Chapter 1

Introduction

A State of the Environment (SoE) report is designed to communicate credible, timely and accessible information about the condition of the environment to decision-makers and society.

Chapter 1

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1.1 ABOUT THE 2ND SOUTH AFRICA ENVIRONMENT OUTLOOK REPORT

1.1.1 State of Environment reporting

1.1.1.1 Purpose

A State of the Environment (SoE) report is designed to communicate credible, timely and accessible information about the condition of the environment to decision-makers and society. The 2nd South Africa Environment Outlook (SAEO) (this report) does not consider all of the environmental issues South Africa faces. Rather, it focuses on the major environmental issues, so as to draw attention to them, and informs the setting of a national environmental policy agenda for the next five to fifteen years (Box 1.1).

State of environment reporting is an important step in the process of refining the information and knowledge base on which decisions about development are made. It aims to stimulate debate and to raise awareness on key environmental issues and challenges.

This SAEO focuses on the key environmental issues at a national scale, and provincial and local State of Environment reports have a role to play in highlighting and communicating regional or local issues. Plans and strategies developed by particular sectors in order to achieve their particular objectives will focus on specific issues.

1.1.1.2 Value of a State of the Environment report

South Africans depend not only on the rich natural resources that the country has been blessed with, but importantly also on how they are managed. Poor or inappropriate environmental management tends to result in a steady deterioration in the

Box 1. 1: The 2nd SAEO

The main purpose of this report is to provide relevant and useful information on environmental issues to the public and decision-makers, in order to raise awareness and support more informed environmental management decisions that lead to improved sustainable use and conservation of environmental assets.

This 2nd SAEO goes beyond a descriptive summary of conditions and includes indicators that report on environmental conditions and trends, pressures and management effectiveness. The report also includes an overview of the drivers of environmental change, risks, and future possible outcomes and 'outlooks' on tipping points.

availability and quality of the natural environment, often exceeding the natural resilience of the underlying ecosystems, which in turn affects the socio-economic activities of individuals and communities.

However, the environment is a complex inter-related system that does not conform to human-made boundaries and that is not always easy to measure or model. Yet, adequate management of the environment requires a good understanding of how it functions. "*You can't manage what you can't measure*" is an old adage, but it remains true, not knowing whether the object of management is definitively changing for the better or for the worse means that there can be no understanding of whether the management actions are appropriate, correct, effective or optimal.

Monitoring of the environment should ideally take place on an ongoing basis in order to inform both short- and long-term responses to changing conditions, or to prevent significant deviations from a desired path. There is also, however, place for periodic 'big picture' reflections on overall progress that can inform strategic decision making and overall monitoring system design to in turn help improve forecasting. Such reporting at defined time horizons can offer a comparison between discrete states of the environment, and a more accessible narrative of the changes that take place over time.

In the context of reporting on the management of the environment, the periodic reporting function is carried out in the form of SoE reports. SoE reports provide snapshot pictures of environmental conditions as found at specific times, thereby informing decision-makers and civil society alike on the state of health of the environment, and on how well environmental management has performed between sequential reports.

The reports therefore provide a broad-based insight into the condition of the living environment at a national scale, and with a view towards guiding strategic interventions. This insight is based on a synthesis of environmental monitoring results which in turn provides for an opportunity to identify trends, causal relationships, danger signs, success stories and the like.

The value of SoE reports resides most clearly in their ability to guide decisions for future policy based on a report on what has been happening in the past. This also creates awareness of environmental issues on a wider and more general level and informs broader planning and strategic decision-making.

1.1.1.3 History

The SAEO is the country's highest level report on environmental conditions and environmental management. It represents a compendium of the results of environmental monitoring and reporting at a country level, and is now in a 2nd SAEO edition. Previous instalments were published in 1999 (DEAT 1999) and 2006 (DEAT 2006).

The national report is supported on various levels by provincial and municipal reports, as well as by sector-specific environmental reporting. For example, recent municipal SoE reports include annual reporting by the City Cape Town (2006, 2008 and 2009), and a 2008 City of Johannesburg State of Environment Report. Gauteng launched a State of Environment Report in 2012, and sectoral reports include a State of the Coast Report (2006), State of the Forests Report (2007-2009) and National Biodiversity Assessment (2011) among others. A list of SoE reports available in South Africa is given in Annexure 1.A of this chapter.

1.1.1.4 Method

As with the previous SAEO, this report is based on an integration of sector (theme) chapters compiled by sector specialists in fields such as air quality and water resources. The process was coordinated by the Department of Environmental Affairs (DEA).

The specialist research and reporting for this edition of the SAEO took place during 2011 and 2012, and focussed on collecting and interpreting information on the current state of the environment in South Africa, as well as obtaining general consensus on changes in the state of representative indicators. Nine specialist chapters were produced:

- Land;
- Biodiversity and ecosystem health;
- Inland water;
- Oceans and coasts;
- Air quality;
- Climate change;
- Human settlements;
- Energy; and,
- Waste management.

Stakeholders were invited to participate in the compilation process either through contributions in the form of environmental information and data, or specifically as reviewers of the different specialist chapters. Engagement focussed on governmental entities or forums with mandates that include data custodianship, but also included certain private or semi-governmental bodies that play important roles in their particular economic, social or environmental sectors. The assembly of stakeholders and reviewers from wide-ranging fields and organisations ensured that the SAEO maintains a high level of robust objectivity without bias towards particular viewpoints.

The reviewed theme chapters then underwent a process of integration that extracted common themes, improved coherence, and cross referenced each other. The integration process further provided the necessary background and context as an introduction to the theme chapters. Wider stakeholder engagement followed, including review by the Ministers and Executive Committee (MINMEC) and Ministerial Technical Committee (MINTECH) forums, circulation to sector departments, provinces and public entities, and the third in a series of national invited stakeholder workshops.

1.1.1.5 Report structure

The 2nd SAEO consists of four parts and a separate Executive Summary report.

The sections are structured as follows: Part I, the 'Introduction', provides a background to the report and provides details on the report context. It also includes discussions on 'Sustainability', 'What is affecting our environment', 'Human settlements', 'Environmental governance' and key drivers of environmental

change in the South African context as issues common to all environmental sub-themes. Part II, the eight specialist chapters, discusses the current environmental state in terms of specific themes, and identifies theme-specific trends in environmental change. The 'Scenarios for environmental Change' (or the 'Outlook'), found in Part III, couches the information on environmental trends from the specialist chapters within possible future outcomes for the country in order to anticipate the strategic decisions and actions that need to be taken in order to avoid environmental degradation or radical negative change. Finally, Part IV explores different 'Options for action' in order to guide policy formulation and decision making.

1.1.2 DPSIR framework

As with its predecessors, the 2nd SAEO reports on the state of the environment based on the commonly accepted Drivers-Pressures-State-Impact-Response (DPSIR) framework. This framework is adopted by organisations such as the United Nations Environment Programme (UNEP) and the European Environment Agency (EEA) as a further development of the Pressure-State-Response framework originated by the Organisation for Economic Coordination and Development (OECD).

The framework is illustrated in Figure 1.1. As shown, the DPSIR components represent a cyclical process of causal links. Each component can be traced back to its precursor, and also to its effect in the overall scheme. Importantly though, societal responses have the potential to affect all other components of the framework, and not just its neighbours in the cycle.

The DPSIR framework uses the causal network very effectively to not only describe the state of a particular environmental feature, but also the causes of environmental change, as well as the impacts of change and the societal responses to the changes. Definitions and examples of the different components are provided in Table 1.1.

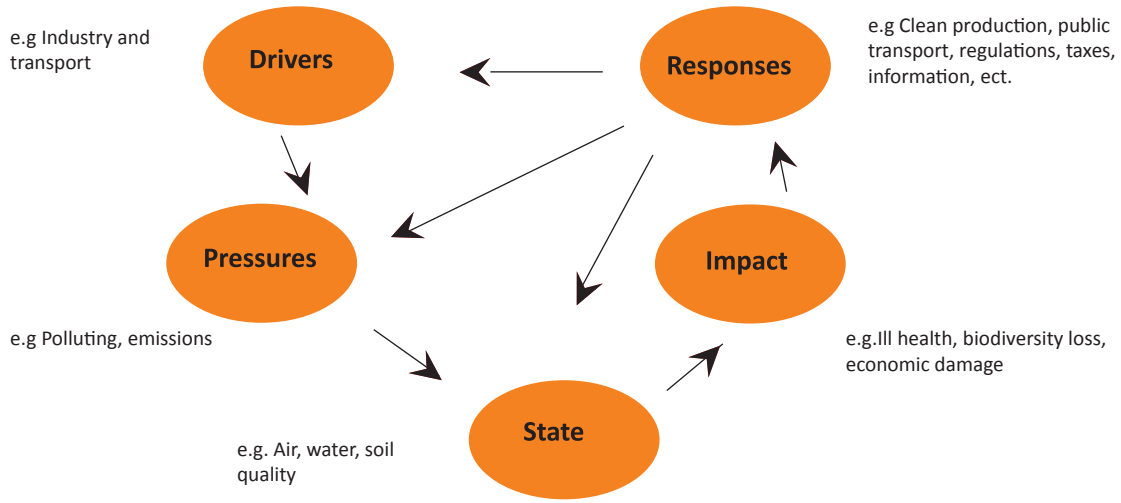

Figure 1. 1: The DPSIR framework
Source: EEA (1997)

Table 1. 1: Definitions of Drivers, Pressures, State, Impacts and Responses

Element	Definition
Drivers	'Drivers' (human induced or natural) are defined as the primary agents driving change in the environment. These underlying socio-economic and political agents of change, such as patterns of production and consumption and population dynamics, determine where and how people use and consume natural resources. Driving forces emanating from natural processes (e.g. solar cycles) are possible, but are typically too infrequent, not well understood or operate over timescales that do not relate easily to the 4-yearly reporting framework of the SAEO process.
Pressures	'Pressures', in terms of the DPSIR framework, are the human activities and processes that act on the environment and directly cause environmental change (for example pollution). They are distinct from the driving forces since they relate directly to the use and exploitation of natural resources, as opposed to the driving forces that determine the scope or extent of the pressures. This subtle distinction is important to understand, and is easily confused, even by environmental specialists. Pressures can be categorized into three main types: (i) use of environmental resources; (ii) changes in land use; and, (iii) emissions (of chemicals, waste, radiation, noise) to air, water and soil.
State	The 'State' describes the actual condition of the environment resulting from the pressures outlined above. For example, air quality in terms of the level of air pollution, and proportion of degraded area of land. The 'State' is described both in terms of current state and trends over time. A study of environmental trends will reveal whether the state of the environment is getting better or worse. It also gives an indication of how quickly changes are happening (the rate of change) and whether rates of change are increasing or decreasing.
Impacts	'Impacts' describe the consequences of the good or bad state of elements of the environment for sustainability, specifically on humans, the economy, ecosystems and other environmental systems, and could include regional or global effects. For example: high levels of indoor air pollution may result in respiratory tract infections; and, land degradation may lead to decreased food production, increased food imports, increased fertilizer use, malnutrition and siltation of aquatic systems. The impacts should be seen as changes that are occurring to environmental, economic and/or social systems and their ability to perform functions or services for society.
Responses	The societal actions taken collectively or individually to ease or prevent negative environmental impacts, correct damage or conserve natural resources can be seen as 'Responses'. Responses may include policy and regulatory action, environmental or research expenditures, public opinion and consumer preferences, changes in management strategies and the provision of environmental information.

1.1.3 Indicators

Since no report can ever hope to precisely and comprehensively describe the whole of the natural environment and all its constituent systems, especially at a national level, representative indicators are used as proxies for the state of the environment. Indicators for the SAEO are carefully selected to provide a representative picture of the state of various environmental themes, as well as the changes over time to the drivers, pressures, impacts and responses related to those themes. By tracking the indicators over time, the SAEO can assess the effectiveness of responses to environmental challenges.

Each iteration of the SAEO attempts to keep the reporting on indicators consistent in order to maintain consistency, but contextual changes often necessitate ongoing adjustment to the set of indicators being reported against. For example, as knowledge of the need for integrated management of coastal features improves, a need arises to track indicators that show trends in the state of the interface between terrestrial and marine systems rather than, or in addition to, such systems individually.

1.1.4 Aims/limitations/audience

As with the 2006 SAEO report, it needs to be reiterated that this report is aimed at providing a non-specialist and user-friendly overview of the state of environmental features and trends over time. This broad objective implies that the information and guidance that is provided needs to be reproduced in a simple manner that appeals to and is considered useful and accessible to a wide range of audiences. As a consequence, the report should be seen as a summary of environmental information and expert knowledge of the relationships between components of the environmental system rather than an original detailed scientific research project.

Every effort has been made to present a report that is free from undue bias, technical jargon and information with limited relevance. The intention is for the report to not only capacitate non-specialists, but also key decision-makers so that they can participate as well-informed contributors to environmental debates and decision-making processes that affect the living environment. It might, therefore, not answer all questions from all audiences and in sufficient enough depth for some, but will at least go a long way towards fostering more inclusivity in the environmental management field.

1.2 SETTING THE SCENE

1.2.1 Natural capital and economic development

1.2.1.1 Natural resources

South Africa, as with many other African countries, is blessed with an abundance of, and in certain cases relatively unexploited, natural resources. Of particular value are rich mineral deposits, South Africa's exceptional biodiversity and one of the most productive coastal upwelling systems (on the Cape west coast) in the world. Some ten per cent of the world's total known bird, fish and plant species occur in the country (Mittermeier *et al*. 2000). The diversity, rarity, endemism and other unique aspects, is what sets South Africa's biodiversity apart, and for this, the country is recognized by the UNEP World Conservation Monitoring Centre (WCMC) as amongst 18 other mega-diverse countries. On the materials extraction side, the country's mineral wealth is amongst the world's top five in terms of coal production, consumption and exports. South Africa's mineral reserves represent 88 per cent of the world's known reserve of platinum metals, 80 per cent of its manganese, 73 per cent of its chromium, 45 per cent of its vanadium and 41 per cent of its gold. The Chamber of Mines of South Africa also reports that during 2009, the mining industry contributed 8.8 per cent to the country's Gross Domestic Product (GDP) and created direct employment for 491,922 people (Chamber of Mines of South Africa 2011).

Exploitation of the resources benefits the population of the country (and in some cases outside investors) in terms of monetary gains for consumable articles and the creation of wealth. However, at the same time, extracting value from natural systems for lifestyle gains (through choice or purely for survival) without paying attention to sustainability can do irreparable harm to the very systems that are required for human well-being.

A general obligation is therefore placed on the country to look after its natural systems and resources to ensure their persistence in the face of pressures from increased production and consumption and human-induced changes to the global climate system. Protection of the natural environment and in turn protection of people and assets will ensure that economic development and the satisfying of human needs and desires can continue into the future. It will also improve social resilience during instances of natural variability. Part of the solution may be found in the rise of the green economy – a system of economic activities that is currently largely focused on cleaner energy and that improves human well-being without compromising the natural system. Green economy initiatives also have an expanded focus on for example, growing the wildlife economy and creating jobs through restoring ecological infrastructure.

Effective and successful protection and management actions must, however, understand the links between the components of the natural system and human activities, as well as where finite limits to exploitation may lie. Such an understanding is crucial to ensure that utilisation of resources does not exceed their natural rate of regeneration or the minimum level required for ecological functioning, or that more acceptable alternatives are found.

The SAEO thus forms part of a larger systematic process of monitoring environmental change and environmental management actions, in order to better understand the patterns of variability and drivers of change at a local, regional, continental and global level.

1.2.1.2 National concerns

Priority concerns with regards to environmental management at a national level are generally well publicized in the media, but a good understanding of the underlying issues is not necessarily guaranteed. It is therefore one of the main

objectives of the SAEO to educate South African and other readers alike, and thereby improve their understanding of the critical environmental challenges and issues of the day.

Environmental concerns that have recently captured the public interest include current and proposed mining (especially the proposed hydraulic fracturing exploration in the Karoo, as well as coal mining in the Chrissiesmeer and Mapungubwe areas), acid mine drainage on the East and West Rand goldfields and abandoned coal mines in KwaZulu-Natal and Mpumulanga, water stress, energy generation and use, inefficient land use and the reliability of basic services provision.

The past few years have witnessed a rise in prospecting and mining permit applications in South Africa. In some cases, particularly at ecologically and socially important sites, these have been met with significant opposition, such as at the Mapungubwe World Heritage Site. The effects of past mining activities on the natural environment have worsened significantly over the past few years, partially due to mine abandonment and closures amidst the current global economic crisis, socially and environmentally irresponsible business practices and the use of legal loopholes in the penalty regulations.

The energy and consequent emissions intensive nature of the South African economy plays an important role in reducing the sustainability of development. Specifically, the National Strategy for Sustainable Development (NSSD) notes that South Africa has one of the highest per capita carbon emissions rates in the world (DEA 2011). It also notes that the typical form of spatial development (spatially extensive) makes urban areas and extensive rural settlements particularly inefficient from an infrastructure and energy usage perspective.

National concerns also relate to social indicators, and specifically the high unemployment rate. StatsSA (2012) reports that, in the latter part of 2012, 25.5 per cent of the population was unemployed and actively seeking employment, severe socio-economic inequalities and lack of access to basic services, especially with regards to sanitation and electricity (DEA 2011). Historical spatial development patterns also still serve to obstruct social integration and maintain spatial segregation between socially disadvantaged people and employment opportunities.

These environmental concerns relate to both the drivers and impacts of environmental change, and tend to make headlines due to the difficulty of balancing the ever-growing needs of people with the essentially finite ability of natural systems to supply those needs. Such is the importance of finding resolutions for these environmental complexities that the National Development Plan (NDP) (NPC 2012) takes them up in its listing of primary challenges – unemployment, the insufficiency of basic infrastructure, poor spatial planning unsustainable resource-intensive economic activity, poor public health and an unequal society.

"*South Africa is not only a contributor to greenhouse gas emissions – it is also particularly vulnerable to the effects of climate change on health, livelihoods, water and food, with a disproportionate impact on the poor, especially women and children. While adapting to these changes, industries and households have to reduce their negative impact on the environment. This will require far-reaching changes to the way people live and work*." (NPC 2012).

The NDP identifies climate change as a primary determinant of the global future, and by implication also the future of

South Africa. The country's reliance on fossil fuel derived energy (especially coal), as well as a low level of energy efficiency, results in the contribution to anthropogenic climate change being significant. Global demands, as well as national commitments to change, will require significant changes to economic activities and approaches to wealth creation. On the other hand, South African's need to recognise that their capacity for adapting to accelerating climate change related environmental stresses is low, particularly within poor communities, but also in terms of food security, water supply and ecological stability. For these reasons, the NDP identifies "*interventions to ensure environmental sustainability and resilience to future shocks*" as critical actions.

Fortunately, the government of South Africa recognizes and actively promotes a sustainable development path that can balance the needs of the population with the carrying capacity of the country's natural resources. The NSSD (DEA 2011) provides a roadmap for the proactive implementation of an environmentally, socially and economically sustainable development plan. Five strategic objectives have been identified, and these need to guide development in the current implementation phase (until 2014):

1. Enhancing systems for integrated planning and implementation;
2. Sustaining ecosystems and using natural resources efficiently;
3. Working towards a green economy;
4. Building sustainable communities; and,
5. Responding effectively to climate change.

Tracking performance against these objectives will largely be the responsibility of StatsSA (StatsSA is in the process of developing environmental accounting indicators that will cover the different sectors, such as water and energy), but the SAEO is identified as one of the key informants (DEA 2011). It is therefore critical to ensure that the 2nd SAEO continues to fill information gaps in the baseline reference started in 1999 and report on progress for the different sustainability indicators.

Performance against environmental targets is also captured in the Government Outcomes Programme of the Office of the Presidency which tasks relevant government departments with specific actions related to environmental quality. According to the latest progress report (South Africa 2012), significant progress has been made in terms of the establishment of environmental compliance and enforcement, but further action needs to be taken if the targets set for 2014 are to be reached in areas such as the monitoring of water use licenses on mines, the rehabilitation of environmental degradation and the creation of long-term jobs through the Extended Public Works Programme.

1.2.1.3 International concerns

International concerns that have grown in significance since 2006 and that relate to the state of the environment include the economic recession that started in 2008, and the growing spectre of human-induced climate change. The recession exacerbated price increases in basic commodities such as staple foods and oil, which places people at all levels of society, but specifically the poor, at greater risk in terms of meeting basic needs.

The NDP stresses that the country should not lose sight of the fact that the world economy remains in crisis. Both the United States and European Union struggle to find lasting solutions to their respective macroeconomic troubles, which in turn impacts negatively on South Africa as a trading partner. The South African economic situation is similarly under pressure from a growing level of socio-economic inequality, characterized by high absolute unemployment and examples of poor governance. The Gini Coefficient, which is a number between 0 and 1, where 0 indicates total income equality and 1 indicates total inequality, is calculated to be approximately 0,64 per capita (excluding taxes) in South Africa (StatsSA 2012). This indicates that South Africa experiences a high level of income inequality. The Human Settlements chapter in this report provides detailed information on some of these inequalities and the links to the environment.

Significant achievement has been made since 1994 in terms of the provision of a welfare safety net for the poorest members of society, but its expansion and affordability over the long term remains uncertain. Similarly, economic development, and indeed economic survival, will require a determined and carefully executed medium-term strategy aimed at unlocking value chains and co-ordinating responses throughout the economic system.

Our knowledge and understanding of climate change has also improved to the point where there is general global consensus about the nature and scale of human-induced climate change. More focus is now required in terms of applying the knowledge through adaptation and mitigation actions. Unfortunately, a global response to the threat can only be successful if more effort to address climate change is made at a national and regional level.

Reporting against the targets of the Millennium Development Goals (MDG) Project of the United Nations Millennium Summit of 2000 is further representative of some of the current major global environmental and other concerns, and also provides a valuable contribution in terms of the national state of environment reporting process. This reporting is led by StatsSA, which is the designated local MDG Secretariat. The eight MDGs are:

1. To eradicate extreme poverty and hunger;
2. To achieve universal primary education;
3. To promote gender equality and empower women;
4. To reduce child mortality;

5. To improve maternal health;
6. To combat HIV/AIDS, malaria and other diseases;
7. To ensure environmental sustainability; and,
8. To develop a global partnership for development.

Although the goals are focussed primarily on human health and social welfare, the understanding that sustainable utilization and responsible management of the natural environment is critical for human welfare is recognized within Goal 7.

Achieving environmental sustainability necessarily means that global concerns regarding climate change, loss of biodiversity and a shortage of basic environmental resources need to be addressed. It is therefore important to maintain a record of key environmental performance areas in order to direct response actions and measure their effectiveness as a contribution towards global targets and commitments. A good example of such global environmental indicators is the Living Planet Report of the World Wide Fund for Nature (WWF) (WWF 2012). This report is a global-scale State of Environment report, and tracks aspects such as biodiversity, the human ecological footprint, carbon footprint and water scarcity.

1.2.2 State of Environment reporting in South Africa

1.2.2.1 Constitutional/legal obligation for reporting

Although SoE reporting is not currently a legal obligation in South Africa, it is a consequence of a constitutional obligation for government to look after the environmental resources of the country, to provide for a safe and healthy living environment, as well as provide citizens with access to information. Specifically, Section 24 of the South Africa's Constitution (the Constitution), or the 'Bill of Rights', provides citizens with the right to "*an environment that is not harmful to their health or well-being, and to have the environment protected for the benefit of present and future generations*." It also obliges the State to "*secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development*."

By implication, the State must ensure that the necessary systems are put in place to manage the environment, which naturally also needs to include monitoring and reporting in order to track the state of environmental conditions and the effectiveness of the management measures introduced. SoE reporting provides and distributes some of the information needed to meet these requirements.

The National Environmental Management Act (No 107 of 1998) (NEMA), which encourages more proactive, co-operative and conciliatory environmental management, is a little more specific with regards to SoE reporting. Section 26 requires all spheres of government to inform the Minister of Environmental Affairs on their performance, specifically with respect to Agenda 21 (the action plan of the United Nations Conference on Environment and Development (UNCED) held in Rio de Janeiro, Brazil, in 1992, also known as the 'Earth Summit').

Section 31(a) of the National Environmental Management Act (NEMA) (No 107 of 1998) further specifies that that "*…every person is entitled to have access to information held by the State and organs of state which relates to the implementation of this Act and any other law affecting the environment and to the state of the environment and actual and future threats to the environment, including any emissions to water, air or soil and the production, handling, transportation, treatment, storage and disposal of hazardous waste and substances*."

Subsection 4 of 16A of the National Environmental Laws Second Amendment Act (No 30 of 2013) necessitates the Minister to publish a Gazette Notice outlining the procedure for compiling the Environment Outlook reports, the format and the content of such reports. The subsection also compels the Minister to prescribe the process for the submission, evaluation and adoption of the reports.

1.2.2.2 National and international commitments

Reporting to the United Nations (UN) is specifically aimed at providing a South African report card in terms of commitments made towards the Rio Earth Summit Agenda 21 implementation and the World Summit on Sustainable Development (WSSD) Johannesburg Plan of Implementation (2002). According to the Johannesburg Plan of Implementation, signatories of the declaration commit to observations of the earth system over the long-term and at multiple spatial scales, along with the necessary programmes for appraisal and reporting. A specific call is made to: "*Enhance the implementation of national, regional and international strategies to monitor the Earth's atmosphere, land and oceans, including, as appropriate, strategies for integrated global observations*..." (World Summit on Sustainable Development & United Nations Department of Public Information 2003). Reporting is also required in support of the MDGs Project of the United Nations Millennium Summit of 2000.

1.2.2.3 Environmental reporting in South Africa

The department tasked with the obligation to monitor and manage the environment on a national scale is the DEA which reports to the Minister of Environmental Affairs. The DEA produces the SAEO on a regular basis, and also oversees the national co-ordination and collation of sub-national SoE reports. The DEA is also active in producing a range of guideline documents to assist other Government departments and sub-national entities in their efforts to compile reports.

In parallel to the national SoE reporting system, certain sector-specific 'State of…' reports are produced in the various sector departments. Many of the Water Management Areas (WMAs) in South Africa have, for example, been subjected to a State of Rivers evaluation, as have some coastal areas.

The 2006 SAEO reported that at the time, there were 19 sub-national SoE reports produced during the report period 1999 to 2006. Since then, there have been three provincial reports (North West 2008, KwaZulu-Natal Terrestrial State of the Environment Report 2008, Gauteng 2012), five State of Rivers reports (for the Breede, Mthatha, Mokolo, Gouritz, and the Olifants/Doring and Sandveld) a State of the Coast Report (2006), State of the Forests report (2007-2009) and several municipal SoE reports (e.g. City of Cape Town 2006, 2008

& 2009, City of Johannesburg 2008 and Bojanala Platinum District Municipality 2012), as well as a range of local scale sectoral reports (e.g. State of the Bay reports, State of the Cities report and Local Biodiversity Strategies and Action Plans). The publication of these reports is commendable, but as is quite evident, many gaps in reporting exist. Regular updating of reports also comes up short.

1.3 FINDINGS FROM EXISTING REPORTS

1.3.1 Findings from the 2006 SAEO

As might be expected, the 2006 SAEO report contained good as well as bad news, and highlighted both commendable and ineffective responses to environmental issues.

1.3.1.1 The good news

- Large areas of natural habitat remain in many parts of the country, and these areas present opportunities for conservation and land uses compatible with persistence of biodiversity;
- The use of ozone-depleting substances such as chlorofluorocarbons (CFCs) and carbon tetrachloride has almost completely been phased out, with only small amounts of legal CFCs being imported and exported for use in asthma inhalers, air conditioners and fridges manufactured prior to 1996. The CFC methyl bromide (used as a pesticide) is still being used in the absence of a cost effective substitute;
- A comprehensive and generally sound environmental regulatory regime centred on Environmental Impact Assessments (EIAs), environmental management permits, and compliance and enforcement, has been established; and,
- There has been a steady increase in the budget allocation for environmental management at both the national and provincial levels.

1.3.1.2 The bad news

- All major ecosystems are threatened in one way or another, whether through direct threats or because of weaknesses in the overall structure of their environmental management systems;
- The loss and degradation of natural areas and resources continues, as does the fragmentation of protected areas. This results in the loss of biodiversity and concomitant ecosystem services, which is likely South Africa's most serious environmental problem;
- Our system of protected areas is patchy with some ecosystems poorly represented. Less than six per cent of land in South Africa is formally protected and the protected area network does not sufficiently represent all of South Africa's habitat types;
- In cities and other human settlements, poor or problematic service infrastructure and systems create pockets of poor quality living environments that are detrimental to the general environment and to human health. Issue can also be taken with poorly functioning transport systems, air pollution, stormwater management, water supply, sanitation and sewage treatment, as well as waste disposal. Insufficient access to electricity and clean water exacerbate the situation in some areas;
- Indoor air quality within fuel-burning households remains a concern;
- Climate change will have significant environmental and societal impacts and is likely to increase the vulnerability of people, especially the poor;
- Our per capita carbon dioxide emissions are almost twice the global average;
- Ignorance or lack of resources for adequate investigations and management have led to current levels of inland water resources usage that do not sustain minimum flow levels required for ecological functioning. Furthermore, a four per cent GDP growth rate per year will result in a growth in water requirements and consequently a potential water deficit by 2025. This situation is exacerbated by the poor water quality of most surface water resources; and,
- The coastal zone is under severe threat from the over-exploitation of both marine and terrestrial resources, as well as uncontrolled coastal development. The pressures on the coastal zone are unlikely to lessen, given the anticipated impacts of climate change such as sea level rise.

1.3.1.3 The uncertainties

- Availability of information was a limiting factor for reporting on certain issues, including aspects of urban air quality, water systems, land cover change, greenhouse gas emissions, persistent organic pollutants, and human vulnerability to environment change; and,
- Considerable uncertainty remained in 2006 in terms of the direction and scale, as well as resulting impacts, of anthropogenic climate change.

1.3.1.4 Our responses

Mixed results were also reported on in terms of responses to the state of the environment. Commendable actions listed in the 2006 SAEO included:

- The establishment of Transfrontier Conservation Areas, World Heritage Sites, the expansion of Marine Protected Areas (MPAs) and the involvement of communities in the management of protected areas;
- The development of a comprehensive national water resources strategy;
- The establishment of environmental courts and increased capacity to deal with prosecutions;
- Tackling concentrated pollution related issues such as in the Durban South Basin, and launching an initiative to identify the 50 top polluters in South Africa;
- The deployment of new patrol vessels along the coast;
- Our increasing role in international environmental governance;
- Transition to unleaded petrol and banning the use of asbestos; and,
- The establishment of the South African National Biodiversity Institute (SANBI).

Less adequate or effective responses identified included:

- The ability to manage the environment that was constrained by structural and capacity problems especially at the local government level;
- Development planning in general did not adequately incorporate environmental sustainability;
- The lack of a concerted effort to redirect patterns of

production and consumption in a sustainable direction;
- The myriad of environmental responsibilities placed on provinces and local authorities without addressing capacity constraints was leading to confusion and despair; and,
- Corporate environmental responsibility was deemed to be poor.

1.3.2 Findings from regional and global State of Environment reports

The SAEO shares its philosophy and purpose with a range of other SoE reports, all differing in terms of scale and reporting periods.

In particular, the SAEO needs to be differentiated from regional studies such as the Southern Africa Environment Outlook (published in 2006 by the Southern African Development Community - SADC), and the Africa Environment Outlook (published in 2008 by the UNEP). These reports, however, offer the opportunity to benchmark the local situation against the performance of the sub-continent and South Africa's immediate neighbours.

1.3.2.1 Southern Africa Environment Outlook

The second Southern Africa Environment Outlook (SADC 2008) reports to be an "*...integrated assessment of the state and trends of key environmental resources, including land, freshwater, marine and coastal resources, forests and woodlands, and wildlife. The report takes a 10-year retrospective and forward-looking analysis of issues, and also covers cross-sectoral elements relating to human settlements, energy and atmospheric dynamics*." It follows on from the first regional Outlook report which was published in 1994. With the regional Outlook, the SADC community hopes to monitor performance in the targets set for the region under initiatives such as the SADC Regional Indicative Strategic Development Plan (RISDP), MDGs, Johannesburg Plan of Implementation, and the environment programme of the New Partnership for Africa's Development (NEPAD). It also serves to inform the development of the SADC Protocol on Environment.

The main drivers of environmental change in the SADC are reported to relate most significantly to population trends, especially population growth, demographic structure and the growth in urban populations. A particular concern in the area is deterioration in the mortality rate for children as an indicator of public health and environmental conditions. Between 1980 and 2001, the average child mortality rate increased from 83 per 1,000 births to 91.3. A related concern is the poor performance in terms of the AIDS pandemic, with South Africa still ranked as the country with the highest recorded Human Immunodeficiency Virus (HIV) infection rate in the world.

Southern Africa's national economies are recognized as determinants of environmental performance. They are characterized by a high reliance on exports of primary natural resources, limited commercial manufacturing, a growing services sector and a large subsistence component (to a lesser extent in South Africa, Mauritius and Zimbabwe). Extraction of natural resources tends to impact directly and significantly on the health of the natural environment, whilst the dependence on international mineral and commodity markets leads to instability in the local economic base. The high dependence of the SADC economy on international trade also means that the global economic downturn of 2008 has had a material effect on economic development in the region. The poor economic outlook leads to poor socio-economic conditions, which in turn contribute to general neglect and unsustainable reliance on ecosystem services. This is still a concern, with food riots in Mozambique and unrest elsewhere.

Social indicators in the area are improving, with access to clean water being significantly higher than the global average, i.e. 75 per cent as compared to the global 60 per cent. There are, however, growing concerns that pressures emanating from population growth and demographic change are impacting on the provision of water and sanitation services. Poverty indices nevertheless remain unacceptably high, which locks societies into unsustainable patterns of environmental exploitation.

Both urban and rural contexts are of concern from the perspective of environmental health and functioning. Urban areas experience population growth rates that far outstrip the ability of governance systems to keep up with the provision of basic services, whilst rural areas show signs of not being able to adjust agrarian production systems quick enough to keep pace with demands.

The SAEO consequently calls for a committed effort to improve the structure and sustainability of the regional economy, as a prime force in improving environmental and social standards. Democratic governance systems need to provide support for systems of production and basic services that will improve social resilience and lower dependence on non-renewable or unsustainable environmental resource utilization. This includes secure land tenure and improved agricultural production, investment in renewable energy production, water conservation technologies, and protection for productive ecosystems. Population growth and economic development must be tempered through collaborative conservation efforts and the provision of sufficient urban services.

1.3.2.2 Africa Environment Outlook

UNEP, through the Division of Early Warning and Assessment and the Regional Office for Africa, has been providing support to the African Ministerial Conference on Environment (AMCEN) to produce the Africa Environment Outlook report. The Africa Environment Outlook (UNEP 2006) has provided a coherent framework for improving capacities of countries in information management to support decision-making related to natural resources management in Africa. A third edition of the African Environment Outlook is currently in production (the first having been published in 2002), with a main theme focussing on environment and health, and its impacts on human wellbeing in Africa.

The UNEP (2006) reported that a close relationship exists between environmental health, environmental wealth and human welfare. This relationship means that concerted efforts are required to look after the natural resources of Africa in order to avoid a downward spiral and declines in social welfare. Particularly valuable resources to be managed in a sustainable manner include mineral wealth, water and agricultural production systems.

Drivers of environmental change in Africa are listed as demographics, health, economics, social issues, culture, technology, governance, peace and conflict, as well as the two natural drivers of climate change and natural disasters. Importantly, the combination of natural drivers and human activities often leads to compound stresses of the natural system.

Population growth, coupled with demographic characteristics, including migration and urbanization patterns, health and levels of skill place tremendous strain on natural resources and ecosystem services. Overall growth rates remain above two per cent annually, along with a high dependency age cohort ratio. Employment opportunities need to be created, since sub-Saharan Africa is burdened with a youth unemployment ratio of 21 per cent. Without a structural change, this unemployment level will translate into further escalation in poverty rates and social conflict, which automatically reduces the capacity for conservation of natural resources and environmental management. Linked to population growth, and adding to the pressures, is also Africa's status as the most rapidly urbanizing region in the world. Urban population is expected to grow from 38.2 per cent in 2000 to 50.7 per cent in 2025.

Culture is also identified as a significant shaping force in terms of environmental performance – in terms of traditional practices and the influence of western culture. Both cultural groupings present obstacles to responsible environmental management, but at the same time both can offer opportunities for progress. Finally, a serious concern is raised over the issues related to climate change and variability. Africa finds itself in a particularly precarious position with regards to human vulnerability due to a heavy reliance on direct exploitation of natural resources and low levels of individual economic resilience. Extreme environmental events and shifts in natural patterns are therefore bound to bring further hardship to people who are already compromised economically and socially.

1.3.2.3 Global Environment Outlook 5

The more recent Global Environment Outlook (GEO-5) (UNEP 2012), which summarizes and integrates environmental assessments on a global scale, updates the information from the Africa Environment Outlook in its Africa Summary. It notes that Africa lags behind in the achievement of internationally agreed goals (such as the MDGs) and that there are many environmental, social and governance challenges facing the continent. Yet Africa still displays examples of successful policies and projects, including cross-border co-operation and public-private collaboration that hold promise for the future.

In terms of the drivers of environmental change, the GEO-5 report lists population, urbanization, energy use, economic development and patterns of globalization as the key aspects that determine the state of the African environment. These drivers impact on all components of the natural environment, including land, freshwater, oceans and seas, and biodiversity, as well as in terms of climate change. Less critical environmental aspects are air quality and environmental governance.

On a global scale, international agreements are also not fully met yet, but significant improvement or progress are shown in eliminating the production and use of substances that deplete the ozone layer, removal of lead from fuel, increasing access to improved water supplies and boosting research to reduce pollution of the marine environment. The majority of environmental issues and indicators, however, show that no, little or limited progress has been made.

The report cautions that if humanity does not urgently change its ways, several critical thresholds may be exceeded, beyond which abrupt and generally irreversible changes to the life-support functions of the planet could occur. It also recognizes that scientific information is not yet at a desired level, especially not in terms of reliable time series data. GEO-5 therefore insists that further and more accurate research is still required to inform decision-making and policy formulation.

A policy focus is also advised that will address the underlying drivers of change, rather than the impacts caused by environmental change. Such policy and programme interventions can be structured to take advantage of recent developments in science and technology, and the emergence of the green economy. In addition, there must be much more co-operation between entities.

1.4 CONCLUSION

The 2nd SAEO is a key tool in the drive towards sustainable development. The report aims to take a critical look at how the South African environment has changed over the past six years and allows the acknowledgement of achievements, but also to adjust and realign policies and activities where performance is poor or environmental degradation is present or worsening.

The SAEO consists of four main parts, an introductory section that deals with the drivers of environmental change and the quest for sustainability, specific theme chapters that detail the current environmental state of different components of the environment, an Outlook (scenarios) section and finally an Options for Action section which casts a look into the crystal ball to see what needs to change on the developmental path in order to secure a more desirable future.

1.5 REFERENCES

1. Chamber of Mines of South Africa (2011). *Introduction to the Chamber of Mines of South Africa 2011*. http://www.bullion.org.za. Viewed 2 November 2011.

2. DEA (Department of Environmental Affairs), (2011). *National Strategy for Sustainable Development and Action Plan (NSSD 1) 2011-2014*. Department of Environmental Affairs, Pretoria.

3. DEAT (1999). *National State of the Environment Report for South Africa*. Department of Environmental Affairs and Tourism. www.grida.no/soesa/.

4. DEAT (Department of Environmental Affairs and Tourism), (2006). *South Africa Environment Outlook. A Report on the State of Environment*. Department of Environmental Affairs and Tourism, Pretoria.

5. EEA (1997). *Air Quality in Europe 1997*. European Economic Area. www.eea.europa.eu.

6. Mittermeier, R.A., Myers, N., Gill, P.C. and Mittermeier, C. G. (2000). *Hotspots: Earth's Richest and Most Endangered Terrestrial Ecoregions*. CEMEX, Mexico City.

7. NPC (National Planning Commission), (2012). *National Development Plan 2030: Our future – make it work*. National Planning Commission, Pretoria.

8. South Africa (2012). *South Africa Yearbook 2011/12*. www.gcis.gov.za. Viewed 30 October 2012.

9. South Africa (2012). *Programme of Action Core Indicators Progress Report*. www.poa.gov.za. Viewed 27 November 2012.

10. StatsSA (Statistics South Africa), (2012). *Quarterly labour force survey: Quarter 3 (July to September), 2012*. Statistics South Africa, Pretoria.

11. UNEP (United Nations Development Programme), (2006). *Africa Environment Outlook 2: Our Environment, Our Wealth*. United Nations Environment Programme, Nairobi.

12. UNEP (United Nations Development Programme), (2012). *GEO5 – Global Environmental Outlook*. United Nations Environment Programme, Nairobi.

13. WWF (World Wide Fund for Nature), (2012). *Living Planet Report 2012: Biodiversity, Biocapacity and Better Choices*. World Wildlife Fund, Global Footprint Network, ZSL Living Conservation, Switzerland.

14. World Summit on Sustainable Development and United Nations Deptartment of Public Information (2003). *Johannesburg Declaration on Sustainable Development and Plan of Implementation of the World Summit on Sustainable Development: the final text of agreements negotiated by governments at the World Summit on Sustainable Development, 26 August-4 September 2002, Johannesburg, South Africa*. United Nations Department of Public Information, New York.

1.6 ANNEXURE 1.A: Published reports on the State of the Environment

Published State of Environment Reports	
Title of the published output	**Year of publication**
Summary State of the Environment Report for the Cape Metropolitan Area, Year 1	1998
Summary State of the Environment Report for the Cape Metropolitan Area, Year 2	1999
Summary State of the Environment Report for the City of Cape Town, Year 3 (Summary)	2000
North West Province State of the Environment Report Overview	2002
State of the Environment Report, North West Province, South Africa	2002
State of the Environment Report for the City of Cape Town, Year 5	2002
State of the Environment Report for the City of Cape Town, Year 4	2002
Ekurhuleni Metro State of the Environment Report	2003
Johannesburgburg State of the Environment Report	2003
Limpopo State of the Environment Overview	2003
Mangaung State of the Environment Report	2003
Mbombela State of the Environment Report	2003
Mogale City State of the Environment Report	2003
Mpumalanga State of the Environment Report (Comprehensive and Overview)	2003
State of the Environment Report Gap Analysis for the City of Tshwane (2001—2002) (Gap Analysis)	2003
Ekurhuleni State of the Environment Report 2004 (Summary)	2004
Eastern Cape State of the Environment Report	2004
Ekurhuleni State of the Environment Report (Comprehensive and Overview)	2004
Gauteng State of the Environment Report	2004
Northern Cape State of the Environment Report	2005
Western Cape State of the Environment Overview Report	2005
Knysna Municipality State of the Environment Report, Year 1	2005
Southern Africa Environment Outlook	2008
Municipal State of Environment Reports	
Municipality	**Year of publication**
Drakenstein Local Municipality	2006
Nkangala District Municipality	2006
Sedibeng District Municipality	2006
The City of Tshwane	2006
West Rand District Municipality	2006

Eden District Municipality	2006
Provincial State of Environment Reports	
Province	**Year of publication**
Gauteng State of the Environment	2011
Free State	2007
KwaZulu-Natal	2006
Limpopo	2006
North West (second five yearly SoE report)	2007
North West Province Environment Outlook	2008
Sectoral Reports	
Title of the published output	**Year of Publication**
State of Rivers Reports	
Crocodile, Sabie-Sand and Olifants River Systems	2001
Letaba and Luvuvhu River Systems	2001
uMngeni River and neighbouring rivers and streams	2002
Diep, Hout Bay, Lourens and Palmiet River Systems	2003
Free State Region River Systems	2003
The Hartenbos and Klein Brak River Systems	2003
Berg River System	2004
Buffalo River System	2004
Crocodile (West) Marico Water Management Area	2005
Greater Cape Town's Rivers	2005
Olifants / Doring and Sandveld Rivers	2006
State of Estuaries	
State of South African Estuaries: geomorphology, Ichthyofauna, water quality and aesthetics	2000
Catchment Land Cover	2001
State of Vegetation	
Vegetation of South Africa, Lesotho and Swaziland	1999
Other Reports	
State of Air	2005
Monitoring the State of Coasts	2006