TWENTY YEAR REVIEW

SOUTH AFRICA

1994 - 2014

BACKGROUND PAPER:

ENVIRONMENT AND SUSTAINABLE DEVELOPMENT

20 YEARS OF FREEDOM

south africa 1994 - 2014

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List of Acronyms and Abbreviations

AMD	Acid mine drainage
CONNEPP	Consultative National Environmental Policy Process
COP	Conference of the Parties
EIA	Environmental impact assessment
EMF	Environmental management framework
EMI	Environmental management inspector
EPWP	Expanded Public Works Programme
GDP	Gross Domestic Product
GHG	Greenhouse gas
IDP	Integrated Development Plan
IEM	Integrated environmental management
IRP	Integrated Resource Plan
ISP	Internal strategic perspective
NEMA	National Environmental Management Act
NDP	National Development Plan
NEPAD	New Partnership for Africa's Development
NSSD	National Strategy for Sustainable Development
NWRS	National Water Resources Strategy
RBIG	Regional Bulk Infrastructure Grant
RDP	Reconstruction and Development Programme
SALGA	South African Local Government Association
SAPS	South African Police Service
SEA	Strategic environmental assessment
TCTA	Trans-Caledon Tunnel Authority
TFCA	Transfrontier conservation area
UNFCCC	United Nations Framework Convention on Climate Change
VIP	Ventilated improved pit (latrine)
WSDP	Water services development plans

Executive summary

South Africa emerges from a legacy of apartheid in which environmental issues and sustainable development were fragmented. In this respect, narrow environmental goals were pursued for the benefit of the minority at the expense of the majority. Legislation and policies were very weak and did not promote environmentally sustainable development. The apartheid system was poised to ensure that the poor and marginalised were excluded and suffered from the legacies of deliberate and poor environmental management. This was largely driven by an inadequate and non-existing legal framework, and the poor enforcement of policies and legislation. Economic development was pursued at the expense of the environment, and natural resources were exploited for the benefit of the few. Most historically black settlements were planned in areas that made people susceptible to environmental pollution. Protected areas, such as parks, were planned to exclude the majority from opportunities and recreation.

Addressing past imbalances

The new government inherited a legacy of inequity in the use of natural resources, environmental pollution and degradation in most parts of the country. The Constitution of South Africa (South Africa, 1996) introduced a rights-based approach to environmental sustainability, and enshrined environmental rights and equity in the values guiding the management of environmental and natural resources. The declaration of the right to a clean and healthy environment is one of the progressive prescripts in the Constitution. This provision implies that, in pursuit of a clean and healthy environment, the state must ensure that negative impacts do not adversely affect people. Environmental justice is therefore to be pursued in order to achieve environmental sustainability.

In terms of the Constitution, government is required to promote and advance this right through reasonable legislative and other measures. This constitutional provision gave rise to the development of policies and laws that are being applied across government and society. Through such tools, government has to advance environmental justice by providing a clean and healthy environment.

Since the advent of democracy, there has been a substantive repositioning of environmental sustainability within government. The mandate developed from being focused on conservation and tourism to promoting a broad, integrated environmental management approach. This approach takes account of the need to balance social, economic and environmental issues so as to advance sustainable development. Consequently, the relationship between environmental degradation and poverty is clearly articulated, and there is a high degree of policy coherence around the importance of sustainable development. On the other hand, climate change and global warming poses a major threat to socio-economic development.

Since 1994, government has moved swiftly to redress past imbalances and to position South Africa as a country on a path to sustainable development. While development was accelerated through programmes such as the Reconstruction and Development Programme (RDP), the guiding principle in regulating development and service delivery was sustainable development.

In the last 20 years, South Africa has experienced some successes in promoting the right to a clean and healthy environment with a sound policy and legislative framework based on cooperative governance. Environmental sustainability has been mainstreamed across government and all sectors of society through a number of mechanisms. In general terms, the following trends can be discerned since 1994:

- There has been a substantive repositioning of environmental management within government. The relationship between environmental degradation and poverty has been clearly articulated within a sustainable development approach, and there is a high degree of policy coherence around the importance of sustainable development.

- Significant progress has been made in the development of legislation and policy frameworks. The framework National Environmental Management Act (NEMA) legislation is a rights-based regulatory framework that is given articulation through a suite of more detailed sectoral pieces of legislation, covering most of the areas under review. The main gap lies in the field of climate change and the mechanisms that are needed to drive mitigation action.

- South Africa has a well-developed institutional framework for environmental governance, with national and provincial departments coordinating the exercise of their concurrent powers relating to the environment. The cooperative governance mechanisms relating to the environment are well developed, but the participation of local government in these structures is less well developed. Inadequate coordination remains with other enforcement agencies, such as the South African Police Service (SAPS) around poaching.

- There is considerable unevenness of capacity for environmental regulation at the provincial and local level. Capacity gaps, especially at the provincial and local levels of government, have resulted in the uncoordinated implementation of initiatives and regulatory reforms.

- Public participation in policy formulation has become entrenched as an approach, but a deeper partnership with civil society is needed around environmental initiatives.

- Compliance and enforcement have historically been a weak area in environmental governance. Government's compliance and enforcement capacity around environmental issues has been dramatically improved with the formation of the Green Scorpions. However, some capacity and funding constraints remain in terms of the expansion of this capacity, especially at local level.

- There is an overemphasis on a compliance and enforcement approach, rather than the use of softer incentives and market-based instruments. In general, the development of proactive planning instruments, such as strategic environmental assessments (SEAs) and environmental management frameworks (EMFs), has lagged behind, leading to an excessive reliance on the reactive environmental impact assessment (EIA) system.

South Africa is one of the few countries in which tap water is safe for drinking and use, with expansive irrigation schemes and bulk supply for industrial purposes. However, since South Africa is a water-scarce country, the democratic government sought to redress water supply by prioritising water for domestic use and water for the environment. Through this programme, 94.7 percent of households have access to water, compared to 59 percent in 1994. In the provision of water, the approach was "all for some", and post-1994, a new approach was adopted that promoted "some for all" (Department of Water Affairs and Forestry, 2005a).

The basic tenets for this right entrenched the principle of prioritising water supply for domestic use and for the environment by increasing environmental flows to sustain ecosystem health and to maintain future supply for other uses. While all water resources have been developed and allocated, there is sufficient water for socio-economic development and for the environment to sustain critical ecosystems. Nevertheless, water resources are heavily strained by pollution from poor infrastructure, which is not well maintained.

In the past, water resources were developed and exploited for the benefit of the few, and largely to support agriculture, which consumed 60 percent of water across the country (Department of Water Affairs, 2012b). Land ownership also gave the right to riparian rights, which compromised downstream users. The new government sought to redress this through the water allocation reform process. Since 1994, a large number of bulk water and reticulation systems have been developed to secure current and future supply.

While adequate policy and legislative frameworks are in place, the reform of water allocation and water institutions will be enhanced through the policy review process in the next decade to achieve equity and universal access.

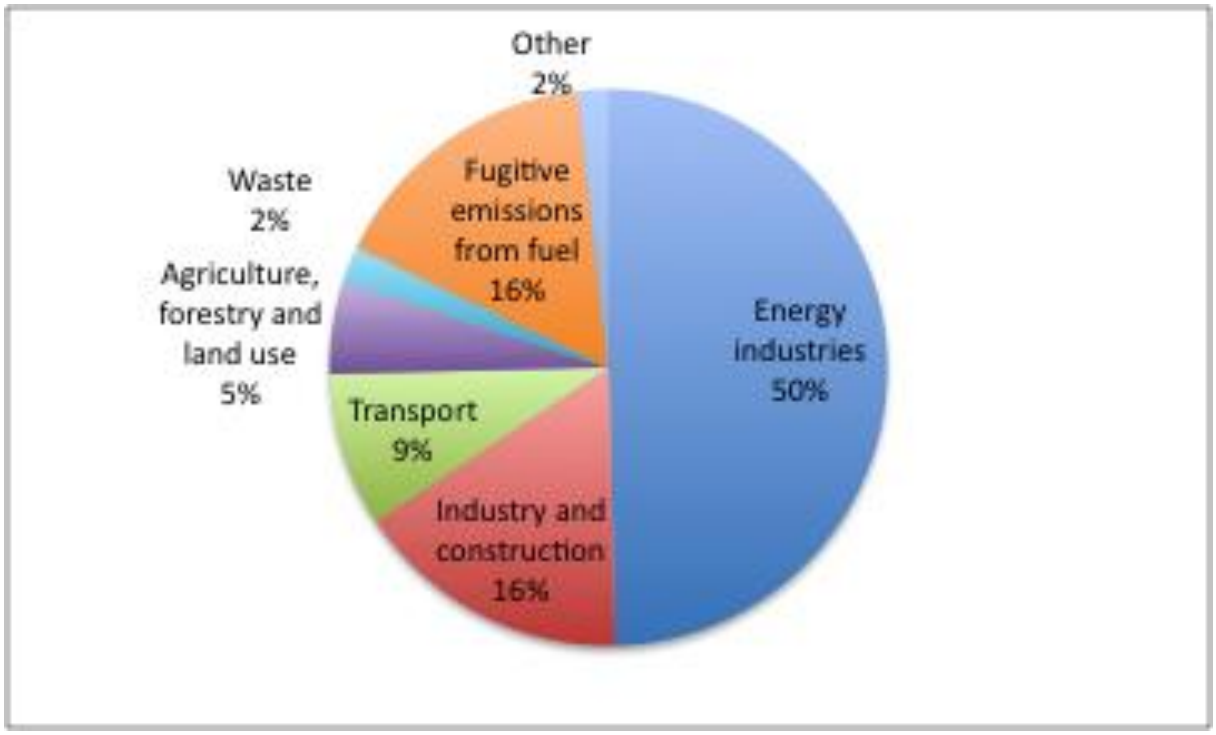
In cities and other human settlements, poor and ageing service infrastructure and systems create pockets of poor-quality living environments that are detrimental to the general environment and to human health (Department of Environmental Affairs and Tourism, 2009a). Inadequate transport systems, air pollution, storm water management, water supply, sanitation and sewage treatment, as well as waste disposal, contributed to environmental degradation. Insufficient access to energy and clean water exacerbates the situation in some areas.

Mining, as the backbone of economic development, was shielded from stringent environmental regulation and had no requirements to rehabilitate land after closure. The legacy of poor and weak regulation is evident, with mine dumps from which dust emanates. In some cases, settlements and open-mine stockpiles residues, such as asbestos, that affect the health of people. The emergent residual impact of mining is the threat of rising acid mine water on the Witwatersrand, which has negative effects on the environment and is likely to compromise economic gains. The democratic government inherited a heavy liability to rehabilitate derelict and ownerless mines, and to treat acid mine water.

The emergence of an industrial economy and the growing use of inferior-quality coal with a high sulphur and ash content by low-income communities resulted in high levels of pollutants in densely populated areas. As part of improving socio-economic conditions, the new government moved swiftly to provide electricity to poor households; thus reducing reliance on coal and thereby reducing air pollution. Ozone-depleting substances that also cause cancer, which have been found in household appliances, were phased out. Environmental management developed from a narrow conservation perspective, with vast areas of land enclosed as natural protected areas (national parks) to which black people did not have access.

Climate change is emerging as a major global concern that will have significant environmental and societal impacts, and that is likely to increase the vulnerability of people, especially the poor. South Africa contributes about 3 percent of total emissions, making it one of the top 20 contributors to global emissions, and Africa’s biggest contributor (Department of Environmental Affairs and Tourism, 2007). The country’s per capita carbon dioxide emissions are almost twice the global average. This is largely due to a heavy reliance on coal for electricity and the conversion of coal to liquid fuel. Energy legislation has been largely geared towards regulating the electricity industry, and since democracy, a focus has been given to renewable energy, energy efficiency and the development of an Integrated Resource Plan (IRP) to guide future energy investments and guarantee the security of supply. Figure 1 shows the direct greenhouse gas emissions per sector.

Figure 1: South Africa's greenhouse gas emissions by sector in 2000

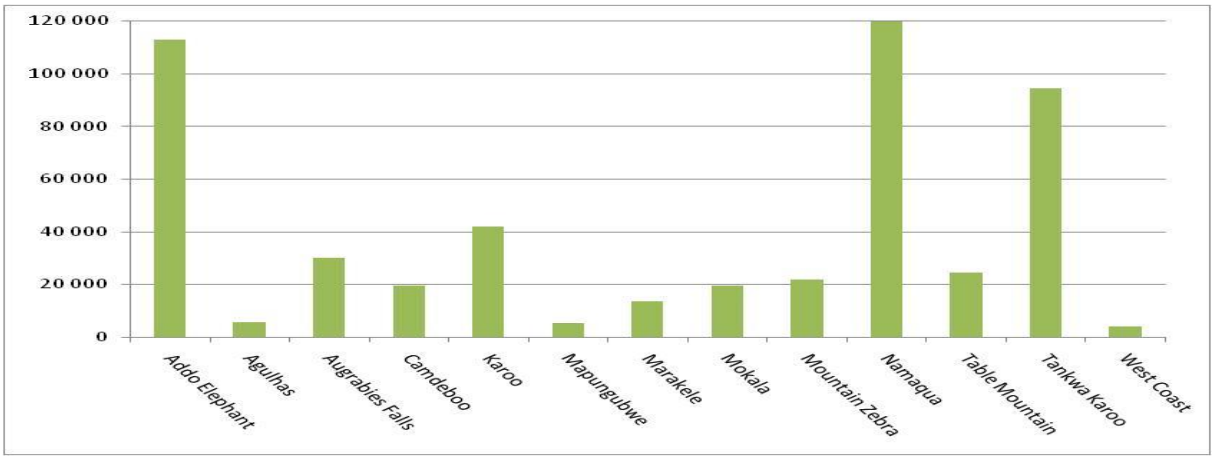


Source: Department of Environmental Affairs and Tourism, 2009b

South Africa has acknowledged that climate change poses a major threat, and in 2008, a Policy Response Paper was developed to guide the appropriate response to climate change. In 2009, on the eve of the Copenhagen Conference of the Parties (COP) to the United Nations Framework Convention on Climate Change (UNFCCC), the President announced that South Africa would implement mitigation actions that would collectively result in a 34 percent and a 42 percent deviation below its "business-as-usual" emissions growth trajectory by 2020 and 2025, respectively. The achievement of these targets is subject to financial, capacity-building, technology development and technology transfer support, and is dependent on the existence of a global, legally binding agreement on mitigation (Department of Environmental Affairs and Tourism, 2009a). To this end, in 2011, South Africa hosted the 17th session of the Conference of the Parties (COP 17) on climate change as part of mobilising support.

The expansion of the terrestrial, freshwater and marine areas under conservation is a significant achievement of the democratic government. The conservation estate has been increased by 9 percent, which is short of the 10 percent international benchmark of land under conservation.

Figure 1: Area (hectares) added to conservation estate since 1994



Source: Department of Environmental Affairs, 2012a

South Africa has collaborated with neighbouring countries on conservation and, to date, six transfrontier parks have been proclaimed, which contribute to conservation and tourism. In addition, four world heritage sites have been proclaimed to preserve the natural heritage. These efforts have afforded South Africa international recognition in the field of sustainable development. Notwithstanding these achievements, major ecosystems remain threatened and endangered species, such as the rhino, are being poached at alarming rates. The transformation and degradation of natural areas and resources continues, as does the fragmentation of protected or undisturbed areas. This results in a loss of biodiversity and concomitant ecosystem services.

There has been significant progress since the advent of democracy to advance environmental sustainability and equity in the use of natural resources. This has included measures to strengthen governance, increase the conservation estate and reduce pollution. Notwithstanding progress that has been made, challenges remain. Climate change, if not addressed, threatens to undermine the gains of the past. The next phase will involve a concerted effort towards policy reform to ensure equity and access in the allocation of water resources. This will be supported by appropriate institutional mechanisms to drive such reform process.

In light of the eminent threat of climate change, steps will be taken towards greening the economy to enable low-carbon development. Sustainable development and the impacts of climate change will require the introduction of market-based instruments to provide the much-needed revenue streams for the Green Economy.

Review

1. Introduction and background

Before 1992, environmental governance was highly fragmented. The apartheid government placed great emphasis on certain environmental aspects, such as conservation and water infrastructure, yet environmental policies and services were formulated within a framework that perpetuated social inequality by benefiting the white minority, and generally disregarded the environment and sustainability. The past 20 years have seen a dramatic and sustained process of formulating environmental guiding principles, institution-building and restructuring, legislation and policy development, and domestic and international engagement – all with the intention of addressing the historical legacy of inequality, international isolation and the fragmented structures of environmental governance.

Environmental governance was selectively applied with no clear overarching framework or approach. Legislation to manage land, water and mineral resources was meant to protect narrow minority interests and government interests in these economic sectors. Ownership of these resources was also skewed with large tracts of land, water and mineral resources in the hands of a few people.

Decision-making on environmental issues was focused on protecting state and minority interests and pursuing development at the expense of the environment and the majority of the people. This also perpetuated the injustice of apartheid, when access to natural resources by the disadvantaged was limited or non-existent. Environment pollution was directed at the poor and marginalised, and was also used as a spatial barrier to opportunities. For example, in Gauteng, the Orlando power station was built in the middle of the township of Soweto, with resultant air pollution and negative impacts on health. The mine dumps of the Witwatersrand mining belt serves as a spatial divide between the rich and the poor. As a consequence of weak environmental governance, the residual impacts of environmental pollution continue at great costs to the health and livelihood of the disadvantaged population and the quality of the environment.

Access to environmental resources for benefit use and sharing was skewed towards the minority, with the majority of the population denied access to environmental resources for livelihoods. The right to a clean and healthy environment was not enshrined in a constitutional system, but was nevertheless selectively applied. The majority of the population did not have access to national parks, nor were they allowed to sustainably harvest wildlife in areas close to them. White group areas had a high degree of environmental protection, such as proper waste management, good air quality and well-maintained public open spaces. Black communities were located on the periphery of urban areas, usually adjacent to industrial areas with comparatively lax environmental controls. They also suffered negative health impacts. The strong emphasis on waste management in white group areas, provided through municipalities, further resulted in infrastructure such as landfills being

located next to black townships. Homelands were largely rural. The land that was set aside for this purpose was of low agricultural productivity, prone to erosion, had an inadequate water supply and was far from economic opportunities.

The legacy of mining pollution from mine dumps close to communities, open asbestos pits, acid mine water and water pollution still remains. There were no specific tools or systems in place, and environmental management was largely motivated by the exploitation of mineral resources and conservation, with some areas being declared conservation areas after the relocation of the rightful owners. The provisions of the Minerals Act were largely motivated by managing the negative environmental impacts of the mines and their residual impacts, as there was no requirement for rehabilitation before the promulgation of the act. Mineral resources, the basis of the country's economic prosperity, were exploited with no regard for the environmental consequences or impact on the communities close to such mines. When mines reached the end of their life and the mining companies withdrew, sprawling towns were left worse off, finding it difficult to recover and remain sustainable. In the absence of mining companies that have closed and have been liquidated, the state remains with the challenge of the soaring rehabilitation and health costs of the affected communities.

South Africa is also sitting with a legacy of acid mine drainage (AMD), the effect of which is diffuse pollution, especially in the vicinity of the gold mines on the Witwatersrand and the coal mines in Mpumalanga (McCarthy, 2011).

With evolving pressure on the then government to improve governance, the Environmental Conservation Act was promulgated in 1989. It laid the basis for the General Environmental Policy that promoted the Integrated Environmental Management (IEM) approach. The legislation and policy laid the basis for the development of the Minerals Act of 1991, which required mines to submit environmental management programme reports before mining and to rehabilitate the land when the mines closed.

After 1994, the Consultative National Environmental Policy Process (CONNEPP) was initiated, which resulted in the White Paper on Environmental Management Policy being adopted in 1998. This laid the basis for sound environmental governance. The policy was anchored in promoting environmental rights. It enjoyed buy-in from all stakeholders of society. Consultation and cooperation underpinned the process and the outcome. The policy laid the basis for the development of the National Environmental Management Act (NEMA) of 1998.

CONNEP ran parallel to the development of Environmental Impact Assessment Regulations under the Environmental Conservation Act of 1989. The main objective of these regulations was to ensure that all impacts are considered before a decision can be made about any development, using the IEM approach.

NEMA laid the basis for sectoral legislation, policies and strategies. Great strides have been made in implementing regulatory instruments, supported by the implementation of requisite strategies. In response to these, government has gradually developed its implementation capacity. Appropriate institutional structures have been put in place to serve as cooperative governance mechanisms to avoid the duplication of efforts in the interest of sustainable development. Environmental legislation has spurred the development of business specialists, as well as the growth of activism in the non-governmental sector.

Monitoring tools are in place to measure environmental performance, supported by requisite reporting mechanisms and systems. Although the degree of awareness and behavioural change is evident in some areas, challenges remain in others.

Prior to 1994, environmental governance was seen as an emerging discipline that was selectively applied and highly fragmented in its application. The apartheid government placed great emphasis on certain environmental aspects, such as conservation and water infrastructure; yet environmental policies and services were formulated within a framework that perpetuated social inequality by benefiting the white minority. For the apartheid state, environmental policies and regulations were subservient to the overall security agenda of the government, designed to preserve social inequality and apartheid.

The department responsible for environmental affairs was comparatively weak, and the minister that held this portfolio generally had a junior position in Cabinet. Early governance arrangements for the environment were enshrined in the South African Council for the Environment, which was established in 1972. This body highlighted the need to consider the environmental impacts of major development projects in a report on the identification and evaluation of the effects of development projects on the environment, published in 1976.

The White Paper on a National Policy Regarding Environmental Conservation was published in 1980, and set out a national policy on environmental conservation to protect the natural, as well as the urban environment. Following the publication of the white paper, the State President appointed a Commission of Inquiry into environmental legislation in 1981. The Commission’s report adopted and expanded on the policy recommendations contained in the white paper, and a draft bill on environmental conservation was proposed.

The white paper and draft bill formed the basis for the Environmental Conservation Act, promulgated in 1982. This was largely concerned with governance arrangements, and it was not until the Environmental Conservation Act of 1989 that substantive provisions were put in place to regulate activities that may have a detrimental impact on the environment and that would require environmental impact reports to be prepared.

2. The journey since 1994

2.1 Regulatory reform

The RDP, developed after 1994, championed the idea of an integrated approach to poverty eradication, economic growth and the transformation of the state, within which environmental policies are located.

Since 1994, in accordance with section 24 of the Bill of Rights, establishing cooperative environmental governance mechanisms to promote environmentally sustainable development that meets the needs of all South Africans, while conserving the country's natural assets, has been a key focus of environmental governance.

The White Paper on Environmental Management sets out a comprehensive policy framework for integrated environmental management. In order to mainstream environmental issues across government, the Constitution assigned the environment as a concurrent function between national government, provincial government and local government.

NEMA was promulgated as a framework act to establish principles of cooperative governance, the institutional mechanisms that were required and the sustainable development tools that were needed to promote environmental sustainability. NEMA also identified tools for cooperative governance, which included environmental impact assessments, environmental management frameworks, environmental management cooperation agreements, environmental management plans, environmental implementation plans and the State of the Environment Report.

As an act, NEMA is progressive in that it makes provision for whistle-blowers to report environmental crimes and to be protected as such. Compliance and enforcement mechanisms have also been determined, with provision made for fines for non-compliance and transgressions.

Based on NEMA, sectoral legislation for air quality, waste management, biodiversity and protected areas, and oceans have also been developed. Capacity within government has grown and expertise in the private sector, as well as the academic and non-governmental sectors, has also developed.

2.2 Towards environmental sustainability

The past 20 years have seen a dramatic and sustained process of formulating environmental guiding principles, institution-building and restructuring, legislation and policy development, and domestic and international engagement – all with the intention of addressing the historical legacy of inequality, international isolation and the fragmented structures of environmental governance.

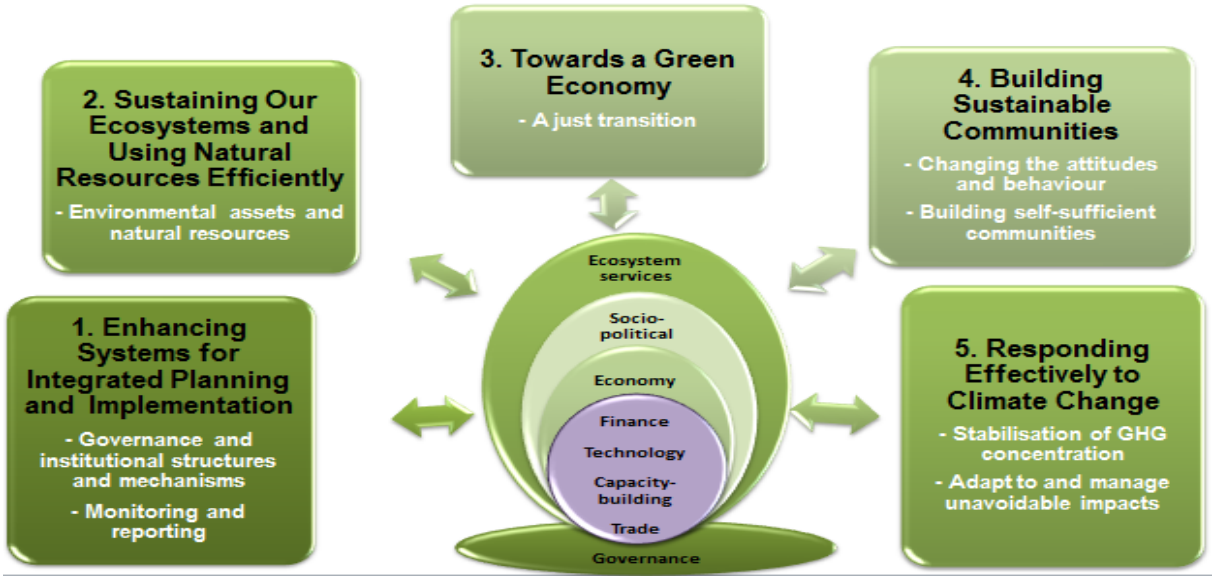
The steady evolution of the policy and regulatory framework for integrated environmental management has resulted in a well-developed system that is responsive to emerging economic issues, and coordinated across the different departments of government.

The reform of the regulatory framework for air quality management is a major milestone. Together with the compliance and enforcement capacity that has been historically lacking in air quality management, this will make a major impact on air pollution levels. The increase in qualified environmental management inspectors (EMIs) also represents progress towards effective compliance with, and enforcement of, air quality regulations. Since 1994, significant progress has been made in consolidating and delineating regulatory authority and institutional arrangements for waste management, with the Waste Act providing a far more detailed framework for waste management than the measures previously outlined in the Environmental Conservation Act.

The production of the first-generation environmental implementation plans and environmental management plans by government departments, entities and provinces has contributed to the mainstreaming of environmental sustainability within government. Some industry-specific environmental management cooperation agreements have been signed and the first of these were the agreements with the waste management sector on tyres and on plastics.

In 2008, the National Framework for Sustainable Development was adopted. This framework redefined versions of the strategic “pathways” into the National Strategy for Sustainable Development (NSSD) (DEA, 2011a) with five strategic interventions and means of implementation required to achieve the nation’s vision for sustainable development, as illustrated in Figure 3.

Figure 3 Sustainable Development priorities and means of implementation



To implement the NSSD's interventions, programmes and projects are aligned with, and contribute to the outcomes of national government and annual performance plans. The biennial NSSD Monitoring and Evaluation Country Report to the United Nations is linked, among others, to the Environment Outlook Millennium Development Goals and Sustainability Indicators. Initiatives have been launched to introduce sustainability indicators through the census of Statistics South Africa, as this provides a systematic process of acquiring information.

3. Reflection on achievements

3.1 Water resource management

South Africa is not endowed with large rivers (Figure 4). The combined flow of all the rivers in the country amounts to approximately 49 000 million m^3/annum, which is less than half of that of the Zambezi River, the closest large river to South Africa (Department of Water Affairs and Forestry, 2004). Four of the country's main rivers (the Limpopo, Inkomati, Pongola (Maputo) and Orange (Senqu) rivers), which together drain about 60 percent of the country's land area and contribute about 40 percent of its total surface runoff (river flow), are shared with other countries. Water underpins socio-economic development; therefore a reliable supply in sufficient quantities and of the desired quality is critical for economic growth and job creation. Approximately 70 percent of South Africa's gross domestic product (GDP) and a similar percentage of the population are supported by water supplied from these rivers, making their judicious joint management of paramount importance to South Africa (Department of Water Affairs and Forestry, 2004).

Groundwater, which is used extensively in the rural and more arid areas of the country, is generally a safe, clean and reliable supply of water. Groundwater plays a critical role in rural water supply, in particular. Its development is therefore a great opportunity in addressing water shortages and other national priorities (Development Bank of South Africa, 2006). The quality of the country's water resources is generally deteriorating, in particular, through marked increases in nutrients and microbiological contaminants, as well as acid mine water. The ecological component of the reserve that specifies the quantity and quality of water required for the protection of ecosystems is not yet fully implemented in most water management areas. A study of 905 towns (excluding metros and large cities) found that 28 percent of the towns have inadequate water resources. Available water resources are at their limit. Approximately 25.4 percent of the estimated 36.8 percent is due to physical leakages (McKenzie et al., 2012). As a result, in order to service water needs in areas where there are inadequate water resources, water has to be distributed over large areas and difficult terrain at a high cost, which most water service authorities cannot afford.

The use of ventilated improved pit (VIP) “dry toilets” and bucket systems was the norm in rural areas where bulk water supply and effluent treatment infrastructure was not in place. At the worst, a majority of people relieved themselves in the open veld or bush. A substantial number of water treatment works and waste water treatment works across the country are generally in a poor condition. The effect is that regular service failures are experienced, resulting, among others, in health impacts, financial losses and customer dissatisfaction. Only a few of the 1 689 water treatment works in the country are properly managed. Approximately 9 percent of water treatment works are completely dysfunctional, while 66 percent require short- to medium-term interventions and 25 percent require capacity upgrades. About 56 percent of water treatment works need additional skilled operating and maintenance staff.

Figure 4: Major rivers of South Africa

3.1.1 Policy and institutional reform

The South African Constitution is considered to be one of the most progressive in the world, as it provides a rights-based approach to the administration of the affairs of the country. By placing the responsibility for water resource management and water services in a public trust , government is able to ensure that the resource is protected, used, developed, conserved, managed and controlled, and that many areas of great need, which were excluded in the past, have access to water in a sustainable and equitable manner for the benefit of all the people. The Free Basic Water Policy provided a minimum level of services to guarantee supply, specifically to poor households.

The two pieces of legislation that govern water resource management and use provide for the redress of the imbalances of the past, ensuring that there is equitable distribution and access for all. The basic water services standards that have been developed ensure that every citizen has a minimum amount of water for their livelihood. In ensuring that water services are delivered to all, appropriate institutional mechanisms had to be put in place, which are representative of the population.

Through the enactment of the National Water Act and the Water Services Act, government brought about a fundamental reform in the management of the country's water resources and water services respectively. By underpinning and concretising the entire law and water policy framework in these acts, it established a coherent policy framework, while also rehabilitating the institutional framework and institutional boundaries.

The new water law reconciled the disjuncture between surface and groundwater, and established a principle of unity of the hydrological cycle, which recognises the fact that all water resources, including surface water and groundwater, are linked to each other[1]. In addition, the water law delinked water rights and land ownership[2]. By delinking water use claims and land ownership, government ensured that those who do not own or control land have equal access to, and use of the nation's water resource.

The development, implementation, monitoring and evaluation of various instruments – such as water resource management and water services regulations, guidelines and strategies – ensured that the protection, use, development, conservation, management and control of the nation's water resources take social and economic development considerations into account.

Central to water services is the need for proper planning. Through the integrated water resource strategy and other instruments, such as the internal strategic perspectives (ISPs), reconciliation studies and all town studies, an understanding of the country's water resources has been established at the national, regional and local level.

Water governance in South Africa identifies priority needs in the use of water. The top priority is the reserve, which is water for the environment. This is followed by meeting international obligations, as the hydrological cycle has no boundaries. The third priority is the allocation of water for social needs, such as poverty eradication, primary domestic needs and uses that contribute to maintaining social stability and achieving greater racial and gender equity. The introduction and implementation of water services development plans (WSDPs) was aimed at improving water services

[1] Water legislation before 1994 made a distinction between surface and groundwater.

[2] By virtue of land ownership, riparian owners had the right to water on their land and the state played a minor role in the protection, management and development of water resources and the allocation of water rights

planning and at ensuring that all consumers or potential consumers have access to water in an efficient, affordable, economical and sustainable manner. Through the WSDP, a water service authority is able to determine the quantity and location of people who are not provided with water services, the reasons for not providing those services, as well as the time frame within which basic water and sanitation may reasonably be expected to be provided to those people. Most municipalities have developed WSDPs, which form part of their five-year integrated development plans (IDPs). WSDPs are also used as a mechanism to access other funding sources for water and sanitation services.

In providing basic sanitation services, considerations of human health, the protection of the quality of both surface and underground water, and functionality to meet human requirements were applied. Different types of VIP latrines were designed and constructed to set standards in order to ensure that an appropriate and adequate basic level of sanitation service was provided. The proportion of households that have flush toilets connected to the sewage system increased from 49.1 percent in 2001 to 57.0 percent in 2011 (Statistics South Africa, 2012). The proportion of households with VIP latrines increased from 5.7 percent in 2001 and 6.6 percent in 2007 to 8.8 percent in 2011 (Statistics South Africa, 2012).

In accordance with government policy, which states that basic sanitation is a human right and that people must be involved in choosing, planning and implementing sanitation improvements that meet their needs and aspirations, the implementation of the Sanitation Programme incorporated social issues. Through the consultative and participatory process of the IDP, the views of all stakeholders, including communities and women, were taken into account during the planning of the Sanitation Programme.

In order to inculcate a sense of ownership of sanitation facilities and also address the high unemployment rate, particularly in rural areas, government encouraged the use of labour-intensive techniques, providing beneficiaries with employment opportunities and supporting the development of the local economy by using local material, products, suppliers and contractors. This approach is supported by the Department of Public Works through its Expanded Public Works Programme (EPWP).

The Department of Water Affairs has worked and continues to work in collaboration with other government departments, such as the Department of Human Settlements and the South African Local Government Association (SALGA), to support local government with capacity-building and skills development in order to enhance local government’s knowledge of water services, health and hygiene. After every local government election, government conducts nationwide workshops with newly appointed community representatives responsible for water services (water and sanitation) to induct them on sanitation policies, strategies, guidelines and tools. The Department of Water Affairs’ performance with respect to the management of national and regional infrastructure has been poor. This is partly due to the fact that

functions between the Department of Water Affairs and the Trans-Caledon Tunnel Authority (TCTA) are duplicated. Financing arrangements across the sector are suboptimal, with the result that assets are being funded out of government's budget, where these could be financed through loans (Department of Water Affairs, 2012b).

The revision of the country's National Water Resource Strategy, which was first produced in 2004 and was supposed to be revised and updated at intervals of not more than five years in accordance with the National Water Act, was delayed. It took seven years to review the strategy, with variable levels of success in the implementation of strategies. The significance of this delay is that the country's water resources' data and information, as well as strategies to balance supply and demand, have not been updated.

The Department of Water Affairs has embarked on an approach to implement institutional reform that includes defining best institutional design and practice, establishing sound grounds for reform and building collective leadership capacity.

3.1.2 Addressing equity and access to water

The achievement of democracy necessitated a review of the policy relating to water resource management. A water law review process therefore commenced in 1995, culminating in a set of principles that guided South Africans in the development of a new water policy. By virtue of the fact that water is a strategic resource and that water resource management is a constitutional and national function, the task of managing the country's water resources had to be carried out directly by a central agency. The Department of Water Affairs is charged with the responsibility of managing the nation's water resources (Department of Water Affairs and Forestry, 1994).

In 1997, the White Paper on a National Water Policy was produced for South Africa. The white paper expanded on the objective of ensuring that the broad water needs of South Africa were addressed. Some of the key proposals made in the National Water Policy to guide the future management of the country's water resources included water allocation and water use charges.

The reform process culminated in the enactment of the National Water Act of 1998, which became the overarching framework for the protection, use, development, conservation, management and control of the nation's water resources. To ensure that the above principles are promoted in ways that facilitate equitable access to water resources to meet the basic needs of present and future generations, the main tool developed was the National Water Resources Strategy (NWRS). This strategy provides information on the ways in which water resources are to be managed and the institutional mechanisms that must be established to manage the resource. It also provides quantitative information about the present and future availability of, and requirements for water in water management areas across the country, as well as interventions by which these may be reconciled.

A set of instruments was created for the protection of water resources in relation to their use, development, conservation, management and control. A system was established to classify water resources in terms of desired environmental protection levels. It focused on determining different classes of water resources, classifying water resources and determining resource quality objectives, determining the basic human needs, determining the reserve and the ecological reserve, and identifying ways to prevent the pollution of the nation's water resources.

When the new democratic government came into effect, much of the available water in many parts of the country had already been allocated to other users. Since government had the overall responsibility for, and authority over water resource management, including the equitable allocation and beneficial use of water in the public interest, various mechanisms were created to give effect to the equitable allocation and beneficial use of water in the public interest. Some of these mechanisms included defining the types of water uses, establishing regulations for the use of water, as well as determining licensed and unlicensed entitlements for water use.

Studies indicate that the assured yield of South Africa's surface water resource is about 12 billion m3/annum, of which more than 80 percent has already been allocated. Recent studies estimate the current total reliable yield (at 98 percent assurance of supply) to be about 15 billion m3/annum, while the potential reliable groundwater yield is estimated at 5 billion m3/annum.

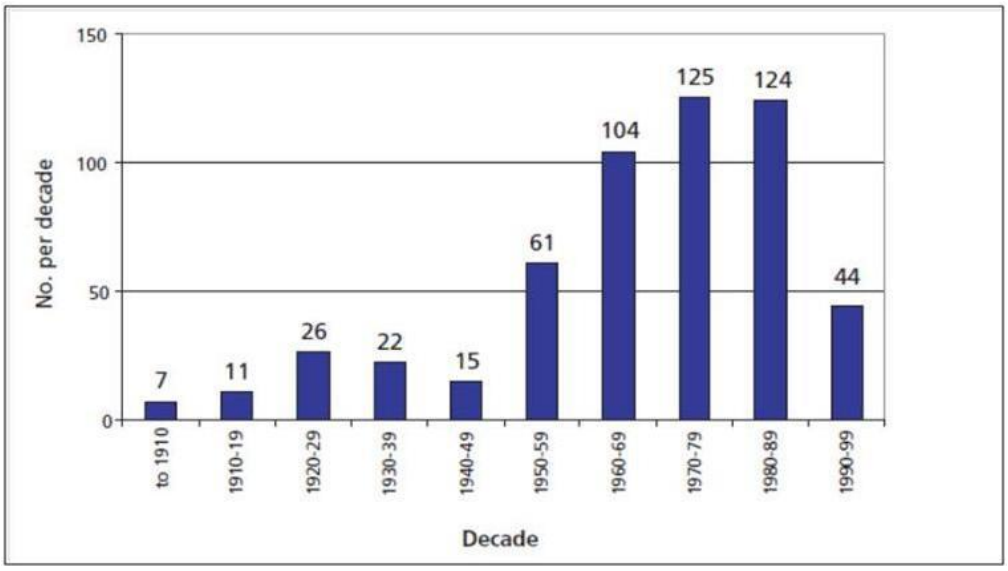
The current basic domestic water use component (i.e. 25 litres per person per day) translates into 472 million m3/annum or 11 percent of the total domestic water use. In 1996, only 9.1 million people (22.4 percent) had access to some form of water supply, 3.9 million people (9.6 percent) received piped water in their dwellings, while 1.4 million people (3.4 percent) received water on site or in their yards. Some 16.7 percent of the 6.53 million black South Africans who had access to some form of water collected this water from dams, rivers or streams.

At the dawn of democracy in 1994, an estimated 21 million South Africans did not have access to adequate sanitation facilities. Sanitation in most rural areas was inadequate. Poorly designed or operated water-borne sewage systems were common in urban areas. A dedicated Basic Services Development Programme, initiated in 1994, started with the eradication of the historic sanitation backlogs to be completed by 2014. Sanitation remains a challenge due to historical imbalances, settlement patterns and the quality of infrastructure. Service provision ranges from water-based systems connected to the municipal sewer system, localised sewer systems, traditional pit latrines common in the homeland areas, and the VIP latrines introduced after 1994.

3.1.3 Water – Some for all

To date, government has developed large water resources infrastructure to ensure that all current water requirements can reasonably be met without impairing the socio-economic development of the country. By 2000, 539 commissioned dams had been built (see Figure 5).

Figure 5: Number of dams commissioned in South Africa per decade



Source: Development Bank of South Africa, 2006

Water resources infrastructure includes 794 large dams with a combined storage capacity estimated at 31 million m3. In excess of two-thirds of the country's mean annual runoff is stored in these dams (Department of Water Affairs, 2013). After 1994, government invested in the refurbishment of existing water services infrastructure and the development of new infrastructure to ensure that people have sustainable access to water. A total of seven dams were built between 1994 and 2013 for purposes, among others, of water supply, irrigation and economic development.

In order to address the problem of water shortages in urban and industrial development, as well as some dense rural settlements located far from large watercourses, government developed a network of interbasin water transfer schemes to transport water from areas of relative abundance to areas where water is relatively scarce (National Water Resource Strategy, 2004; Muller, n.d.). To date, there are 28 interbasin transfer schemes with a total transfer capacity exceeding 7 billion m3/annum. A good example is the Lesotho Highlands Water Project, which supplies water to the Vaal Water Management Authority through transfers from the Katse and Mohale dams in Lesotho. According to Statistics South Africa, 73.4 percent of households have access to piped water inside dwellings, compared to 60.8 percent in 1996. The information also shows that 17.9 percent of households'

access water from outside their dwellings. A staggering 8.8 percent has no access to water at all.

Currently, the country has 923 known water treatment systems, with a total combined design capacity of 11 548 Mℓ/day. An audit of the state of waste water treatment works found that only 40 percent are compliant.

South Africa is one of the few countries in which water can still be consumed from the tap. Over the last 19 years, government has performed well in providing water services to the people of South Africa. In 1994, for example, only 59 percent of South Africa's population received water services equal to or above RDP standards. Between 1994 and 2011, a 35.7 percent improvement was realised. Given the number of people who did not have access to water at the dawn of the democratic government, statistics indicate that currently, 94.7 percent of all people have access to basic water. This is a considerable improvement from 1994, when only 59 percent of the population had access to basic water. The Free Basic Water Policy provided the framework to achieve the goal of access to basic water services by all. It defined the water needed to meet basic household water supply as 25 litres per person per day, or at least 6 000 litres per household per month. Through the Free Basic Water Policy, every South African is afforded the right to a basic amount of water and a basic sanitation service that is affordable. This amount is defined as 25 litres per person per day, carted not more than 200 m from their dwelling. To date, no less than 21.1 million people benefited from the basic supply programme and the Free Basic Water Policy, in particular. Similarly, 17.3 million people received at least a basic level of sanitation. Through the implementation of water services instruments, South Africa met and exceeded the Millennium Development Goal targets (Department of Water Affairs, 2012c).

3.1.4 Reducing pollution

In September 2008, the Department of Water Affairs introduced the Blue Drop Certification Programme for drinking water quality management regulation and the Green Drop Certification Programme for waste water quality management regulation. Together, these two incentive-based regulation programmes form a holistic and transparent approach to drinking water quality management and waste water quality management for future generations and the health of the natural environment. A total of 162 municipalities and 914 water supply infrastructure network systems (i.e. all the municipalities and systems in South Africa) were assessed in 2011 (Department of Water Affairs, 2011).

In 2009, the National Blue Drop score was recorded at 51.4 percent. In 2010, the status improved to 67.2 percent, and in 2011 to 72.9 percent (Department of Water Affairs, 2011). This shows a marked improvement in the quality of water supplied by water services authorities. Table 1 shows the various aspects assessed for national certification, the outcomes over the past three years and the performance trend.

Table 1: Comparative analysis of Blue Drop status at a national level

Blue Drop Comparative Analysis:	2009	2010	2011
Number of municipalities assessed	107	153	162
Number of water supply systems assessed	402	787	914
Number of Blue Drop scores ≥50%	183 (45.5%)	370 (47.0%)	536 (58.7%)
Number of Blue Drop scores <50%	219 (54.5%)	417 (53.0%)	378 (41.3%)
Number of Blue Drop awards	25	38	66
National Blue Drop score	51.4%	67.2%	72.9%

Source: Department of Water Affairs, 2011e

In 2011, the number of systems found to be “excellent” increased to 66, from 38 Blue Drop awards in 2010. Despite the national improvement in performance, not all provinces showed a positive trend. This can be attributed to a number of factors, including increasingly rigorous requirements for the assessment, a growing demand for water, inadequate maintenance and operational deficiencies. These declines also have implications for maintaining potable water quality.

Table 2 presents the Blue Drop scores per province from 2009 to 2011. The Western Cape produced the highest number of Blue Drop municipalities. It is disturbing to note that the Blue Drop scores in the Eastern Cape, North West and Mpumalanga municipalities recorded a decline between 2010 and 2011.

Table 2: A comparison of provincial Blue Drop scores

Province	2009	2010	2011	Performance trend
Gauteng	74.4	85.54	95.1	↑
Western Cape	No data	No data	94.09	↑
KwaZulu-Natal	73	65.91	80.49	↑
Eastern Cape	54.33	79.4	77.33	↓
Free State	40.03	48.5	64.01	↑
Limpopo	40.82	54.95	64	↑
North West	39.97	66.01	62.25	↓
Northern Cape	28.3	46.87	62.07	↑
Mpumalanga	51	65.42	56.5	↓

Key: ↑ = improved →= no change ↓ = deteriorating

Source: Department of Water Affairs, 2011e

The Green Drop Certification Programme focuses on regulating and improving on waste water quality management in the country. The Green Drop assessment assesses the entire functioning of municipal waste water services, with a specific focus on the risks to waste water treatment. In this manner, the Green Drop Certification Programme allows for the identification, quantification and management

of risks according to the potential impact on the water resource and for ensuring the prioritisation of municipal systems that are not functioning optimally. It is important to note that there is no direct correlation between Green Drop reporting and ecological integrity.

A total of 156 municipalities and 821 waste water systems were assessed in 2010, compared to 98 municipalities and 444 systems in 2009. This exceeds the Delivery Agreement Outcome 10 target for waste water treatment works assessed by 2014, which includes 700 systems. Table 3 shows the national performance of waste water treatment works from 2009 to 2011.

Table 3: National Green Drop comparative analysis.

Performance category	2009	2010/11	Performance trend
Number of municipalities assessed	98	156 (100%)	↑
Number of wastewater systems assessed	444	821	↑
Average Green Drop Score	37%	45%	↑
Number of Green Drop Scores ≥50%	216 (49%)	361 (44%)	↓
Number of Green Drop Scores <50%	228 (51%)	460 (56%)	↓
Average Site Inspection Score	33	40	↑
Provincial Green Drop Score	N/A	51.40%	N/A

Key: ↑ = improved, → = no change, ↓= deteriorating, N/A = Not Applied

Source: Department of Water Affairs, 2011d

The number of Green Drop scores greater than 50 percent in 2011 has decreased to 44 percent. This trend is the result of the 377 “first-time” systems that were assessed, many of which achieved low Green Drop scores, very similar to the 2009 results.

The Green Drop report uses a cumulative risk rating to describe the risk to waste water infrastructure being able to perform its treatment of waste water to the required standard (Department of Water Affairs, 2011). It is calculated by looking at the design capacity of each plant, linked to operational flows and capacity, as well as the non-compliance trends for effluent quality discharged into the receiving water body and compliance with the required technical skills to operate the plant. While the national picture looks stable to slightly negative, there are a number of plants that require urgent intervention. Unless those plants drastically improve their operations, the results will not show a positive risk profile for the country, and the health of the receiving environment will remain under threat.

3.1.5 Institutional reform- water

According to the Department of Water Affairs, the deterioration in the security of supply and quality is negatively affecting economic growth and job creation, and thus undermining government's ability to effectively address inequality and reduce poverty. Many South Africans feel excluded from the benefits of development and transformation (Department of Water Affairs, 2012b).

The institutional framework has progressed slowly in so far as ensuring equity and access has been slow. The process of aligning water management authorities, and restructuring catchment management authorities and water boards, has hampered the necessary reforms that are required to meet constitutional obligations. Many rural communities still do not have access to water. Delays in delegating the responsibility for the development, apportionment and management of available water resources to a catchment or regional level, where possible and appropriate, deprives interested parties of the opportunity to participate in the management of the resource to meet their needs. Because of the financial challenges faced by many municipalities, many water boards cannot supply water to rural municipalities. The challenge water boards experience is that they are required to balance their economic and social mandates. They need to strive to be financially viable (defined as full recovery of operating and capital costs, including depreciation and interest of loans), while at the same time responding to the imperative to support the expansion of service delivery to the poor within their service areas. The water boards that operate in poor areas face the greatest social needs, but are the least able to cross-subsidise these services from a wealthy customer base (Department of Water Affairs, 2012b).

Many rural communities still do not have access to basic water services. This is due, among other factors, to insufficiently developed water resources (i.e. the sources of water) and an institutional gap[3] in the water services sector. Many water service authorities have invested in water supply infrastructure, and yet there is no water for the infrastructure to supply to consumers. The delays in the establishment of catchment management authorities and the restructuring of the water boards are some of the problems that makes it impossible for government to provide water to the nation in a sustainable manner.

As part of institutional reform and to achieve the objective of wall-to-wall coverage of water resources and the optimal use of scarce resources, the number of water boards will be reduced from 12 to eight. Non-viable water boards will be rescinded, while viable ones will be restructured into regional water utilities. The number of catchment management authorities will be reduced from 19 to nine in line with the recommended number of water management authorities (Department of Water Affairs, 2012b).

[3] Many municipalities are not within the jurisdiction of some water boards so that they can be supplied with water. Most of those that can be supplied with water are not supplied because of their inability to pay for the cost of water supply.

The dire lack of competent technical capacity within the water service authorities is causing many water service authorities to fail to provide sustainable services or to run a successful water services business. Studies further revealed that municipal water consumption per capita is unacceptably high, that there are high water losses in the system, and that poor water use efficiency is prevalent across the sector. Apart from problems of management capacity at local government level, there are also major problems with regard to the condition of the infrastructure and the adequacy of vital instrumentation (meters) and other information systems, without which the adequate management of the resource cannot be implemented.

Despite the development of instruments to implement the Water Allocation Programme, government has fallen short in implementing them in order to expedite issues of equity, job creation and poverty alleviation. One of the challenges faced by the Water Allocation Reform Programme is the current legislation of the Department of Water Affairs, which has a number of inferences that make it difficult for the department's functionaries to implement the programme at the pace that would make a meaningful impact. Despite the water legislation being pro-equity, it does not provide for the promulgation of regulations to expedite the implementation of the programme. The danger in this regard is that, as long as water allocation is not curtailed, and historically disadvantaged individuals are not effectively participating and benefiting from the programme, the resource will be depleted before the programme can achieve its objectives of ensuring the effective promotion of equity, job creation, economic development and poverty alleviation.

There is a need to invest in the upgrading of the current infrastructure, as the majority of capital investments were made in the 1970s and 1980s. Most of the water infrastructure assets are approaching the end of their useful lives, which means that funding will be required for major rehabilitation to extend the lifespan of these assets. The capital replacement cost of the Water for Growth and Development Framework assets in poor condition amounts to about R6.4 billion, and there is a maintenance backlog for those assets deemed to be in good condition. About R4 billion is required per annum to renew or rehabilitate this infrastructure (Department of Water Affairs, 2012a). In terms of the National Water Infrastructure Framework of 2012, the total infrastructure requirements, including maintenance, amount to just over R700 billion. In 2007, National Treasury approved a once-off three-year Regional Bulk Infrastructure Grant (RBIG) to support water service authorities and the water sector to implement regional bulk infrastructure projects. The RBIG Fund has since been upgraded from a once-off programme to an ongoing programme. The amount allocated up to the 2012/13 fiscal year is R5.74 billion.

3.2 Energy

Energy legislation during the apartheid years was largely geared towards regulating the electricity industry. Renewable energy and energy efficiency in energy investments, which would guarantee security of supply and reduce carbon emissions, were not priorities.

Energy production in South Africa remains largely dependent on coal. The Integrated Resource Plan for energy was developed in 2011 to guide future energy investments, guarantee the security of supply and reduce carbon emissions. The plan identified the need to accelerate efforts to tap into the country's solar, wind and hydropower resources, while responsibly exploiting fossil fuels and mineral resources. To date, 2 460 MW of renewable energy has been secured through the Renewable Energy Independent Power Producer Procurement Programme. The increased use of nuclear energy, which will drastically reduce emissions, is also being explored. Various demand-side management and energy efficiency programmes are being implemented in industry and households.

3.3 Air quality management

Mining and industrial activity, compounded by the burning of poor-quality coal and biomass by those with limited access to electricity, has resulted in high levels of air pollution in some areas. Since 2007, plans to manage air quality and ambient air-quality standards have been developed for identified areas. Some regions, such as the Highveld and Vaal Triangle, have been declared priority areas due to high pollution from burning coal to produce electricity and liquid fuel.

To assess whether air quality is improving or not, the national air-quality indicator was developed, as well as the greenhouse gas emissions inventory for energy and industrial process emissions. The focus is currently on reducing the burning of solid fuel in residential areas and vehicle emissions. To reduce emissions from transport, lead has been phased out of liquid fuel, and regulations have been introduced to allow for blending.

The management of air quality is intrinsically challenging due to the technical complexity of monitoring and managing industrial emissions from multiple sources, the rapid growth in scale and composition of emissions from industry and other sources, and the difficulties of linking point source emissions to ambient air quality.

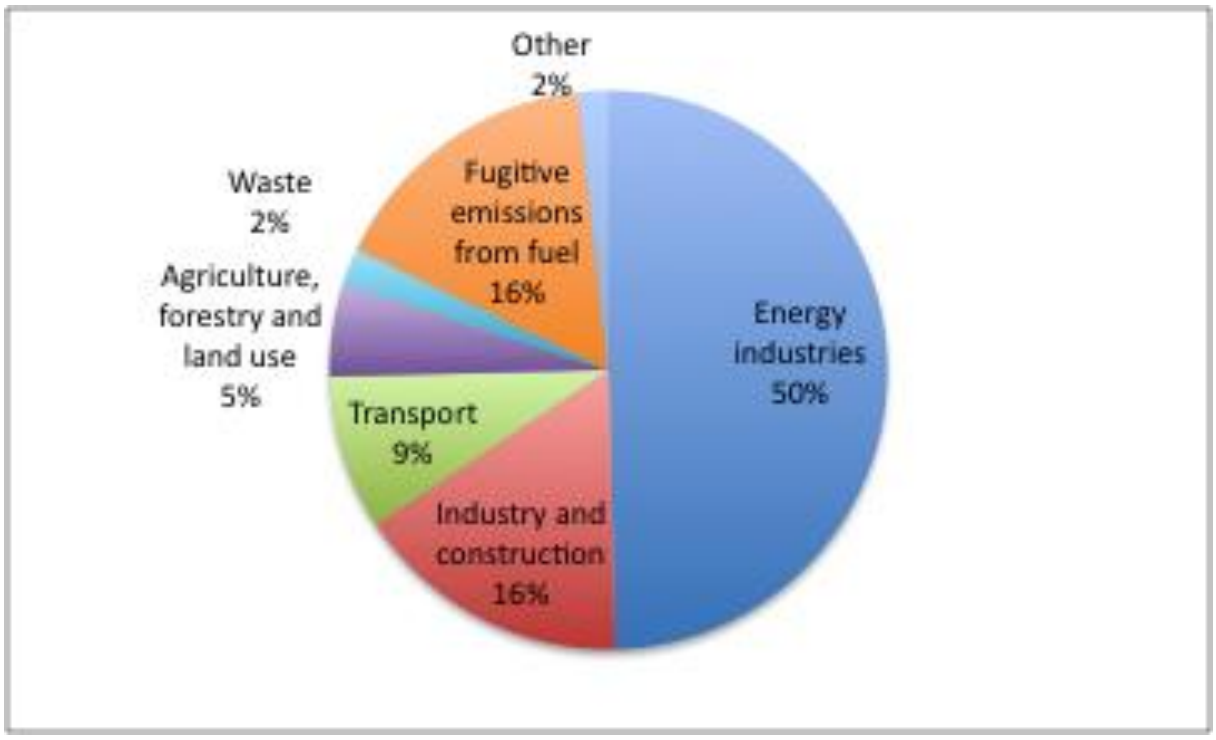
3.4 Climate change

As an emergent global issue, climate change poses a significant threat to South Africa's socio-economic development. South Africa is a significant contributor to global emissions due to its heavy reliance on fossil fuels for energy, as shown in Figure 6. As a developing country, South Africa is vulnerable to the impacts of the climate, with a proportion of the poor population likely to be negatively affected. While there are opportunities to be realised in mitigating the impacts of climate change, more investments have to be made in adaptation strategies that will build resilience in the economy, the environment and the population at large.

Climate change poses enormous challenges to biodiversity and, as yet, there is no overarching legislative and regulatory framework for this dilemma. Climate change policy can still be considered to be in a developmental phase, characterised by a proliferation of research, the consideration of strategic options and coordination

structures, and piecemeal target-setting and regulation. A lot of research is biased towards mitigation, while the greater challenge remains in climate adaptation.

Figure 6: South Africa's greenhouse gas emissions by sector in 2000

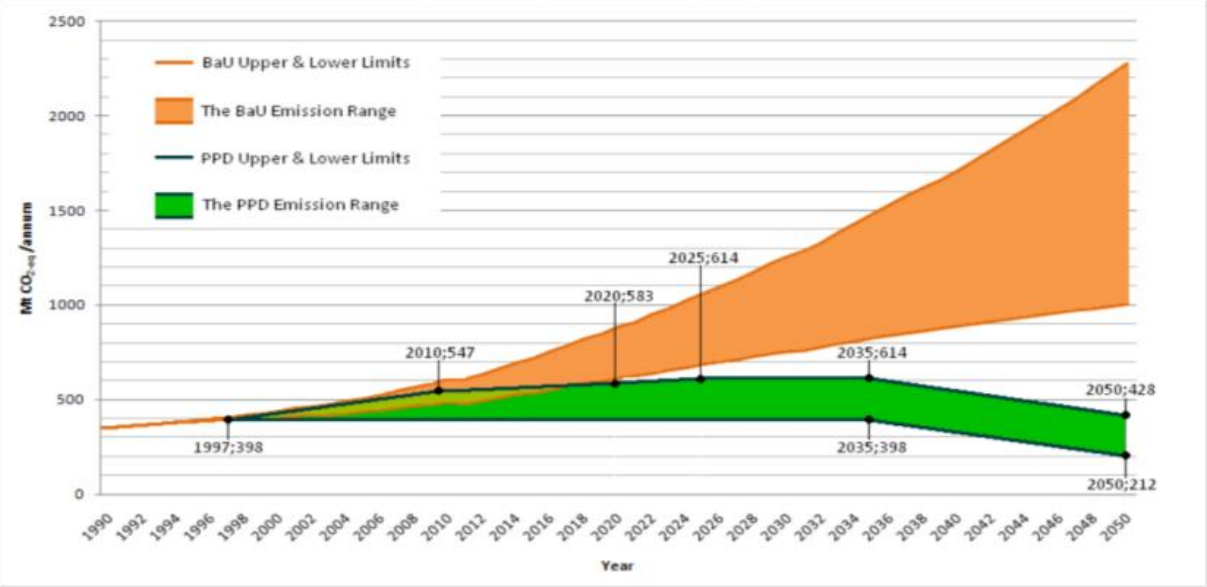


Source: Department of Environmental Affairs and Tourism, 2009b

The last 20 years have entailed a steady evolution of climate change mitigation planning and the governance of the climate change response at the national, provincial and municipal levels. The National Climate Change Response White Paper is a significant milestone, in that it lays out a comprehensive climate change response for the country.

The National Greenhouse Gas (GHG) Emissions Trajectory Range has been quantified, and will be used as the benchmark against which the collective outcome of all mitigation actions will be measured. Good progress has been made with establishing a national system of data collection to provide detailed, complete, accurate and up-to-date emissions data in the form of a GHG Inventory and a monitoring and evaluation system to support the analysis of the impact of mitigation measures. In 2009, on the eve of the Copenhagen Conference of the Parties, the President announced that South Africa would implement mitigation actions that would collectively result in a 34 percent and a 42 percent deviation below its "business-as-usual" emissions growth trajectory by 2020 and 2025, respectively. The extent to which this outcome can be achieved is predicated, however, on the extent to which developed countries meet their commitment to provide financial, capacity-building and technology development, and technology transfer support, to developing countries, and on the existence of a global, legally binding agreement on mitigation.

Figure 7: Proposed peak-plateau-decline trajectory for South Africa's emissions



Source: Department of Environmental Affairs, 2011b

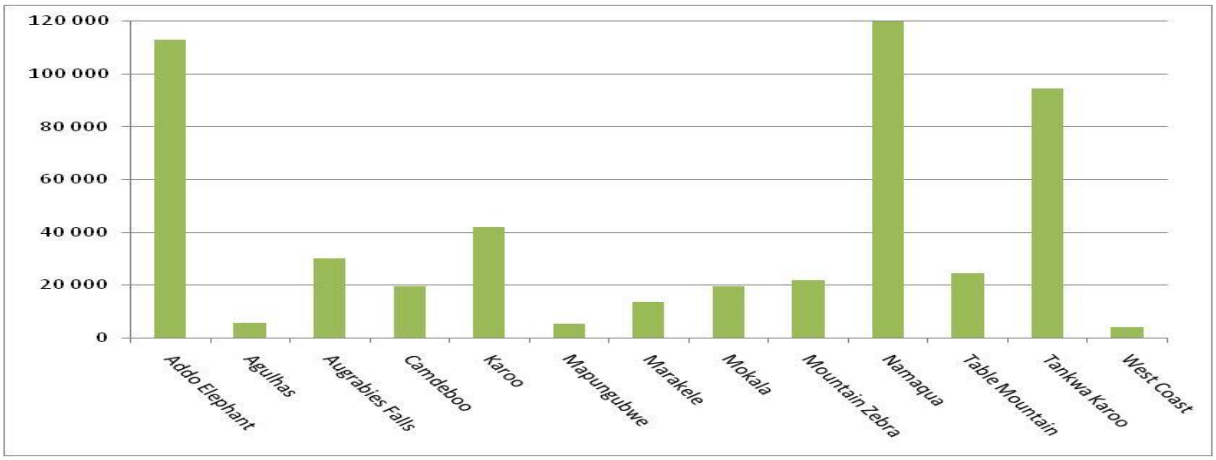
More recently, this deviation off an undefined trajectory has been expressed as a range of absolute numbers in the National Climate Change Response White Paper (South Africa, 2011). Under this trajectory, emissions peak in the period 2020 to 2025 in a range with a lower limit of 398 Mt CO2e and upper limits of 583 Mt CO2e and 614 Mt CO2e for 2020 and 2025 respectively. Emissions then plateau for up to ten years after the peak within the range, with a lower limit of 398 Mt CO2e and an upper limit of 614 Mt CO2e. From 2036 onwards, emissions decline in absolute terms to a range with a lower limit of 212 Mt CO2e and an upper limit of 428 Mt CO2e by 2050.

As climate change becomes the driving force for global change, South Africa's trajectory in the next 20 years is towards a low-carbon economy, driven largely by the Green Economy. This calls for support by international partners for innovative strategies supported by technology, finance and capacity-building.

3.5 Conservation and biodiversity management

It is worth celebrating the establishment and development of six Trans frontier conservation areas (TFCAs) as vehicles for the conservation and sustainable use of biological and cultural resources. The objective of these is to facilitate and promote regional peace, cooperation and socio-economic development. These tap into the notion that nature knows no boundaries. These TFCAs include the !Ai-!Ais/Richtersveld Trans frontier Conservation Park, the Kgalagardi Trans frontier Park, the Limpopo-Shashe Trans frontier Conservation Area, the Great Limpopo Trans frontier Park, the Lubombo Trans frontier Conservation and Resource Area and the Maloti-Drakensberg Trans frontier Conservation Area.

Figure 8: Area (hectares) added to conservation estate since 1994



Source: Department of Environmental Affairs

The democratic government has also declared four natural world heritage sites, namely the iSimangaliso World Heritage Site, the Mapungubwe World Heritage Site, the uKhahlamba World Heritage Site and the Vredefort Dome. Cultural world heritage sites include Robben Island and The Cradle of Humankind. The expansion of marine protected areas, as well as freshwater and marine areas under conservation, is also a significant achievement of the democratic government. Overall, 9 percent of land mass under conservation has been added in the last 20 years.

One of the remaining challenges in respect of biodiversity is that the seven biomes are not proportionately protected under the conservation estate, and key ecological processes are excluded (Department of Environmental Affairs, 2011b). Certain ecosystem types, especially wetlands, are severely threatened. The water-scarce nature of South Africa leaves rivers vulnerable to over-use and transformation, which has implications for aquatic ecosystem functioning and biodiversity

With regard to species protection, endangered species, such as the rhino, face the threat of poaching, particularly in the Kruger National Park. The 2010 South Africa Risk and Vulnerability Atlas, notes that 30 percent of species with specific habitat requirements will be reduced by 2050. Primary causes of biodiversity loss at the national level include mining, timber plantations, and agricultural and urban development. Growing numbers of invasive plant species threaten biodiversity, water security and ecosystem services. The greatest concerns for biodiversity are located to the west of the country, where biodiversity hot spots are at risk. Of major concern is the prediction that the floristically diverse succulent Karoo biome is likely to be lost.

3.6 Waste management

The municipal solid waste sector is, in general, facing a serious fiscal situation, with operating deficits threatening the sustainability of service delivery. In this context, the need to expand delivery in the solid waste services sector requires greater efficiency

of fiscal mechanisms, and a clear strategy to improve operating competence, to secure the financial sustainability of waste services delivery and to boost municipal revenue. Existing landfill capacity is tight and municipalities must make the necessary capital investments in the context of proper planning to ensure that safe and adequate waste disposal can continue. Much of the existing waste management infrastructure is outdated and requires significant investment to bring it in line with modern, integrated waste management practice. There are overlooked opportunities for job creation in the waste management system, and for using waste as an energy resource. The complex composition of the waste stream presents challenges for the coordination of waste management structures, particularly for hazardous waste types, including waste from the mining and health sectors, and the growing problem of electronic waste.

The 1998 Integrated Policy on Waste Management and Pollution advocated waste minimisation, recycling, treatment and disposal. The 2001 Polokwane Declaration on Waste Management built on this commitment to develop a waste management system that would reduce waste by 50 percent by 2012 and result in zero waste by 2022.

Although these principles inform local and provincial integrated waste management plans, the targets have not been achieved. Minimum standards for waste collection and disposal have been introduced and the percentage of households with access to at least a basic level of refuse removal increased from 55 percent in 2009 to 72 percent in 2013.

Medical waste has not been adequately managed, with incidences of medical waste pollution reported and cases that have been prosecuted in court. This is an area that still requires specific regulations in terms of the National Environmental Management Waste Act of 2008. Monitoring and enforcing compliance of health sector waste disposal presents a capacity challenge, as new regulations will require all thermal medical waste treatment facilities to comply with air-quality standards and all existing permits for non-thermal treatment facilities to be reviewed. An example of successful prosecution for contravening medical waste regulations is given in the box below.

Enforcement Case Study 2

A waste disposal site in Butterworth was investigated by environmental management inspectors and the Eastern Cape Department of Economic Development and Environmental Affairs in 2010. The site was illegally storing healthcare-risk waste. The case was tried in February 2012 and the accused charged with contravening section 20(1) of the Environment Conservation Act (operating a waste disposal site without a licence) and section 35(2) of the Air Quality Act. The company was fined R200 000 and suspended from trading for five years.

A concerted effort is required to redirect patterns of production and consumption in a sustainable direction. The waste hierarchy is not effectively applied from producer to disposal. While government set targets for waste minimisation and reducing disposal in line with the Polokwane Declaration targets, these have not been met. Waste has to be considered as a resource for socio-economic development. Producer responsibility is very weak and disposal facilities are not properly licensed. There is a need to consider the whole value chain of waste.

3.7 Regional and international engagement

South Africa has made its mark in promoting multilateral environmental governance through the United Nations. Government has ratified a number of conventions and protocols in this respect. To this end, in 2002, South Africa hosted the World Summit on Sustainable Development. This was followed by the hosting of the World Parks Congress in 2005 and the 17th Conference of the Parties to the United Nations Framework Convention on Climate Change in 2012.

South Africa continues to play a leading role in advocacy and lobbying for a better world, and has bid to host the 16th Conference of the Parties to the Convention on Biodiversity in 2016.

On a regional level, South Africa plays a leading role in implementing the New Partnership for Africa's Development (NEPAD) Action Plan for the Environment initiative and developing a climate change implementation framework. This includes playing an active role in the Southern African Development Community (SADC) through the African Ministerial Conference on the Environment and the African Ministerial Conference on Water.

3.8 Business and civil society

Since 1994, civil society has significantly contributed to shaping environmental policy through the Consultative National Environmental Policy Process. Through advocacy programmes, these non-government actors have made a significant contribution to shaping government policies and strategies related to sustainable development, particularly in areas of energy security, energy mix and the effects of climate change.

Corporate sector responses to environmental responsibility have been driven by compliance to minimum requirements, rather than the need for continuous improvement. In recent years, the disclosure of carbon emissions has been growing, but only as far as listed companies are concerned. Environmental stewardship has grown in the business sector through, among other initiatives, the development of the King Codes of Good Practice. Launched in 2009, these codes require businesses to provide integrated reports that include financial results, their social effect on the community in which they operate, and how they intend to increase the positive effects and minimise the negative effects on these communities in future. Most South African companies now report in line with this code.

In addition, South African companies report on their carbon footprint and efforts to minimise and reduce environmental risks through the Global Reporting Initiative. The Carbon Disclosure Project, launched in 2007, assesses the disclosure quality in the annual reports of the top 100 companies listed on the Johannesburg Securities Exchange. On a global level, businesses participate in the World Business Council on Sustainable Development.

4. Summary and recommendations

Significant progress has been made in the development of legislative and policy frameworks, which are in place for most environmental sectors. Drawing on the Constitution, there is a rights-based regulatory framework, with framework NEMA legislation setting out the principles that inform environmental decision-making. This has been articulated through a suite of more detailed sectoral legislation, covering most of the areas under review. The major void in legislation lies in the field of climate change and the mechanisms to drive mitigation action. There has been a steady improvement in government capacity to implement legislation, as evidenced by the reduction in the backlog of EIA decisions. Challenges remain, however, at the level of local government, in particular, where the development of recycling infrastructure in terms of the National Waste Management Strategy has been slow.

None of the above would have been possible without the repositioning of environmental management within government. The relationship between environmental degradation and poverty has been clearly articulated within a sustainable development approach, and there is a high degree of policy coherence around the importance of sustainable development. The sustainable development approach was enshrined in the National Strategy for Sustainable Development, which integrates environmental protection with economic and social goals.

South Africa has a well-developed institutional framework for environmental governance, with national and provincial departments coordinating the exercise of their concurrent powers relating to the environment. The cooperative governance mechanisms relating to the environment are well developed, and ensure that

environmental regulation is coordinated between national and provincial levels. The participation of local government in these structures is less well developed. While there are concerted efforts in place to stem the tide of rhino poaching and to protect other endangered species, enforcement alone does not seem to be effective. Multipronged strategies are required to ensure the sustainable use of natural resources.

In general, environmental governance policies are mature and mainstreamed in national policy and programmes. However, there is considerable unevenness of capacity for environmental regulation at the provincial and local level. Capacity gaps, especially at provincial and local level, have resulted in the uncoordinated implementation of initiatives and regulatory reforms. Despite recent improvement, considerable inefficiency remains in the processing of permits and applications, leading to the threat that some of the impact management regulations could be rolled back.

Public participation in policy formulation has become entrenched as an approach, and in some instances this has resulted in a deeper partnership with civil society around environmental initiatives. However, there is considerable room to expand on this partnership approach, and a greater willingness from both government and civil society to collaborate on initiatives could result in far more effective environmental governance. There are considerable opportunities for government to partner with industry around the development of industrial waste management plans, as well as the development of strategic environmental assessments and greenhouse gas mitigation strategies.

Compliance and enforcement have historically been a weak area in environmental governance. The compliance and enforcement capacity around environmental issues in government has been dramatically improved with the formation of the Green Scorpions. However, some capacity and funding constraints in terms of the expansion of this capacity remain, especially at local level. There is also an overemphasis on a compliance and enforcement approach, rather than the use of softer incentives and market-based instruments, resulting in an excessive demand on the public sector for the processing of permits, for example. In general, the development of proactive planning instruments, such as strategic environmental assessments and environmental management frameworks, has lagged, leading to an excessive reliance on the reactive EIA system.

A key strategic policy direction moving forward is the introduction of market-based instruments to support the valuing of natural resources, the sustainable use of resources, the funding of environmental management initiatives, and disincentivising pollution and environmentally destructive activities. South Africa’s traditional reliance on the command-and-control regulation of environmental activities is very complex and costly, and a market-based approach promises greater efficiency and the generation of fiscal resources to support environmental management objectives.

Payment for ecosystem services and environmental offsets could provide a much-needed revenue stream for conservation efforts, and the carbon tax is an effective instrument for introducing a value for carbon emissions in the economy. These valuation tools will play an increasingly important role in environmental management, particularly in the climate change response. The rights-based approach has led to the development of a number of institutional mechanisms to respond to environmental issues.

The backbone of the South African economy has been maintained by the mining sector, with its resulting negative impact on the environment. While the environmental regulation of mines evolved earlier than the generally applied environmental impact assessment instrument, the residual impacts of old mines continue to threaten the quality of the environment. Mining will, however, continue to make a significant contribution to the economy. The mushrooming of informal settlements, coupled with poor service provision and environmental management, contributes to a negative state of the environment. While there has been progress in regulating industrial air pollution, the challenges of domestic sources of pollution remain with their huge environmental health burden.

South Africa is involved in a number of international environmental treaties, and engages in multilateral and bilateral relations that facilitate nation-to-nation cooperative governance of environmental matters, such as the Kyoto Protocol. In some cases (and climate change is a good example), progress in international governance lags behind the requirements of science. The transition to an environmentally sustainable economy requires trade-offs to be made. These include the following:

- Sequencing and balancing the decline of the legacy sectors, such as coal-fired power stations, and growth in the Green Economy sectors
- Developing a new model for waste management that sees waste as a resource from which enterprises can be built to reduce unemployment, poverty and inequality
- Environmental stewardship by all South Africans, with commensurate behavioural change, driven by a growing awareness of sustainable development
- A revolution of social values that promotes social and environmental responsibility

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.

Alternative tools for integrated environmental management, such as strategic environmental assessments and environmental management frameworks, have not

really been properly utilised. The system of environmental management has remained a largely project-based and reactive system. The limitations of EIAs are increasingly being experienced. These include the fact that they are reactive rather than forward-looking and not strategic. Therefore, further work is required to expand the use of more proactive planning instruments.

A key challenge over the medium term is to assign value to natural resources and ecosystem services that will generate financial resources to support biodiversity conservation.

In the water sector, trade-offs are necessary to be able to do things differently. In undertaking water reform, there has to be a balance between water allocations for industrial and urban use, which has economic implications, and water allocations for agriculture and conservation, which has implications for social and environmental use. With high water losses in agriculture, water use efficiency measures for the sector are important to ensure a vibrant agriculture sector and universal food security. A balance has to be maintained between the cost of environmental protection and social and economic needs to maintain a certain reserve for ecological functioning. The provision of infrastructure has to consider alternative water supply and sanitation infrastructure that are cost-efficient and effective. In order to promote investment in water supply, a balance has to be maintained between allocating investment for higher levels of service and providing for unserviced settlements, while maintaining and refurbishing infrastructure. Such a model will also allow for operating subsidies in areas with consumers that cannot afford the high cost of services. Efficient water resource protection and service provision requires a flexible model for institutional water and sanitation services at municipal level that transcend municipal boundaries.

Access to water and sanitation still represents the struggle to break the vicious cycle of poverty for many South Africans. The inferior quality, poor location and improper maintenance of water and sanitation infrastructure, ignorance and endemic corruption in the system are some of the aspects that continue to undermine well-intended development objectives (National Planning Commission, 2010).

The National Development Plan (NDP) states that development should be a process of continuously raising national capabilities that enable competitiveness, and shifting from a paradigm of entitlement, which for the past 20 years had engrossed a huge segment of South Africa’s society. The plan also indicates that leadership, unity and cohesion are still a huge challenge in our divided society. The NDP notes the following key policy issues to guide appropriate actions to improve the management, use and conservation of water resources:

- Enhanced capacity to address increasing pressures on water resources – priority should be given to the development and retention of specialised staff

- The finalisation of water resource management institutions, especially water management areas and mechanisms, through which users will be involved in the management and development of water resources
- A review of existing water allocations in areas where new users need access, but current users abstract more than they need
- New water management approaches and strategic planning for the development of new water resources
- Investments to support the economic use of water, including urban consumption funded through appropriate funding measures, which must include affordability while sustaining service provision to the poor
- Policy to guide substantial water and agriculture investments to support rural development, with a balance between financial costs and social benefits
- The allocation of funds for basic water supply and sanitation, based on norms and standards
- The use of regional utilities and community management franchises in areas with no capacity for management and service provision
- An independent regulator for the management of demand and supply/availability

The country has the inherent capacity to address inequality and poverty, and build a united society. From a water governance point of view, attention needs to be paid to a few critical issues, which have been identified in the NDP:

- Water governance is a major expression of the paradigm of sustainable development, with its objectives of promoting management efficiency in terms of water availability and quality, the protection of consumers and the solution of conflicts. The past 20 years have proved to the new dispensation that water governance models are varied and complex. Scarcity, poor infrastructure, poverty and inequity have deprived most people of access to water for social and economic development. South Africa needs to convert the potential for reliably accessible water through significant investments in infrastructure.

- There is also a critical need for a national paradigm shift towards an understanding that water is a finite resource, the protection, responsible management and use, controlled development and conservation of which is key to creating sustainable jobs and livelihoods. A new “storyline” cannot be written through inadequate institutional and managerial organisation, or the lack of political will to root out systemic corruption.

At a strategic level, the NDP envisages a transition to an environmentally sustainable, climate change-resilient, low-carbon economy and just society. This trajectory to 2030 will be largely driven by the Green Economy, and a strategic framework has already been completed. The NDP indicates that “ ... shifting to a

Green Economy, including to a low-carbon economy, is shifting to a more sustainable economic growth and development path in the long term..."

The transition will be facilitated through the following measures:

- Coordinated planning and investment in infrastructure and services that take account of climate change and other environmental pressures, with access to secure housing, clean water and decent sanitation, and affordable, safe energy, making communities more resilient to the impacts of climate change and less socio-economically vulnerable
- The implementation of adaptation strategies in conjunction with national development strategies, including disaster preparedness, and investment in more sustainable technologies and programmes to conserve and rehabilitate ecosystems and biodiversity
- Investment in consumer awareness, green product design, recycling infrastructure and waste-to-energy projects, which will result in significant strides being made to becoming a zero-waste society
- Growth in the renewable energy sector, as envisaged in the Integrated Resources Plan (IRP 2010), should take off in response to falling technology costs, government's bold support for the sector and the introduction of targeted carbon-pricing mechanisms to facilitate further private investment in renewable energy
- The development and marketing of niche products and services, coupled with mutually beneficial partnerships with neighbouring countries, creating jobs in the domestic manufacturing of renewable energy technologies
- Reducing carbon emissions in line with international commitments, while maintaining competitiveness in the global economy by carefully managing investments in local and regional renewable energy resources and aggressively promoting just and equitable trading arrangements
- The creation of policy and regulatory frameworks for land use to determine the environmental and social costs of new developments and ensure the conservation and restoration of resources
- Public investment in new agricultural technologies and the development of resilient and environmentally sustainable strategies and support services for small-scale and rural farmers to protect rural livelihoods and the current expansion of commercial agriculture

The Green Economy holds the promise of creating up to 30 000 new jobs by 2030. Fostering a Green Economy will therefore also fulfil the national development agenda.

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