South Africa Yearbook 2015/16

Environment

The Department of Environmental Affairs (DEA) is mandated to give effect to the right of citizens to an environment that is not harmful to their health or well-being, and to have the environment protected for the benefit of present and future generations. To this end, the department provides leadership in environmental management, conservation and protection towards sustainability for the benefit of South Africans and the global community.

Strategies are therefore in place to:

- ensure that the department has optimal capacity to deliver services efficiently and effectively
- ensure that South Africa's environmental assets are conserved, valued, sustainably used, protected and continually enhanced for the benefit of both current and future generations
- enhance socio-economic benefits and employment creation in a safe, clean and healthy environment for both present and future generations
- provide leadership in environmental management, conservation and protection towards sustainability for the benefit of both current and future generations
- manage the interface between the environment and development to encourage the transformation of the development trajectory to an environmentally sustainable, inclusive, low carbon and green economic growth path
- promote compliance with environmental legislation, and act decisively against transgressors
- develop and facilitate the implementation of a climate change adaptation and mitigation regulatory framework
- facilitate the transition to an environmentally sustainable, job creating and low carbon, green development pathway through the Green Fund and environmental projects in the Expanded Public Works Programme (EPWP)
- improve the provision of quality waste-management services across the country with clear environmental health benefits for communities, particularly those with no previous access to waste-management services.

The medium-term policy focus of the DEA is on job creation and sustainable development. The National Development Plan (NDP) aims to create five million jobs by 2030, and the department will contribute to this aim by creating jobs in the environment sector.

The department's sustainable development work over the medium term supports the NDP's aim to make interventions to ensure environmental sustainability and resilience to future shocks.

Legislation and policies

The framework within which the department fulfils its mandate is guided by a number of policies and legislation:

- The National Environmental Management Act (Nema), 1998 (Act 107 of 1998); the National Environmental Management Amendment Act, 2003 (Act 46 of 2003); the National Environmental Management Amendment Act, 2004 (Act 8 of 2004); the National Environment Laws Amendment Act, 2008 (Act 44 of 2008); the National Environmental Management Amendment Act, 2008 (Act 62 of 2008), and the National Environment Laws Amendment Act, 2009 (Act 14 of 2009) establish the concepts of participatory, cooperative and developmental governance in environmental management, as well as principles for environmental management and provides for structures to facilitate these.
- The National Environmental Management: Biodiversity Act (NEMBA), 2004 (Act 10 of 2004), reformed South Africa's laws regulating biodiversity. It sets out the mechanisms for managing and conserving South Africa's biodiversity and its components; protecting species and ecosystems that warrant national protection; the sustainable use of indigenous biological resources; the fair and equitable sharing of benefits arising from bioprospecting, including indigenous biological resources; and the establishment of the South African National Biodiversity Institute (SANBI).
- The National Environmental Management: Protected Areas Act, 2003 (Act 57 of 2003) provides for the protection and conservation of ecologically viable areas, the establishment of a national register of protected areas, as well as the proclamation and management of these areas.
- The National Environmental Management: Protected Areas Amendment Act, 2009 (Act 15 of 2009) provides for the assignment of national parks, special parks and heritage sites to South African National Parks (SANParks).
- The National Environmental Management: Protected Areas Amendment Act, 2004 (Act 31 of 2004) provides for a national system of protected areas in South Africa as part of a strategy to manage and conserve the country's biodiversity.
- The National Environmental Management: Air Quality Act (AQA), 2004 (Act 39 of 2004)

reforms the law regulating air quality to protect the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development.
- The National Environmental Management: Integrated Coastal Management Act, 2008 (Act 24 of 2008) establishes a system of integrated coastal and estuarine management in the country, ensuring socially and environmentally responsible development and use.
- The National Environmental Management: Waste Act, 2008 (Act 59 of 2008) reforms the law regulating waste management to protect health and the environment.
- The World Heritage Convention Act, 1999 (Act 49 of 1999) provides for the cultural and environmental protection and sustainable development of, and related activities in a world heritage site.
- South African Weather Service (SAWS) Act, 2001 (Act 8 of 2001).
- Sea Shores Act, 1935 (Act 21 of 1935).
- Sea Birds and Seals Protection Act, 1973 (Act 46 of 1973).
- Dumping at Sea Control Act, 1980 (Act 73 of 1980).
- Sea Fishery Act, 1988 (Act 12 of 1988).
- Antarctic Treaties Act, 1996 (Act 60 of 1996).
- Marine Living Resources Act, 1998 (Act 18 of 1998).
- Prince Edward Islands Act, 1948 (Act 48 of 1948).
- The National Environmental Management: Waste Amendment Act, 2014 (Act 449 of 2014)

Other policy frameworks include:
- The *White Paper on National Climate Change Response, 2011*.
- The *White Paper on Integrated Pollution and Waste Management, 2000*.
- The *White Paper on Environmental Management, 1998*.
- The *White Paper on Conservation and Sustainable Use of Biodiversity, 1997*.
- The *White Paper for Sustainable Coastal Development in South Africa, 2000*.

The following legislation was amended or pending promulgation:
- Draft regulations on the format of the atmospheric impact report.
- Draft notice on the amendment of the national list of activities, which result in atmospheric emissions which have or may have a significant detrimental effect on the environment, including health, social, economic and ecological conditions or cultural heritage published for public comment.
- Draft notice on the declaration of small boilers as controlled emitters published for public comment.
- Draft national dust control regulations published for public comment.
- Under section 62 of the NEMBA of 2004, the summary of the non-detriment findings made by the Scientific Authority published for public comment.
- The Biodiversity Management Plan for Pelargonium sidoides.
- Under section 97 of the NEMBA of 2004, the Regulations related to listed Threatened or Protected Species were published for public comment.
- The National Environmental Management Laws Amendment Act, 2013 (Act 14 of 2013).
- The National Environmental Management: Air Quality Amendment Act, 2014 (Act 20 of 2014).
- The National Environmental Management: Waste Amendment Act, 2014 (Act 26 of 2014).
- The National Environmental Management: Protected Areas Amendment Act, 2014 (Act 21 of 2014).
- In terms of section 97 of the NEMBA of 2004, the Draft Regulations for the Registration of Professional Hunters, Hunting Outfitters and Trainers were published for public participation.

The Waste Classification and Management Regulations and the Norms and Standards for the Assessment of Waste for Landfill and the Norms and Standards for the Disposal of Waste to Landfill were published.

Budget and funding

In the 2015/16 financial year, the DEA spent R5 937 920 of the total allocation of R5 943 297, which presents a 99,9% total spending.

An amount of R103 million for the period of 2014/15 to 2016/17 has been allocated to SANParks to combat rhino poaching. This is in addition to other financial assistance that SANParks has and continues to receive from private-sector organisations.

An amount of R12,1 million was allocated in 2015/16 for the repair of infrastructure damaged by natural disasters at the Kruger National Park in both Limpopo and Mpumalanga.

Both job creation and sustainable development are largely funded through the Environmental Programmes programme. The aim is to create jobs by increasing investment in climate resilient, low carbon, sustainable development.

The programme had an allocation of R2,947 billion during 2015/16 and an allocation of R11,8 billion over the medium term,

accounting for 62,4% of the department's total allocation. The department aims to create 107 193 full-time equivalent jobs and 224 643 work opportunities through EPWPs over the medium term, reflected in increased expenditure in the Environmental Programmes programme.

As the department has an ongoing duty to promote the environmental legal regime, so enforcement and compliance are integral departmental activities.

The department deploys inspectors mainly at points of entry and exit, but also across the country. Increases in the department's personnel to 2 124 by 2017/18 are mainly for increased enforcement and compliance capacity, and to combat rhino poaching. Compensation of employees is expected to reach R1 billion by 2017/18, accounting for 15,9% of the department's budget.

In addition, the department's oceans economy development strategy has the potential to contribute up to R26 billion to GDP and create 55 000 direct jobs by 2019, initially through aquaculture, marine transport, offshore oil and gas exploration. The strategy contributes to the first phase of implementing Operation Phakisa, namely unlocking the economic potential of South Africa's oceans.

Operation Phakisa is government's initiative, announced in June 2014, to speed up delivery on some of the priorities of the NDP. The implementation of the oceans economy development strategy over the medium term is reflected in the 17,3% increase in the Ocean and Coast programme budget to R1,5 billion.

In addition, funding of R296 million is reprioritised from SANParks to fund the strategy, due to slow spending and the accumulation of surpluses in that entity. This is reflected in the Biodiversity and Conservation programme.

The department will be supporting sustainable development over the medium term by, among other interventions, expanding land under conservation (towards the international target of 17% of the country's land area by 2020), rehabilitating degraded ecosystems and identifying environmentally significant areas where mining activities are to be restricted, thus ensuring the sustainable exploitation of natural resources. These activities are funded in the Biodiversity and Conservation programme, which is allocated over R2 billion or 10,8% of the departmental budget over the medium term.

The department will also be focusing on the prevention and elimination of air pollution. The number of air quality monitoring stations will increase to 105 by 2017/18. The finalisation of the desired emission reduction outcomes for the energy, industry, transport, agriculture and forestry, and waste sectors will provide a regulatory framework to improve ambient air quality. Spending for this is in the Climate Change and Air Quality programme, and is expected to increase by 7,7% over the medium term.

Transfers to the SAWS will increase to R570 million over the medium term to strengthen the meteorological operational capacity of the entity, and to ensure air pollution emissions are constantly monitored in terms of the AQA of 2004.

International environment days

World Environment Day

As part of the Environment Month calendar of events, the Department hosted and celebrated the 2015 World Environment Day in Kimberley, Northern Cape. The DEA partnered with the Northern Cape to celebrate the day – marked annually on 5 June – under the theme "Seven Billion Dreams. One Planet. Consume with Care".

The theme, which was declared by the United Nations (UN) Environment Programme (UNEP), centred on the well-being of humanity, the environment, and the functioning of the economy, which ultimately depend upon the responsible management of the planet's natural resources.

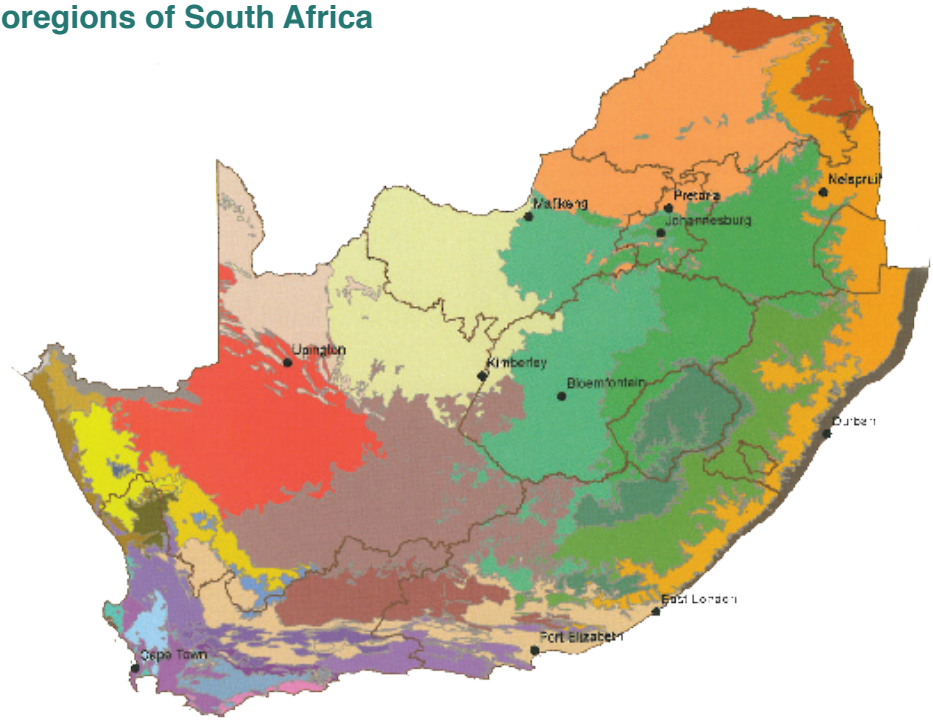
World Environment Day was established in 1972 by the UN General Assembly at the Stockholm Conference on Human Environment to present an opportunity for everyone to realise their responsibility to become agents of change. The day is to create, educate and raise awareness on environmental conservation.

World Oceans Day (WOD)

The 2015/16 WOD event was held on 8 June 2015 in Port Elizabeth, Eastern Cape. The purpose of this event is to raise awareness about the significance of the marine environment and to also promote the role of the oceans and the importance of conserving and protecting the marine environment.

WOD was celebrated under the UNEP's theme: "Healthy Oceans, Healthy Planet". The DEA has strategically customised the theme to "Healthy Oceans, Healthy Planet: Enabling Sustainable Ocean Economy Development," as a way to highlight government's commitment to sustainable ocean economy through Operation Phakisa.

Bioregions of South Africa



- Northwest Fynbos Bioregion
- Southwest Fynbos Bioregion
- Southern Fynbos Bioregion
- South Coast Fynbos Bioregion
- Western Fynbos-Renosterveld Bioregion
- Eastern Fynbos-Renosterveld Bioregion
- West Coast Renosterveld Bioregion
- East Coast Renosterveld Bioregion
- Karoo Renosterveld Bioregion
- Namaqualand Cape Shrublands Bioregion
- Dry Highveld Grassland Bioregion
- West Strandveld Bioregion
- Richtersveld Bioregion
- Namaqualand Hardeveld Bioregion
- Namaqualand Sandveld Bioregion
- Knersvlakte Bioregion
- Trans-Escarpment Succulent Karoo Bioregion
- Rainshadow Valley Karoo Bioregion
- Southern Namib Desert Bioregion
- Gariep Desert Bioregion
- Bushmanland Bioregion
- Upper Karoo Bioregion
- Lower Karoo Bioregion
- Drakensberg Grassland Bioregion
- Dry Highveld Grassland Bioregion
- Mesic Highveld Grassveld Bioregion
- Sub-Escarpment Grassland Bioregion
- Central Bushveld Bioregion
- Mopane Bioregion
- Lowveld Bioregion
- Sub-Escarpment Savanna Bioregion
- Eastern Kalahari Bushveld Bioregion
- Kalahari Dunneveld Bioregion
- Albany Thicket
- Indian Ocean Coastal Belt

Source: *Vision Endangered Wildlife Trust Seventeenth Annual*

World Day to Combat Desertification (WDCD)

On 17 June 2016, South Africa joined other nations around the world in celebrating the WDCD under the theme "Inclusive cooperation for achieving Land Degradation Neutrality".

The slogan for the day, "Protect Earth. Restore Land. Engage People" addresses the importance of comprehensive participation and cooperation in working towards achieving land degradation neutrality.

Marine Week

On 5 October 2015, South Africa launched the celebration of the Marine Week in Polokwane, Limpopo.

It was the first time the celebration was taken to an inland location with the objective to create awareness of the oceans and coastal environment in order to promote sustainable use and conservation for the benefit of present and future generations.

The campaign was celebrated under the theme: "Oceans 70/20: Decoding Mysteries, Maximising Opportunities." Oceans are often mysterious, unexplored and full of wonder.

Important dates on the world's environmental calendar	
2 February	World Wetlands Day
20 March	Earth Day
22 March	World Water Day
23 March	World Meteorological Day
27 March	Earth Hour
22 April	Earth Day
22 May	International Day for Marine Biological Diversity
5 June	World Environment Day
8 June	World Oceans Day
17 June	World Day to Combat Desertification
5 – 11 September	World Water Week
16 September	International Day for the Protection of the Ozone Layer
18 September	International Coastal Clean-up Day
22 September	World Car-Free Day
5 October	World Habitat Day
11 December	International Mountain Day

National Strategy for Sustainable Development (NSSD)

Following the World Summit on Sustainable Development held in South Africa in 2002, the then departments of Environmental Affairs and Tourism and Foreign Affairs were mandated to formulate the NSSD. The first phase of this process culminated in the adoption of the National Framework for Sustainable Development (NFSD) in 2008.

To remain within the prevailing and flexible context, the NFSD strategic priorities were reformulated to form the NSSD. The NSSD builds on the NFSD and a number of existing initiatives by business, government, NGOs, academia and other key role players to address sustainability issues in South Africa.

The goals of the NSSD are to:

- develop and promote new social and economic goals based on ecological sustainability and build a culture that recognises that socio-economic systems are dependent on and embedded within ecosystems;
- increase awareness and understanding of the value of ecosystem services to human well-being;
- ensure effective integration of sustainability concerns into all policies, planning and decision making at national, provincial and local levels;
- to ensure effective integration and collaboration across all functions and sectors;
- to monitor, evaluate and report performance and progress in respect of ecological sustainability.

Mining and Biodiversity Guideline

The Mining and Biodiversity Guideline: Mainstreaming Biodiversity into the Mining Sector, launched in May 2013, is a product of the collaboration between the South African Mining and Biodiversity Forum, the DEA and the Department of Mineral Resources. The guideline seeks to find a balance between economic growth and environmental sustainability and is a key outcome of the Outcome 10 Delivery Agreement.

The Life: State of Biodiversity Report is symbolic of the culmination of 100 years of science in assessing biological resources and highlighting the status of water resources in the country.

The key points in the report are:

- Dynamite in a small package: wetlands, which make up only a little over 2% of the country's footprint, perform irreplaceable functions, such as purifying water and slowing down flood

waters. Many wetlands have already been lost; of those which remain, nearly half are endangered.
- Protect water factories: areas with high natural runoff, such as the Drakensberg, the Soutpansberg and the Wolkberg in Limpopo gather and channel the water, which the semi-arid country depends on. Only about a fifth of these areas are formally protected.
- Treasure the small tributaries: all those smaller rivers, which feed into the country's main, arteries such as the Orange and the Vaal rivers, are needed to keep water supplies in good health.
- Paving over the coast: nearly a fifth of the coastline has some form of development within 100 m of the shoreline, which means nature's buffers against storm surges and rising seas may have been stripped away and paved over in parts. This puts people and property at risk in the face of climate change. Coastal and inshore ecosystems are more threatened than offshore marine ecosystems.
- Lost at sea: further out to sea, offshore ecosystems are the most poorly protected of all South Africa's ecosystems. Yet, these are the lifeblood for healthy and productive fisheries. Marine protected areas (MPAs) are essential for keeping both the ecosystems and the fisheries safe.
- Hand-in-hand – State meets the private sector: biodiversity stewardship programmes, where private landowners enter into an agreement with State conservation bodies to protect a section of their land and biodiversity, are making headway, in terms of national protected area targets. This is more affordable than when the State buys land for conservation purposes. With modest increases in resources, this scheme could make an even larger contribution.
- Warning signs: some parts of the country have lost more natural habitat than others. If Gauteng, KwaZulu-Natal and North West keep losing natural landscapes to cultivation, mining and urban expansion at the current rate, these provinces will have almost no natural habitat left outside protected areas by 2050. Where natural vegetation is being converted to other land uses at a high rate, it's important to use maps of biodiversity-priority areas to guide decisions about where best to locate development.
- Planning for an uncertain climate: with an uncertain and extreme climate in the future natural habitats should be kept healthy so they can support functional, stable landscapes in the long term, which can then better support human activities. Scientists have drawn up a new national map, which identifies areas that are important for climate change resilience and need to be kept intact.
- Protecting natural medicines: South Africa has over 2 000 plant species that are used for medicinal purposes, about a third of which are traded commercially; some are threatened.
- A bridgehead against invasion: invasive alien plants increased their footprint in South Africa in about a decade. The country loses about R6.5 billion worth of ecosystem services to them each year.
- Having the right tools for the job: scientists have made great strides in mapping and classifying South Africa's ecosystems. This has provided the foundation for meaningful assessment, planning and monitoring of ecosystems. The first maps by which to identify marine and coastal habitat types and wetland ecosystem types have been completed.

Projects, programmes and initiatives

South Africa's Green Economy

South Africa's green economy strategy comprises eight key pillars, namely; green buildings and built environment; sustainable transport and infrastructure; clean energy and energy efficiency; resource conservation and management; sustainable waste management; water management; sustainable consumption and production; and agriculture food production and forestry.

As outlined in South Africa's Integrated Resource Plan, by 2030 energy demand needs to be decreased significantly, through technological innovation, good behavioural practice and public commitment to more efficient, sustainable and equitable energy use.

This includes the development of an efficient, lower-carbon public transport system that makes everyday use of private vehicles an unnecessary extravagance.

By 2030 all houses, offices and commercial building will no longer be energy drains, but rather energy sources – supplying electricity to communities through smart meters and smart grids.

National Green Fund

The Green Fund was founded in 2008 and provides start-up funding for innovative and high-impact green economy projects that the private sector or banks would not finance – and supports the transition to a greener economy, all

the while working on poverty reduction and job creation.

Through the implementation of the 17 Strategic Development Goals and South Africa's NDP: 2030, the department aims to address the triple challenges of poverty, unemployment and inequality over the next 15 years.

Efforts to facilitate the transition to a green economy have resulted in the approval of 53 projects by the National Green Fund, resulting in approximately 8 124 job opportunities being created and at least 6 300 individuals being trained since 2013.

Green Fund interventions have realised some 30 000 hectares (ha) converted to conservation land-use, benefiting landowners within the wildlife economy.

This fund continues to make strides, with the recent approval of major projects within the thematic areas of energy and pilot technology for recycling of plastic, contributing significantly towards the management of plastic waste stream.

Sustainable Development and the Green Economy

South Africa continues to play an instrumental role within other global coordination mechanisms. The country's leadership of the G77 plus China in 2015 was instrumental in influencing these negotiations.

Climate Change Response Policy

The national Climate Change Response Policy is guided by the vision of the NDP of a transition to an inclusive, equitable, low carbon and climate resilient economy and society by 2030.

By 2030, South Africa will have an efficient, lower-carbon public transport system that makes everyday use of private vehicles an unnecessary extravagance.

The development of the first phase of desired emission reduction objectives and carbon budgets are well underway. The Carbon Budget system will be introduced in five-year phases – an initial phase from 2016 to 2020, and the subsequent phases from 2021 onwards.

Priority focus areas are communities most vulnerable to the impacts of climate change, namely the indigent, rural dwellers and women.

Given its demonstrated capacity, Sanbi has been appointed the national implementing entity of the Global Adaptation Fund.

Pilot projects include the Greater uMgeni Catchment area in KwaZulu-Natal, the Mopani District in Limpopo and the Namaqua District in Northern Cape.

These projects, to the value of US$10 million, include the enhancement of early warning systems, protecting local communities from extreme weather events, and promoting climate smart agriculture practices.

The SAWS continues to host the Global Atmospheric Watch Station at the Cape Point, one of only three in Africa. This network arose from the need to understand and control the increasing influence of human activity on the global atmosphere and provide climate change information and services.

People and parks

South Africa is home to more than nine million ha of protected areas network, which includes national parks, nature reserves and world heritage sites, equating to about 8% of the country's land.

These protected areas, among other things, serve as sites for conserving South Africa's ecosystems, protection of high biodiversity value and provision of ecosystem services. Most of these protected areas are geographically located in rural areas, forming an integral system with rural communities whose livelihoods and cultures are closely dependent on.

The People and Parks Programme is an initiative that promotes interface between conservation and communities in South African protected areas.

Through the People and Parks Programme, the DEA is actively involved in restoring and maintaining natural ecosystems to stimulate rural economies; upgrading and developing new infrastructure in protected areas to boost tourism, developing commercial assets for communities owning and or living around protected areas; and supporting related industries.

In 2016, the department reported that of the 34 projects that had been initiated, 12 projects have been completed and handed over to owning entities with 12 projects still under implementation and 10 projects still finalising planning processes.

The DEA, through the Environmental Protection and Infrastructure Programme (EPIP), has prioritised funding to the People and Parks programme, as well as to the wildlife economy. An amount of R877 447 290 for People and Parks and R130 300 000 with a total of R1 007 747 290 has been budgeted from 2015/16 to 2017/18.

Wildlife Economy

South Africa is the third most biologically diverse country in the world, and therefore has one of the

largest natural capital assets. This biodiversity is not only economically viable to the economic wellbeing of the country but can be used as a vehicle for social upliftment.

The country's biodiversity comes with a number of challenges, ranging from poaching to overexploitation. The Wildlife Economy in South Africa is centred on the sustainable use of indigenous biological resources, including biodiversity-derived products for trade and bio-prospecting, the hunting industry, agriculture and agro-processing of indigenous crops and vegetables and livestock breeds and indigenous marine resources and fisheries.

The focus of the Wildlife Economy is centred on the socio-economic benefits of eco-tourism, co-managed conservation areas and ancillary services to protected areas.

Harvesting indigenous biological resources is a significant source of income for communities. In many cases, one harvester supports an entire household but the overdependence on these have led to the depletion and at the extreme the extinction of some of the biodiversity.

For example, the existing commercial market for trade in South African bitter aloe, or Aloe ferox is well established, as is the trade in Pelargonium sidoides, buchu, rooibos, honey bush, Devil's Claw and crocodile fat/oil. These indigenous biological resources are predominantly used in the manufacturing of herbal medicines, cosmetics and food flavours and fragrances.

Additional products with commercial potential for industrial or pharmaceutical application are micro-organisms, marine organisms, gums and resins and venoms.

Other significant drivers of the biodiversity economy include trophy hunting and the associated industry of taxidermy, sale of live game, and sale of game meat. Further opportunities exist in the sale of game meat, skins for leather, bones and horns.

Another example of biodiversity-based industry is in silk production. Other biodiversity-based products include bee-keeping products (honey, wax, propollis and royal jelly), Mopane worms and ostrich egg shells and feathers.

Combined, South Africa's national botanical gardens receive nearly 1,5 million visitors a year, with Kirstenbosch, considered one of the world's "Magnificent Seven" botanical gardens, receiving over 820 000 visitors a year.

South African Carbon Disclosure Project (CDP)

The Carbon Disclosure Project (CDP) is a UK-based not-for-profit organisation holding the largest database of corporate climate change information in the world. Established in 2000, the CDP, on behalf of 551 institutional investors, challenges the world's largest companies to measure and report their carbon emissions.

A CDP report released in 2015 showed a steady emissions decline since 2008.

The high level trends show that over the last nine years, there has been an improvement in both disclosure and performance scores, as well as an overall reduction in greenhouse gas (GHG) emissions by the JSE 100. However, the emission reductions achieved in the recent years do not meet required global and national reduction targets.

The CDP report highlights that the number of companies setting specific emission reduction targets has increased from 18 (34%) in 2008 to 58 (78%) in 2015, and more emission reduction activities (ERAs) have been implemented over the reporting years. These ERAs have benefited companies through total monetary savings equivalent to R6,7 billion, from 2011 to 2015 and a total of 16,8 million tonnes CO_2e emission savings from 2012 – 2015.

The response rate over the reporting period has increased from 58% in 2008 to 79% in 2015, with a similar trend observed in the median disclosure scores which increased from 71 in 2008 to 96 in 2015. Additionally, 99% of companies now report their scope 1 and scope 2 emissions which is up from 75% in 2008. Based on these disclosure and performance scores, South Africa has grown to become one of the best responding countries in the world.

More companies are integrating climate change into their governance activities, which shows increased awareness and effort from companies. Since 2008, the percentage of companies that have climate change issues overseen by a board has increased from 75% to 100%; the percentage of companies that have integrated climate change into their risk management strategies has increased from 74% to 97%; and the percentage of companies that have integrated climate change into their business strategies has increased from 80% to 95%.

Role players

South African National Biodiversity Institute

In support of the NDP, government is working through Sanbi to spearhead an innovative

programme of work on analysing ecological infrastructure and costing natural capital. This body of knowledge will empower the DEA to make informed development-related decisions.

The Groen Sebenza Project, launched in 2015 is a R300-million training, mentoring and workplace-based learning project aimed at building a pool of young, capable professionals for the country's biodiversity and natural resource management sector.

Spearheaded by Sanbi, the innovative project will see 800 unemployed graduates and matriculants being placed in skilled biodiversity jobs in both the public and private sector for a period of two-and-a-half years.

The practical workplace experience and training will, it is hoped, kick-start their careers in a fast-growing industry. The project is sponsored by the Government's Jobs Fund, which is administered by the Development Bank of Southern Africa.

SANBI is a respected authority in research and has an unmatched research record in the indigenous, naturalised and alien flora of southern Africa and beyond. Its research management covers systematics and collections expansion, conservation and applied biodiversity science, and climate change. SANBI is also responsible for ensuring that biodiversity knowledge influences policy, management and decision making.

Its biome programmes, which focus on South Africa's biodiversity hotspots, ensure that the country's most important biodiversity regions, such as the grasslands, wetlands and succulent Karoo, are protected in a sustainable and beneficial way. SANBI is increasingly embracing biodiversity in its broadest sense through the inclusion of the country's fauna as part of its taxonomic research mandate. It is coordinating a catalogue of all South Africa's species (at least 100 000), including animals, through the South African Tree of Life Project.

The institute operates environmental education programmes within its national botanical gardens, while outreach greening programmes focus on promoting indigenous gardening at disadvantaged schools in surrounding areas.

SANBI is South Africa's official body for facilitating access to the Adaptation Fund, set up to help developing countries cope with climate change. It was established by the parties to the Kyoto Protocol of the UN Framework Convention on Climate Change (UNFCCC) to finance concrete adaptation projects and programmes in developing countries that are parties to the protocol.

Working for the Coast (WftC) programme

The WftC programme of the DEA was established to deal with some of the challenges in line with the Integrated Coastal Management Act, 2008. The WftC programme is informed by the broader EPWP, which is using labour-intensive methods in its implementation.

The programme is also linked to other inland EPIP aimed at street cleaning and greening, waste management, rehabilitation of degraded areas (catchments) and bio-remediation of polluted rivers.

iSimangaliso Wetland Park Authority

The Lake St Lucia System is the most important estuary and a key nursery for fish on the southeast African coast. For six decades St Lucia received too little fresh water, due to human interventions and drought, leaving this flagship estuary in poor condition and closed to the sea for much of the past 10 years. Work has begun on restoring St Lucia back to health, a top priority for the iSimangaliso Wetland Park Authority, but it is challenging and will take time.

As an area of exceptional and outstanding universal heritage significance, the iSimangaliso Wetland Park was named South Africa's first World Heritage site in December 1999.

The park has received recognition under three of four natural criteria recognised by the World Heritage Convention: it has outstanding examples of ecological processes, superlative natural phenomena and scenic beauty, and exceptional biodiversity and threatened species.

iSimangaliso is located in one of South Africa's poorest rural areas and has been largely under claim. All but three of the land claims settlements have been concluded and a series of co-management agreements have been signed with land claimants. The management of such a diverse asset in an area of extreme poverty and high expectations requires an adaptive and inclusive approach.

MET Mbokodo Unite was launched in August 2015. This is a networking and mentorship programme for women in meteorology and related sciences, developed by the South African Weather Service.

The MET Mbokodo Unite Project aims to attract young women into the sector through targeted outreach programmes and mentorship.

Another objective is the retention of women in the sector through creating an enabling environment through the networking programme as well as engagement of women in weather-sensitive industries (e.g. agriculture) and targeting education and awareness programmes in this regard.

South African Weather Service

The SAWS provides useful and innovative weather, climate and related products and services by:

- enhancing observational data and communications networks
- developing and managing talent within the sector
- enhancing collaborative partnerships and disseminating weather services products to their users
- using cutting-edge technology to convert data into meaningful products and services for risk mitigation
- advancing the science of meteorology, research and relevant applications
- enhancing fiscal discipline and resource mobilisation to ensure sustainability.

In its continued efforts to carry out its legal mandate, the work of SAWS is guided by four key strategic goals:

- ensuring the continued relevance of the organisation in delivering meteorological-related products and services in compliance with all applicable regulatory frameworks
- ensuring effective management of stakeholder, partner and key client relations
- addressing the short-term viability and long-term sustainability of the entity's revenue and ensuring continued fiscal discipline
- ensuring the availability of strategy-driven human capital capacity for the performance of the SAWS.

Environmental resources

National botanical gardens

SANBI manages the 10 national botanical gardens, classified as conservation gardens, in seven of South Africa's nine provinces. Together, they conserve more than 7 500 ha of natural vegetation.

South Africa's national botanical gardens have, since their establishment at different times during the 20th and 21st century, focused on growing and conserving South Africa's indigenous plants. Together they conserve over 7 400 ha of natural vegetation and associated biodiversity within their boundaries.

The national botanical gardens are natural escapes close to some of the country's urban centres, offering visitors a taste of the country's uniquely rich and colourful biodiversity. They feature facilities such as restaurants, function rooms and conference venues and include activities such as hikes, picnics and shopping.

The botanical gardens are:

- Kirstenbosh, Cape Town
- Pretoria, Tshwane
- Harold Porter, Betty's Bay
- Walter Sisulu, Roodepoort
- Hantam, Nieuwoudtville
- Free State, Bloemfontein
- Karoo Desert, Worcester
- KwaZulu-Natal, Pietermaritzburg
- Lowveld, Nelspruit
- Kwelera, East London

> The Succulent Karoo Biome is one of only two arid biodiversity hotspots in the world, the other being the Horn of Africa.

National Herbarium

The National Herbarium, situated within the Pretoria National Botanical Garden, houses over one million scientific plant specimens in southern Africa.

The Crompton Herbarium in Cape Town focuses mainly on the flora of the winter rainfall region of southern Africa, while the KwaZulu-Natal Herbarium in Durban primarily focuses on the flora of the subtropical eastern region of South Africa, in particular the flora of the province.

Protected areas

The Convention on Biological Diversity (CBD) founded in 1992 at the Rio Summit, is the legally binding agreement on the use and conservation of biological diversity.

The Convention provides the framework for 196 parties to guide efforts to conserve, and sustainably use biological diversity and equitably share the benefits from the use of genetic resources. In October 2010, the parties approved the Strategic Plan for Biodiversity for 2011 – 2020 including 20 Aichi Targets. There are a number of management categories of protected areas in South Africa, which conform to the accepted categories of the International Union for Conservation of Nature (IUCN).

South Africa has 528 protected areas, of which 20 were marine, totalling 7,5 million ha or 6,2% of the country's land area.

South Africa aims to expand the conservation areas under formal protection to the international standard of 10% of the total area of the country. The department works closely with landowners to ensure their participation in the Stewardship Programme, which allows land owners to use their land for biodiversity and conservation purposes. This is aimed at expanding the country's conservation estate.

Scientific reserves

Scientific reserves are sensitive and undisturbed areas managed for research, monitoring and the maintenance of genetic sources.

Access is limited to researchers and staff. Examples of such areas are Marion Island and the Prince Edward Islands near Antarctica.

Wilderness areas

These areas are extensive, uninhabited and underdeveloped, and access is strictly controlled with no vehicles allowed. The highest management priority is the maintenance of the intrinsic wilderness character.

Wilderness areas include the Cederberg Wilderness Area and Dassen Island in the Western Cape, and the Baviaanskloof Wilderness Area in the Eastern Cape.

South African National Parks

SANParks' primary mandate is to oversee the conservation of South Africa's biodiversity, landscapes and associated heritage assets through a system of national parks. Its mandate is based on the following core values:

- conservation management through the national parks system
- constituency building and people-focused eco-tourism management
- corporate governance and sound business and operational management.

SANParks manages a system of parks, which represents the indigenous fauna, flora, landscapes and associated cultural heritage of the country.

SANParks is responsible for 3 751 113 ha of protected land in 20 national parks. SANParks has increased the area of land under its protection by 360 000 ha over the past 20 years. Since 2000, SANParks has added 558 897 ha to its national parks.

In 2015/16, SANParks welcomed close to six million guests to its parks, a 6% increase compared to 2014/15. There was also an increase in operating tourism revenue, which grew by 14,7% in 2015/16. Operating tourism revenue reached a figure of R1,29 billion, which was R93,8 million greater than budget. All components of operating tourism revenue saw good growth in the year under review with concession fee income growing by 14%, accommodation income by 12% and concession fees by 21%.

This revenue funds activities and projects, mostly infrastructure, which could not be accommodated in the budget allocations.

The national parks are:

- Addo Elephant National Park
- Agulhas National Park
- Ai-Ais/Richtersveld Transfrontier Park
- Augrabies Falls National Park
- Bontebok National Park
- Camdeboo National Park
- Garden Route (Tsitsikamma, Knysna and Wilderness) National Park
- Golden Gate Highlands National Park
- Karoo National Park
- Kgalagadi Transfrontier Park
- Kruger National Park
- Mapungubwe National Park
- Marakele National Park
- Mokala National Park
- Mountain Zebra National Park
- Namaqua National Park
- Table Mountain National Park (which incorporates the Cape of Good Hope, Table Mountain and Silvermine nature reserves)
- Tankwa Karoo National Park
- West Coast National Park.

Tourism activities within the parks include self-drive safaris, game viewing, accommodation tariffs, adventure activities such as guided walks and hiking, bird-watching, 4x4 trails, sight-seeing, cultural and historical experiences, mountain biking, golf, canoeing and swimming.

In 2015/16, 23 298 people from 359 communities adjacent to the national parks were employed in a range of EPWP initiatives. This equates to a total of 6 364 Full Time Equivalents of employment, which is greater than the total number of full-time employees in SANParks.

Transfrontier conservation areas (TFCAs)

A TFCA is a cross-border region. The conservation status of the areas within a TFCA ranges from national parks, private game reserves and communal natural-resource management areas to hunting-concession areas. Although fences, highways, railway lines or other barriers

The 10th Annual Air Quality Governance Lekgotla was hosted in Bloemfontein, Free State, in September 2015. During the opening session of the Lekgotla, the 2015 State of Air Report and National Air Quality Indicator was tabled.

The 2015 Lekgotla was hosted under theme "Launching the Air Quality Management Systems for Transparent Governance and Improved Service Delivery."

The Lekgotla brought together at least 350 air quality officials from all three spheres of government, to deliberate on various pertinent issues such as Air Quality Management Planning Tools, Ambient Air Quality Monitoring as well as Compliance Monitoring and Enforcement.

The platform created an opportunity for government officials to interact and strengthen regulatory tools towards improved air quality management.

separate the constituent areas, they are managed jointly for long-term sustainable use of natural resources.

Unlike in transfrontier parks, free movement of animals between the components of a TFCA is not always possible. TFCAs facilitate and promote regional peace, cooperation and socio-economic development.

The success of TFCAs depends on community involvement. In turn, TFCAs provide local communities with opportunities to generate revenue.

The seven TFCAs are the:

- Ai-Ais/Richtersveld (Namibia, South Africa)
- Great Limpopo Transfrontier Park (Botswana, South Africa, Zimbabwe)
- Greater Mapungubwe
- Kavango-Zambezi (Angola, Botswana, Namibia, Zambia, Zimbabwe)
- Kgalagadi Transfrontier Park (Botswana, South Africa)
- Lubombo Transfrontier Conservation and Resource Area (Mozambique, South Africa, Swaziland)
- Maloti-Drakensberg Transfrontier Conservation and Development Area (Lesotho, South Africa).

Biosphere reserves

A biosphere designation is given by the UN Educational, Scientific and Cultural Organisation (UNESCO) to special landscapes where people are collaborating to ensure their environmental integrity as the basis for their economic development. Biosphere reserves are nominated by their governments for inclusion in the Man and the Biosphere Programme.

Whether they are terrestrial, freshwater, coastal or marine in nature, all are experimental areas where different approaches to integrated environmental management (IEM) are tested. This helps to deepen knowledge of what works in conservation and sustainable development.

South Africa's biosphere reserves include:

- Vhembe, situated in the north-east of Limpopo, which includes the northern part of the Kruger National Park; the Makuleke Wetland, which is protected under the Ramsar Convention; the Soutpansberg and Blouberg biodiversity hot spots; and the Makgabeng Plateau.
- The 100 000-ha Kogelberg Reserve on the country's southern coast is in the middle of the Cape Floral Region and home to 1 880 different plant species, 77 of which are found only in this region.
- The Cape West Coast Biosphere Reserve starts in Cape Town in the southern suburb of Diep River and stretches up the west coast as far as the Berg River, encompassing parts of the Cape Floral Region. The reserve includes the Ramsar-protected Langebaan Lagoon as well as Dassen Island, which is home to a penguin colony.
- The Cape Winelands Biosphere Reserve includes a part of the Cape Floral Region, as well as the wine-growing region.
- In the north there is the Waterberg Biosphere Reserve, an area of some 400 000 ha in Limpopo. It is an important catchment area for the Limpopo Basin, with four large rivers originating within its borders – the Lephalale, Mokolo, Matlabas and Magalakwena rivers.
- The Kruger-to-Canyons Biosphere Reserve stretches from the Kruger National Park to the Blyde River Canyon. It is an important conservation area as it covers three biomes.
- The Gouritz Cluster Biosphere Reserve is recognised by UNESCO in terms of the Man and Biosphere Programme.

World heritage sites

A UNESCO World Heritage Site is listed by UNESCO as being of special cultural or physical significance.

It catalogues, names and conserves sites of outstanding cultural or natural importance to the common heritage of humanity.

While each World Heritage Site remains part of the legal territory of the province wherein the site is located, UNESCO considers it in the interest of the international community to preserve each site.

South Africa has eight world heritage sites proclaimed by UNESCO:

- Robben Island: situated 11 km offshore from Cape Town, the island is most famous as the place where Nelson Mandela was imprisoned. It is now home to the world-renowned Robben Island Museum and has become a popular tourist attraction.
- The iSimangaliso Wetland Park was listed

In March 2015, World Wildlife Fund (WWF) South Africa in partnership with Local Governments for Sustainability, the City of Tshwane and Tshwane University of Technology (TUT) hosted the Earth Hour Capital Challenge, an event aimed at raising the profile of public transport as a means to support low-carbon development.

TUT students paired with WWF and City of Tshwane partners used all available modes of public transport to navigate a series of destination checkpoints across the city. Guided by the newest release of the urban transportation and journey planner app, Findmyway, the winning team was one that completed the route with the lowest carbon footprint.

as South Africa's first World Heritage Site in December 1999 in recognition of its natural beauty and unique global values. The 332 000-ha park contains three major lake systems, eight interlinking ecosystems, 700-year-old fishing traditions, most of South Africa's remaining swamp forests, Africa's largest estuarine system, 526 bird species and 25 000-year-old coastal dunes – among the highest in the world. The name iSimangaliso means miracle and wonder. The park also has four Ramsar sites.

- The Cradle of Humankind consisting of the hominid fossil sites at Swartkrans, Sterkfontein and Kromdraai. The world heritage status of Sterkfontein's fossil hominid sites was extended in July 2005 to include the Taung skull fossil site in North West and the Mokopane Valley in Limpopo. The Cradle of Humankind has one of the world's richest concentrations of hominid fossils that provide evidence of human evolution over the past 3,5 million years. Found in Gauteng and North West, the fossil sites cover an area of 47 000 ha. The remains of ancient forms of animals, plants and hominids are encased in a bed of dolomite deposited around 2,5 billion years ago. In April 2010, a new species of hominid, Australopithecus sediba, estimated to be two million years old, was discovered in the Cradle of Humankind.
- The Ukhahlamba-Drakensberg Park (a mixed natural and cultural site) is a world heritage site covering 242 813 ha (2 428 km²). The park spans parts of both South Africa and Lesotho. The park includes the Royal Natal National Park, a provincial park, and the Drakensberg National Park, which covers part of the Drakensberg, the highest mountain in southern Africa. Under the Ramsar Convention, the park is in the List of Wetlands of International Importance.
- Mapungubwe Heritage Site: in September 2011, the DEA, SANParks and Coal of Africa Limited signed an historical Memorandum of Agreement (MoA) as part of the environmental authorisation issued in accordance with Nema of 1998, to ensure the integrity of the Mapungubwe Cultural Landscape World Heritage Site. According to the MoA, the integrity of the World Heritage Site will be maintained through comprehensive biodiversity offset programmes, thereby optimising benefits to local communities.
- Cape Floral Region, the smallest of the six recognised floral kingdoms of the world, is an area of extraordinarily high diversity and home to more than 9 000 vascular plant species, of which 69% are endemic. Much of this diversity is associated with the fynbos biome. The economical worth of fynbos biodiversity, based on harvests of fynbos products (e.g. wildflowers) and ecotourism, is estimated to be in the region of R77 million a year. In July 2015, UNESCO approved the extension of the Cape Floral Region Protected Areas World Heritage Site. At the time of inscription, the site was made up of eight protected areas comprising about 553 000 ha. The eight protected areas are located in the Eastern Cape and the Western Cape. The extension brings the size of the World Heritage Site to 1 094 742 ha and increases the number of protected area clusters making up the Cape Floral Region from eight to 13.
- Richtersveld Cultural and Botanical Landscape: The site covers 160 000 ha of dramatic mountainous desert in the north-west of South Africa. It is the only area where the Nama still construct portable rush-covered domed houses, or Iharu oms.
- Vredefort Dome, about 120 km south-west of Johannesburg, is a representative part of a larger meteorite impact structure, or astrobleme. Dating back more than two million years, it is the oldest astrobleme yet found on Earth. With a radius of 190 km, it is also the largest and the most deeply eroded. Vredefort Dome bears witness to the world's greatest known single energy release event, which had devastating global effects including, according to some scientists, major evolutionary changes. It provides evidence of the Earth's geological history and is crucial to understanding of the evolution of the planet.

South Africa's Ramsar sites include:

- Barberspan
- Blesbokspruit Nature Reserve
- De Hoop Vlei
- De Mond (Heuningnes Estuary)
- Kosi Bay
- Langebaan
- Makuleke Wetlands
- Ndumo Game Reserve
- Ntsikeni Nature Reserve
- Nylsvley Nature Reserve
- Orange River Mouth Wetland
- Prince Edward Islands in Antarctica
- Seekoeivlei
- St Lucia
- the turtle beaches and coral reefs of Tongaland
- Ukhahlamba-Drakensberg Park
- Verlorenvlei Nature Reserve
- Wilderness Lakes.

Despite the importance of impact sites to an the planet's history, geological activity on the Earth's surface has led to the disappearance of evidence from most of them, and Vredefort is the only example to provide a full geological profile of an astrobleme below the crater floor.

Habitat and wildlife management areas

These areas are subject to human intervention, based on research into the requirements of specific species for survival. They include conservancies; provincial, regional or private reserves created for the conservation of species habitats or biotic communities; marshes; lakes; and nesting and feeding areas.

Protected land and seascapes

These areas are products of the harmonious interaction of people and nature, and include natural environments protected in terms of the Environment Conservation Act, 1989 (Act 73 of 1989), scenic landscapes and historical urban landscapes.

Sustainable-use areas

These areas emphasise the sustainable use of protected areas such as the Kosi Bay Lake System in KwaZulu-Natal.

Nature areas in private ownership are proclaimed and managed to curtail undesirable development in areas with high aesthetic or conservation potential.

Conservancies are formed to involve the ordinary landowner in conservation. Landowners can establish a conservancy where conservation principles are integrated with normal farming activities.

Wetlands

The IUCN identifies wetlands as the third most important support system on Earth.

Wetlands make up only 2,4% of South Africa's surface area but they are responsible for a disproportionately high value of "ecological infrastructure" that provides critical ecosystem services such as water purification and flood regulation, among others.

Wetlands support a range of specialised plant, insect and mammal life and also supply food, grazing, building and craft material. They are able to improve water quality, reduce flood impacts, control erosion and sustain river flows. Of special importance is the role wetlands play in ensuring a steady supply of clean water for communities and helping government save hundreds of millions of rands that would be required to set up purification plants/facilities.

South Africa was one of the first six countries to become a signatory to the Convention on Wetlands of International Importance, called the Ramsar Convention, when it came into force in 1975. It is an intergovernmental treaty that provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources.

South Africa has 22 Ramsar sites.

The DEA is responsible for the South African Wetlands Conservation Programme, which ensures that South Africa's obligations in terms of the Ramsar Convention are met.

South Africa's Ramsar sites include:

- Barberspan
- Blesbokspruit Nature Reserve
- De Hoop Vlei
- De Mond (Heuningnes Estuary)
- Kosi Bay
- Langebaan
- Makuleke Wetlands
- Ndumo Game Reserve
- Ntsikeni Nature Reserve
- Nylsvley Nature Reserve
- Orange River Mouth Wetland
- Prince Edward Islands in Antarctica
- Seekoeivlei
- St Lucia
- the turtle beaches and coral reefs of Tongaland
- Ukhahlamba-Drakensberg Park
- Verlorenvlei Nature Reserve
- Wilderness Lakes.

South Africa is seen as a leader in the rehabilitation of wetlands. The damage done to wetlands can be reversed, as is seen at Rietvlei Dam in Gauteng.

Government has pledged more than R75 million to rehabilitating wetlands. Rehabilitation is ongoing, with attention given to poverty-stricken areas.

World Wetlands Day is annually celebrated on 2 February.

Marine protected areas

MPAs conserve natural environments and assist in the management of fisheries by protecting and rebuilding economically important stocks. They are also used to develop and regulate coastal ecotourism opportunities.

Government shares joint responsibility for South Africa's MPAs with SANParks and Ezemvelo KwaZulu-Natal Wildlife.

South Africa's MPAs include:

- Aliwal Shoal, KwaZulu-Natal
- Betty's Bay, Western Cape
- Bird Island, Eastern Cape

- De Hoop, Western Cape
- Dwesa-Cwebe, Eastern Cape
- False Bay, Western Cape
- Goukamma, Western Cape
- Hluleka, Eastern Cape
- iSimangaliso, KwaZulu-Natal
- Langebaan Lagoon, Sixteen Mile Beach, Malgas Island, Marcus Island, Jutten Island, Western Cape
- Pondoland, Eastern Cape.
- Robberg, Western Cape
- Sardinia Bay, Eastern Cape
- Stilbaai, Western Cape
- Table Mountain, Western Cape
- Trafalgar, KwaZulu-Natal
- Tsitsikamma, Western Cape.

Zoological gardens

Established in 1899 in Pretoria, and given national status in 1916, the National Zoological Gardens (NZG) of South Africa is the largest zoo in the country and the only one with national status. Over 600 000 people visit it every year.

It plays a major role in the conservation of wildlife, maintaining one of the largest animal collections in Africa, and has over 8 000 individual animal specimens representing over 500 species.

The species are managed across two facilities stretching into Gauteng (Pretoria) and Limpopo (Mokopane). About 70% of the species are of African origin and 30% of global representation.

As a member of the World Association of Zoos and Aquariums and the African Association of Zoos and Aquaria, the NZG participates in several endangered species management programmes and successfully breeds several endangered species of both continental and global significance.

Among the endangered species the NZG contributes to conserving are the cheetah, rhino, ground hornbill, red-billed oxpecker and several endangered antelope species.

The animal collections of the NZG are the direct responsibility of the Animal Collection and Conservation Department. The department operates in two facilities: the main facility in Tshwane and the Mokopane Biodiversity Conservation Centre, 200 km north of Tshwane.

The Johannesburg Zoological Gardens' core business is the accommodation, enrichment, husbandry and medical care of wild animals.

It also plays an important role in conservation projects of both indigenous and internationally endangered animals. The zoo joins other conservation organisations in programmes involving:

- wattled crane recovery
- amphibian conservation
- ground hornbill breeding and off-site surveys
- vulture conservation
- chimpanzee conservation with the Jane Goodall Institute.

The Endangered Wildlife Trust (EWT) is a major partner.

Mitchell Park in Durban is the country's second oldest zoo after the NZG. There are about 30 projects on the cards for the zoo, including cheetah and chimpanzee enclosures.

Breeding centres

There are a number of game-breeding centres in South Africa. The NZG of South Africa is responsible for the management of the Lichtenburg Biodiversity Conservation Centre, which covers an area of some 6 000 ha, and the Mokopane Biodiversity Conservation Centre, covering 1 333 ha.

The two centres supplement the NZG's breeding programme for various endangered animals, and its own animal collection.

The Lichtenburg Biodiversity Conservation Centre houses, among other animals, Père David's deer, which are extinct in the wild, pygmy hippopotamus, white rhino, the endangered addax, and scimitar-horned and Arabian oryx. Large herds of impala, springbok, zebra, blesbok and red hartebeest also roam the area.

About 32 ha of the wetland area at the centre have been developed into a system of dams and pans, which serve as a natural haven for waterbirds such as spoonbills, kingfishers, ibises and herons.

The Mokopane Biodiversity Conservation

The animal collections of the NZG are the direct responsibility of the Animal Collection and Conservation Department. The department operates in two facilities: the main facility in Tshwane and the Mokopane Biodiversity Conservation Centre, 200 km north of Tshwane.

The facility in Tshwane is an 84-ha ex situ based facility, which is home to approximately 5 000 different mammals, birds, fish, reptiles, amphibians and invertebrates, comprising of around 600 species and subspecies. One of its unique features is that it has the largest inland aquarium in Africa, which also has a marine fish component. It is also the only zoo in South Africa that is home to koalas, okapi, Komodo dragons and forest buffalo, to name but a few.

The second facility, the Mokopane Biodiversity Conservation Centre, has both an ex situ and in situ component. The centre is 1 394 ha in size and hosts approximately 830 animals of 42 different species and subspecies directly in its care. In the reserve component, a total of 105 tree species, 71 grass species and 173 free-ranging bird species have also been identified. In 2007, the MBCC was proclaimed as a protected area as a Fossil Hominid Site of SA: Mokopan Valley.

Centre is home to an abundance of exotic and indigenous fauna such as the lemur, the rare tsessebe, roan antelope and black rhino.

The De Wildt Cheetah and Wildlife Centre near Pretoria, is best known for its captive-breeding programme that contributed to the cheetah being removed from the endangered list in the South African Red Data Book – Terrestrial Mammals in 1986.

De Wildt also breeds a number of rare and endangered African species.

The most spectacular of these is the magnificent king cheetah, which is a true cheetah, but with a variation in coat pattern and colouring. De Wildt also plays a major role in breeding and releasing wild dogs.

It has donated breeding nuclei of the highly endangered riverine rabbit and suni antelope to the Kruger National Park.

The De Wildt Vulture Unit is a rehabilitation and holding facility for injured, poisoned and disabled vultures.

The Hoedspruit Endangered Species Centre in Limpopo was established as a breeding programme for the then endangered cheetah.

The centre caters for, among other animals, five species of vulture: Cape griffins as well as white-backed, hooded, whiteheaded and lappet-faced vultures.

The centre is also known for its wild-dog breeding programme.

The Hoedspruit Research and Breeding Programme includes the rare black-footed cat, vulnerable African wild cat, ground hornbills (in cooperation with the NZG), the bald ibis and the endangered blue crane. Elephant, white rhino, buffalo, caracal, sable antelope, bushbuck and tsessebe have also been cared for and rehabilitated there.

The Cape Vulture Breeding and Reintroduction Programme celebrated the first release of three different ages of captive-bred Cape vultures into the Magaliesberg Mountains in February 2015. Each bird was fitted with a solar-powered GPS tracking unit to enable post-release monitoring as a vital part of the reintroduction and research programme. The chicks are being monitored to follow their integration into wild populations by observing ranging and roosting behaviours, competitive behaviours, weight gain and body condition.

Aquariums and oceanariums

There are aquariums in Pretoria, Port Elizabeth, Cape Town, Durban and East London.

The Aquarium and Reptile Park of the NZG in Pretoria is the largest inland aquarium in Africa, with the largest collection of freshwater fish.

It is also the only aquarium in South Africa that exhibits a large variety of marine fish in artificial sea water and the only inland aquarium housing ragged-tooth sharks.

The Port Elizabeth Oceanarium is one of the city's major attractions. Exhibits include an underwater observation area, a dolphin research centre, various smaller tanks containing 40 different species of bony fish and two larger tanks that display sharks and stingrays. East London aquarium was 84 years old in 2015, making it South Africa's oldest aquarium.

At the Two Oceans Aquarium at the Victoria and Alfred Waterfront, Cape Town, more than 3 000 specimens represent some 300 species of fish, invertebrates, mammals, birds and plants supported by the waters along the Cape coast.

The aquarium at uShaka Marine World in Durban incorporates both fresh and sea water species, and is the fifth largest aquarium in the world by water volume. It comprises Sea World, Dolphin World, Beach World, and Wet and Wild World.

Sea World has a unique shipwreck-themed aquarium, a penguin rookery and a 1 200-seater dolphin stadium, the largest dolphinarium in Africa.

Snake and reptile parks

The Port Elizabeth Snake Park at Bayworld has a wide variety of South African and foreign reptiles, including tortoises, boa constrictors, pythons, crocodiles, lizards and deadly venomous snakes such as cobras, mambas and rattlers. Rare and threatened species, including the Madagascar ground boa, are housed in realistically landscaped glass enclosures.

The Aquarium and Reptile Park at the NZG houses 80 reptile species from all over the world.

The Hartbeespoort Dam Snake and Animal Park near Pretoria features one of the finest reptile collections in southern Africa. It offers seal shows and snake-handling demonstrations.

The Pure Venom Reptile Farm is one of the largest of South Africa's reptile parks. It is inland from Shelly Beach, on KwaZulu-Natal's South Coast.

The CrocRiver Enviro Park in Nelspruit is the largest facility of its type in Africa. The park offers, among other things, turtle, crocodile and fish ponds; the water monitor lizard pond; and the Desert House, in which a desert-like atmosphere has been created, and which is home to the reptile gallery where indigenous and exotic reptiles from all over the world are

displayed.

Khamai Reptile Centre's primary aims are conservation, breeding of endangered reptiles and education. Located outside Hoedspruit in Mpumalanga, it offers a close-up look at many local as well as exotic snakes, crocodiles and lizards.

Managing environmental resources

Rhino poaching

For the first time since 2007, the number of rhinos poached fell in 2015. Some 1 175 rhinos were poached – 40 fewer than in 2014. Poaching in Kruger National Park, which is home to somewhere between 8 400 and 9 300 rhinos, has been on the rise. Some 202 poachers were arrested in the park in 2015, and another 115 were arrested just outside it. South Africa is home to an estimated 19 700 rhinos, about 80% of the world's population.

Government continued to strengthen holistic and integrated interventions and explore new innovative options to ensure the long-term survival of the species.

Prevention of rhino poaching included an intensification of anti-poaching actions by SANParks and the police, as well as the South African National Defence Force and provincial conservation and security officials.

South Africa's multi-disciplinary response further included the creation of an intensive protection zone within the Kruger National Park, the introduction and implementation of new technology, pro-active intelligence, improving national, regional and international collaboration, and translocating rhino to safe areas within the country, and in rhino range states.

The DEA has a number of interventions to fight rhino poaching. They include strategic translocation of rhino, increased collaboration between law-enforcement agencies, disruption of criminal syndicates and tightening ports of entry and exit to combat the smuggling of illicitly sourced wildlife parts, including rhino horns. Other interventions include: providing economic alternatives for communities vulnerable to recruitment by poachers and collaboration with range, transit and end-user states.

Marine pollution and sustainability

South Africa has one of the world's busiest shipping routes and has experienced many oil spills over the years. It is estimated that 80% of the world's tanker traffic passes South Africa's coast.

In South Africa, numerous private bodies are involved in conservation activities. More than 400 organisations concentrate on conservation, wildlife and the general environment, while more than 30 botanical and horticultural organisations concentrate on the conservation of the country's fauna and flora. These include the:

- BirdLife South Africa
- Botanical Society of South Africa
- Centre for Rehabilitation of Wildlife
- Conservation International
- Delta Environmental Centre
- Dolphin Action Protection Group
- EcoLink
- EWT
- Ezemvelo KZN Wildlife
- Green Trust
- Keep South Africa Beautiful
- KwaZulu-Natal Sharks Board
- National Conservancy Association of South Africa
- Peace Parks Foundation
- Southern African Foundation for the Conservation of Coastal Birds
- Trees and Food for Africa
- Wildlife and Environment Society of South Africa
- World Wildlife Fund of South Africa.

The then Department of Environmental Affairs and Tourism developed the National Contingency Plan for the Prevention and Combating of Pollution from Ships, in consultation with the South African Maritime Safety Authority and the Department of Transport. This includes disposing of, recovering or stabilising spilt oil and rehabilitating the environment.

With 80% of marine pollution emanating from land-based activities, the DEA will be implementing the national Programme of Action for land-based sources of pollution, while refining strategies for combating marine pollution from oil spills.

The department has embarked on a process to adopt a new protocol on land-based sources of marine pollution under the amended Nairobi Convention for the Protection, Management and Development of the Marine and Coastal Environment of the Western Indian Ocean.

The department has also developed the Cape Zone Oil Spill Plan.

Protecting the coastline

To counter illegal activities along the coastline, as well as the country's 1 155 000-km^2 Exclusive Economic Zone (EEZ), the former Department of Environmental Affairs and Tourism boosted its compliance unit with the appointment of more than 80 fishery-control officers and 100 honorary fishery-control officers, after the implementation of the Honorary Fishery-Control

Officers Policy.

The department took delivery of four environmental-protection vessels as part of measures to protect marine and coastal resources, namely the Lillian Ngoyi, Ruth First, Victoria Mxenge and Sarah Baartman. They patrol up to the 200 nautical-mile limit from the shore and the most remote reaches of the EEZ as well as around the Prince Edward Islands. The vessels also conduct multilateral patrols in the SADC coastal states.

Operation Phakisa: Oceans Economy

Operation Phakisa was launched in 2014. The project was expected to play a critical role in fast-tracking delivery of the priorities outlined in the NDP. The first phase of implementing Operation Phakisa was led by the DEA. It focused on unlocking the economic potential of South Africa's oceans, which are estimated to have the potential to contribute up to R177 billion to the country's GDP by 2033 compared with R54 billion in 2010.

Operation Phakisa's achievments in 2015/16 include:

- In April 2016, it was announced that government had unlocked investments amounting to about R17 billion in the Oceans Economy.
- In addition, over 4 500 jobs had been created in the various sectors since the inception of Operation Phakisa: Oceans Economy.
- The programme added great impetus in the development of infrastructure: over R7 billion had been allocated by Transnet National Ports Authority to improve the country's ports.
- Of the nine tugboats being built by South African Shipyards for Transnet National Ports Authority in the Port of Durban, two were destined for the Port of Port Elizabeth.
- Two bulk carriers were registered on the South African Ships Register and would be using the Port of Port Elizabeth as home port, providing opportunities for South African crew and cadets. A further registered vessel would be using Cape Town as it home port.
- Work had also continued to refurbish the Port of Durban.
- The Durban Dry Dock Caisson, which allows water to be pumped out of the dock and for work on vessels to occur in the dry, had been installed and floated by January 2016. The dry dock was opened for business. This development represents an investment of R43 million.
- In the Port of Saldanha Bay, which is to be established as an oil and gas hub, work had already commenced on the Offshore Supply Base. This is one of three projects making up a R9,2 billion public-private partnership investment over a five-year period.
- R353 million had been committed in the ports of Durban and Cape Town for boatbuilding infrastructure, creating approximately 355 direct jobs.
- Investments in boatbuilding and a fuel storage facility in the Port of Cape Town, amounting to approximately R3,6 billion, had been committed.
- Operation Phakisa will also be used to develop rural economies through small harbour development, coastal and marine tourism and aquaculture. R80 million had been allocated for the rehabilitation and maintenance of proclaimed fishing harbours in Gansbaai, Saldanha Bay, Struisbaai, Gordons Bay and Lamberts Bay in the Western Cape.
- The establishment of three new harbours in Northern Cape, Eastern Cape and KwaZulu-Natal would also provide opportunities for local and rural economic development.
- In the aquaculture sector, more than R400 million worth of investments, both from the private sector and government, had been committed across 10 aquaculture farms in the Eastern Cape, KwaZulu-Natal, Western Cape and Northern Cape.
- The Siyazama Aquaculture Cooperative in Hamburg sold its first harvest of dusky kob to the Cape Town Fish Market at the V&A Waterfront in Cape Town.
- A total of 12 new aquaculture projects, which included inland provinces such as Mpumalanga and Gauteng, had also been selected. An additional 17 new applications were being processed.
- The South African Marine Research and Exploration Forum was launched. This is an important partnership between the public sector and private sector extractive industries, represented by the Offshore Petroleum South Africa, to exploit the broader research opportunities presented by offshore oil and gas exploration to undertake research, using private sector vessels in the interests of South Africa.
- The establishment of the South African International Maritime Institute based at the Nelson Mandela Metropolitan University. This has been achieved through a R295-million contribution by the National Skills Fund. This institute is responsible for the implementation of all skills development initiatives of the Oceans Economy in Operation Phakisa, under

the leadership of the Department of Higher Education and Training.
- The DEA was in the process of appointing a Nautical Science specialist.

Vessel monitoring

The department is making it obligatory for fishing vessels to have satellite technology on board so that their movements can be monitored.

Five coastal nations in the SADC have taken the innovative step of linking their vessel-monitoring systems. Angola, Mozambique, Namibia, South Africa and Tanzania have signed a MoU that will allow them to share information about the movement of licensed boats along the southern African coast.

Strategic Environmental Assessment

In May 2015, the Minister of Environmental Affairs launched the commission of a strategic environmental assessment of shale gas development in South Africa.

The aim of the strategic environmental assessment is to provide an integrated assessment and decision-making framework to enable South Africa to establish effective policy, legislation and sustainability conditions under which shale gas development could occur. The strategic environmental assessment will consider both the exploration and production related activities of shale gas development across different scenarios in a holistic and integrated manner; and will include an assessment of all the material social, economic and biophysical risks and opportunities associated with the industry.

The strategic environmental assessment will be undertaken by a science council consortium, consisting of the Council for Scientific and Industrial Research, SANBI and the Council for Geosciences.

Chemicals and waste management

South Africa has taken a number of steps to promote environmentally sound management of chemicals and waste throughout the life cycle, including being a party to a range of multilateral environment agreements and an active member in instruments on chemicals and waste. These include the:
- Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade
- Stockholm Convention on Persistent Organic Pollutants
- Montreal Protocol on Substances that Deplete the Ozone Layer
- Basel Convention on the Control of Transboundary Movement of Hazardous Wastes
- Strategic Approach to International Chemicals Management, which is governed by the International Conference on Chemicals Management.

South Africa had a significant role in the ongoing negotiations concerning the Intergovernmental Negotiating Committee to Prepare a Globally Legally Binding Instrument on Mercury, including research into coal-dependent power/electric stations and the situational analysis of mercury in the country.

To align fragmented legislation, the department established a National Multi-Stakeholder Committee for Chemicals Management to facilitate coordination.

The National Waste Management Strategy has eight key goals:
- promoting waste minimisation, reuse, recycling and recovery of waste
- ensuring effective and efficient delivery of waste services
- growing the contribution of the waste sector to the green economy
- ensuring that people are aware of the impact of waste on their health, well-being and the environment
- achieving integrated waste management planning
- ensuring sound budgeting and financial management for waste services
- providing measures to rehabilitate contaminated land
- establishing effective compliance with and enforcement of the National Environmental Management: Waste Act, 2008.

The department was expected to establish the Waste Management Bureau from 1 April 2016. The bureau will largely work to reduce waste through recycling by monitoring recycling plans and providing specialist services to government and other clients.

These services will carry a fee, as part of the department's revenue generation activities. Some R79.4 million over the medium term has been reprioritised in the Chemicals and Waste Policy, Evaluation and Monitoring subprogramme of the Chemicals and Waste Management programme to fund the establishment and initial operational costs of the bureau.

Youth Jobs in Waste and Township Greening Projects

These projects are funded by the DEA through its EPIP and aim to contribute towards poverty alleviation while empowering beneficiaries to

participate in the mainstream economy.

The youth will benefit from this project through the formation of self-help groups, which will positively impact on their knowledge of financial literacy and self-empowerment.

The Youth Jobs in Waste initiative is focused on landfill operation and management, planning administration relating to waste collection and planning and undertaking waste awareness campaigns. The people who will be assisting with the activities will be located in the municipalities for a year.

The DEA aims to create eco-friendly greener open spaces that are safe, attractively designed, well managed for the benefit of all our communities as well as promoting maximum use of alternative energy sources and promote an environment that is clean, green and healthy for all.

In 2015/16, the DEA invested over R180 million into the development of 30 buy-back centres, of which 15 had been completed, 10 were under implementation and five were in the planning stages.

The Youth Jobs in Waste programme provided 3 750 job opportunities of which 2 213 benefited women and 78 benefited people with disabilities.

Recycling

The National Recycling Forum (NRF) is a non-profit organisation created to promote the recovery and recycling of recyclable materials in South Africa.

Members of the NRF include representatives of:

- the formal recycling industry in South Africa
- government departments
- regional recycling forums
- local government-based organisations
- local government utilities and co-opted advisory members

To promote the interests of its members and the formal recycling industry in South Africa, the NRF:

- provides a national communication forum for key players in the field of recycling
- interacts with central and provincial government to encourage the recycling of glass, paper, plastics, tin-plate steel, used oil and electrical and electronic waste
- facilitates the formation of regional forums that draw their memberships from enthusiastic and interested volunteers as well as small recyclers, in the major centres of South Africa
- encourages the establishment of buy-back centres and drop-off points through the activities of its members in the various centres.

Collect-a-can, one of the oldest recycling initiatives in South Africa, has been instrumental in creating a culture of recycling in South Africa. It has obtained local and international acclaim for its contribution towards protecting the environment, as well as its significant contribution to job creation and poverty alleviation.

Collect-a-Can has introduced millions of school children to the idea of caring for the environment through its schools competition.

Recycling has been valued at a contribution of as much as R50 billion to the South African economy. In effect, waste is now a renewable resource and not something to throw away.

Climate change and air-quality management

South Africa is making steady progress in implementing the National Climate Change Response Policy, despite having to balance its economic aspirations and environmental protection.

Government continues to engage actively and meaningfully in international climate change negotiations, specifically with the UNFCCC.

The policy implementation actions and activities flowing from this include the analysis of mitigation potential in key economic sectors as the basis for the establishment of desired emission reduction outcomes, and defining the optimal mix of measures for achieving those outcomes, with the greatest benefit and least cost to the economy.

Air quality remains an important and challenging environmental issue in South Africa.

Technical and legislative tools have been developed to roll-out and monitor the implementation of national environmental management including the:

- National Framework for Air Quality Management
- air quality model by-laws
- Air-Quality Management Planning Manual
- National Ambient Air-Quality Standards and Listed Activities and the Minimum Emission Standards.

Several of these tools were under review accelerate the ongoing implementation of the AQA of 2004.

The South African Air-Quality Information System (Saaqis) contains the latest updated data on locations and can give the status of air quality or pollution for a specific day and time on its website: *www.saaqis.org.za*.

A number of air-quality monitoring stations, mostly in Mpumalanga, eThekwini Municipality, the City of Johannesburg and the City of

Tshwane, report to Saaqis.

South Africa reached legally binding climate change agreement at the 21st Conference of the Parties to the UNFCC in Paris, France in December 2015.

The agreement was the culmination of a four-year negotiation process that was initiated in Durban in 2011 at the 17th Conference of the Parties to the UNFCCC.

The conclusion to the Durban Mandate, which was to develop a protocol, legal instrument or an agreed outcome with legal force, under the convention, by no later than 2015, will see the new agreement come into effect from 2020.

In April 2016, South Africa joined leaders from across the globe in signing the Paris Agreement at the UN in New York. South Africa is committed to ensuring that we continue to play a positive role in the building of a low-carbon, jobcreating and pro-development green economy.

Environmental impact management

South Africa's environmental impact assessment (EIA) regulations are:

- streamlining the EIA process
- introducing an approach where impact on the environment gets more attention
- introducing a listing notice dedicated to activities planned for predefined sensitive areas.

The Environmental Assessment Practitioners' (EAP) Association of South Africa aims to:

- achieve effective quality assurance in environmental assessment practice in South Africa
- promote the empowerment of black and female professionals within the environmental assessment field
- encourage continued professional development for EAPs
- promote awareness of the purpose and practice of environmental assessment in South Africa.

The DEA has a new and improved EIA and management approach. In addition, the department is using alternative approaches to environmental impact management.

The department is already fully integrating waste and EIA.

Aquaculture

Government showed its dedication to aquaculture with the launch of Operation Phakisa in July 2014. The operation will look to unlock the growth potential of the country's coastline, which is in line with the NDP.

It will also implement policies and programmes faster and more effectively. As a result, it can unlock the ocean's potential to contribute up to R177 billion to the country's GDP and create as many as one-million direct jobs.

Aquaculture is a big part of that plan and government recognises the industry as a way of contributing to food security since it has shown strong growth of 6,5% a year. Operation Phakisa will look to grow all segments of the aquaculture industry, especially by creating jobs within processing and marketing.

Despite aquaculture's advantages, the wild capture sector remains fishery's biggest contributor. According to the WWF-SA, wild capture fisheries include commercial, recreational and subsistence fisheries. It estimated about 500 000 people fished recreationally in South Africa. Commercially caught line fish was about 16 000 tons, which placed pressure on fish resources.

National Environmental Impact Assessment and Management Strategy (EIAMS)

The EIAMS consists of voluntary and regulated instruments where:

- regulated EIAs are used only when it is the most appropriate tool
- EIAM occurs within the strategic context of environmentally informed spatial instruments, sector strategies and policies
- authorities have enough capacity with skilled and experienced officials
- other stakeholders have the capacity and skills to ensure maximum impact on the effectiveness and efficiency of the strategy
- government regulatory processes have been integrated and aligned
- government, EAPs, developers, and the community are equally committed to making it work.

4x4 regulations

The Strategy Towards Co-Regulation of the Off-Road Sector in South Africa is aimed at minimising the impact of off-road driving on the environment by giving direction to off-road users and owners to develop and use inland routes in sensitive areas responsibly. The strategy applies to the inland recreational use of off-road vehicles, including two-wheel, three-wheel and four-wheel vehicles, which include 2x4 and 4x4 motor vehicles, quad bikes and motorbikes.

A key outcome of the strategy was the development, drafting and implementation of national norms and/or standards, with a

supportive enabling legislative framework, to facilitate environmental compliance, responsible tourism and the longterm sustainability of the offroad industry.

The banning of off-road vehicles in coastal zones has enabled several shore-breeding birds, especially the Damara tern and the African black oystercatcher, to breed successfully on beaches again. The number of loggerhead and leatherback turtles hatching successfully on KwaZulu-Natal's northern beaches has also increased since the ban was enforced.

Coastal management

The ocean covers three quarters of the Earth, hence the importance of its protection. The DEA recognises the challenges regarding the management of ocean spaces in South Africa's adjacent ocean areas.

Of the 200 estuaries found along the South African coast, 25% are in a degraded state. This is due to inappropriate developments along the banks of estuaries and in their catchment areas. The department is focusing its attention proactively on these degraded systems and prioritising developing management plans to improve the functioning of estuaries in associated hinterlands.

The Buoy Oceans Monitoring System, which provides information on the state of the oceans at Storms River in the Tsitsikamma National Park, is the first in a series of observation and monitoring platforms, which will form the basis of the South African National Oceans and Coastal Monitoring System. The DEA reviewed the Recreational Water Quality Guidelines for Coastal Waters intending to develop effective early warning systems to pre-empt the catastrophic impacts of possible hazards.

Erosion and desertification

According to the UN Environment Programme, desertification affects 900 million people in 99 countries with 24 million tons (Mt) of topsoil being lost to erosion annually. The resultant land degradation costs Africa about US$9 billion every year.

Most South African soil is unstable. The country loses an estimated 500 Mt of topsoil annually through erosion caused by water and wind.

About 81% of South Africa's total land area is farmed. However, only 70% of this area is suitable for grazing. Overgrazing and erosion diminish the carrying capacity of the veld and lead to land degradation. This process has already claimed more than 250 000 ha of land in South Africa.

South Africa is a signatory to the UN Convention to Combat Desertification (UNCCD). Its main objectives include cooperation between governments, organisations and communities to accomplish sustainable development, especially where water resources are scarce.

South Africa also acts as the coordinator for the Valdivia Group for Desertification.

The group consists of Argentina, Australia, Brazil, Chile, New Zealand, South Africa and Uruguay. The aim is, among other things, to foster scientific and technological cooperation.

South Africa has introduced legislation such as the NEMBA of 2004 to promote the conservation of biodiversity, and fight desertification and land degradation.

As part of the UN international campaign to address global environmental deterioration and in particular, combat dry land degradation, which affects up to one-quarter of the world's land surface, the UN has designated 17 June as the WDCD. The theme of 2015's WDCD was attainment of food security for all through sustainable food systems. With the slogan "No such thing as a free lunch. Invest in healthy soil", the WDCD highlighted the benefits of mainstreaming sustainable land management policies and practices into collective response to climate change.

Biodiversity

South Africa is home to some 24 000 species, around 7% of the world's vertebrate species, and 5,5% of the world's known insect species (only about half of the latter have been described).

In terms of the number of endemic species of mammals, birds, reptiles and amphibians found in South Africa the country ranks as the fifth richest in Africa and the 24th richest in the world.

Marine biodiversity is also high, with more than 11 000 species found in South African waters, which is about 15% of global species. More than 25% of these species (or 3 496 species) are endemic to South Africa, many of which are threatened, especially in river ecosystems (82%) and estuaries (77%).

South Africa ratified the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilisation to the Convention on Biological Diversity, popularly referred to as the Nagoya Protocol on ABS. The Nagoya Protocol is a legally binding agreement outlining a set of terms prescribing how one country will gain access to another country's genetic resources and how the benefits derived will be shared.

The aim of the National Biodiversity and Business Network is to assist businesses from various sectors to integrate and mainstream biodiversity issues into their strategies and operations.

Government and businesses are realising that the economic and social development of the country depends on healthy ecosystems and biodiversity. The South African NDP: Vision 2030 confirms that national economic growth depends on the environmental sustainability of the country's proposed development path.

South Africa is the third most biodiverse country in the world, after Indonesia and Brazil. These countries harbour most of the Earth's species and collectively accommodate more than two thirds of global biodiversity.

South Africa is a signatory to several biodiversity-related multilateral agreements such as the:

- Convention on Biological Diversity Cartagena Protocol on Biosafety
- Ramsar Convention
- Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)
- UNCCD
- Convention on Migratory Species.

The National Biodiversity Strategy and Action Plan (NBSAP) is aimed at establishing a framework and plan of action for the conservation and sustainable use of South Africa's biodiversity and the equitable sharing of benefits derived from this use.

A scientific, systematic biodiversity assessment for the country was carried out in 2004 to spatially support the NBSAP, titled the National Spatial Biodiversity Assessment (NSBA).

The NSBA was updated in 2012, forming the National Biodiversity Assessment, 2011, with many significant findings requiring conservation action.

The implementation plan, effective until 2017, gives further impetus to the fight against wildlife crimes, particularly rhino poaching.

The National Biodiversity Framework (NBF), published in 2009, provides a framework to coordinate and align the efforts of the many organisations and individuals involved in conserving and managing South Africa's biodiversity, in support of sustainable development. The NBF is a requirement of the NEMBA of 2004.

Three internationally recognised biodiversity hotspots are found in South Africa. They are the:

- Cape Floral Kingdom (equivalent to the fynbos biome)
- Succulent Karoo (shared with Namibia)
- Maputaland-Pondoland-Albany Centre of Plant Endemism, which stretches from the Albany Centre in the Eastern Cape, through the Pondoland Centre of Plant Endemism and KwaZulu-Natal, and the eastern side of Swaziland, into southern Mozambique and Mpumalanga.

The Succulent Karoo Biome is one of only two arid biodiversity hotspots in the world, the other being the Horn of Africa.

There are eight major terrestrial biomes, or habitat types, in South Africa, which are divided into 70 veld types.

National biodiversity biomes

Savanna Biome

The Savanna Biome is the largest biome in southern Africa, occupying 46% of its area, and over a third of South Africa. It is an area of mixed grassland and trees, generally known as bushveld.

In the Northern Cape and Kalahari sections of this biome, the most distinctive trees are the camel thorn (*acacia erioloba*) and the camphor bush (*tarchonanthus camphoratus*).

In Limpopo, the portly baobab (*adansonia digitata*) and the candelabra tree (*euphorbia ingens*) dominate. The central bushveld is home to species such as the knob thorn (*acacia nigrescens*), bushwillow (*combretum spp.*), monkey thorn (*acacia galpinii*), mopani (*colophospermum mopane*) and wild fig (*ficus spp.*). In the valley bushveld of the south, euphorbias and spekboom trees (*portulacaria afra*) dominate.

Abundant wild fruit trees provide food for many birds and animals in the Savanna Biome. Grey loeries, hornbills, shrikes, flycatchers and rollers are birds typical of the northern regions.

The subtropical and coastal areas are home to Knysna loeries, purple-crested loeries and green pigeons. Raptors occur throughout the biome. The larger mammals include lion, leopard, cheetah, elephant, buffalo, zebra, rhino, giraffe, kudu, oryx, waterbuck and hippopotamus.

About 8,5% of the biome is protected. The Kruger National Park, Kgalagadi Transfrontier Park, Hluhluwe-Umfolozi Park, iSimangaliso Wetlands Park and other reserves lie in the Savanna Biome.

Nama-Karoo Biome

The Nama-Karoo is the third largest biome in South Africa, covering about 20,5% of the country or more than 260 000 km^2. It stretches across the vast central plateau of the western half of the country. This semi-desert receives

little rain in summer.

Rainfall varies from about 200 mm a year in the west to 400 mm a year in the north-east. Summer is very hot and winter is very cold with frequent frost.

Most of the plants are low shrubs and grass. Many plants are deciduous. Trees such as the sweet thorn (*acacia karoo*) are usually only found along rivers or on rocky hillsides.

Common animals include the bat-eared fox, ostrich, spring hare, tortoises and brown locust. The riverine rabbit is a threatened species found in the Nama-Karoo Biome.

This biome includes the Namaland area of Namibia, and the central Karoo area of South Africa.

Because of low rainfall, rivers are non-perennial. Cold and frost in winter and high temperatures in summer demand special adaptation by plants.

Only 1% of the Nama-Karoo Biome falls within officially protected areas, of which the Karoo and Augrabies national parks are the largest.

Overgrazing and easily eroded soil surfaces are causing this semi-desert to advance slowly on the neighbouring savanna and grassland biomes.

Grassland Biome

The Grassland Biome is the second largest biome in South Africa, covering an area of 339 237 km^2 and occurring in eight of South Africa's nine provinces. It is one of the most threatened biomes in South Africa, with 30% irreversibly transformed and only 1,9% of the biodiversity target for the biome formally conserved.

The Grassland Biome provides essential ecosystem services, such as water production and soil retention necessary for economic development. It holds important biodiversity of global and domestic significance and value.

Trees are scarce and found mainly on hills and along riverbeds. Karee *(rhus lancea)*, wild currant *(rhus pyroides)*, white stinkwood *(celtis africana)* and several acacia species are the commonest.

The Grassland Biome has the third largest number of indigenous plant species in the country.

Eight mammal species endemic to South Africa occur in the wild in this biome.

The area is internationally recognised as an area of high species endemicity for birds. The black korhaan, blue crane and guinea-fowl are among the birds found in the area.

Succulent Karoo Biome

The Succulent Karoo Biome covers a flat to gently undulating plain, with some hilly and "broken" veld, mostly situated to the west and south of the escarpment, and north of the Cape Fold Belt.

One of the natural wonders of South Africa is the annual blossoming of the Namaqualand wild flowers (mainly of the family asteraceae), which transforms the semi-desert of the Northern Cape into a fairyland. After rain, the drab landscape is suddenly covered with a multicoloured carpet of flowers (from August to October, depending on the rainfall). This is a winterrainfall area with extremely dry and hot summers. Succulents with thick, fleshy leaves are plentiful. Most trees have white trunks to reflect the heat.

The quiver tree (*aloe dichotoma*) and the human-like elephant's trunk (*pachypodium namaquanum*) are prominent in the Richtersveld. Grass is scarce.

The animal life is similar to that of the neighbouring Fynbos and Nama-Karoo biomes.

The biome includes 2 800 plant species at increased risk of extinction.

Fynbos Biome

The Fynbos Biome is one of the six accepted floral kingdoms of the world. This region covers only 0,04% of the Earth's land surface.

Fynbos, which is found mainly in the Western Cape, is the name given to a group of ever-green plants with small, hard leaves (such as those in the Erica family). It is made up mainly of the protea, heathers and restio, than 8 500 kinds, of which more than 6 000 are endemic).

The Fynbos Biome is famous for the protea, which is South Africa's national flower. The biome also contains flowering plants now regarded as garden plants, such as freesia, tritonia, sparaxis and many others.

Protected areas cover 13,6% of the Fynbos Biome and include the Table Mountain and Agulhas national parks.

This biome is not very rich in bird and mammal life, but does include the endemic Cape grysbok, the geometric tortoise, the Cape sugarbird and the protea seed-eater. Baboon, honey-badgers, caracal, the buck and several types of eagle and dassies are found in the mountains.

Forest Biome

South Africa's only significant natural forests are those of Knysna and Tsitsikamma in the Western and Eastern Cape respectively. Other reasonably large forest patches that are officially protected are in the high-rainfall areas of the eastern escarpment (Drakensberg mountains), and on the eastern seaboard. Forest giants such as yellowwood (*podocarpus spp.*), ironwood

(olea capensis) and lemonwood (xymalos monospora) dominate.

The indigenous forests are a magical world of ferns, lichens and colourful forest birds such as the Knysna loerie, the endangered Cape parrot and the rameron pigeon. Mammals include the endangered samango monkey, bushpig, bushbuck and the delicate blue duiker.

Thicket Biome

The Thicket Biome is the second smallest biome in South Africa, and is known for its high biodiversity. Subtropical thicket ranges from closed shrubland to low forest, dominated by evergreen succulent trees, shrubs and vines.

It is often impenetrable and has little herbaceous cover. Roughly 20% of the species found there are endemic to the Thicket Biome.

The Thicket Biome, which is predominantly in the Eastern Cape, supports four species of tortoise: the leopard tortoise (*geochelone pardalis*), angulate tortoise (chersina angulata), tent tortoise (*psammobates tentorius*) and parrot-beaked tortoise (*homopus areolatus*).

Desert Biome

True desert is found under very harsh environmental conditions, which are even more extreme than those found in the Succulent Karoo and the Nama-Karoo biomes. The climate is characterised by summer rainfall, but also by high levels of summer aridity. Rainfall is highly variable from year to year. Desert is found mostly in Namibia, although it does occur in South Africa in the lower Orange River Valley.

The vegetation of the Desert Biome is characterised by the dominance of annual plants (often annual grasses). This means that after a rare season of abundant rain, the desert plains can be covered with a sea of short annual grass, whereas in drier years, the plains appear bare with annual plants persisting in the form of seeds.

Perennial plants are usually encountered in specialised habitats associated with local concentrations of water from broad drainage lines or washes. Nearer the coast, coastal fog also governs the distribution of certain species commonly associated with the desert.

The Desert Biome incorporates abundant insect fauna, which includes many tenebrionid beetles, some of which can use fog water. There are also various vertebrates, including reptiles, springbok, ostrich, gemsbok, snakes and geckos.

Some areas in this Biome are formally protected in the Richtersveld National Park.

International cooperation

Benguela Current Large Marine Ecosystem (BCLME)

The BCLME is regarded as one of the richest ecosystems on Earth, with ecosystem goods and services estimated to be worth at least US$54,3 billion a year. Offshore oil and gas production, marine diamond mining, coastal tourism, commercial fishing and shipping are some of the most important industrial activities that take place in the region.

The accord, signed in Angola, is a formal agreement between Angola, Namibia and South Africa that seeks to provide economic, environmental and social benefits for the three countries.

The Benguela Current Commission is a permanent intergovernmental organisation, with a mandate to promote the long-term conservation, protection, rehabilitation, enhancement and sustainable use of the BCLME.

South Africa has signed several international conventions, treaties, protocols and other agreements supporting the principles of sustainable development including the:

- Convention on Biological Diversity (ratified in 1995)
- Cartagena Protocol on Biosafety (South Africa became a party in 2003)
- Kyoto Protocol (signed in 2003)
- UNCCD
- World Heritage Convention (ratified in 1997)
- Convention on Wetlands of International Importance (Ramsar Convention) (ratified in 1975)
- Convention on the Conservation of Migratory Species (acceded in 1991).

UN Framework Convention on Climate Change

South Africa ratified the UNFCCC in 1997. The UNFCCC is aimed at:

- implementing urgent action, from 2013 to 2020, including the adoption of a second commitment period under the Kyoto Protocol and a number of institutional mechanisms such as the Green Climate Fund
- acknowledging the inadequate commitments to reduce emissions made thus far; a work programme was agreed upon to increase pre-2020 levels of ambition
- action for the future with the negotiation of a legal agreement for the period beyond 2020.

The UNFCCC entered into force in 1994. The Conference of the Parties (COP) to the UNFCCC meets annually to assess progress in dealing with climate change. The COP is

the supreme body of the convention and is its highest decision-making authority.

With 195 parties, the UNFCCC has near universal membership and is the parent treaty of the 1997 Kyoto Protocol. The Kyoto Protocol has been ratified by 193 of the UNFCCC parties.

Under the protocol, 37 states, consisting of highly industrialised countries and those making the transition to a market economy, have legally binding emission limitation and reduction commitments.

The ultimate objective of both treaties is to stabilise greenhouse-gas (GHG) concentrations in the atmosphere at a level that will prevent dangerous human interference with the climate system.

The launch of negotiations to shape the new global climate change agreement and first discussions on how to raise ambition took place at the UNFCCC in Bonn in May 2012, which prepared decisions for adoption at the UNFCCC in Qatar later in 2012.

South Africa played a leading role at COP 21 in Paris, as the Chair of the Group of 77 and China, a group of 134 developing countries that are worst affected by climate change.

UN Commission on Sustainable Development (CSD)

The UN CSD was established by the UN General Assembly in December 1992 to ensure effective follow-up of the UN Conference on Environment and Development, also known as the Earth Summit.

From its inception, the CSD was highly participatory in structure and outlook, by engaging in its formal proceedings a wide range of official stakeholders and partners through innovative formulae.

Convention on International Trade in Endangered Species of Wild Fauna and Flora

South Africa was a founding member of the CITES Treaty, which was adopted on 3 March 1973, but only came into force on 1 July 1975.

Signed by 149 countries, CITES is an international agreement between governments to protect endangered species against over-exploitation through regulations regarding imports and exports and in some cases prohibiting trade.

CITES was drafted as a result of a resolution adopted in 1963 at a meeting of members of the IUCN. CITES accords varying degrees of protection to more than 30 000 animals and plant species, whether they are traded as live specimens, fur coats or dried herbs.

South Africa hosted the 17th CITES (COP17) from 24 September 2016 to 5 October 2016 at the Sandton Convention Centre in Johannesburg.

South Africa demonstrated commitment to the sustainable utilisation of natural resources in contributing to socio-economic development of poor and rural communities as part of the development agenda of government.

Montreal Protocol on Substances that Deplete the Ozone Layer

In 2015, parties to the Montreal Protocol on Substances that Deplete the Ozone Layer celebrated the International Day for the Preservation of the Ozone Layer under the theme: "Ozone: All there is between you and UV".

The International Ozone Day is an annual event that commemorates the date of the signing the Montreal Protocol in 1987. South Africa, which became a signatory to the Montreal Protocol in 1990, has phased out CFCs, halons, methyl chloroform and carbon tetrachloride.

South Africa was able to meet the target of reducing HCFC consumption by 10% in 2015, which meant that the country remains in compliance with the requirements of the Montreal Protocol.

World Summit on Sustainable Development

At the UN World Summit on Sustainable Development Goals (SDGs) 2030 held in September 2015, world leaders adopted the 17 SDGs of the 2030 Agenda for Sustainable Development. Over the next 15 years, with these new goals that universally apply to all, countries will mobilise efforts to end all forms of poverty, fight inequalities and tackle climate change, while ensuring that no one is left behind.

The SDGs build on the success of the Millennium Development Goals and aim to go further to end all forms of poverty. The new goals are unique in that they call for action by all countries, poor, rich and middle-income to promote prosperity while protecting the planet.

The 17 SDGs are as follows:

- Goal 1: End poverty in all its forms everywhere
- Goal 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture
- Goal 3: Ensure healthy lives and promote well-being for all at all ages
- Goal 4: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all
- Goal 5: Achieve gender equality and empower

all women and girls
- Goal 6: Ensure availability and sustainable management of water and sanitation for all
- Goal 7: Ensure access to affordable, reliable, sustainable and modern energy for all
- Goal 8: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all
- Goal 9: Build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation
- Goal 10: Reduce inequality within and among countries
- Goal 11: Make cities and human settlements inclusive, safe, resilient and sustainable
- Goal 12: Ensure sustainable consumption and production patterns
- Goal 13: Take urgent action to combat climate change and its impacts
- Goal 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development
- Goal 15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss
- Goal 16: Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels
- Goal 17: Strengthen the means of implementation and revitalise the Global Partnership for Sustainable Development.

UN Conference on Sustainable Development (Rio+20)

Rio+20 refers to the UN Conference on Sustainable Development which took place in Rio de Janeiro, Brazil, in June 2012. The meeting took place 20 years after the landmark 1992 Earth Summit in Rio, when more than 108 heads of State agreed to work together to develop national strategies to reduce carbon emissions, stabilise GHG, protect forests from destruction, and pay for their share of the damage caused to the Earth through pollution.

At the Rio+20 talks 50 of the 193 member states of the UN launched new energy strategies, and private investors pledged more than US$50 billion to carry out the goal of doubling the share of global renewable energy and the rate of energy efficiency improvement by 2030.