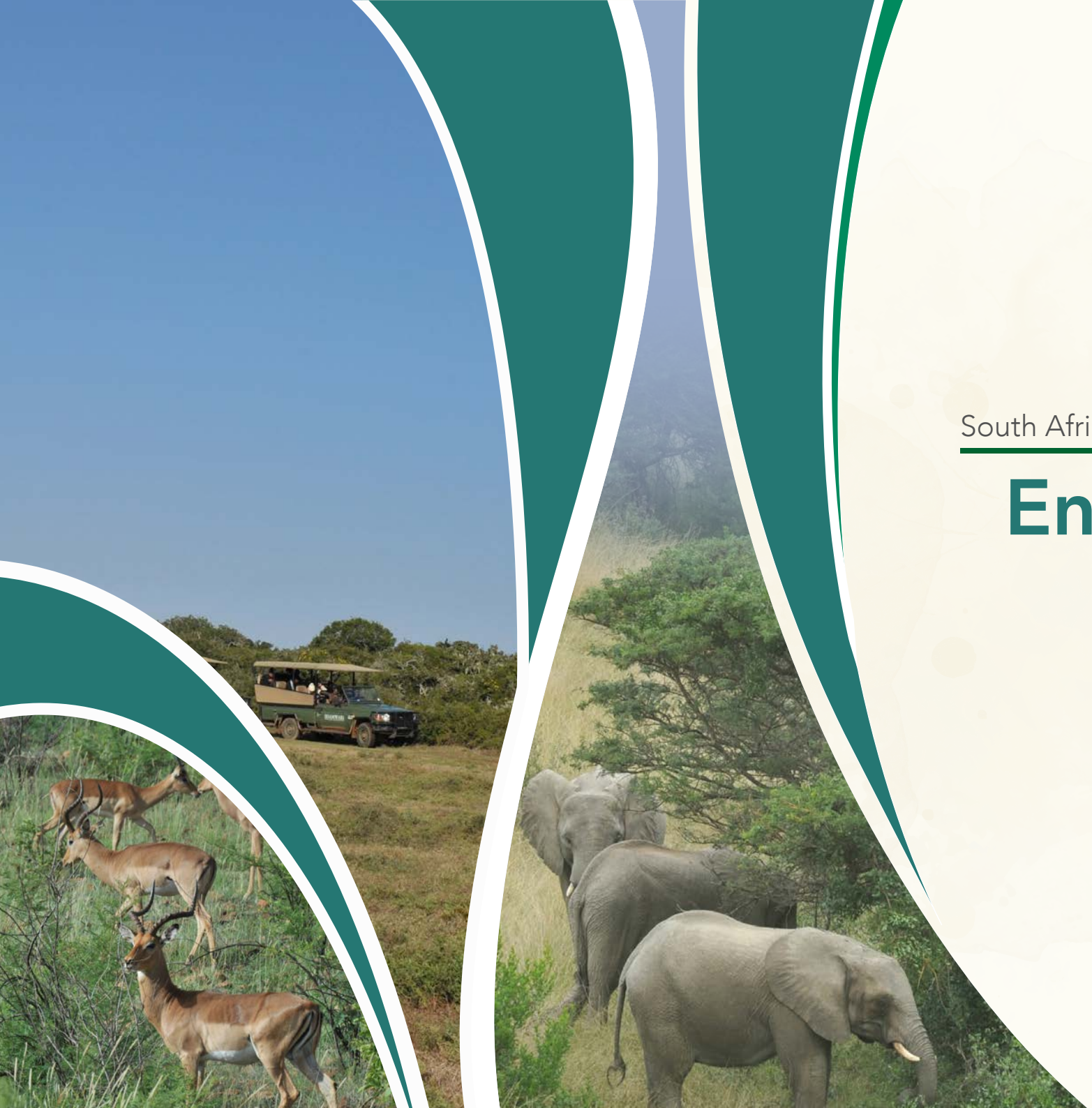


South Africa Yearbook 2018/19

Environment

The Department of Environmental Affairs (DEA) is mandated to realise 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.

Over the medium term, the department will focus on creating job opportunities through the EPWP in moving towards a green economy; enforcing and monitoring compliance with environmental legislation; conserving marine ecosystems; investing in biodiversity; monitoring climate change and air quality; and managing waste. 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 DEA'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.

The environmental sector continues to be a source and facilitator of investment, job creation, entrepreneurship and skills development – in line with the key objectives of the NDP.

The DEA has adopted a three-pronged strategic approach to facilitate the government's long-term radical economic transformation goals – the Phakisa Strategic Approach, Environmental Justice Strategic Approach and Economy-wide Service Delivery Strategic Approach. The approaches work in pursuit of low-carbon, inclusive and climate resilient growth.

Creating jobs

The department's work is pivotal in the creation of a green economy in which economic development is not at the expense of the environment. In its efforts to provide 119 267 full-time equivalent jobs and 221 923 work opportunities through the EPWP over the medium term, the department anticipates spending R11.6 billion, accounting for 48.9% of its total budget over the Medium Term Expenditure Framework (MTEF) period.

These jobs and work opportunities will be made available through projects that focus on restoring and rehabilitating degraded ecosystems; expanding the conservation estate; protecting, restoring and rehabilitating wetlands; protecting water resources; and managing land use sustainably. These services are budgeted for in the Environmental Programmes programme, which has an allocation of R12.7 billion over the medium term.

Enforcing and monitoring compliance with environmental legislation

Effective compliance and enforcement underpins environmental justice and the integrity of South Africa's regulatory system. As such, the department will continue to enforce legislation and regulations governing international trade in wild animals and plants at ports of entry and exit. The department currently has nine environmental management inspectors deployed at only one of the 16 designated ports of entry: OR Tambo International Airport. Deploying environmental management inspectors and compliance and enforcement officials at all ports will require the procurement of office space, equipment to handle animals, safes and microchip scanners.

This will enable officials to inspect an estimated 495 environmental permits over the MTEF period to ensure that protected species and alien plants are not smuggled into and out of the country. An estimated R661 million is provided over the medium term for these activities.

Conserving marine ecosystems

The department plans to continue supporting research voyages to Antarctica, Marion Island and Gough Island. These expeditions support long-term biological, environmental and meteorological research. To carry out this work, the operation and manning of two research vessels accounts for an estimated 23.6% (R380.5 million) of total expenditure in the Oceans and Coasts programme over the medium term.

A further R330.6 million is allocated to implementing the Oceans Economy Strategy, which includes manufacturing for marine transport, offshore oil and gas exploration, aquaculture, marine protection services, and ocean governance.

Investing in biodiversity

In its efforts to ensure that a representative sample of the country's biodiversity is placed under formal protection, the department plans to increase the area of land under conservation from 13.5% in 2018/19 to a projected 14.7% in 2021/22. This entails facilitating the identification of 2 000 hectares for the cultivation of indigenous species across the country, and providing training to 800 biodiversity entrepreneurs as part of the department's efforts to ensure that biodiversity contributes substantially to the economy. This is expected to result in expenditure of R156 million over the medium term, representing 6.1% of the programme's total budget of R2.6 billion over the same period. The bulk of

this expenditure is for operational transfers to the South African National Parks, the South African National Biodiversity Institute and the iSimangaliso Wetland Park Authority.

Monitoring climate change and air quality

To contribute towards the reduction in air pollution, the department plans to increase the number of government-owned air quality monitoring stations reporting to the South African Air Quality Information System from 117 in 2018/19 to 125 in 2021/22. This will be made possible by an allocation of R148 million over the medium term. This allocation will also enable the department to roll out the Let's Respond toolkit to a projected 40 municipalities to integrate their climate change responses into the department's planning documents.

This entails reviewing the development plans of municipalities and guiding them to be responsive to climate change, with particular focus on the effects of climate change on vulnerable communities and sustainable economic development.

Managing waste

The department's Waste Management Bureau is tasked with promoting and facilitating the minimisation, reuse, recycling and recovery of waste. The bureau provides specialist advice and support for the development and monitoring of integrated waste management plans for industry and municipalities, and manages the disbursement of revenue generated from charges for waste management.

The bureau has been managing the disposal of waste tyres as a transitional arrangement since October 2017, when the previous contractor was suspended. The process of appointing a new contractor is expected to be finalised over the medium term. To carry out its duties, 68.9 % (R1.3 billion) of the allocation in the Chemicals and Waste Management Programme over the medium term is earmarked for the bureau.

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.
- The South African Weather Service (SAWS) Act, 2001 (Act 8 of 2001).
- The Sea Shores Act, 1935 (Act 21 of 1935).
- The Sea Birds and Seals Protection Act, 1973 (Act 46 of 1973).
- The Dumping at Sea Control Act, 1980 (Act 73 of 1980).
- The Sea Fishery Act, 1988 (Act 12 of 1988).
- The Antarctic Treaties Act, 1996 (Act 60 of 1996).
- The Marine Living Resources Act, 1998 (Act 18 of 1998).
- The 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

The department's budget for the 2018/19 financial year was R7.4 billion.

As a result of Cabinet-approved reductions to the department's baseline of R83.5 million over the medium term, transfers to the South African National Biodiversity Institute are reduced by R42.4 million, transfers to South African National Parks by R39.9 million, and transfers to the iSimangaliso Wetland Park Authority by R1.2 million. These entities are expected to generate increased revenue to accommodate these reductions.

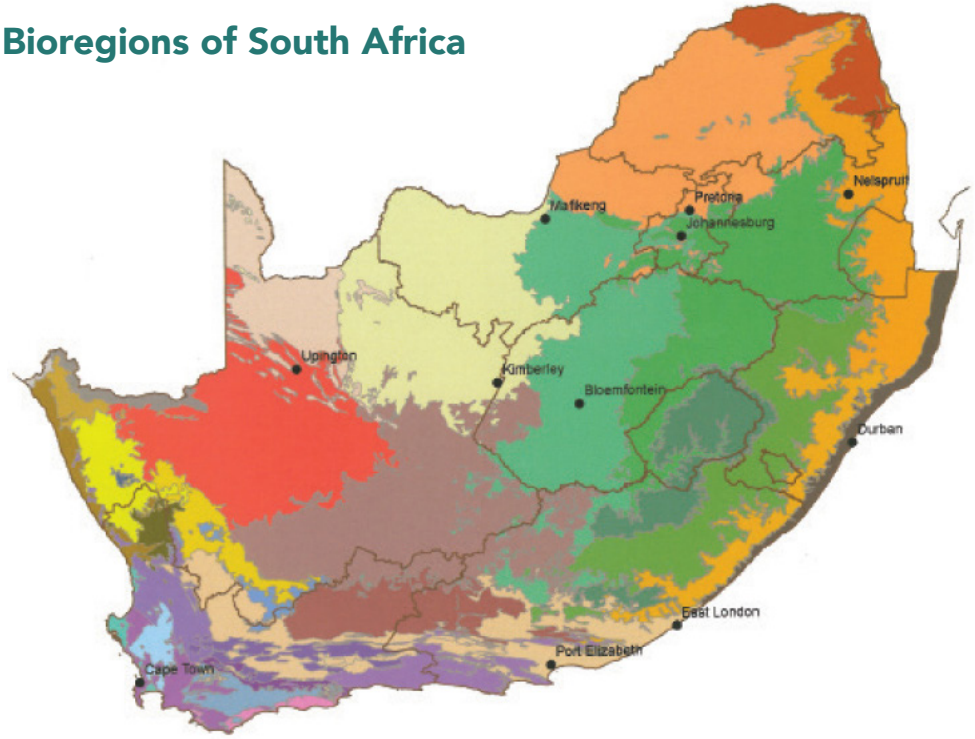
International environment days

South Africa has adopted the entire month of June to heighten awareness of environmental issues through various pertinent activities. It is during the month of June that the country celebrates the World Environment Day, World Oceans Day and the World Day to Combat Desertification.

World Environment Day .

World Environment Day is the biggest, most globally celebrated day for positive environmental action. Every year,

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

participants organise clean-up campaigns, art exhibits, tree-planting drives, and concerts, dance recitals, recycling drives, social media campaigns and different contests themed around caring for the planet.

World Environment Day is the United Nations'(UN) principal vehicle for encouraging worldwide awareness and action for the environment. Over the years, it has grown to be a broad, global platform for public outreach that is widely celebrated by stakeholders in over 100 countries. It also serves as the 'people's day' for doing something positive for the environment, galvanising individual actions into a collective power that generates an exponentially positive impact on the planet.

The day is marked annually on 5 June as per the declaration of the UN in 1972. Each World Environment Day is organised around a theme that focuses attention on a particularly pressing environmental concern. The theme for 2018 was, "beating plastic pollution".

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

The theme urged governments, industry, communities and individuals to come together and explore sustainable alternatives and urgently reduce the production and excessive use of single-use plastic products polluting the environment and oceans, damaging marine life and threatening human health.

World Oceans Day

South Africa joined the rest of the world to mark World Oceans Day on 8 June 2018. The day is aimed at appreciating, protecting, restoring and honouring ecosystem services and resources provided by oceans.

The 2018 World Oceans Day was held under the theme "Prevent Plastic Pollution and encourage solutions for a healthy ocean."

Plastic pollution is a worldwide problem that affects human health and safety, endangers marine wildlife and costs states and nations countless millions in wasted resources and lost revenue. Globally and locally, plastic and synthetic materials are the most common types of marine litter that cause the most problems for marine animals and birds.

Plastic in the oceans eventually moves up the food web, from plankton to larger animals and as it moves up in the food chain, toxic chemicals get more and more concentrated and pose serious danger to humans and top predators since they are at the top of the food chain. Plastic pollution is therefore, a complex environmental challenge that requires joint efforts at the local, regional and global level.

The country has a jurisdiction over one of the largest exclusive economic zones in the world, as it is uniquely surrounded by three ocean spaces (directly by the Atlantic and Indian oceans and in close proximity to the Southern Ocean, which has not yet formally finalised and globally acknowledged) offering a resource rich and biologically diverse environment.

The oceans are vital to human survival and economic development. The protection of ocean ecosystems is the cornerstone of sustainable ocean development, underpinning many economic opportunities that provide significant job creation and livelihood security. Approximately 40% of South Africa's population lives within 100 km of the coastline and coastal resources are relied on for commercial opportunities as well as for food, recreation and transport.

In order to realise the full socio-economic potential of the ocean resources, it is necessary to strengthen management efforts to control negative human impacts on our ocean resources. The UN has identified pollution, especially originating from land, as a one of the "big stressors" to the health and integrity on marine ecosystems. Globally, it is estimated that roughly 80% of all marine pollution stems from activities carried out on land.

South Africa participates in the Global Programme of Action for the Protection of the Environment from Land-based Activities, which has identified litter as one of the key sources of pollution in the ocean environment.

World Day to Combat Desertification

On 19 June 2018, the DEA celebrated the World Day to Combat Desertification jointly with the Limpopo Provincial Department of Agriculture and Rural Development and the Collins Chabane Local Municipality. The day was celebrated under the theme "Land has true value, invest in it".

The theme called upon producers, consumers, communities and policy makers to utilise land in a sustainable manner. The event focused on raising public awareness on the importance of investing on land, its benefits and role it plays in people's livelihoods as well as reminding the world that land is a tangible asset with measurable value beyond just cash.

World Wildlife Day

The 2019 World Wildlife Day official celebrations were held at the Treasure Beach Environmental Centre in Durban. It was held under the theme "Life below water: for people and planet", which aligns with goal 14 of UN Sustainable Development Goals.

The day is celebrated annually on 3 March with countries around the world turning their attention to the role played by human beings in the protection of wildlife and their habitat. The theme for World Wildlife Day 2018 was, "Big cats: predators under threat".

The day was first proclaimed in 2013 at the 68th session of the UN General Assembly (UNGA), and aims to raise

awareness of the world's wild animals and plants. Among the actions required to advance the 2030 Agenda and Sustainable Development Goals is raising public awareness on the links between wildlife conservation, rural livelihoods and sustainable development, as well as the role of governance and public-private partnerships.

Marine Week

Each year, the DEA observes the National Marine Week to highlight the importance of oceans and the role they play in the life of all citizens. Commemoration of National Marine Week takes place during the second week of October annually.

Due to the substantial and increasing impact of pollution in South Africa, particularly plastic pollution that affects all terrestrial, coastal and oceanic ecosystems, the National Marine Week 2018 was held under the theme: "Nature Knows No Waste". The aim was to educate and encourage the general public, particularly the youth, towards curbing the pollution problem. Most pollution originates from land before it gets transported to the coastal areas and the oceans through river systems.

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, 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, non-governmental organisations, 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
- ensure effective integration and collaboration across all functions and sectors
- 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 is a product of the collaboration between the South African Mining and Biodiversity Forum as well as the departments of Environmental Affairs and 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:

- 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.
- Areas with high natural runoff, such as the Drakensberg, the Soutpansberg and the Wolkberg in Limpopo gather and channel the water on which the semi-arid country depends. Only about a fifth of these areas are formally protected.
- 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.
- Nearly a fifth of the coastline has some form of development within 100 m off 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.
- 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.
- 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.
- 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 is important to use maps of biodiversity-priority areas to guide decisions about where best to locate development.
- 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 that identifies areas that are important for climate change resilience and which need to be kept intact.
- 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.
- 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.
- 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

Low carbon and climate resilient economy

South Africa is a Board member of three significant funding bodies: namely the Green Climate Fund (GCF); the World Bank's Climate Investment Fund and the Global Environment Facility .

The memberships enable the country to shape the policies, programming and governance of these respective institutions. The country is also a member of the Partnership for Action on Green Economy.

SANBI and the Development Bank of Southern Africa are accredited as South African Direct Access Entities of the GCF.

The increasing frequency and intensity of extreme weather events around South Africa – from flash flooding in some parts of the country to devastating drought in other parts, has prompted the government to sign the Paris Agreement to Combat Climate Change as an acknowledgement that the problem requires a global effort.

The country continues to play an active role on the international stage through participation in a number of key multilateral environmental agreements and their associated negotiations.

In addition to finalizing the National Climate Change Adaptation Strategy, the country has developed a draft Climate Change Bill to provide effective national response for both mitigation and adaptation action.

South Africa is also in the process of implementing Phase One of the Greenhouse Gas Emission Reduction system, with carbon budgets already allocated to most of the significant emitters.

South Africa's Green Economy Strategy

There is increasing global recognition that today's economic growth and development trajectory is driven by the worldwide shift towards sustainable green economies.

Through the DEA's Green Economy Strategy, the department continues to work towards promoting equitable, inclusive, sustained and environmentally sound economic growth and social development to the benefit of all.

The Green Economy Strategy has eight key pillars, namely:

- green buildings and the built environment
- sustainable transport and infrastructure
- clean energy and energy efficiency
- natural resource conservation and management
- sustainable waste management
- water management
- sustainable consumption and production
- agriculture food production and forestry.

As outlined in the Integrated Resource Plan, by 2030 the DEA aims to have sliced the country's energy demand significantly through technological innovation, good behavioural practice and public commitment to more efficient, sustainable and equitable energy use.

> In January 2019, South Africa hosted the Third Partnership for Action on Green Economy Ministerial Conference in Cape Town. The conference advanced the agenda of inclusive growth, and the adoption of a low carbon and climate resilient economy, domestically and on the African continent. More than 500 delegates attended the conference, including 15 international Ministers or Deputy Ministers of Environment, Finance, Business, Science and Technology and Development who participated in robust discussions on tools and strategies for shaping greener economies and meeting the Paris Agreement requirements.
>
> The conference was an opportunity for member states to reinforce their commitment to transition to a green and sustainable economy. It was also an opportunity to demonstrate implementation of the tools and strategies required to accelerate, scaling up and sustaining of the momentum to broaden green economy principles in the heart of socio-economic and environmental planning frameworks.

National Green Fund

The Green Fund focuses on innovative projects that require financing to cover funding gaps. The fund has a portfolio of 20 active and two completed investment projects, representing investment of R679,8 million since the fund's inception.

Established in 2011, the Green Fund is a national fund providing catalytic finance for investment in green initiatives that will support South Africa's transition towards a green economy.

The fund is additional and complementary to existing fiscal allocations, focusing on innovative projects that need to cover a funding or financing gap.

The fund is managed by the Development Bank of Southern Africa on behalf of the DEA.

Over the medium term, the Green Fund is expected to receive additional allocations from the economic competitiveness and support package of R95 million in 2018/19, R111 million in 2019/20 and R117.1 million in 2020/21. Direct investment into projects, including co-investments and additional support realised thus far, amount to R285 million, with contributions from the private sector amounting to R91 million.

Drawing investment from the private sector is one of the key mandates of the fund. As investments begin to show favourable returns, it is expected that private sector investors will invest without any state involvement. As a result, direct investment is expected to exceed R500 million over the medium term.

Over 1 600 direct job opportunities and at least 11 300 indirect job opportunities have been created. The majority of these job opportunities are created under the investment projects portfolio. More than 7 400 individuals have been directly trained and capacitated in the area of green skills.

Sustainable Development and the Green Economy

South Africa continues to play an instrumental role within other global coordination mechanisms.

The final adoption of the Paris Climate Change in December 2015 represented a major step forward in international cooperation towards sustainable green, low-carbon and climate-resilient economies globally. During the Paris negotiating process, South Africa played a key role as Chair of the Group of 77 plus China, representing 134 developing countries, and as lead negotiator for the Africa group.

In April 2016, South Africa joined 174 other countries in New York as a proud signatory to the Paris Agreement. The DEA has started domestic ratification processes to enable the entry into force of the agreement in 2020.

This new legal framework will guide international efforts to limit greenhouse gas emissions, and enable the transition to climate resilient societies and economies, particularly through the commitment by developed countries to provide financial, technology and capacity building support to developing countries in their effort to address the climate change challenge.

In the lead-up to the Paris climate change negotiations, South Africa submitted its Intended Nationally Determined Contribution (INDC) to the UN Framework Convention on Climate Change (UNFCCC). South Africa's INDC is guided by the National Climate Change Response Policy and outlines the national goals for the country's adaptation effort; and it clearly outlines that South Africa will peak and plateau its greenhouse gas emissions by 2030.

Managing waste

The Waste Management Bureau was established in 2016 in terms of the Nema. The bureau is tasked with promoting and facilitating the minimisation, reuse, recycling and recovery of waste by providing specialist advice and support for the development of integrated waste management plans for industry and municipalities. The bureau is also tasked with monitoring the implementation of industry waste management plans, and managing the disbursement of revenue generated from charges for waste management. To carry out these and other related activities, the bureau received an allocation of R1.2 billion over the medium term.

Green Deeds Good

In March 2019, the government launched the Good Green Deeds Programme to mobilise every citizen, and social partners to act now to be a Good Samaritan for Green Deeds.

The programme is led by the DEA and aims to promote environmental actions that take into consideration sustainable living practices. At the centre of this campaign are principles of environmental justice, an understanding that becoming environmentally conscious starts with one small action, and one small action can go on to inspire a global change. South African citizens have to work together to restore and maintain Mother Nature's majesty.

Climate Change Response Policy

> On 8 March 2019, President Cyril Ramaphosa unveiled Billy Bin, the cheery green mascot who is passionate about keeping the environment clean. Billy Bin will be a constant reminder to all South Africans that the responsibility to keep South Africa clean lies with them.

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 hectares 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, protecting high biodiversity value and providing 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 by these communities.

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, 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 and 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.

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.

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 UNFCCC to finance concrete adaptation projects and programmes in developing countries that are parties to the protocol.

The Department of Science and Technology, the DEA, the National Research Foundation and SANBI signed a business transfer agreement to enable the transfer of the national zoological gardens in Pretoria from the National Research Foundation to SANBI with effect from 1 April 2018.

For this purpose, amounts of R69,7 million in the 2018/19 financial year, R73.6 million in the 2019/20 financial year and R77.6 million in the 2020/21 financial year are being shifted from the foundation to the institute.

Managing oceans and coastal conservation

The department continues to support annual research voyages to Antarctica, Marion Island and Gough Island.

Servicing the contract with African Marine Solutions for the manning and operation of two research vessels, SA Agulhas II and SA Algoa, is one of the major cost drivers in the Oceans and Coasts programme, amounting to a projected R557 million over the medium term.

Implementing the Oceans Economy Strategy forms part of Operation Phakisa, a fast results delivery programme launched by government in 2014. An estimated R311.1 million is provided over the MTEF period in the Oceans and Coasts programme for implementing the oceans economy strategy, which includes activities in marine transport and manufacturing, offshore oil and gas exploration, aquaculture, marine protection services, ocean governance, small harbours, and coastal and marine tourism.

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.

In an effort to combat climate change, the SAWS recently adopted the approach of building "a WeatherSMART nation". This is expected to enhance the early warning system to ensure that climate and weather data, products and applications are available to all South Africans.

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 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.

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 CBD 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 are marine, totalling 7.5 million ha or 6.2% of the country's land area.

Over the medium term, the DEA aims to increase the percentage of land under conservation to 16 121 794 ha in 2018/19 – improving the size of state-managed protected areas that are effectively managed to 90% (5 873 300 ha out of 6 525 889 ha).

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 DEA 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. 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 21 national parks in seven of the nine provinces of South Africa, with a total area of just over 4 million ha and comprising 67% of the protected areas under state management.

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, birdwatching, 4x4 trails, sightseeing, cultural and historical experiences, mountain biking, golf, canoeing and swimming.

The organisation is working to increase the number of visitors to national parks from 5.9 million in 2016/17 to 6.5 million in 2019/20, with the aim of increasing commercial activities revenue from R1.4 billion in 2017/18 to R1.6 billion in 2019/20.

Spending on tourism infrastructure improvements and extensions is projected at R422 million over the medium term.

SANParks will also manage and monitor protected areas and raise awareness about national parks through the biodiversity and conservation programme, with an allocation of R893 million, growing at an average annual rate of 3.4%.

SANParks plays a key role in employment creation through implementation the EPWP.

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 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:

- 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 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.

> The animal collections of the National Zoological Gardens 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.
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> 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(MBCC), 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, 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.

World heritage sites

A UNESCO World Heritage Site is listed by the organisation 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.

For a site to be deemed as a world heritage site, it has to be recognised as having global historical or environmental significance, signify a phenomenal achievement of humanity, or reveal ancient civilisations. The recognition allows the country to access funds for conservation from the World Heritage Fund. To be accepted onto the list, a country must meet stringent criteria and show how the site will be conserved.

South Africa has 10 world heritage sites proclaimed by UNESCO:

- Robben Island: situated 11 kilometres (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 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. 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.
- The Khomani Cultural Landscape covers 959 100 ha, forming part of the Kgalagadi Transfrontier Park and including the whole Kalahari Gemsbok National Park, associated with the former San hunter-gatherers. It is a vast desert area associated with Khomani San culture since the Stone Age.

10th World heritage site for South Africa

The Barberton Makhonjwa Mountains were added to the prestigious World Heritage List in July 2018, becoming the 10th World Heritage Site for South Africa. The mountains were inscribed at the 42nd UNESCO World Heritage Committee session held in Manama, Bahrain.

Situated in Mpumalanga Province, the site comprises 40% of the Barberton Greenstone Belt, one of the world's oldest geological structures. The Barberton Makhonjwa Mountains represent the best-preserved succession of volcanic and sedimentary rock dating back 3.25 to 3.6 billion years. It features meteor-impact fallback breccias resulting from the impact of meteorites formed just after the Great Bombardment (4.6 to 3.8 billion years ago). It has attracted researchers from all over the world because of its most exposed layers of rock formations. Scientists found fossilised bacteria under thin layers of rock thought to be 3.2 billion years old. The intensive work which culminated in a ground breaking research on the site and to nominate it for world heritage recognition started in the early 2000s.

The recognition by UNESCO is expected to unlock the potential of Makhonjwa Mountains and contribute to socio-economic development, attesting to the strategic value of heritage in economic development. It is also expected to boost local eco-tourism development and provide job creation opportunities for rural communities.

Before this new addition, South Africa was tied with Morocco and Egypt with nine World Heritage sites each.

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.

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. The 2019 theme for the World Wetlands Day was: "Wetlands and Climate Change". Wetlands are important ecosystem as they provide a number of benefits, not only to the natural environment but also a human being. The aim of the theme was to demonstrate that, wetlands are the planet's most effective carbon sinks or storage and represent an unrealised potential for climate mitigation

The theme is in line with the 2030 Sustainable Development Agenda's goals, especially the Sustainable Development Goal 13, which states that "take urgent action to combat climate change and its impacts" particularly its targets 13.1 which advocates for "strengthening resilience and adaptive capacity to climate-related hazards and natural disasters in all countries".

The theme also responds to article 2 of the Paris Agreement which calls for increasing the ability to adapt to the adverse impacts of climate change and foster climate resilience and low greenhouse gas emissions development, in a manner that does not threaten food production and livelihoods of communities.

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.

The 85-ha NZG is the largest zoo in the country and houses 3 117 specimen of 209 mammal species, 1 358 specimen of 202

bird species, 3 871 specimen of 190 fish species, 388 specimen of four invertebrate species, 309 specimen of 93 reptile species, and 44 specimen of seven amphibian species.

It plays a major role in the conservation of wildlife, maintaining one of the largest animal collections in Africa.

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 Mokopane Biodiversity Conservation Centre, covering 1 333 ha.

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

The Mokopane Biodiversity Conservation 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. .

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.

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

Wildlife protection

The Convention on the International Trade in Endangered Species of Wild Fauna and Flora (CITES) states that big cats, which are among the most widely recognised and admired animals, are facing many and varied threats caused mostly by human activities worldwide.

South Africa adheres to the principle of sustainable utilisation of natural resources, as well as principles set out in the NDP aimed at creating a climate-resilient society while growing the economy and increasing jobs. As such, a range of measures have been introduced to ensure that lion, leopard and cheetah populations are conserved and properly managed. This includes the implementation of a Biodiversity Management Plan for the African Lion. The Scientific Authority of South Africa conducted a Non-Detriment Finding (NDF) as required by CITES. The final NDF was published for implementation in January 2018.

The NDF for lion states that there are currently no major threats to the wild and managed lion populations in South Africa, although the management of re-introduced wild lion needs some improvement. Minor, but non-detrimental threats include over-utilisation, disease, poaching and conflict with communities around protected areas.

Wildlife crime not only threatens natural resources, but also the economy through financial burdens and the loss of economic and development opportunities. As a country richly endowed with natural resources, South Africa is not immune to these challenges with criminal syndicates targeting iconic species, such as the cycad, rhino, elephant and lion, as well as species not often considered as being under threat – birds, tortoises, lizards and snakes.

The declaration of wildlife crime as a priority crime in South Africa has resulted in a multidisciplinary, multi-sectoral approach focused on collaboration through our national security structure. This involves border and customs officials, the National Prosecuting Authority, the Police and institutions such as the Airports Company of South Africa which manages international airports.

The country has also introduced the development of critical skills aimed at increasing its capacity to detect and investigate these crimes. The DEA is currently working with World Wide Fund for Nature on a project to increase the country's ability to tackle wildlife trafficking. This project, funded by the US Department of State's Bureau of International & Law Enforcement Affairs, focuses on the development of further training materials to bolster the country's national compliance and enforcement programme, including an e-learning platform for officials, audio visual materials, specific curriculum and manuals.

Traveller awareness material has also been developed to highlight the threat that wildlife crime poses to the rich biodiversity and encouraging people not to support the illegal trade in wildlife.

The DEA"s Environmental Management Inspectors (EMIs) check consignments of wildlife for exports from South Africa to ensure that that they meet all legal requirements. About 300 legal wildlife-related consignments are exported/imported on a monthly basis at the OR Tambo International Airport. The EMIs inspected and endorsed approximately 4 200 CITES permits during 2017.

The SARS K9 unit at O R Tambo International Airport use specialist sniffer dogs to detect attempts to smuggle wildlife into South Africa.

Rhino poaching

Combating rhino poaching remains a national priority, and as such, all the relevant government departments will continue their close collaboration to ensure that this iconic species is conserved for generations to come. Rhino poaching has been declared a National Priority Crime, and government continues to work as a team in the implementation of the Integrated Strategic Management of Rhinoceros.

This is a multi-sectoral, interdisciplinary approach involves other stakeholders such as SANParks, the Department of Home Affairs, the Department of Defence (as a leader of the SANDF), the South African Police Service and the Hawks, the State Security Agency, the South African Revenue Service, the Department of Justice and Constitutional Development, and the provincial conservation authorities.

South Africa's largest game reserve, the Kruger National Park, now houses a court which will combat rhino poaching. The Skukuza Regional Court periodically sits once a week.

For the third consecutive year, there has been a decline in rhino poaching, particularly in national parks, and it is the first time in five years that the annual figure is under 1000.

During 2018, the number of rhino poached countrywide decreased to 769. This is a decrease of 259 rhino compared to th e previous year when 1 028 rhino were killed for their horns.

A total of 421 rhino were poached in the Kruger National Park, 16.5% less than the 504 poached in the previous year. The number of poacher activities in the Kruger National Park, however, declined by only two recorded activities during the year, with a total of 2.620 incursions and 125 contacts recorded during 2018.

From 1 January to 31 December 2018, a total of 365 alleged rhino poachers and 36 alleged rhino horn traffickers were arrested nationally.

A total of 229 alleged poachers were arrested inside and adjacent to the Kruger National Park, 40 more that those arrested in the previous year.

During 2018, a total of 104 firearms were recovered in anti-poaching operations inside the Kruger National Park and a further 74 firearms were recovered in operations/investigations linked to the park.

Collaboration between the different law enforcement role players such as the conservation and environmental authorities, the South African Police Service (SAPS) Stock Theft and Endangered Species Unit, the Hawks and SAPS Crime Intelligence during 2018, is having a positive impact. This improved cooperation is benefitting both anti-poaching

and crime prevention operations as well as focusing efforts on specific high priority investigations.

There are currently 318 rhino poaching-related cases on the court roll, involving 645 accused and 897 charges. About 275 of these cases are trial-ready.

From January 2018 to December 2018, the National Prosecuting Authority (NPA) obtained convictions in 78 of the 82 cases that went to trial. This represents a 95.1% conviction rate. The 78 cases involved 135 accused, all of whom were convicted of rhino poaching and related matters and this translated into over 500 years imprisonment in terms of sentencing in respect of these guilty verdicts.

Operations conducted during 2018 between Customs, the South African Revenue Service, Hawks, the Green Scorpions, Airport Security and other role-players saw the arrest of seven Chinese and four South African citizens and the confiscation of 78 rhino horns, one rhino horn sculpture, two bangles made from rhino horn and 27 pieces of rhino horn.

The lifting of the moratorium on the domestic trade in rhino horn does not mean that rhino horn in private possession can be sold without a permit. Noone is allowed to trade rhino horn (including selling, donating, or in any way acquiring or disposing of a rhino horn) without a permit issued by the DEA as well as relevant possession / transport permits issued by the provincial conservation departments. Commercial international trade in rhino horn is and remains prohibited in terms of the CITES provisions.

Managing rhino populations

The biological management initiative focuses on continued movement of rhinos to expand ranges and support rhino strongholds. In small parks and provincial reserves, the translocation of rhinos seek to mimic how young animals disperse naturally. Within Kruger National Park, the translocation of rhinos from Kruger as part of South Africa's biological management innovations of expanding ranges and establishing additional rhino strongholds are challenged by the emergence of bovine tuberculosis in both black and white rhino, albeit at low incidence.

South Africa's veterinary regulations require several procedures to ensure that translocated rhinos do not serve as a source of spreading the disease into commercial stock production areas of South Africa. The development of efficient systems to overcome this challenge is in progress.

Even so, innovative biological management have used translocations within Kruger National Park as a mechanism to direct poaching to focus less on cows. This goes hand in hand with initiatives to dehorn rhinos embedded in strategic approaches that target individuals that frequent poaching hotspots, but more importantly, approaches that minimize the losses of cows. Complimenting these interventions are guarding initiatives that focus on regular individual monitoring of individual rhinos. These combinations of interventions seek to maximiuse the breeding potential of both black and white rhinos.

The integrated initiatives of SANParks to manage its rhino population have had varied successes. Within Kruger National Park the continued onslaught of poaching resulted in a continued decline of rhinos.

International Cooperation

International cooperation remains a critical component of the overall response strategy to halt rhino poaching, and related wildlife crime. South Africa continues to engage countries where rhino horn seizures take place in order to request that samples of the rhino horn DNA be sent to South Africa for analysis in line with the CITES resolutions. This enables the country to link the seized horns to poaching cases and live rhino or rhino horn stockpiles, thus providing key information to further support investigations and understand transit routes.

Towards the end of 2018 the Global High Level commitment to combat wildlife crime was again reinforced during the London Conference on Illegal Wildlife Trade. At this event South Africa pledged to continue the important work of implementing and further enhancing the integrated, multi-disciplinary approach in tackling wildlife crime as a serious organised crime; to ensure closer collaboration with international partners and law-enforcement counterparts and continue to focus efforts on dismantling the more sophisticated operational layers of wildlife smuggling networks.

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.

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 then 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 Southern African Development Communication coastal states.

The Phakisa Approach

Operation Phakisa was launched in 2014 to enable government to implement its policies and programmes better, faster and more effectively.

The initiative was designed to fast-track the implementation of solutions on critical development issues. This is a unique initiative to address issues highlighted in the NDP Vision 2030 such as poverty, unemployment and inequality.

The department has registered notable progress with regards to Operation Phakisa: Oceans Economy; Chemicals and Waste Phakisa, and Operation Phakisa: Biodiversity Economies.

Operation Phakisa: Oceans Economy

The department to continues to unlock the economic potential of South Africa's oceans, growing the gross domestic product and creating more sustainable jobs – while ensuring that the country's oceans and coastal ecosystems are sustainably managed.

Highlights include the development of a National Guideline Towards the Establishment of Coastal Management Lines. This is intended to minimise risks posed by short and long term coastal processes such as storm surges, erosion and sea level rise. A National Coastal Access Strategy is also being development to provide guidance around the public's access to closed off beaches.

The Marine Spatial Planning Bill was approved by the National Assembly on 24 April 2018 and is expected to undergo procedures of the National Council of Provinces. The department continued to enhance legislation for the Integrated Coastal and Oceans Management Act or Oceans Act. It has finalised an associated Marine Spatial Planning Framework, and is working on the development of sub-regional marine spatial management plans.

Marine pollution is another challenge that threatens fragile ecosystems. South Africa has a number of measures in place to tackle this problem, including the National Pollution Laboratory operated by the Walter Sisulu University which is expected to start working in the near future. The lab will allow for in depth analysis of the samples that could not be done through mobile laboratories.

In addition, South Africa is amongst the countries that have endorsed the UN Environmental Programme's Clean Seas Campaign. The campaign is aimed at stepping up international, regional and national efforts to combat marine litter. As part of the campaign, the department has announced the piloting of its Source to Sea Initiative – new strategy to investigate and combat pollution, in particular plastic pollution which threatens both freshwater and marine ecosystems.

The oceans have the potential to contribute up to R177 billion to the GDP and create just over one million jobs by 2033.

Operation Phakisa: Oceans Economy Marine Protected Areas

The gazetting of a network of 20 new representative Operation Phakisa: Oceans Economy MPAs has increased South Africa's marine ecosystem area under protection in the country's EEZ, from the current 0.4% to 5.4%, to provide protection to 90% of habitat types, as well as contribute to global protection in line with South Africa's international commitments.

The new network strives to support multiple objectives for biodiversity in alignment with oceans economy goals. The new MPAs represent seamounts, submarine canyons, volcanic pinnacles, and a variety of ecosystem types on the shelf, continental margin, and abyss in both the Indian and Atlantic oceans. The new network also provides the first protection for several threatened and fragile ecosystem types, including threatened mud, gravel, and shelf edge habitats and sensitive deep water scleractianian, stylasterine, and soft coral-dominated ecosystem types.

This new network of 20 MPAs will, among other things, contribute to fisheries sustainability, advance marine ecotourism, and will help maintain resilience in ecosystems that are under stress from climate change.

Work on the new approved network of MPAs dates back to 2014, when the South African government endorsed a plan to achieve, as part of Operation Phakisa: Ocean Economy, a viable network of MPAs. South Africa's ocean space, which is one of the most varied in the world, is highly productive with rich biodiversity providing for living and non-living resources that contribute significantly to the country's economy and to job creation.

MPAs provide safe spaces in which fish can breed undisturbed. They are essential to maintain eco-certification of the South African deep-sea trawl fishery. This certification process assesses whether habitat and nursery areas for the hake fishery, are adequately protected. MPAs also contribute to growing South Africa's marine eco-tourism sector by providing undisturbed natural habitat for whales, sharks, seals, dolphins, turtles and seabirds for international and domestic tourists to experience.

An adequate network of MPAs will also provide the basis for ongoing resilience to the impact of climate change. Oceans are an essential component of the climate system, absorbing and transferring heat, and regulating the exchange of carbon dioxide with the atmosphere. With increasing carbon dioxide levels, and rising ocean temperatures, this regulatory capacity is at risk. The network of MPAs will assist in building ecological resilience, and therefore social and economic resilience in the growing ocean economy.

The new MPA network is a product of extensive consultation and negotiation with all stakeholders, which sought to ensure that the network is aligned with relevant policies and priorities for fisheries, aquaculture, tourism, as well as marine mining and oil exploration, while also protecting ecologically important areas.

Operation Phakisa: Biodiversity Economy

South Africa has a multi-faceted approach to the management of its rich natural heritage. The approach focuses on an inclusive, value-chain approach to the development of the biodiversity economy, taking into consideration the fact that communities are the primary custodians of the country's biodiversity.

In the 2018/19 financial year, the department plans to increase the supply of indigenous species by availing at least 500 ha of land for the production of high value species. This will be complemented by ongoing implementation of a game donation and custodianship policy framework.

In line with the President's investment drive, the department plans to launch a Biodiversity Economy Investment Catalogue, that will profile investment-ready biodiversity economy projects.

New Operation Phakisa MPAs:
- Orange Shelf Edge
- Namaqua Fossil Forest
- Namaqua National Park
- Childs Bank
- Benguela Muds
- Cape Canyon
- Robben Island
- Southeast Atlantic Seamounts
- Brown Bank Corals
- Agulhas Bank Complex
- Agulhas Muds
- Southwest Indian Seamounts
- Agulhas Front
- Port Elizabeth Corals
- Addo Elephant National Park
- Amathole Offshore
- Protea Banks
- Aliwal Shoal
- uThukela
- iSimangaliso

Operation Phakisa: Chemicals and Waste

Waste economy has the potential to address inequality, poverty alleviation and create jobs. The department continues to support waste pickers through various programmes such as the Recycling Enterprise Support Programme which has already made a material impact to the lives of 12 black-owned and managed enterprises.

The primary objective of the programme is to provide developmental funding for projects in the form of start-up grants. These projects are either start-up or pre-existing enterprises establishing buy-back centres, material recovery facilities, construction & demolishing solutions and plastic palletisation plants in line with the Operation Phakisa initiatives.

The programme has been allocated a budget R194 million over a three-year period.

With regards to chemicals, Cabinet has recommended that South Africa should ratify the Minamata Convention on Mercury and the Kigali Amendment to the Montreal Protocol on the Protection of the Ozone Layer. The Kigali amendment will have co-benefits for mitigating climate change and ozone-depletion.

The South African government is also committed to minimize plastic pollution. The department recently conducted a Plastic Material Study and is in the process of consulting with the cosmetics industry to phase out the use of micro beads in cosmetics. Plans are also underway to review the impact of the implementation of plastic bag policies.

In addition, the DEA will continue to work with the packaging sector (paper, glass, plastic and metal) to increase over and above 58% the amount of waste diverted from landfill.

The DEA is expected to launch the Keep South Africa Clean campaign with the aim of mobilizing citizens to become environmentally conscious and create a South Africa free of litter and illegal dumping.

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.

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 Trans-boundary 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 of 2008.

The DEA established the Waste Management Bureau in April 2016. The programme is aimed at reducing waste through recycling. The bureau monitors recycling plans, and provides specialist services to government and recycling companies.

Over the medium term, the bureau plans to introduce tyre recycling initiatives, which are set to receive operational funding of R230 million in 2018/19 and R245 million in 2019/20.

The bureau also plans to introduce the recycling enterprise support programme, which will provide support services, training and advice to transporters, storage depot operators and tyre recyclers.

An amount of R155 million over the medium term has been allocated to the plastics programme, which will promote waste minimisation, create awareness in the plastics industry, expand

collector networks and support rural collection through building the capacity of small, medium and micro-enterprises.

The National Regulator for Compulsory Specifications also receives transfers of R22,5 million over the medium term to implement compulsory specifications for plastic bags.

Youth Jobs in Waste and Township Greening Projects

These projects are funded by the DEA through its Environmental Protection and Infrastructure Programme and aim to contribute towards poverty alleviation while empowering beneficiaries to participate in the mainstream economy.

The youths 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 the country's communities as well as promoting maximum use of alternative energy sources and promote an environment that is clean, green and healthy for all.

The DEA has funded numerous projects within the Randfontein Municipality, which are being implemented using labour-intensive methods in line with the EPWP, with an aim of 58% women employment, 65% youths and 2% being people with disabilities.

The waste sector has been identified as a key role player in achieving the goal of economic upliftment through job creation as the DEA works towards reaching the NDP's goal of creating an environmentally sustainable, climate change resilient, low-carbon economy and just society by 2030.

The Youth Jobs in Waste Programme was designed to address some of the critical areas of assistance, including capacity-building, where youths are placed in municipalities for a period of a year to assist with administration relating to waste collection and planning.

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 schoolchildren 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 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*. The DEA and the SAWS have upgraded the Saaqis . South Africans can now view the state of air live from the government monitoring network on their smart phones and other gadgets.

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 (COP 21) 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 (COP17) 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.

South Africa is among the countries that have signed the Paris Agreement – commiting to ensuring that the country continued to play a positive role in the building of a low-carbon, job-creating and pro-development green economy.

To manage climate change and air quality effectively, the department aims to increase the number of government-owned air quality monitoring stations reporting to the South African air quality information system from 116 in 2017/18 to 125 in 2020/21.

Other activities include rolling out the Let's Respond toolkit in 40 municipalities to provide a process map for integrating responses to climate change into municipalities' integrated development plans. To achieve this, R924 million is provided over the MTEF period.

Environmental impact management

2018 marked 20 years since the adoption of the Environmental Impact Assessment (EIA) as a tool to advance sustainable development.

South Africa's 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 impact assessments on waste and EIA.

In order to advance and fast-track environmental authorizations for key infrastructure projects, the department continues to undertake Strategic Environmental Assessments (SEAs).

The vast scientific information from these assessments have aided in the streamlining of decision-making for South Africa's Strategic Infrastructure Projects (SIPs) led by the Presidency. A total of 33 SIP catalyst projects were authorized in the past financial year.

South Africa is one of the top investment destinations globally for renewable energy, and over the past financial year, SEAs were conducted for renewable energy, shale gas and electricity grid infrastructure. Work is also underway on the Gas Pipeline SEA.

Aquaculture

Through Operation Phakisa, the government has showed its commitment to aquaculture. The operationl looks to unlock the growth potential of the country's coastline, which is in line with the NDP.

It will also ensure that policies and programmes are implemented 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 long-term 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 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.

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 Access and benefit sharing. 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
- UNCCD
- Convention on Migratory Species.

The National Biodiversity Strategy and Action Plan (NBSAP) 2015 – 2025 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.

The National Biodiversity Framework, 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

In 2018, South Africa participated in a number of important international forums, including the 13th meeting of the Conference of the Contracting Parties to the Ramsar Convention on Wetlands and the 14th meeting of the Conference of the Parties to the Convention on Biological Diversity, the 9th Meeting of the Parties to the Cartagena Protocol on Biosafety and the 3rd Meeting of the Parties to the Nagoya Protocol on Access and Benefit-sharing.

The country also hosted the 7th Meeting of Parties to Agreement on African-Eurasian Migratory Waterbirds (AEWA) from 4 to 8 December 2018. The meeting was developed under the framework of the Convention on Migratory Species.

AEWA brings together countries and the wider international conservation community in an effort to establish coordinated conservation and management of migratory waterbirds throughout their entire migratory range. An example of these are flamingos and blue crane that are Intra-Africa migrants as well as some species of penguin, falcon and swallows that migrate to other continents.

Hosting the conference was expected to boost the bird-watching tourism or avitourism, which according to a Department of Trade and Industry study is found to generally offer higher than average trip spend and longer trip lengths in multiple provinces.

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 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 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.

The DEA, SANBI, the Scientific Authority and provincial authorities are working together to ensure full compliance with decisions taken at the 17th Conference of Parties to the Convention on International Trade in Endangered Species of Wild Fauna and Flora.

These include identifying and implementing protocols for the registration of over 1 000 facilities for breeding captive bred parrots; strengthening the monitoring of leopard populations to improve science based-decision making; and initiating a research project to understand how trade in lion bone may impact wild lion populations.

Montreal Protocol on Substances that Deplete the Ozone Layer

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 outchlorofluorocarbons, halons, methyl chloroform and carbon tetrachloride.

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:

- 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 that 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.