin margin between security and insecurity in South Africa, firstly, the scope and pace of climate change has already been scientifically proven and officially accepted (with AR5 predicting an even faster pace than anticipated in AR4); secondly, the institutional capacity of the country to adapt to such changes is questioned given the existing stress on vital resources (food water and energy), the influx of migrants and the quadruple burden of disease; and thirdly, Government's receptiveness to the challenges is moderate, although its response is limited and slow.

It should be mentioned that the apparent lack of an official securitised stance is, amongst other, the motivation for the MOU between the ISS and UNEP (as mentioned in Chapter 4 Section 4.3.2). However, the MOU was signed without the involvement of the South African government, which indicates resistance on the part of Government to officialy acknowledge the security implications of environmental risks and reacting accordingly in terms of, *inter alia*, its institutional arrangements.

In summary, there is an established link between the environmental realm and South Africa's national interest. Furthermore, official perceptions by the Cabinet, in particular, are in agreement that climate change is a challenge to humankind; and a threat to national sustainable growth and development, as well as to the MDGs. Thus, the collective official perception concurs with the linkage of the environment and development. However, Cabinet has conflicting perceptions regarding the linkage of the environment and security, as certain Cabinet members recognise the correlation between the impact of climate change and its security ramifications. These Cabinet Ministers recognise the adverse effects of climate change on food security, water security, energy security and health security, leading to climate refugees; this recognition is indicative of a securitising speech act and a securitisation move.

In considering the abovementioned official perceptions and rhetoric, it is clear that environmental risks are perceived as a threat to human security (food, water and health) in some cases, and as a threat to national security (economy, energy and the influx of climate refugees) in other cases. Correspondingly, the Defence Review 2014 – as the most recent official response by Government to address national security, in the absence of a publicised National Security Strategy – also falls short of successfully securitising environmental risks. In its partial securitisation, the draft Review (RSA-DOD, 2012) depicts environmental security – in particular climate change – as a 'security concern', while the 2014 Review considers environmental risks such as climate change to be drivers of insecurity. In terms of the securitisation continuum, 'security concerns' are rated between risks and threats. The position of the continuum builds on Bernhardt's (2004) findings, which indicate the similarities between security risks and potential threats. The interchangeable use of terms such as 'threats', 'challenges' and 'concerns' indicates inconsistencies in domestic perceptions of environmental security by the executive. In doing so, they allocate different 'values' to climate change on the spectrum of securitisation. This dissertation therefore does not support Government's official perception and treatment of climate change as an interchangeable risk/threat/concern.

5. INSTITUTIONAL ARRANGEMENTS

Currently, the duty to respond to environmental risks such as climate change lies primarily with the DEA, and resorts under the jurisdiction of the Minister of Water and Environmental Affairs. This responsibility confirms that climate change has primarily been politicised, rather than securitised. However, based on the complex and cross-cutting nature of environmental risks, responding to them is not the exclusive responsibility of one particular government department; rather, it requires an inter-departmental approach that includes, amongst others, the security sector. Although the current focus of the South African government is primarily on the adverse environmental, social and economic impacts of environmental degradation (including climate change) on sustainable development, the security ramifications are not extensively recognised and are not prioritised. The mainstreaming of climate change into the policy realm is hampered by the largely fragmented environmental policy space as well as the perception that climate change prioritisation will restrain growth imperatives (Giordano *et al*., 2011:6). This results in the departments not prioritising the issue.

The South African government follows a cluster approach to most policy matters, in order to ensure the proper alignment and coordination of government programmes at three levels, namely the national, provincial and local levels. The seven Ministerial Clusters provide a consultative platform on cross-cutting priorities including the environment. The complexity of the cluster approach, however, is illustrated by the

fact that the DEA works in concert with the Department of Water and Sanitation, the DIRCO, the DAFF, the Department of Minerals and Energy (DME), the Department of Energy (DOE), the Department of Mineral Resources (DMR), the Department of Transport, the Department of Health (DOH), and the Department of Rural Development and Land Reform (see *Appendix 8*). As a result, the DEA forms part of the Infrastructure Development Cluster, the International Cooperation, Trade and Security (ICTS) Cluster, and the Social Protection and Community Development Cluster. Similarly, the Economic Sectors and Employment Cluster includes the DAFF and the DMR, while the DOH forms part of the Human Development Cluster (RSA-Presidency, 2009b). Due to the fact that the *National Climate Change Response White Paper* does not identify and/or address the security implications of climate change as such, the Safety, Security and Defence Cluster is, at a policy level, not involved in Government's response to climate change and other environmental risks.

The cluster approach to governance is not without problems and beyond criticism. For example, Giordano *et al.* (2011:6) contend that in practice, the cluster approach (coordination across the different departments) poses huge challenges, with at least 19 of the 32 national sector departments being primarily or secondarily involved in the prioritisation of climate change. Furthermore, they find that the splintering of institutions and regulations impedes 'horizontal coordination', and that the departments (other than the DEA) do not regard climate change to be a priority in their sectors (Giordano *et al*., 2011:6). In addition, the Southern Africa Development Bank found an inadequacy in the capacity of the two centralised mechanisms endorsed by the *National Climate Change Response White Paper* – namely the IMCCC and the Forum of South African Directors-General (FOSAD) – to translate policy to execution (Giordano *et al*., 2011:6). Likewise, the disparity between sectoral policies and climate policies must be identified and resolved. Claxton and Turton (2009:7) equally recommend merging the policy debates on National Water Security, National Energy Security and National Food Security, in order to address the unintentional consequences of the current energy and water policies; these consequences include AMD and acid rain. In addition, it is noted with concern that no specific reference has been made to the Safety, Security and Defence Cluster, apart from the NEMA mentioning the EMI. Thus, this sector is not cited in any environmental policy, including the *National Climate Change Response White Pa*per. This leads to a disconnection between the executive's rhetoric and policy making, and results in the inadequate consideration and implementation of security policy.

6. ANALYSIS

This section aims to analyse the official South African perceptions of environmental risks at the hand of securitisation theory. Firstly, as mentioned previously, it is clear (in terms of all three factors mentioned in *Section 4.2 p105*) that climate change leads to the instability of the country. Secondly, according to theory, successful securitisation requires authoritative securitising speech act and a securitisation move that are accepted by a relevant audience. Subsequently, the issue must be presented as an existential threat (real or perceived) to a referent object by a securitising actor, who then authorises the use of extraordinary measures. In order for an issue to be considered an exisential threat, it has to necessitate a high level of response and be significant in terms of urgency and the need for extraordinary measures. Therefore, dynamics, units of analysis, and steps to be taken are analysed in the light of securitisation theory.

Cabinet's perception, although divided on the issue of environmental risks, indicates both authoritative securitising speech act and a securitisation move (see *Section 4.2*). In response, the South African population, as audience, appears to have accepted the securitising speech act and the securitisation move by enlarge; the former possibly to a greater extent than the latter. In terms of the units of analysis, official perception indicates the referent objects of security in this case to be the following: the biosphere and the ecosystem at large; human security aspects (such as human livelihoods and health; vital resources including food, water and energy; sustainable development; and migration); and national security aspects (such as politics, economies and societies). In turn, the securitising actors are certain members of the Cabinet, including the former Ministers of Environmental Affairs and Tourism, State Security, Home Affairs, and Water and Environmental Affairs. In order to fill the vacuum left by Government, the ISS and the UNEP are currently championing environmental security in Africa, and therefore serve as functional actors.

Futhermore, despite rhetoric favouring limited securitisation, and the country's historic inferences of the resource-conflict-nexus (e.g. the xenophobic violence in 2008) (see *Chapter 4 Section 5.3*), environmental risks have not been officially identified as existential threats, and emergency action has not officially been taken to address the issue; nor have inter-unit relations been affected by the breaking free of rules. As such, the issue of environmental risks and their impact on security is not officially cast as an existential threat to the country's human and national security (in terms of urgency and level of response); rather, the general official responses indicate a lack of urgency. Therefore, no concrete 'steps of successful securitisation' that may well be classified as extraordinary measures have been taken in order to align environmental risks such a climate change with security.

Hence, in the South African context, some of the elements and conditions for securitisation exist, but the process, in terms of the dynamics, are not followed through. For instance, no securitisation in full or in actual fact takes place. Although speech act and a move are evident, there is limited conversion into an existential threat, and limited responses that do not translate into securitisation. Based on the evidence presented, there is a partial securitisation – the conditions do exist, but the elements are not all evident, due to the fact that the dynamics do not go the full length towards culminating in securitisation. Based on the official perception, it is thus concluded that Government does not conceptualise the issue of environmental risks in general, and climate change in particular, in terms of security. Rather, it is working towards a condition of asecurity by keeping the environment unsecuritised and in the realm of 'normal' politics, mostly because it has to attend to other issues that it perceives to be 'more urgent'.

7. CONCLUSION

In summary, South Africa has committed itself to sustainable development by means of ratifying the most significant international environmental treaties and voluanterily pledging to reduce its high GHG emissions in the next decade. Futhermore, the country's legislative framework provides for the broad application of the term 'security', underscoring human security. For instance, the country's national security is inextricably linked to among others its energy security, in order to sustain development.

Despite the country's focus on human security and sustainable development, there are disparities (on several levels) in its policy responses to environmental risks such as pollution (of air, water and land), environmental degradation, and resource scarcity. On the one hand, South Africa's national interests reflect the water-food-energy nexus, and the executive locates environmental risks in the strategic priorities. On the other hand, the Presidency's seven overarching priorities do not speak directly to a sustainable environment or to environmental risks. This is indicative of a disconnection between national priorities and the administration's priorities. Similarly, despite national interests reflecting the need for water security, food security and energy security, national environmental legislation – for instance the response to climate change – does not make any reference to the implications for security; this provides further evidence of the disconnection between the national interest and policy responses.

Furthermore, the disconnect between governmental rhetoric on environmental security and the subsequent policy responses also stems from the country's solidarity with its BASIC and BRICS partners, who prioritise economic development over a sustainable environment. The accompanying disconnect between the environmental policy sector and other policy sectors stems from the complex, interdependent and challenging socio-economic context of South Africa's developmental priorities, which often leads to the

reluctance of departments to respond to what they perceive to be the 'additional constraint' of environmental risks.

Although rhetoric by the executive concedes to the security threat posed by environmental risks, the South African government has not successfully securitised environmental risks. Although the official speech act and the securitisation move are tantamount to partial securitisation, they do not translate to the issue's being presented as an existential threat, and therefore none of the policy responses provide for extraordinary measures. As such, Government's policy responses to the perceived environmental threats remain outside the realm of security – the threats are either politicised or, to a limited extent, asecuritised – and contains only functional (non-securitised) sustainable development issues and challenges.

CHAPTER 6
EVALUATION AND RECOMMENDATIONS

1. AIM OF THE STUDY

The primary aim of this study was to explore the relationship between the environment and security in South Africa between 2007 and 2012, and determine - within the context of the current international focus on the potential security effects of climate change - whether and if so, to what extent the impact of environmental risks are securitised in terms of official South African perceptions and responses. The study was conducted with particular emphasis on the impact of environmental risks, in particular climate change, as a potential source of insecurity, and its effect on other sectors of security; therefore, as a threat to national security. In doing so, the study determined how the notion of environmental security is accommodated by the contemporary conceptualisation and theoretical framing of security; to what extent global and regional organisations have linked the impacts of environmental risks such as climate change to security; what the impact of environmental risks such as climate change is on the RSA's security; and finally, what the RSA's official perceptions of and responses to the security impacts of environmental risks are, and whether it point to the politicisation, asecuritisation, securitisation, or de-securitisation thereof. As a thesis statement, the study argues that despite environmental security being mentioned in South African policy documents pertaining to national security and threat perceptions, the rhetoric and statements of government officials and political leaders, as well as the country's historic inference to the resource-conflict nexus, the risks associated with the environment and the policy responses to such risks are not sufficiently reflected in security policy and are therefore not securitised.

In response to the main research question, it was assumed that the concept of security has evolved to include non-military threats such as the environment, and that therefore, in principle, environmental risks could pose security risks and could therefore be securitised. The study also accepted in principle the outcomes of the IPCC's AR4, which generated greater sensitivity towards transnational environmental risks, including climate change, and led to the linkage of the environment and security at some global and some regional levels. Furthermore, the study assumed that the effect of environmental risks such as climate change has implications for security in South Africa. Lastly, it assumed that despite the views, rhetoric and pronouncements of South African officials, environmental risks (including climate change) and the policy responses to these are not sufficiently reflected in South African threat perception and national security policy. Therefore, the study argued that environmental risks are not securitised successfully;

however, the process and the evidence of the securitisation of environmental risks are apparent, albeit to a limited extent.

2. SUMMARY

As a point of departure, the traditional state-centric, military-orientated notion of security was complemented with new thinking, CSS, which allowed for the broadening and deepening of the concept of security. This approach accommodated non-military threats and non-state referent objects of security, resulting in the focus being shifted to include the concept of human security. Moreover, CSS accommodates five different sectors of national security, amongst others the environment; this paved the way for the development of the theory and practice of environmental security and human security. Thus, the contemporary notion of national security – as reflected by the Copenhagen school of thought – includes both formal state security and human security. As a result, environmental risks (e.g. pollution, environmental degradation and resource depletion) – of which the climate change debate is foremost in terms of present impetus – were related to human security and other sectors of security (political, military, economic and social).

The concept of securitisation involves the assumption that individual countries set their 'security bar' according to societal perceptions of what consitute existential threats, be it real or perceived. CSS further assumes that environmental risks – based on their interdependent nature and transnational scope – interact with other threats to exacerbate conflict, thereby affecting both national security (in terms of politics, economics and energy) and human security (in terms of food, water, health and human migration). Thus, securitisation of the environment is premised on the environment-conflict nexus, resulting in the relationship between the environment and national security. Conversely, the asecuritisation and desecuritisation of the environment are based on the narrow definition of security, contesting such links and rejecting the existence of the relationship between the environment and security.

In terms of climate change in particular, AR4 reshaped the global framework of environmental security and ultimately contributed significantly to the UN's securitisation of environmental risks, with the global body establishing a top-down development path. Subsequently, the EU was pivotal in recasting climate change as a global security threat; and was followed by other leading developed Western countries such as the UK, Germany and the USA, which indicates (in their view) the evolution of climate change from an environmental issue to a security threat. The regional African perspective is that peace and security entail not just the absence of war, but also a focus on human security. However, although the AU recognised Africa's vulnerability to environmental degradation and its spill-over effects on aspects of human security,

as well as, to a lesser degree, national security (peace and security), the continental body's actions were more limited. In comparison with the UN and the EU, the AU was slow to establish a link between the impact of climate change and security. The AU only later recognise the link, both jointly with the EU (in 2010) and independently, to a very limited degree (in 2013). This indicates a slower and restricted response in terms of the securitisation of the environment on the part of the AU.

Regionally, when environmental degradation is amplified by the effects of climate change, it threatens human security aspects such as food security, water security and energy security, and subsequently undermines efforts to create long-term peace and human security. It is projected that the impact of climate change on the region will cause a decrease in agricultural production, an increase in water scarcity and diseases, and the large-scale migration of climate refugees who will exploit additional vital natural resources. The combined burden of climate change also threatens national security aspects such as the economic, social and political development of emerging countries. Southern Africa is particularly vulnerable, as it is faced with concurrent multiple stressors, including unequal access to resources, food insecurity, water scarcity and disease prevalence.

Similarly, the medium- to long-term impact of climate variation on South Africa is considerable and will result in parts of the country being much drier, and a decrease in water accessibility. This will considerably impinge on food production (agriculture and fishing), water-demanding economic sectors (such as mining and power-generation), water supply, and human health, which in turn will increase insecurity. South Africa is particularly vulnerable to the effects of climate change, due to its ecological and socio-economic background: declining agricultural and fishing yields, spiking food prices, water scarcity, a coal-reliant economy, and the health risks resulting from pollution. The threat-multiplying impact of all these environmental risks, together with the already large number of immigrants stressing its natural resources, will leave South Africa vulnerable, as Government's ability to provide in for the essential needs of its citizens may be over-stretched. In turn, environmentally induced migration could deepen tension and conflicts, while a scarcity of resources, especially food and water, could convert passive rivalry into hostility.

In general, South Africa applies the broad notion of national security and underscores human security. In doing so, it inextricably links the country's national security to issues of food, water and energy security, in order to sustain development. In analysing Government's perceptions of and responses to environmental security, it is evident that Government is committed to international environmental treaties. However, despite the country's commitment to human security, sustainable development and the legislation (i.e. constitutional provisions) linked to these, the rhetoric and terminology used by Cabinet ministers in relation

to environmental risks varies to include terminology such as risks, concerns and threats. Likewise, there are disparities in Cabinet's policy responses to environmental risks and threats. As such, despite the historic inference to the environment-conflict nexus facilitating the casting of the issue as an existential threat, environmental threats remain outside the realm of security and comprise only functional (non-security) sustainable development issues and challenges. Therefore, only partial securitisation takes place; however, the official response is to asecuritise the issue.

3. KEY FINDINGS

This study supports the contemporary notion of national security, which includes both state security and human security issues, non-military referent objects of security, and non-military sectors such as environmental security. Although securitisation of the environment is premised on the environment-conflict nexus, in terms of theory, securitisation does not necessarily require military action as an extraordinary measure, but rather requires an escalation and intensification of the political process.

Furthermore, based on the theoretical components of securitisation, the study found that the UN and the EU, as well as other leading developed Western countries, have successfully securitised the issue of environmental risks, in particular climate change. The responses of the aforementioned institutions and countries meet the criteria for securitisation: the presence of a speech act and securitisation move (Report by the UNSG), a relevant audience (UNGA Resolution A/64/350), the presentation of the issue as an existential threat (real or perceived) to a referent object by a securitising actor (three UNSC debates on the issue), and subsequently, the authorisation of extraordinary measures (SC/9000).

The Joint Africa-EU Strategy's Peace and Security Cluster (2010) represents the AU's first acknowledgement of the link between environmental risks and security, albeit in conjunction with the EU. The AU Commission's (2013) policy framework for Security Sector Reform similarly recognised the link, signifying the AU's first and only autonomous acknowledgement, albeit very limited, of the linkage of environmental risks and security. Despite these advances, this study found that the AU's response was deferred (until 2013) and was limited in its sectoral linkage, which was in part due to the organ's attention to what it perceived to be 'more pressing issues', and its lack of funding for mitigation. Hence, it falls short of securitisation, but is indicative of partial securitisation in terms of a speech act and a move. This response further suggests the lack of appropriate policies, resulting in Africa being increasingly vulnerable to climate change. Noting the continent's existing internal challenges, the study found that climate change will further amplify such challenges to security; which will likely result in the continental MDGs not being reached.

Considering Africa's vulnerability to environmental risks and the impact of environmental risks, this study found that environmental degradation amplified by climate change threatens food production, water availability, typical energy generation and health security, and is therefore a driver of insecurity. These effects, together with the impact of climate-induced migration, will likely exhaust the resources that provide for essential needs; which in turn may intensify existing ethnic and political tensions, thereby undermining long-term peace and human security. In addition, the combined burden of climate change on the available natural resources in developing countries threatens their economic, social and political development. It was established therefore that, although environmental risks do not pose a direct threat to security, they are an indirect threat that is likely to exacerbate the existing risks in vulnerable countries, especially in Sub-Saharan Africa. In addition, South Africa's susceptibility to immigration is likely to overwhelm Government's ability to provide essential resources and services to its people. Therefore, environmentally induced migration could likely deepen tension and conflicts, while a scarcity of resources could convert peaceful competition into hostility.

Despite the country's commitment to human security and development, and constitutional provisions to this effect, this study found that the country's policy responses to the security impact of, *inter alia,* climate change, indicates a disconnection and inconsistency between Cabinet rhetoric and actual Administration priorities. Furthermore, the absence of any security enunciation in the *National Climate Change Response White Paper* indicates a further disconnection between the national interests and the policy responses. Similarly, the most recent (July 2014) reference by the Minister of State Security to the (still to be released) *National Security Strategy* does not make any reference to climate change *per se*. Moreover, the *South African Defence Review* 2014 also falls short of pronouncing environmental risks to be a security threat. The official asecuritised response has emerged notwithstanding South Africa's particular vulnerability to the resource-conflict-nexus, and its historic inference to aggression – i.e. xenophobic violence and service delivery protests – which facilitates the casting of environmental risks as an existential threat. Besides, the constitutional provisions for environmental rights are 'subject' to economic and social development, resulting in the response to environmental risks not been provided precedence by the government's strategic prioritisation. Therefore, the study found that in terms of Government's response to environmental risks such as climate change, its strategic objectives are rather short-sighted: it favours the shorter-term aim of development, rather than address the longer-term goal of ensuring sustainable development through the protection of the environment.

Thus, in terms of securitisation theory, the official response to enviornmental risks indicates partial securitisation, consisting only of securitising speech act and a securitisation move. However, this does not constitute successful securitisation, as the issue has not been presented as an existential threat (real or perceived), and subsequently there is a lack of extraordinary measures. In fact, the study found that the policy responses to environmental risks in general and climate change in particular, indicate politicisation and asecuritisation (domestically), and an attempt to desecuritise the issue (globally). Based on the afore-mentioned, this dissertation does not support the official position on and perception of climate change, or their interchangeable use of terms such as 'risks', 'threats' and 'concerns' when referring to it. Rather, this study emphasises the importance of articulating the issue as an existential threat (real or perceived) and subsequent introduction of non-military extraordinary measures in order to respond successfully to environmental risks.

4. RECOMMENDATIONS

Based on the findings of this study, the following policy-relevant recommendations are made:

- The South African government should ensure that the constitutional provisions for a healthy and protected environment, and the prevention of pollution and environmental degradation are discharged, and not subject such rights to shorter-term goals such as economic and social development; because without the protection of the environment (e.g. natural resources) and the subsequent provisioning of food, water and energy, and a healthy workforce, there will be no economic and social development.

- Government should be sensitised about the resource-conflict-nexus, especially in the light of the country's history of xenophobia brought on by amongst others 'relative deprivation'.

- Government should amend its perception and official view on the security impact of environmental risks such as climate change. Considering that the NDP was largely produced by the ruling party, the ANC should – in order to create real change – make corresponding changes to its official view on the security impact of environmental risks, and subsequently translate these changes into Government policy.

- Government should develop a common position on the security implications of environmental risks, including climate change, and clearly articulate this position. Similarly, it should translate its rhetoric into clearly defined actions, in order to address the security implications of environmental risks such as climate change.

- Government should decide whether to asecuritise, securitise or desecuritise the issue of environmental risks, particularly climate change. In making a choice, Government should strongly consider the following recommendation by Scheffran *et al.* (2012:194):

> Articulating climate change as a security 'issue' is an instrumental attempt to turn climate change into a policy priority. It is hoped that the counterproductive effects of securitisation as defined by the Copenhagen School can be avoided once the meaning of security is reclaimed as human security.

- Should Government decide to securitise the issue of environmental risks, the subsequent extraordinary measures to be implemented could take the form of the extension of policy and politics. Such policy amendments should clearly stipulate the responsibilities of the various Departments, including the security cluster. An additional extraordinary measure would be to deploy the SANDF in general and the South African Military Health Service (SAMS) and South African Army's Corps of Engineers in particular, to simulate the work of the UN's 'green helmets' in promoting environmental and development goals nationally.

- The *National Climate Change Response White Paper* should be reviewed to include and address the security implications of climate change.

- Continentally, the AU should independently articulate its common stance on the security implications of environmental risks such as climate change, and implement policy changes accordingly.

5. CONCLUSION

This study supports South Africa's notion of national security, which encompasses both state and human security, with particular emphasis on human security. The environment's link to human security is clear, but its relation to national security is less evident. Global and regional organisations such as the UN and the EU have successfully securitised the impact of environmental risks, and leading developed Western countries have followed suit. In turn, the AU's response to the effects was deferred and limited, and indicate only limited securitisation.

The impact of climate change on Africa, as a continent most vulnerable, will further threaten aspects of human security (food, water, energy, health and migration patterns), resulting in increased insecurity and accordingly affecting national security sectors (politics, economy and social cohesion). These effects are likely to create tension and conflict, which in turn have the potential to undermine peace and security. Thus, environmental risks such as climate change pose an indirect threat to security by exacerbating prevailing risks and vulnerabilities.

This study holds that despite the national Executive conceding to the security threat posed by environmental risks, it has only securitised the environment to a limited extent (meeting only the requirements of a securitising speech act and a securitisation move). However, the failure to present environmental risks as an existential threat requiring extraordinary measures, negates the successful securitisation of the said threat, resulting in a failure to make appropriate policy responses and to meet the MDGs. This stance of asecuritisation on environmental risks coincides with that of South Africa's strategic development partners, such as the G77 and BRICS, of which the latter are some of the largest CO_2 emitters globally.

This study concludes that although Government's *perception* of environmental risks in general (pollution, environmental degradation and resource scarcity) and climate change in particular, is manifested in limited securitisation; its *policy response* to such perceived environmental risks remains outside the realm of security (it is asecuritised and/or politicised) and includes only sustainable development.

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ABSTRACT

TITLE: OFFICIAL VIEWS ON THE ENVIRONMENT AND SECURITY IN SOUTH AFRICA, 2007-2012: A CASE OF SECURITISATION?

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2. ABSTRACT

This research study emanates from the inclusion of environmental risks on the global security agenda. Although dating back to the Rio Summit on Environment and Development (UNEP, 1992), this trend gained momentum following the publication of the Fourth Assessment Report of the United Nations Intergovernmental Panel on Climate Change (IPCC) in February 2007 (IPCC, 2007a). The report warned that the global climate system is changing mainly because of man-made greenhouse gas emissions, exposing, amongst others, Africa as a continent most vulnerable to the impact of climate variability and change. Subsequent to the report, the security implications of climate change were discussed by the United Nations Security Council in April 2007 (UN, 2007a). With these developments as a point of departure, the aim of this exploratory study is to investigate the securitisation of environmental risks, particularly the impact of climate change, in South Africa, with specific reference to official perceptions of (and where applicable, policy responses to) environmental security between 2007 and 2012.

As a literature and documentary case study on South Africa, the research utilises a conceptual framework that broadens and deepens the concept of security to include the environment as a non-traditional (non-military) aspect. In this context, environmental risks are discussed as a challenge to security, considering their contemporary relevance. Environmental security is discussed as an emerging security issue in the context of its global and regional scope; its linkage to and impact on food, water and energy security; and its influence on the political, economic, and social sectors of security. Further, the study indicates that Southern Africa in general, and South Africa in particular, are highly vulnerable to the impact of environmental risks such as climate change; and that such risks indeed exacerbate existing security risks and threats.

Against this backdrop, the South African government's securitisation (or lack of securitisation) of the environment is described and explored with reference to official views on environmental security. The analysis indicates that the Government securitises environmental risks such as climate change to a limited degree only (in terms of securitising speech and act); and the issue thus does not fall within the ambit of security, but rather that of sustainable development. The Government base their unsecuritised stance on the impact of environmental risks, on the country's basic natural resources (such as food, water and energy) being overwhelmed by existing growth pressures; and that the Administration's current priority is *inter alia* social development issues, such as employment and poverty eradication.

The study concludes with a summary of key findings in response to the stated research problem, and with recommendations concerning the South African government's response to environmental security.

3. KEYWORDS

securitisation theory
national security
political security
economic security
social security
environmental security
human security
food security
water security
health security
environmental risks
environmental degradation
climate refugees

APPENDIX 1: SELECTED INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE MILESTONES

YEAR	MILESTONE
1990	Assessment Report 1 (AR1) notes that the greatest single impact of climate change might be on human migration
1992	The UN Framework Convention on Climate Change (UNFCCC) is agreed to at the Earth Summit in Rio, and enters into force in 1994
1995	The IPCC Second Assessment Report concludes that evidence suggests a distinct human influence on the global climate
1997	The Kyoto Protocol to the UN Climate Convention is adopted
2001	The IPCC Third Assessment Report finds stronger linkage of human activities and the global climate system. The United States of America (USA) announces that it will not ratify the Kyoto Protocol
2004	The Russian Federation ratifies the Kyoto Protocol, triggering its entry into force in February 2005
2005	The first meeting is held of the Parties of the Kyoto Protocol – an international and legally binding agreement to reduce GHG emissions worldwide, which entered into force on 16 February 2005 (UNFCCC, 2005)
2007	The IPCC's AR4 is published (this report is discussed in Section 3.1.1)
2007	The Nobel Peace Prize is awarded jointly to the IPCC and Al Gore "for their efforts to build up and disseminate greater knowledge about man-made climate change ..." (Nobelprize, 2007)

(World Resources Institute, n.d.), unless indicated otherwise

APPENDIX 2: OTHER SELECTED UNITED NATIONS RESPONSES RELATING TO ENVIRONMENTAL SECURITY AND CLIMATE DIPLOMACY

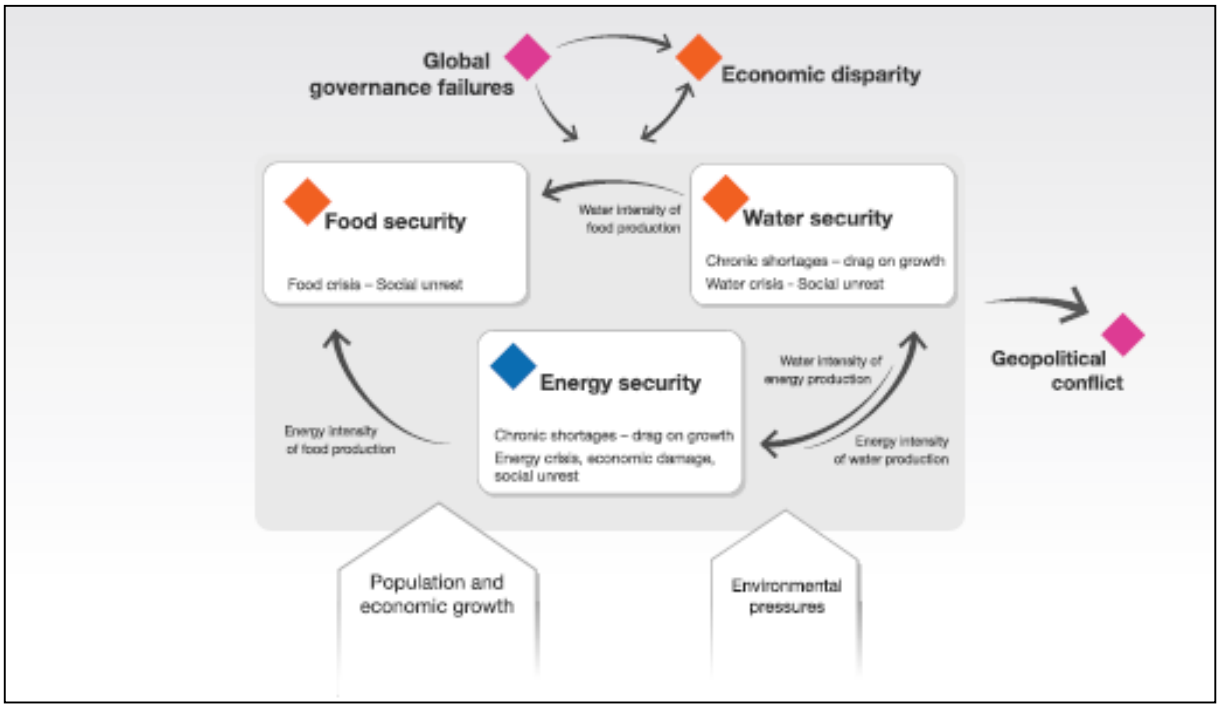
YEAR	REPORT / RESOLUTION / SPEECH DETAIL
2003	UNEP, UNDP and the Organization for Security and Cooperation in Europe (OSCE) launch Environment and Security in Europe, aimed at enhancing cooperation and reducing insecurity (UNEP, 2003a)
2007	UNFCCC COP13, Bali. Negotiations focus on a successor to the Kyoto Protocol. The summit culminates in the Bali Road Map (UNFCCC, 2007)
2008	UNHRC/RES/7/23 – Human Rights and Climate Change warns that climate change poses an immediate threat to people (UN, 2008). Climate change-related effects threaten human rights such as the right to water, food, health and housing (OHCHR, 2008)
2008	UNFCCC COP 14, Posnań, launches the Adaptation Fund under the Kyoto Protocol
2009	UNFCCC COP15, Copenhagen, concludes without the adoption of the Copenhagen Accord compiled by Brazil, South Africa, India and China (the BASIC group) and the US (UNEP, 2009)
2010	UNFCCC COP16, Cancun, results in the Copenhagen Report (UNFCC, 2010)
2010	UNEP/GCSS.XI/INF/3 – Resolutions relevant to the UNEP are adopted by the UNGA (UNEP, 2010c)
2011	UNFCCC COP17, Durban, primarily focuses on securing a global climate agreement for a second commitment period beyond Kyoto (UNFCCC, 2011)
2012	UNFCCC COP18, Doha, succeeds in countries setting a timetable to adopt a universal climate agreement by 2015 (effective from 2020), and the Doha Climate Gateway, increasing ambitions before 2020
2013	UNFCCC CO19, Warsaw, underscores the Durban Platform, the Green Climate Fund and Long-Term Finance, the Warsaw Framework for Reducing Emissions from Deforestation and Forest Degradation (REDD), and the Warsaw International Mechanism for Loss and Damage

APPENDIX 3: SELECTED AFRICAN UNION INITIATIVES REGARDING ENVIRONMENTAL RISKS

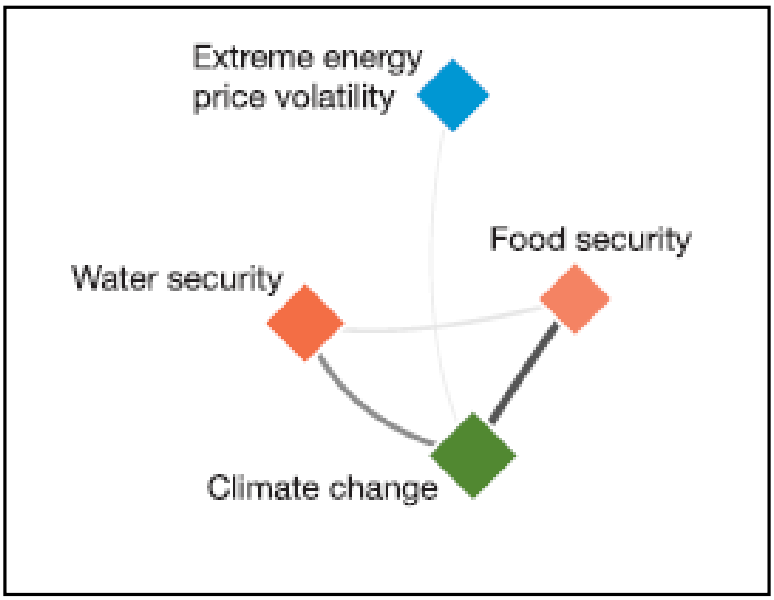
YEAR	INITIATIVE / REPORT / RESOLUTION DETAIL
1968	The Organisation of African Unity (OAU) adopts the African Convention on the Conservation of Nature and Natural Resources
1985	The AMCEN is established, to attend to the implementation of environmental conventions such as the UNCCD and the UNFCCC and its Kyoto Protocol
2000	Africa Water Vision 2025: Equitable and Sustainable Use of Water for Socioeconomic Development (Economic Commission for Africa, 2000)
2002	Formation of the African Ministers' Council on Water (AMCOW) to promote cooperation, security, social and economic development, and poverty eradication through the effective management of Africa's water resources
2007	First commitment by the AU to address environmental risks such as climate change: Decision on climate change and development in Africa – AU Assembly/AU/Dec.134 (VIII) (AU, 2007:5)
2007	AU Assembly Declaration on Climate Change and Development in Africa – Assembly/AU/Decl.4 (VIII) (AU, 2007:49)
2007	AU Assembly Decision on the Implementation of the Green Wall for the Sahara Initiative – Assembly/AU/Dec.137 (VIII), addressing land degradation and desertification in the arid and semi-arid zones of Africa (AU, 2007:9)
2007	Commencement of the development of the African Common Position on Climate Change
2007	Establishment of the African Monitoring of the Environment for Sustainable Development (AMESD) Programme
2008	Adoption of AMCEN Resolution L.2 on climate change and development in Africa, by the First Joint AU-ECA Conference of Ministers of Finance, Planning and Economic Development (UNEP, 2008)
2008	Algiers Declaration on Climate Change, in the form of a common African position (AU, 2008b)
2008	Sharm el-Sheikh declaration on water and sanitation
2008	Agreement by Heads of States and Governments on commitments to accelerate the achievement of water and sanitation goals in Africa and the mandated of AMCOW to develop an implementation strategy for these commitments
2009	AU Assembly emphasis of the "need for international climate change negotiations to give Africa the opportunity to demand compensation for damages caused by global warming" (AU, 2009b)
2009	AU agreement to accede to the UNFCCC and the Kyoto Protocol – AUAssembly/AU/Dec.248(XIII) (AU, 2009j)
2009	Decision on the African Common Position on Climate Change – Assembly/AU/Dec. Dec.236(XII) (AU, 2009d)
2009	Nairobi Declaration on the African Process for Combating Climate Change, Nairobi, 25-29 May, at the AMCEN special session on climate change (AU, 2009e)
2009	Nairobi Statement on Land and Water Management for Adaptation to Climate Change
2009	Raila Odinga in Copenhagen: "We are not begging, we should restore justice" – Press Release No. 2/2009 (AU, 2009g)

2009	Establishment of the Conference of African Heads of State and Government on Climate Change (CAHOSCC)
2010	Establishment of the African Climate Policy Centre (ACPC) by the United Nations Economic Commission for Africa (UNECA)
2010	Formulation of the Water, Climate and Development Programme (WACDEP) by AMCOW and GWP
2011	Agreement on the African Common Position on Climate Change during September 2011 in Mali, in preparation for COP 17
2012	AU commemorates the African Environmental Day and Wangari Maathi Day, by member states re-dedicating themselves to environmental conservation and sustainable development.
2013	AUC and International Federation of Red Cross Red Crescent Societies (IFRC) launch world disaster report 2012, Focus on Forced Migration and Displacement, underscoring the complex causes of forced migration, comprising *inter alia* climate change.

APPENDIX 4: SYSTEM DIAGRAM FOR RISKS ASSOCIATED WITH THE WATER-FOOD-ENERGY NEXUS



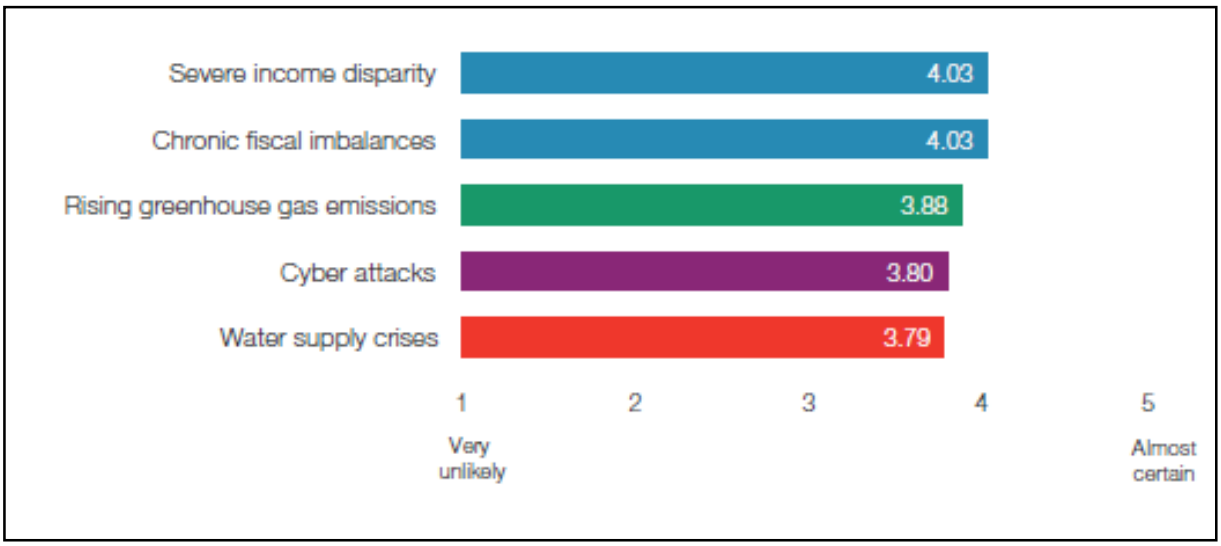
(World Economic Forum, 2011:29)



(World Economic Forum, 2011:2)

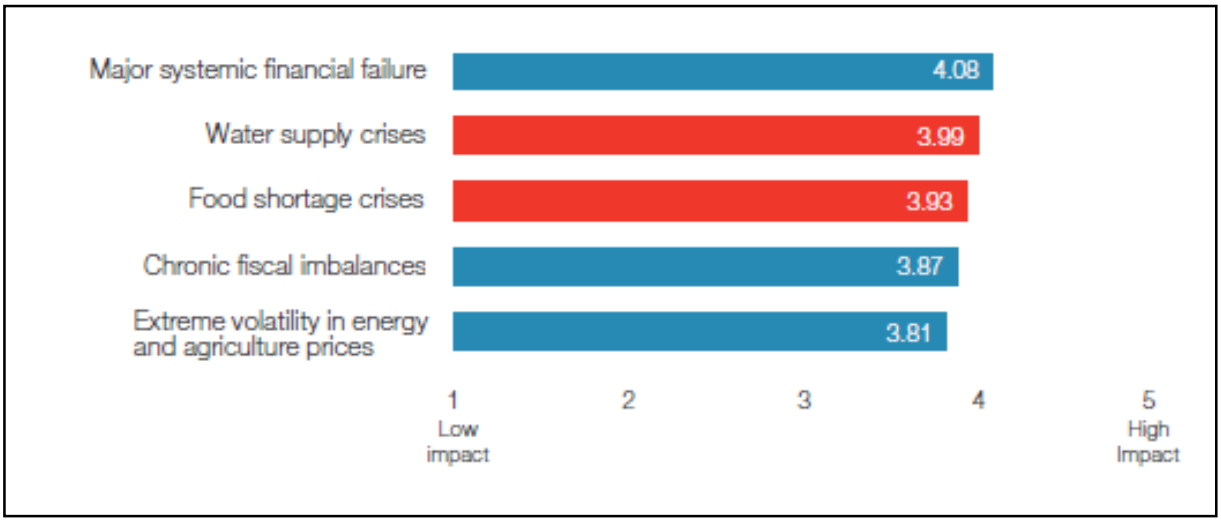
APPENDIX 5: TOP FIVE RISKS IN TERMS OF LIKELIHOOD AND IMPACT, 2012

LIKELIHOOD



(World Economic Forum, 2012:11)

IMPACT

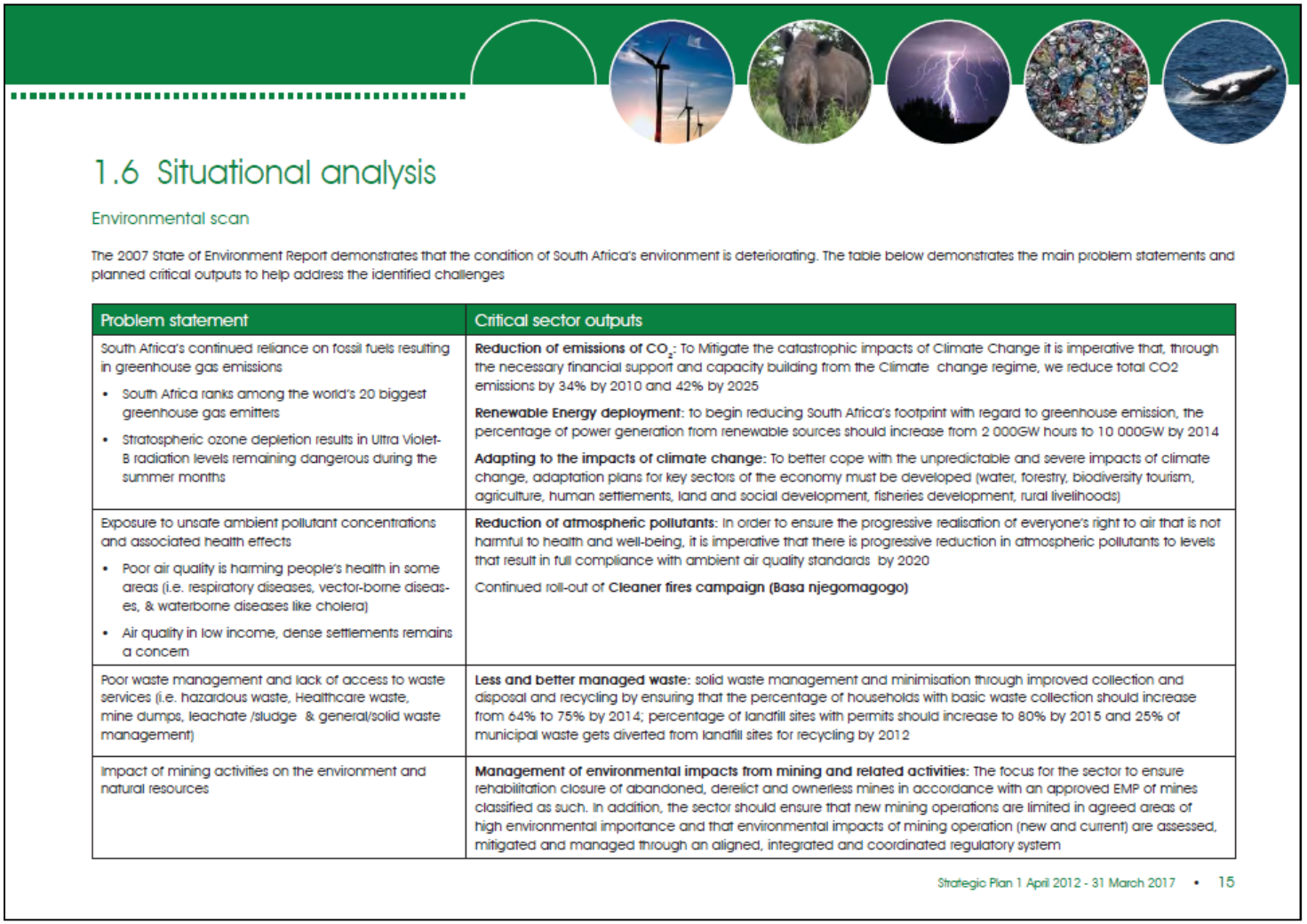


(World Economic Forum, 2012:11)

APPENDIX 6: CLIMATE CHANGE VULNERABILITY IN AFRICA

(Ballance, in UNEP/GRID-Arendal, 2005)

APPENDIX 7: REPUBLIC OF SOUTH AFRICA: STATE OF THE ENVIRONMENT REPORT



1.6 Situational analysis

Environmental scan

The 2007 State of Environment Report demonstrates that the condition of South Africa's environment is deteriorating. The table below demonstrates the main problem statements and planned critical outputs to help address the identified challenges

Problem statement	Critical sector outputs
South Africa's continued reliance on fossil fuels resulting in greenhouse gas emissions • South Africa ranks among the world's 20 biggest greenhouse gas emitters • Stratospheric ozone depletion results in Ultra Violet-B radiation levels remaining dangerous during the summer months	**Reduction of emissions of CO_2:** To Mitigate the catastrophic impacts of Climate Change it is imperative that, through the necessary financial support and capacity building from the Climate change regime, we reduce total CO2 emissions by 34% by 2010 and 42% by 2025 **Renewable Energy deployment:** to begin reducing South Africa's footprint with regard to greenhouse emission, the percentage of power generation from renewable sources should increase from 2 000GW hours to 10 000GW by 2014 **Adapting to the impacts of climate change:** To better cope with the unpredictable and severe impacts of climate change, adaptation plans for key sectors of the economy must be developed (water, forestry, biodiversity tourism, agriculture, human settlements, land and social development, fisheries development, rural livelihoods)
Exposure to unsafe ambient pollutant concentrations and associated health effects • Poor air quality is harming people's health in some areas (i.e. respiratory diseases, vector-borne diseases, & waterborne diseases like cholera) • Air quality in low income, dense settlements remains a concern	**Reduction of atmospheric pollutants:** In order to ensure the progressive realisation of everyone's right to air that is not harmful to health and well-being, it is imperative that there is progressive reduction in atmospheric pollutants to levels that result in full compliance with ambient air quality standards by 2020 Continued roll-out of **Cleaner fires campaign (Basa njegomagogo)**
Poor waste management and lack of access to waste services (i.e. hazardous waste, Healthcare waste, mine dumps, leachate /sludge & general/solid waste management)	**Less and better managed waste:** solid waste management and minimisation through improved collection and disposal and recycling by ensuring that the percentage of households with basic waste collection should increase from 64% to 75% by 2014; percentage of landfill sites with permits should increase to 80% by 2015 and 25% of municipal waste gets diverted from landfill sites for recycling by 2012
Impact of mining activities on the environment and natural resources	**Management of environmental impacts from mining and related activities:** The focus for the sector to ensure rehabilitation closure of abandoned, derelict and ownerless mines in accordance with an approved EMP of mines classified as such. In addition, the sector should ensure that new mining operations are limited in agreed areas of high environmental importance and that environmental impacts of mining operation (new and current) are assessed, mitigated and managed through an aligned, integrated and coordinated regulatory system

(RSA-DEA, 2012b:15)

APPENDIX 8: SOUTH AFRICAN DEPARTMENTS AND CLIMATE CHANGE

Key departments	Agriculture, Forestry and Fisheries	Negative impacts of climate change on agriculture and food production (temperature, rain patterns, droughts, floods) require adaptation measures; agriculture also emits GHG emissions and mitigation measures need to be implemented.
	Cooperative Governance and Traditional Affairs	Oversight of implementation of climate related measures by local governments and legislative power on climate related issues. Responsible for disaster management. Can make regulations setting specific key performance indicators related to climate policy objectives for inclusion in IDPs and the performance management system (PMS) (Du Plessis, 2011: 14).
	Economic Development	Climate change as part of the green economy and of broader development strategy.
	Energy	Energy sources and uses are responsible for current GHG emissions.
	National Treasury	Market based instruments (carbon tax, cap and trade) are key tools for mitigation. Sets the budget which shapes the ability of the country to develop and implement mitigation and adaptation measures.
	Mineral Resources	Emitting sector, energy efficiency implementer, energy producer (co-generation).
	Public Enterprises	Emitting sectors (Eskom, Transnet etc.)
	Rural Development and Land Reform	Related to agriculture and industry and services development.
	Science and Technology	Responsible for innovation for climate resilience and emission reduction (adaptation and mitigation), technology transfer, adaptation and adoption.
	Trade and Industry	Responsible for developing industrial policy as a tool for restructuring the carbon profile of the economy and the development of new technologies.
	Transport	Emitting sector with high potential for CO_2 reduction.
	The Presidency: National Planning	Includes climate change as part of the long-term development planning process.
	The Presidency: Performance Monitoring and Evaluation	The outcomes based approach could be a powerful tool for mitigation and adaptation processes.
Supporting departments	Basic Education	Awareness building on climate change is crucial to help people mitigate and adapt.
	Health	Responsible for modification in the geographical presence of diseases (human, plants).
	Higher Education and Training	Responsible for raising awareness, educating students (engineers, town planners etc.) for mitigation and adaptation.
	Human Settlements	Ensure that housing and the built environment are resource efficient and climate resilient.
	International Relations and Cooperation	President of COP 17.
	Public Works	Many public works programmes are related to environmental issues on which climate change has an impact (biodiversity, land, water etc.) and some direct mitigation actions (eg. Working for Fire and Working for Water programmes).
	Tourism	The tourism value of many natural sites is related to climate patterns.

(Giordano *et al.*, 2011:13)