

Special Report

Appendix 3 Country Review: South Africa

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Marine and Coastal EbA for Enhanced Resilience in Southern Africa Country Review: South Africa

SIYASANGA SAUKA

African perspectives
Global insights

Executive summary

As one of the fastest developing countries in Africa, South Africa has made immense socio-economic strides over the past two decades, although poverty and inequality are still serious challenges. Of a total population of 58 million (in 2019), 45% reside in coastal areas and are highly dependent on coastal resources. These ocean and coastal ecosystem services are important as they directly and indirectly impact human livelihoods, food security and agriculture, trade and industry.

South Africa is considered one of the most biologically diverse countries in the world. The unique ocean current systems around the coastline are highly productive and display rich biodiversity, providing an immense opportunity to support the country's socio-economic development. However, estuaries and coastal, offshore and inshore ecosystems are under threat. In addition, longer-term issues such as climate change and sea-level rise will also negatively affect these threatened ecosystems. As climate change, biodiversity and human well-being are all interconnected, climate change's impact on biodiversity will affect the ecosystem services that humans receive from functioning ecosystems.

Intact coastal ecosystems play an important role in enabling adaptation to climate change. Therefore, actions taken to improve the natural resilience of biodiversity and ecosystem services to climate change are also likely to improve social resilience to climate change. This is achieved by managing, conserving and restoring ecosystems to increase climate resilience and buffer humans, settlements and infrastructure from the impacts of climate change – often referred to as ecosystem-based adaptation (EbA). Therefore, South Africa's main approach to adapting to climate change should be strengthening resilience by maintaining the integrity of ecosystems and the many services they provide.

In South Africa the regulation, governance and management of EbA in marine and coastal areas are primarily the responsibility of the Department of Environment, Forestry and Fisheries (DEFF) at national level, supported by provincial government. In partnership with DEFF, the South African National Biodiversity Institute (SANBI) plays a leading role in the research, management and implementation of EbA. The implementation of EbA projects rests largely with local authorities, which work closely with DEFF, SANBI, other government entities and non-state actors. To facilitate coherence and cooperation, national mechanisms for biodiversity management have been established, complemented by cross-sectoral, multi-level and multi-stakeholder working groups and task teams.

To promote effective EbA governance, the Ecosystem-based Adaptation Strategic Framework and Overarching Implementation Plan (2017) and Ecosystem-based Adaptation Guidelines (2018) were developed. Added this, South Africa has a suite of policies, strategies and legislation that enable the governance and management of EbA. These are backed by the Constitution, which provides for the protection, conservation and sustainable use of the environment.

South Africa is a signatory to the 2030 Sustainable Development Goals and numerous other multilateral environmental agreements, such as the Convention on Biological Diversity (CBD), the UN Convention to Combat Desertification, the Convention on Wetlands of International Importance (Ramsar Convention) and the UN Framework Convention on Climate Change. As required by these international commitments, South Africa has produced a CBD National Report, a National Action Programme (NAP) and Nationally Determined Contributions (NDCs), and has declared 21 Ramsar sites. The NAP and the CBD National Report recognise and respond to the strong linkages between biodiversity and climate change. While the current NDC states that the country is especially vulnerable to climate change impacts, particularly in respect of water, food security and ecosystem services, there is no mention of the need to ensure climate-resilient ecosystems. It is critical that South Africa's next NDC (due in 2020) addresses the critical role that resilient ecosystems play in the country's climate adaptation endeavours.

South Africa recognises the value of an ecosystem-based approach, as evidenced by the numerous projects pioneering the implementation of EbA. With 2 800km of coastline, EbA activities have focused largely on dune rehabilitation, marine protected areas and estuarine management. To increase EbA implementation, there is a need to align and leverage existing experience, strengthen expertise, and learn from previously implemented projects (eg, in river basin and terrestrial environments). This is crucial given the current economic climate, where resources are limited. Additional resources would unlock the ability to scale up small/pilot projects, improve research, coordination and communication, and promote learning.

Although EbA can be considered a low-regret climate adaptation option, obtaining funding is a challenge despite the fact that EbA can be funded through sources targeting themes such as biodiversity, conservation or socio-economic development. As in most countries, financing for EbA interventions and climate adaptation falls below the volumes required. The country currently sources most of the climate adaptation project funding from international funders (eg, Green Climate Fund [GCF], Adaptation Fund and International Climate Initiative). SANBI was accredited as the National Implementing Entity of the Adaptation Fund in 2011 and of the GCF (together with the Development Bank of Southern Africa and Nedbank). Locally, the BIOFIN Biodiversity Finance Plan for South Africa (2017) was developed to identify and support the implementation of innovative finance solutions. To meet funding needs it is crucial that existing funding sources that are not targeted for EbA projects are tapped into, non-traditional sources of finance are investigated, and that public-private partnerships are explored.

The governance of EbA has seen significant advancements over the last three to five years. Added to this, there is a multitude of institutions involved in research, implementation, skills development and knowledge transfer. However, there are currently challenges in terms of institutional coordination (as decision makers tend to operate in silos), both internally within departments and externally across institutions, coupled with resource constraints, which limit the ability of entities to perform their mandate. Added to this, when it comes to EbA implementation the country experiences various challenges at the local

level. Institutions need to coordinate and collaborate to ensure efficient use of resources and effective EbA governance, management and implementation.

Decision makers will need to embrace holistic biodiversity management and climate adaptation by identifying and putting into effect appropriate policies and measures that are coordinated and relevant. It is critical that skills development and capacity building help decision makers and implementers better understand the linkages between climate change, biodiversity and socio-economic development, and how to ensure multi-sectoral benefits. This is critical for building long-term resilience.

Successful EbA implementation requires acknowledging lessons, learning from them, and filling the identified knowledge gaps. EbA projects would also benefit from sufficient financial resources (by exploring innovative sources of finance and partnerships), improved policy relevance, as well as improved communication and knowledge sharing to encourage capacity building, and peer learning. By effectively addressing these challenges and exploring opportunities, South Africa can ensure climate resilience through successful marine and coastal EbA implementation.

Abbreviations & acronyms

ASCLME	Agulhas-Somali Current Large Marine Ecosystem
BIOFIN	Biodiversity Finance Initiative
CBD	Convention on Biological Diversity
CoP	communities of practice
CSP	Conservation Stewards Program
DEFF	Department of Environment, Forestry and Fisheries
DWS	Department of Water and Sanitation
EbA	ecosystem-based adaptation
CCF	Green Climate Fund
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH
MPA	marine protected area
NAP	National Action Programme
NDC	Nationally Determined Contribution
NGO	non-governmental organisation
NIE	National Implementing Entity
SANBI	South African National Biodiversity Institute
SDGs	Sustainable Development Goals
SGF	Community Adaptation Small Grants Facility
UNCCD	UN Convention to Combat Desertification
UNDP	UN Development Programme
UNFCCC	UN Framework Convention on Climate Change
UNIOC	UN Intergovernmental Oceanographic Commission
WGs	Working Groups

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Cover image

MPA Cape Vidal, iSimangaliso Wetland Park (formerly known as Greater St Lucia Wetland Park)
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Background, context and situation analysis

South Africa is one of the fastest developing countries in Africa. It has a relatively stable mixed economy that draws on its highly evolved intellectual capital and natural resources (such as fertile agricultural lands, abundant mineral resources and nature-based tourist attractions). However, from a developmental vantage point the legacy of apartheid is still very evident. South Africa remains a dual economy with one of the highest Gini coefficients in the world, perpetuating both inequality and exclusion. Poverty and inequality are the country's most significant challenges, and therefore undoing both inequality and poverty remains the major preoccupation of its policymakers.¹

Figure 1 Map of South Africa



¹ DEA (Department of Environmental Affairs), 'National Climate Change Adaptation Strategy: Republic of South Africa', 2017, https://www.environment.gov.za/sites/default/files/reports/nationalclimate_changeadaptation_strategyforcomment_nccas.pdf, accessed 24 April 2019.

Populated coastal areas

South Africa is the southernmost country in Africa. It has a total area of approximately 1 200 000km², and the coastline stretches over approximately 2 800km. As shown in Figure 1, there are four major cities along South Africa's coast, namely Durban, East London, Port Elizabeth and Cape Town. Other coastal towns and urban areas serve as commercial and service centres to surrounding rural areas and farming communities.

According to Statistics South Africa, the country's population is estimated at 58 million (as at 2019).² About 45% of this population lives in coastal provinces.³ This coastal population is highly dependent on coastal resources. Ocean and coastal ecosystem services⁴ directly and indirectly impact human livelihoods, food security and agriculture, trade and industry. These ecosystem services range from planetary functions such as heat distribution, nutrient cycling, oxygen production, carbon dioxide absorption and influencing rainfall and weather patterns to the harvesting of fish and mining of oil, gas and other minerals. These resources hold significant value for a number of different sectors, such as mining, fisheries, forestry and tourism, many of which also supply global consumer markets. In addition, the resources are vital for the local coastal communities that depend on them. Many of these communities live in abject poverty.⁵

South Africa's coastal population is highly dependent on coastal resources. Ocean and coastal ecosystem services directly and indirectly impact human livelihoods, food security and the economy

The coastal zone

South Africa's coastlines border the Indian Ocean to the south-east and the Atlantic Ocean to the south-west.⁶ The ocean and coastal zones under South Africa's jurisdiction can be considered largely as wilderness areas and are in fact larger than the country's land territory. Included in the jurisdiction of the oceans and coasts environment are the two sub-Antarctic territories of Prince Edward and Marion islands and the exclusive economic zone

2 Stats SA, 'South Africa Population 2019', <http://worldpopulationreview.com/countries/south-africa-population/>, accessed 23 April 2019.

3 Stats SA, 'Mid-year population estimates, 2018', 23 July 2018, <http://www.statssa.gov.za/?p=11341>, accessed 23 April 2019.

4 Ecosystem services are the direct and indirect contributions of ecosystems to human well-being.

5 DEA, 'Second South Africa Environmental Outlook, Chapter 9: Oceans and Coasts', 2016, https://www.environment.gov.za/sites/default/files/reports/environmentoutlook_chapter9.pdf, accessed 24 April 2019.

6 Britannica, 'South Africa', <https://www.britannica.com/place/South-Africa>, accessed 24 April 2019.

that surrounds these islands.⁷ The two small islands are situated in the Indian Ocean about 1 900km south-east of Cape Town.

South Africa has a unique ocean current system around the coastline that is highly productive with rich biodiversity.⁸ This coastal region is defined by two large marine ecosystems: the Benguela Current Large Marine Ecosystem and the Agulhas-Somali Current Large Marine Ecosystem (ASCLME). These two large marine ecosystems constitute an exceptionally rich marine environment that has enormous value as a national resource, yet little is understood about their natural variability.⁹ This is unfortunate, since the available living and inert ocean and coastal resources are a significant economic and development opportunity for present and future generations of South Africans. This economic opportunity comprises both historical sectors, such as fishing and shipping, and important new and emergent technologically advanced sectors related to medicine, energy, mining and food production.¹⁰

Biodiversity and coastal ecosystems

South Africa's Fifth National Report to the Convention on Biological Diversity (CBD)¹¹ states that the country is considered one of the most biologically diverse countries in the world owing to its species diversity and endemism, as well as its variety of ecosystems. These rich endowments of biodiversity assets are an immense opportunity to support the country's development path, especially as the knowledge base on the value of ecosystems and their management expands. An emerging focus on ecological infrastructure, defined as naturally functioning ecosystems that deliver valuable services to people, is helping the country unlock investment in ecosystems with multiple social, environmental and economic benefits.¹²

Biodiversity is crucial to ecosystem health, and healthy ecosystems are central to human wellbeing as they provide the foundation for clean air and water, fertile soil and food.¹³ However, while South Africa's coastline and ocean are largely in a good environmental state, there are a number of areas of concern. These include higher pollution levels around coastal metropolitan areas; pollution; the reduction of freshwater flow through estuaries (together with extractive pressure); deteriorating environmental health; and the risk of oil spills.¹⁴ It is estimated that 58% of coastal and inshore ecosystem types, 41% of offshore

7 DEA, 2016, *op. cit.*

8 *Ibid.*

9 Du Toit J & L Chivell, 'Some interesting facts about South Africa's coastline', *Hermanus Online*, 2015, <https://www.hermanusonline.mobi/some-interesting-facts-about-south-africa-s-coastline>, accessed 24 April 2019.

10 DEA, 2016, *op. cit.*

11 South Africa, 'South Africa's Fifth National Report to the Convention on Biological Diversity', 2014, <https://www.cbd.int/doc/world/za/za-nr-05-en.pdf>, accessed 24 April 2019.

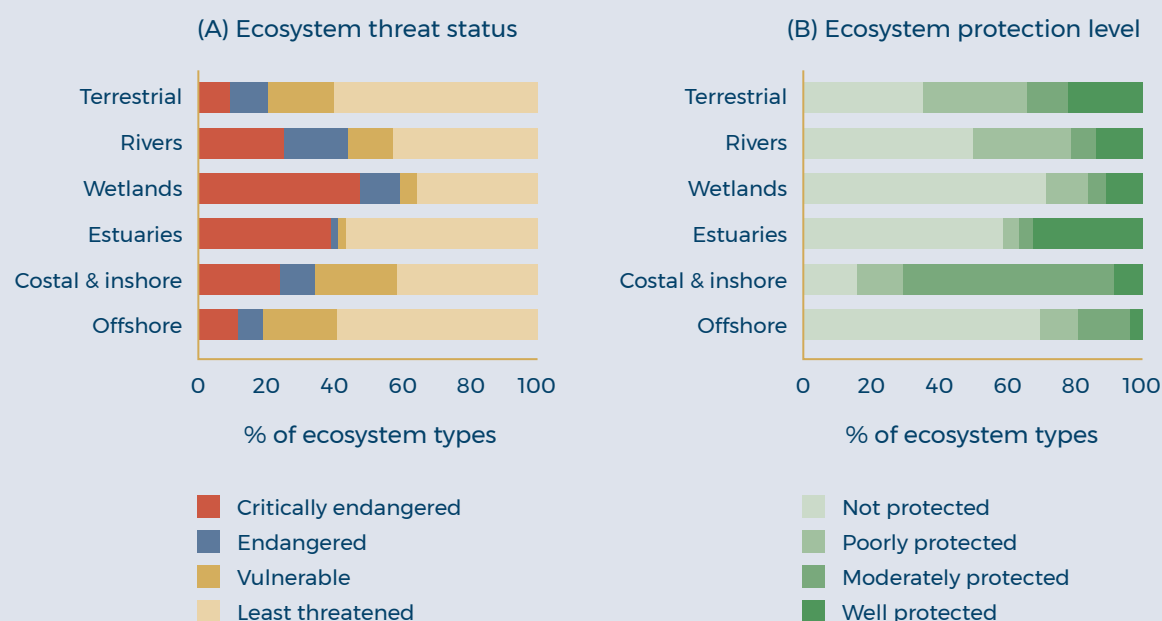
12 *Ibid.*

13 DEA, 2017, *op. cit.*

14 DEA, 2016, *op. cit.*

ecosystem types and 43% of estuary ecosystem types are threatened.¹⁵ In terms of coastal ecosystems, the most threatened ecosystems are wetlands (see Figure 2A) and the least protected ecosystems are offshore marine ecosystems (see Figure 2B).¹⁶

Figure 2 Summary of (A) ecosystem threat status and (B) ecosystem protection level across terrestrial and aquatic environments



There is growing recognition that natural resources are under ever-increasing pressure from anthropogenic activities, which has significant negative implications for their ability to provide goods and services.¹⁷ Cultivation, overgrazing, coastal development, invasive alien species in terrestrial and freshwater ecosystems, mining and certain fishing practices are damaging natural habitats. As a result, terrestrial, freshwater and marine environments are being lost, which means species are being lost. Fragmentation of habitats also prevents landscape-scale ecological processes, such as fire, from functioning effectively and affects livelihoods, as resources may become inaccessible or scarce.¹⁸ These natural resources require protection, continual advancement, avoidance of further loss and rehabilitation.

¹⁵ *Ibid.*

¹⁶ South Africa, 2014, *op. cit.*

¹⁷ DEA, 2016, *op. cit.*

¹⁸ DEA, 2017, *op. cit.*

Added to this, longer-term issues such as global warming and sea-level rise also need to be considered.¹⁹

Climate change, climate adaptation and coastal ecosystems

Climate change is already having an impact on South Africa. Over the last 50 years there have been clear signs of warming, with more hot days and fewer cooler ones, and more frequent rainfall extremes (ie, droughts and floods).²⁰ High and intense rainfall events have become more common, with increasingly devastating floods in highly populated areas. Warming and the increased frequency of rainfall extremes are projected to continue. The coastal zone is projected to experience wide-ranging climate change impacts, such as sea-level rise and coastal storms.

Sea levels are rising around the South African coast, as shown in Table 1. The sea level on the west coast is rising by 1.87mm per year, on the south coast by 1.47mm per year, and on the east coast by 2.74mm per year.²¹

Station	Year of record	Sea-level change (mm per year \pm 1 standard deviation)
Simons Town	1957-2007	+1.58 \pm 0.22
Mossel Bay	1958-2009	+0.33 \pm 0.35
Knysna	1960-2009	+1.81 \pm 0.54
Nelson Mandela Bay (Port Elizabeth)	1978-2009	+2.52 \pm 0.77
Buffalo City (East London)	1967-2009	+2.30 \pm 0.93
eThekweni (Durban)	1971-2009	+2.70 \pm 0.05

Source: Breetzke T *et al.*, 'Drawing Lines in the Sand: Responding to Climate Change in the coastal Zone – Setback, Limited Development and Other Lines', Paper presented at: IAIA (International Association for Impact Assessment) conference, 2011; Mather AA, The Risks, Management and Adaptation to Sea Level Rise and Coastal Erosion along the Southern and Eastern African Coastline', PhD thesis, University of KwaZulu-Natal, Durban, South Africa, 2012, in DEA, 'Second South Africa Environmental Outlook, Chapter 9: Oceans and Coasts', 2016, https://www.environment.gov.za/sites/default/files/reports/environmentoutlook_chapter9.pdf, accessed 24 April 2019

Climate change has, and will continue to have, a serious impact on biodiversity and ecosystems. Areas that will (and have begun to) bear the brunt of these impacts are the sensitive and dynamic ecosystems found where terrestrial and oceanic forces meet.²² In addition, research has shown that the effects of climate change on biodiversity are

¹⁹ DEA, 2016, *op. cit.*

²⁰ National Planning Commission, 'National Development Plan: 2030', 2012, <https://www.gov.za/issues/national-development-plan-2030>, accessed 20 May 2019.

²¹ DEA, 2016, *op. cit.*

²² *Ibid.*

likely to have variable impacts on the different biomes²³ in South Africa. With climate change, the climatic area that is suited to each biome might change, resulting in changes to the size, composition or location of the biomes.²⁴ The strongest evidence of long-term climate change effects is found in natural ecosystems. The best observed natural responses to climate change are changes to the geographic ranges, seasonal activities, migration patterns and abundances of species across the terrestrial, freshwater and marine environments.²⁵ For example, coral reef bleaching in the tropical coastal waters of northern KwaZulu-Natal is increasing, and the geographic ranges and/or timing of migration among wild birds and coastal marine fish species are shifting.²⁶

Climate change, biodiversity and human well-being are all interconnected. Climate change will also affect the ecosystem services that humans receive from functioning ecosystems. This is because the linkages between biodiversity and ecosystem services mean that actions taken to promote resilient ecosystems are likely to improve social resilience to climate change. Therefore, an important additional element of enhancing natural resilience to climate change is to reduce non-climatic stressors, such as land degradation, that may compound its effects.²⁷

Climate change, biodiversity and human well-being are all interconnected. Therefore, actions taken to promote resilient ecosystems are likely to improve social resilience to climate change

South Africa is particularly vulnerable to climate disasters as they affect the key levers of socio-economic development through their broad impact on the economy, businesses and physical, social, cultural and environmental assets. Such impacts can include loss of lives, livelihoods and health. Climate change is intricately linked to almost all facets of South African society, particularly socio-economic progression, as natural resources determine the production potential of many sectors of the economy. This in turn affects the human development aspirations of the country. In some instances, it can cause security issues owing to its threat to communities and countries.²⁸

23 Biomes are ecological units of wide extent with distinctive plant and animal communities that are often determined mainly by bioclimatic ranges of temperature and rainfall values.

24 DEA & SANBI (South African National Biodiversity Institute), 'Strategic Framework and Overarching Implementation Plan for Ecosystem-Based Adaptation (EbA) in South Africa: 2016–2021'. Pretoria: DEA & SANBI, 2016.

25 *Ibid.*

26 DEA, 2017, *op. cit.*

27 Driver A *et al.*, 'National Biodiversity Assessment 2011: An Assessment of South Africa's Biodiversity and Ecosystems,' Synthesis Report. Pretoria: SANBI & DEA, 2012, in DEA & SANBI, *op. cit.*

28 DEA, 2017, *op. cit.*

Intact coastal ecosystems can play an important role in enabling adaptation to climate change. This can be achieved by managing, conserving and restoring ecosystems to buffer humans from the impacts of climate change (often referred to as ecosystem-based adaptation, or EbA). For example, coastal ecosystems such as dunes, mangroves, kelp beds and saltwater marshes provide direct benefits to humans by helping to protect settlements and infrastructure against storm surges and sea-level rise.²⁹ As such, South Africa's primary approach to adapting to climate change should be to strengthen its economic and societal resilience by maintaining the integrity of ecosystems and the many services that they provide.³⁰

Institutional arrangements

Institutional landscape

The regulation, governance and management of EbA in marine and coastal areas is primarily the responsibility of the Department of Environment, Forestry and Fisheries (DEFF) at the national level, supported by provincial government. At DEFF, the 'Biodiversity and conservation' and 'Climate change and air quality' branches are responsible for EbA regulation, governance and management; in coastal areas, the 'Oceans and coasts' branch is the leading regulator and enforcer.

In partnership with DEFF, the South African National Biodiversity Institute (SANBI) plays a leading role in the research, management and implementation of marine and coastal EbA in South Africa. Other national and provincial departments, such as the Department of Water and Sanitation (DWS), also play a critical role in marine and coastal EbA.³¹ The implementation of EbA projects rests largely with local authorities, which work closely with DEFF and SANBI, as well as with other provincial and national government entities.

As multiple entities are involved in the marine and coastal EbA space, it is essential that jurisdiction, roles and responsibilities are clearly defined and articulated. DEFF's jurisdiction, for instance, is primarily from the high-water mark seawards. From the high-water mark landwards, local municipalities are responsible for the regulation, governance and management of EbA. For estuaries management, DWS is the leading regulator. This means that in coastal urban areas, regulating entities can be one of three different entities or a partnership between several entities, depending on the natural system and the geographic boundary. Also, certain EbA interventions will fall under certain departments. For example, the protection of kelp forests (located seawards of the high-water mark) will fall under marine spatial planning/management at DEFF; coastal wetlands under water resources

²⁹ DEA, 2016, *op. cit.*

³⁰ National Planning Commission, *op. cit.*

³¹ Swanepoel E & S Sauka, 'Ecosystems-based Adaptation in South African Coastal Cities', SAIIA (South African Institute for International Affairs) Occasional Paper, 2019, <https://saiia.org.za/research/ecosystem-based-adaptation-in-south-african-coastal-cities/>, accessed 23 April 2019.

management at the DWS; mangrove forests (located landwards of the high-water mark) under forest/biodiversity management at DEFF/SANBI; and coastal spatial planning under the relevant municipality.³²

As multiple entities are involved in the marine and coastal EbA space, it is essential that jurisdiction, roles and responsibilities are clearly defined and articulated

The role of non-state actors

Non-state actors play a major role in marine and coastal EbA in South Africa, particularly in supporting research efforts. For instance, DEFF is partnering with the Council for Scientific and Industrial Research in the development of indicators for monitoring marine and coastal environments. The development of research institutions such as the South African Network for Coastal and Oceanic Research and the National Research Foundation indicate the growth in oceans and coast research. The Department of Science and Technology is also increasingly funding coastal and marine programmes.

Data from funders and project implementers (eg, the World Wide Fund for Nature) shows the growing levels of support for research in the coastal and marine domain.³³ National and regional research institutions, such as the West Indian Ocean Marine Science Association and the Applied Centre for Climate and Earth System Science, also generate a large body of research and provide platforms for integrated and end-to-end research and education, services and training.

Lastly, non-state entities play a key role in the implementation of EbA projects. For instance, non-governmental organisations (NGOs) and companies such as Conservation South Africa, C4 EcoSolutions and The Cirrus Group help to implement EbA, translate EbA policy and strategies, and ensure EbA skills development and knowledge transfer. They work mainly with DEFF, SANBI and other national, provincial and local authorities.

Collaboration through partnerships

Cooperative governance is essential for successfully integrated coastal management, as it promotes integration between the government and civil society as opposed to the

³² *Ibid.*

³³ DEA, 2016, *op. cit.*

traditional top-down approach to coastal management.³⁴ Given the multitude of entities in coastal and marine EbA, collaboration and coordination is central to ensuring effective governance, management and implementation. This is achieved through partnerships and legally established entities such as forums, working groups and committees that promote and drive cooperative coastal governance in South Africa.

Cooperative governance is essential for successfully integrated coastal management, as it promotes integration between the government and civil society as opposed to the traditional top-down approach to coastal management

National mechanisms for coordinating the work of the biodiversity sector, and the country's climate adaptation efforts, facilitate strategy and policy coherence and cooperation between key institutions responsible for biodiversity management and conservation. The work of these structures is complemented by numerous other structures and task teams that operate provincially, locally or internally within specific institutions or multi-stakeholder programmes, to coordinate implementation and operational work plans.

For instance, DEFF is responsible for coordinating and monitoring the implementation of the National Biodiversity Strategy and Action Plan with the support of the environmental minister and members of the Executive Council Committee, the Ministerial Technical Committee and their various working groups (WGs), such as WG 1 (Biodiversity and conservation).³⁵ Another example is communities of practice (CoP),³⁶ which are vital mechanisms for coordinating, enriching and advancing the work of the biodiversity sector and ensuring a consistent approach in the operating environment.³⁷ The recently established EbA CoP plays a critical role in promoting EbA in South Africa.

South Africa has sought to develop working relationships with neighbouring littoral countries in oceans and coasts management. This is achieved through participating in large marine ecosystem science and management programmes. On the West African coast, South Africa participates in the Benguela Current Commission, together with Namibia and Angola. On the East African coast, it is part of the ASCLME programme. The Continental Large Marine Ecosystems programmes generally fall under the Abidjan and Nairobi

³⁴ *Ibid.*

³⁵ DEA, 'Draft National Biodiversity Framework', October 2018, <https://cer.org.za/wp-content/uploads/2018/10/National-Environmental-Management-Biodiversity-Act-10-2004-Draft-the-National-20181026-GGN-41996-01143.pdf>, accessed 20 May 2019.

³⁶ For example, the People and Parks Forum, Marine Protected Areas Forum, Wildlife Forum, National Biodiversity and Business Network, BioPANZA (Bioproducts Advancement Network), Bioprospecting Forum and Adaptation Network.

³⁷ DEA, October 2018, *op. cit.*

conventions, which are focussed on oceans and coasts management. South Africa is also an active participant in and member of the Convention for the Conservation of Antarctic Marine Living Resources. Added to this, while the country has a long history as a member of the UN Intergovernmental Oceanographic Commission (UNIOC), it also belongs to the newly created Africa Sub-Commission of UNIOC. This cooperation ensures an enhanced information base for marine environmental management.³⁸

Challenges and opportunities

It is evident that, on paper, South Africa has set up institutional arrangements aimed at enabling EbA governance, management and implementation. However, in reality, there are issues with institutional coordination, both internally within departments and externally across institutions, as government tends to operate in silos. This is coupled with resource constraints, such as limited funding, and skills and capacity shortages, which inhibit the ability of institutions to perform their mandate. Added to this, when it comes to local-level EbA, for instance, local government continues to face various implementation challenges, such as ineffective management systems and processes, unsustainable partnerships, inadequate communication and engagement, and ineffective and inaccessible financial mechanisms.³⁹

Effective collaboration within departments and externally across institutions is critical for addressing these challenges. This is because institutional arrangements and effective partnerships are a mechanism to enable coordination, collaboration and knowledge/information sharing between various institutions. Effective coordination and collaboration is crucial to ensuring effective EbA governance, management and implementation and the efficient use of resources.

Policy and regulatory landscape

South Africa's Constitution makes provision for the protection, conservation and sustainable use of the environment.⁴⁰ Therefore, sustainable development and sustainable resource governance are embedded in certain national policies and regulations. As a signatory to the UN's 2030 Sustainable Development Goals (SDGs) and numerous other multilateral environmental agreements,⁴¹ South Africa is strongly committed to achieving sustainable development. Sustainable development, and ultimately the protection of ecosystems and biodiversity at a national level, is governed by various pieces of legislation and policy.⁴²

38 DEA, 2016, *op. cit.*

39 Swanepoel E & S Sauka, *op. cit.*

40 DEA, 2016, *op. cit.*

41 Including but not limited to the UN Framework Convention on Climate Change, the UN Convention on Biological Diversity, the UN Convention to Combat Desertification, the Convention on Wetlands of International Importance and the New Urban Agenda.

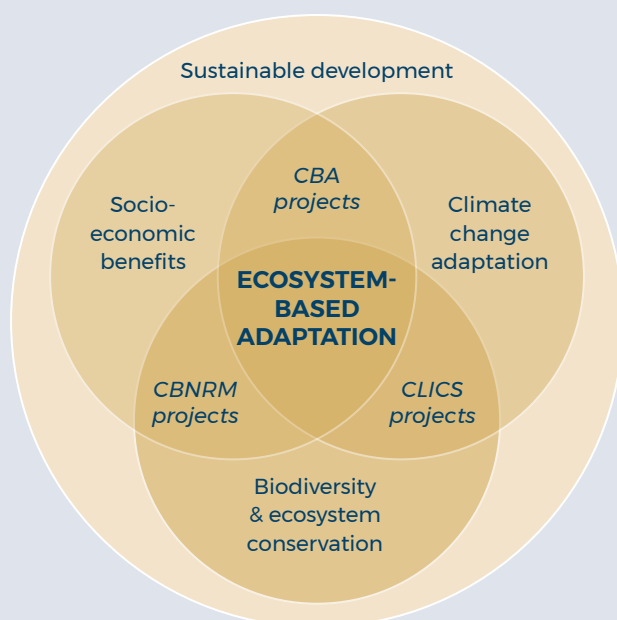
42 Swanepoel E & S Sauka, *op. cit.*

Key policies, strategies and legislation

In terms of EbA, South Africa has undertaken strategy and policy development to enable effective implementation. For instance, the Strategic Framework and Overarching Implementation Plan for Ecosystem-based Adaptation in South Africa (2016–2021) was developed under the leadership of DEFF and SANBI. The strategy, supported by the Ecosystem-based Adaptation Guidelines, aims to promote EbA as a central component of South Africa's programme of work on biodiversity and climate change.

The EbA Strategy draws on the linkages between ecosystem services, climate change and biodiversity, and states that EbA is an approach to sustainable development that contributes to three outcomes simultaneously: socio-economic benefits, climate change adaptation and biodiversity conservation. Therefore, EbA involves the intersection of these three spheres, as shown in Figure 3. This intersection is what makes EbA different from other approaches, and also what makes EbA likely to have a wide range of co-benefits. These co-benefits include climate adaptation, conservation of threatened species, livelihood benefits, sustainable use of natural resources and the maintenance of essential ecosystem services such as water and food security.⁴³

Figure 3 EbA integrates biodiversity and ecosystem conservation, climate change adaptation and socio-economic benefits



Note: EbA involves the intersection of three spheres, ie, socio-economic benefits, climate change adaptation and biodiversity conservation. This intersection is what makes EbA different from other approaches, such as community-based adaptation (CBA), climate change integrated land use strategies (CLICS) and community-based natural resource management (CBNRM), which focus on integrating only two of the three spheres.

Source: DEA & SANBI, 'Strategic Framework and Overarching Implementation Plan for Ecosystem-Based Adaptation (EbA) in South Africa: 2016–2021'. Pretoria: DEA & SANBI, 2016

43 DEA & SANBI, *op. cit.*

South Africa's definition of EbA is informed by the CBD, which defines it as 'the use of biodiversity and ecosystem services as part of an overall adaptation strategy'.⁴⁴ SANBI and DEFF state that EbA approaches should consider ways to manage ecosystems so that they can provide services that reduce vulnerability and increase the resilience of socio-ecological systems to both climatic and non-climatic risks while providing multiple benefits to society.⁴⁵ Figure 4 and Box 1 indicate the principles and cornerstones of EbA, as described by DEFF and SANBI.

BOX 1 PRINCIPLES AND CORNERSTONES OF EBA
<p>Seven principles underscore effective EbA</p> <ul style="list-style-type: none"> • EbA interventions support resilient and functional ecosystems that ensure and enhance ecosystem services • EbA interventions support people in adapting to climate change and climate variability • EbA interventions are participatory, inclusive, and transparent • EbA interventions are knowledge and evidence based as informed by the best available science and robust indigenous and local knowledge • EbA interventions are contextualised within broader national and regional policy and landscape processes and are designed to be scalable and replicable • EbA interventions strive to be integrative and to promote trans-disciplinarity and multi-sectorality throughout the project lifecycle • EbA strives to achieve co-benefits and synergistic outcomes
<p>The following cornerstones must be met before a programme or policy can qualify as EbA</p> <ul style="list-style-type: none"> • It must respond to the impacts of climate change • It must make use of biodiversity and ecosystem services • It must result in building people's resilience to climate change • It must be framed in the context of sustainable development

Source: DEA & SANBI, 'Ecosystem-Based Adaptation (EbA) Guidelines'. Pretoria: DEA, 2018

The EbA strategic framework thus seeks to aid the achievement of South Africa's key sustainable development plans and strategies by supporting the country's overall approach to enabling a long-term, just transition to a climate-resilient society and economy. The EbA Strategy sets out a vision for EbA and identifies four priorities or outcomes required to achieve that vision (see Figure 4).⁴⁶ The strategy is based on the recognition of the co-benefits provided by EbA. South Africa's biodiversity, natural resources and climate change policies also provide clear support for the development of a coordinated programme of work on EbA (see Box 2).

⁴⁴ CBD (Convention on Biological Diversity), 'Climate Change and biodiversity: Introduction', <https://www.cbd.int/climate/intro.shtml>

⁴⁵ DEA & SANBI, 'Ecosystem-Based Adaptation (EbA) Guidelines'. Pretoria: DEA, 2018.

⁴⁶ DEA & SANBI, 2016, *op. cit.*

Figure 4 South Africa's strategic framework for EbA

VISION Ecosystem-based adaptation (EbA) is implemented as part of South Africa's overall climate change adaptation strategy in support of a long-term, just transition to a climate-resilient economy and society

1 Effective coordination, learning and communication mobilises capacity and resources for EbA

2 Research, monitoring and evaluation provides evidence for EbA's contribution to a climate resilient economy and society

3 Integration of EbA into politics and plans supports an overall climate change adaptation strategy

4 Implementation projects demonstrate the ability of EbA to deliver a wide range of co-benefits

PROJECT

PROJECT

PROJECT

PROJECT

PROJECT

PROJECT

Source: DEA & SANBI, 'Strategic Framework and Overarching Implementation Plan for Ecosystem-Based Adaptation (EbA) in South Africa: 2016–2021'. Pretoria: DEA & SANBI, 2016

BOX 2 SOUTH AFRICA'S EbA POLICY AND LEGISLATIVE LANDSCAPE

South Africa's Constitution makes provision for the protection, conservation and sustainable use of the environment^a

The **National Framework for Sustainable Development (NFSD, 2008)** prioritises sustaining ecosystems and using natural resources efficiently as one of the five key strategic priority areas for action and intervention. The NFSD was followed by the development of a **National Strategy for Sustainable Development (NSSDAP, 2011)**, wherein three of the five strategic priorities of the strategy reflect the need for sustaining healthy ecosystems, sustainable utilisation of natural resources and the role ecosystems in climate change adaptation.

The **National Development Plan (NDP)** states that by 2030, South Africa's transition to an environmentally sustainable, climate-change resilient, low-carbon economy and just society will be well under way. For this to be achieved, it is critical that climate change adaptation and disaster preparedness strategies are implemented in conjunction with national development strategies. Added to this, investment in more sustainable technologies and programmes to conserve and rehabilitate ecosystems and biodiversity assets should be promoted.^b

The implementation of the NDP is initiated through the **Medium-Term Strategic Framework (MTSF)**, a 5-year strategic plan that is developed by each elected national government. For the current 5-year MTSF (2014–2019), South Africa set a target of implementing responses in six critical sectors. Intended outcomes of the MTSF include sustainable ecosystems and efficient use of natural resources. Several of the other outcomes are also inextricably linked to social and economic resilience, and hence to climate change resilience (e.g. outcomes related to public health, food security and sustainable human settlements).^c The MTSF (2020–2025) is currently in development.

^a Department of Environmental Affairs, '2nd South Africa Environmental Outlook. Chapter 9: Oceans and Coasts', 2016, https://www.environment.gov.za/sites/default/files/reports/environmentoutlook_chapter9.pdf.

^b National Planning Commission, 'National Development Plan: 2030', 2012. Republic of South Africa.

^c National Planning Commission, 'National Development Plan: 2030', 2012. Republic of South Africa.

The **Strategic Framework for Overarching Implementation Plan for Ecosystem-based Adaptation in South Africa (2016–2021)**, supported by **Ecosystem-based Adaptation Guidelines**, aims to promote

Biodiversity and climate change policies provide clear support for the development of a coordinated programme of work on EbA, as part of an overall adaptation strategy envisaged in the **National Climate Change Response White Paper (NCCRP, 2011)**.^d The NCCRP explicitly recognises the integral role of healthy ecosystems in responding effectively to these risks, and the need to conserve, rehabilitate and restore natural ecosystems that improve resilience to climate change impacts or reduce impacts.^e

In response to the NCCRP, the **Long-Term Adaptation Scenarios (LTAS) Flagship Research Programme (2013)** highlights the ‘potential for ecological infrastructure to provide adaptation benefits and assist in achieving development aspirations across sectors through mainstreaming into policy planning and implementation’. According to LTAS, EbA and the expansion of protected areas using climate-resilient approaches offer two adaptation response options that are appropriate for achieving increases in the climate resilience of biodiversity and maintaining and/or enhancing ecosystem service delivery. These two approaches should be adapted as necessary to build the resilience of ecological infrastructure to support economic sectors and livelihood activities. LTAS also states that ‘adaptation strategies should centre on sound integrated EbA approaches including Integrated Coastal Management and the Ecosystem Approach to Fisheries Management (to complement the current single species approach)’.^f

The **Biodiversity Sector Climate Change Response Strategy (2014)** identifies opportunities for climate change responses, including EbA, to support sustainable livelihoods. This strategy is aligned with the NCCRP, and it outlines principles and key elements of the biodiversity sector’s strategic response to climate change. It serves as an over-arching national strategy to guide policy development and to inform the development of more specific implementation plans by sector departments. The strategy identifies three strategic directions, which include the several activities related to EbA, such as ecological infrastructure (EI), improved land-use planning (incorporating climate change criteria), and improved vulnerability assessment.^g

The **Climate Change Adaptation Plan for South African Biomes (2015)** highlights EbA as one of four categories of actions that could reduce climate threats to biodiversity, and also identifies EbA actions for each biome alongside other adaptation options

The **Climate Change Adaptation and Mitigation Plan (CCMAP) for the South African Agricultural and Forestry Sectors** also highlights the need to reduce the vulnerability of coastal ecosystems so as to increase the resilience of coastal communities. Climate vulnerability assessments, which are currently being completed, highlight the vulnerability of key sectors, such as small-scale fisheries, as well as species, habitats and biomes.

South Africa’s **National Action Programme (NAP) for Combating Land Degradation to Alleviate Rural Poverty**, submitted to the UNCCD, is aimed at combating land degradation and alleviating rural poverty. The NAP clearly recognises and responds to the strong linkages between desertification, biodiversity and climate change.

d DEA & SANBI, ‘Strategic Framework and Overarching Implementation Plan for Ecosystem-Based Adaptation (EbA) in South Africa: 2016–2021’, 2016, Department of Environmental Affairs and South African National Biodiversity Institute, Pretoria, South Africa.

e Republic of South Africa, ‘South Africa’s Fifth National Report to the Convention on Biological Diversity’, 2014.

f DEA, Long-Term Adaptation Scenarios Flagship Research Programme (LTAS) for South Africa. Summary for Policy-Makers’, 2013, Department of Environmental Affairs, Pretoria, South Africa.

g Department of Environmental Affairs, ‘Draft National Biodiversity Framework’, 2018, draft published for public comment.

The **National Biodiversity Strategy and Action Plan (NBSAP)** is required in terms of the CBD, to which South Africa is party. South Africa's NBSAP (2015–2025) identifies, as one of its strategic goals, the 'investments in ecological infrastructure to enhance resilience and ensure benefits to society'; one of the intended outcomes of this strategic goal is for 'EbA to be shown to achieve multiple benefits in the context of sustainable development'. The draft **National Biodiversity Framework (NBF)** provides several recommendations that will accelerate the achievement of this NBSAP objectives, such as to 'develop, fund and implement an implementation plan for EbA in the context of climate change adaptation and sustainable development'.^h

The **National Biodiversity Assessment (NBA)** is a product of high scientific importance, led by SANBI in collaboration with DEFF and several other partner organisations. The NBA 2018 follows from the NBA 2011 and the National Spatial Biodiversity Assessment (NBSA) 2004 (published in 2005). The primary purpose of the NBA is to assess the state of biodiversity based on best available science, to understand trends over time and informing policy and decision-making across a range of sectors.ⁱ

EbA is included in the draft **National Climate Change Adaptation Strategy (NCCAS, 2018)**, as a way to 'integrate climate change adaptation within existing development planning and implementation processes', acknowledging that it can 'enhance adaptive capacity, enhance livelihoods, and reduce the risk of and adverse effects from climate-related disasters'.^j The implementation of the NAS, its revision, and other climate related legislation (such as the Draft **Climate Change Bill** and the **National Climate Change Response Paper (NCCRP)**), need to be aligned to government's planning process (i.e. the MTSF) to ensure integration into the national planning and implementation process.^k

The **Operation Phakisa** aims to unlock the economic potential of South Africa's oceans (i.e. Oceans Economy), providing significant GDP growth and job creation potential. Operation Phakisa aspires to implement an overarching, integrated ocean governance framework for sustainable growth of the ocean economy that will maximise socio-economic benefits while ensuring adequate ocean environmental protection. The six themes include:

- Marine Transport and Manufacturing
- Offshore Oil and Gas Exploration
- Aquaculture
- Marine Protection Services and Ocean Governance (MPSG)
- Small Harbours
- Coastal and Marine Tourism.

Other strategies that promote the Blue Economy and the Green Economy include the **National Biodiversity Economy Strategy (NBES, 2016)** and the **Framework for Investing in Ecological Infrastructure (2014)**.

The goal of the **National Protected Areas Expansion Strategy (NPAES, 2016)** is to achieve cost-effective protected area expansion for ecological sustainability and increased resilience to climate change. The protection of the environment is also supported by the South African Strategy for the Biosphere Reserve Programme (2016–2020), which supports, promotes and demonstrates within Biosphere Reserves a sustainable relationship between socio-economic development, the biodiversity and the sustainable use of natural resources on which people's livelihoods depend.^l

h Department of Environmental Affairs, 'Draft National Biodiversity Framework', 2018, draft published for public comment.

i CSIR, 'National Biodiversity Assessment for 2018 (NBA2018)', 2018, <http://gsdi.geoportal.csir.co.za/projects/national-biodiversity-assessment-of-2018>, accessed 2 May 2019.

j Swanepoel E & S Sauka, 'Ecosystems-based Adaptation in South African Coastal Cities', SAIIA Occasional Paper, 2019.

k National Planning Commission, 'National Development Plan: 2030', 2012, Republic of South Africa.

l Department of Environmental Affairs, South African Strategy for the Biosphere Reserve Programme (2016–2020), 2016.

As a whole, natural resources management and governance in South Africa, is largely governed by the following suite of legislations:

- The National Environmental Management Act 107 of 1998 (NEMA)
- The National Environmental Management: Biodiversity Act 10 of 2004 (NEMBA)
- The Marine Living Resources Act of 1998 (MLRA)
- The NEMA Environmental Impact Assessment (EIA) Regulations.

In coastal areas, the Green Paper on the National Environmental Management of the Oceans (2012), the National Environmental Management: Integrated Coastal Management Act 24 of 2008 (NEM:ICMA), as well as municipal by-laws set out an approach to managing coastal resources to promote social equity and economic development, whilst protecting the natural environment.^m Currently, the implementation of the ICM Act is a priority and aspects such as setback lines (or coastal management lines (CMLs)), coastal management programmes and coastal access are high on the agenda of provinces and local authorities.ⁿ

m Swanepoel E & S Sauka, 'Ecosystems-based Adaptation in South African Coastal Cities', SAIIA Occasional Paper, 2019.

n Department of Environmental Affairs, '2nd South Africa Environmental Outlook. Chapter 9: Oceans and Coasts', 2016. https://www.environment.gov.za/sites/default/files/reports/environmentoutlook_chapter9.pdf.

Source: compiled by author

South Africa thus has a suite of policies, strategies and legislation enabling the regulation, governance and management of the three spheres of EbA (socio-economic benefits, climate change adaptation and biodiversity conservation). Importantly, it is one of the leading countries in EbA policy/strategy development and other countries can learn from its strategies and guidelines.

South Africa thus has a suite of policies, strategies and legislation enabling the regulation, governance and management of the three spheres of EbA (socio-economic benefits, climate change adaptation and biodiversity conservation)

However, South Africa experiences various challenges in the regulation, governance and management of EbA, particularly at the local level.⁴⁷ This is related not only to resource constraints when implementing and enforcing existing policies, strategies and legislation, but also to navigating the comprehensive regulatory landscape. This complex regulatory landscape causes inconsistent and overlapping policies, strategies and legislation, which often lead to unclear mandates, roles and responsibilities (across departments in the three spheres of government). This results in a lack of ownership and subsequently insufficient

47 Swanepoel E & S Sauka, *op. cit.*

implementation and enforcement. Better guidance on how to navigate this complex regulatory landscape is needed, as this will ensure effective governance and enforcement, an enabling regulatory framework, and the efficient use of limited resources.

International conventions and commitments

By ratifying the CBD in 1995 the South African government formally recognised the new and many opportunities offered by the convention for integrated planning and development. It recognised that the conservation of global biodiversity is a common concern of all nations and demonstrated a strong commitment to safeguarding the planet's biotic wealth. Of the five strategic goals of the CBD, South Africa has arguably made most progress towards Goal A (in relation to mainstreaming), Goal C (in relation to increased protection) and Goal E (in relation to knowledge management and capacity building).⁴⁸ This is unfortunate, since Goal B (focused on reducing direct pressures on biodiversity and promoting sustainable use) and Goal D (focused on enhancing the benefits to all from biodiversity and ecosystem services) are aligned with effective EbA implementation. More recently, South Africa has made some progress in ensuring resilient ecosystems, such as the development of a national programme and accompanying strategies for dealing with ecosystem-based adaptation to climate change, as discussed in the section above.

South Africa ratified the UN Convention to Combat Desertification (UNCCD) in September 1997. In fulfilling its obligations, South Africa developed a National Action Programme (NAP) aimed at combatting land degradation and alleviating rural poverty. Added to this, the country is a contracting party to the Convention on Wetlands of International Importance (Ramsar Convention). Twenty-one Ramsar sites have been designated in South Africa, of which seven are estuaries.⁴⁹ Nineteen of these Ramsar sites are formally protected in terms of the Protected Areas Act, mostly in provincial nature reserves. The two that are not formally protected are the Orange River Mouth and Verlorenvlei.

In terms of climate change, South Africa became a signatory to the UN Framework Convention on Climate Change (UNFCCC) in 1997 and since then has participated actively in the UNFCCC and the Kyoto Protocol. Since 2009 South Africa has intensified its focus on climate change adaptation in general, and EbA in particular.⁵⁰ As required by the UNFCCC, South Africa submitted its Nationally Determined Contribution (NDC) in 2015.

Due to these commitments, the country's policies and strategies are built to be aligned to and address specific requirements. The NAP and CBD National Report, for instance, clearly recognise and respond to the strong linkages between biodiversity and climate change. In coastal environments this is critical, as biodiversity and resilient ecosystems play a crucial

⁴⁸ South Africa, 2014, *op. cit.*

⁴⁹ *Ibid.*

⁵⁰ *Ibid.*

role in coastal protection. This should be highlighted and prioritised in all of the country's commitments and objectives, which is unfortunately not the case. For instance, although the NDC states that the country is especially vulnerable to climate change impacts, particularly in respect of water, food security and ecosystem services, EbA and the need to ensure resilient ecosystems are not mentioned. It is critical that South Africa's next NDC (due in 2020) address the important role that resilient ecosystems play in the country's climate adaptation endeavours.

Lastly, in future greater coordination and more linkages between these international processes will contribute to South Africa's reducing its vulnerabilities. This is emphasised in the NAP, which notes that South Africa should take a synergistic approach to implementing the UNCCD, CBD and UNFCCC.⁵¹ Processes such as the development of the Climate Change National Adaptation Strategy, for instance, represent a national effort to align with several key undertakings, such as the Paris Agreement, the 2030 Agenda of the SDGs, the Sendai Framework on Disasters, the NDCs to the UNFCCC, and the UN Habitat Framework on Disasters and Risks.⁵²

Marine and coastal EbA in practice

South Africa recognises the value of an ecosystem-based approach to oceans and coasts management.⁵³ This is evidenced by the fact that various individual small-scale projects have been pioneering the implementation of EbA in the South African context. These have been undertaken by a variety of stakeholders, including government, NGOs and the private sector. However, these projects are not always referred to as EbA projects; often EbA projects are referred to as conservation, ecosystem services or climate adaptation projects. Figure 5 gives an overview of several marine and coastal projects that can be classified as EbA that have been implemented along the South African coast.

These projects, although limited in number, show that South Africa has made some effort in implementing EbA in marine and coastal areas. Currently, most EbA projects in the country are aimed at river basin management and terrestrial conservation (including dryland and rangeland conservation and restoration).⁵⁴ This means that few projects are specifically targeted at vulnerable groups in coastal environments, such as the poor, women and children. However, projects such as the Expanded Public Works Programme by DEFF (which employs people of different ages, races and gender) and the Abalobi Initiative (targeted at small-scale farmers) seek to address this. There is still more to be done for the vulnerable groups in South Africa's coastal environments.

51 *Ibid.*

52 DEA, 2017, *op. cit.*

53 DEA, 2016, *op. cit.*

54 Swanepoel E & S Sauka, *op. cit.*

Figure 5 Marine and coastal EbA in practice

Programmes of work	<p>South Africa has invested significantly in programmes of work that contribute towards poverty reduction, job creation and the improvement of the health and resilience of ecosystems. One such programme is the Expanded Public Works Programme (EPWP) (led by DEFF), which supports ecosystem services, biodiversity management and climate change adaptation, thereby supporting EbA implementation. The various programmes (i.e. LandCare, Working for Water, Working on Fire, Working for Wetlands, Working for Coasts), have proved to be a success in many ways. For instance, Working for Coasts uses poverty relief funding to provide employment and training for unemployed people in coastal communities, to create and maintain a cleaner and safer coastal environment. Some activities undertaken as part of the Working for Coasts initiative are the rehabilitation of coastal ecosystems; assisting with access control; and serving as information and tourist officers. Between 2006 and 2011, a total of ZAR 189 million was allocated to various Working for Coast programmes by the DEFF.</p>
	
Marine Protected Areas	<p>A key government lead initiative is the gazetting of several Marine Protected Areas (MPAs) and declaring new marine conservation areas (called 'Hope SPots') along South Africa's coastline. One such PMA is the iSimangaliso Wetland Park in northern KwaZulu-Natal, which encompasses the adjoining St Lucia and Maputaland MPAs, which both have international and national significance. The park has been included as a World heritage Site.^o Located inside the park is the St Lucia Estuary. The St Lucia Estuary Rehabilitation Project was implemented in 2012 to remove artificially placed sand on the course of the uMfolozi River, which has negative impacts on the natural flow of the river, impacting the ecosystems in the estuary. Since the rehabilitation project, salinities remain low and the health of the St Lucia Estuary has been returned, and this puts the system in a good position during dry winter months where low water levels prevail due to evaporation.^p</p>
	
Cape Research and Diver Development	<p>Cape Research and Diver Development (RADD) is a research institution that is focused on monitoring of the ocean ecosystem. The institution is implementing a research project on kelp forest and reef plant density and distribution. The project aims to monitor kelp forest and reef coverage within South Africa by maintaining a GIS database of density and distribution along the shores of South Africa. Methods include in-situ mapping and remote sensing from LANDSAT imagery.^q</p>
	
Dune rehabilitation and maintenance	<p>Dune rehabilitation and maintenance is a key EbA intervention in the Western Cape, as the dune systems are dynamic. Factors like erosion, drought and lack of vegetation contribute further to the dynamic nature of the systems, ultimately resulting in dunes losing their shape and stability. The Table View Dune System, as an example, has lost its natural shape and stability and the sand blows over the road and the walkways. To manage this, the City of Cape Town (CoCT) has undertaken a rehabilitation project that requires the planting of vegetation to stabilise the dunes and to prevent the sand from blowing away.^r The CoCT is also implementing wide-scale dune rehabilitation and maintenance in Hout Bay. The intervention is aimed at addressing deteriorating dune systems and compounding wind-blown sand problems which are leading to smothered infrastructure.</p>
	

o Swanepoel E and Sauka S, 'Ecosystems-based Adaptation in South African Coastal Cities', SAIIA Occasional Paper, 2019.

p National Planning Commission, 'National Development Plan: 2030', 2012, Republic of South Africa.

q Department of Environmental Affairs, South African Strategy for the Biosphere Reserve Programme (2016 – 2020), 2016.

r Swanepoel E & S Sauka, 'Ecosystems-based Adaptation in South African Coastal Cities', SAIIA Occasional Paper, 2019.

ABALOBI



ABALOBI is an initiative that focus on the use of technology to support sustainable natural resources consumption. ABALOBI is an app that uses information and communication technology (ICT) to promote social justice and poverty alleviation in the small-scale fisheries chain (from hook to cook). It also promotes transformation in the way knowledge is produced and shared, stewardship of marine resources, and therefore building the resilience of small-scale fisheries in the face of climate change. ABALOBI is an open transdisciplinary and social learning endeavour, bringing together various stakeholders, with traditional fishers taking centre stage.^s

Dune rehabilitation through a hybrid approach



eThekweni Municipality implemented **Dune Rehabilitation Through a Hybrid Approach** to address challenges related to coastal dunes. The project involves the dredging of sand from the ocean floor (which is of relatively poor quality, so no nutrients are lost and no ecosystem destruction/degradation occurs), and using the sand to stabilise sand dunes. It also involves the augmentation and protection of existing dunes through the extension of frontal dune zones. This is achieved by erecting sacrificial fencing (to aid dune development) and timber boardwalks (to define beach access points), as well as the planting of indigenous dune plants. As an outcome, the project has resulted in the establishment of a new frontal dune zone along extensive stretches of the promenade and along the Durban Coast (such as South Beach and Bay of Plenty). The key successes of this project were the protection of infrastructure against wave surge and climate change induced sea level rise, the management of wind-blown sand from beaches and the creation of an attractive green space.^t Over the years, this project has been remarkably successful. The rehabilitated dunes have grown vegetation and have caputred sand. Ironically, the project has been so successful that some dunes on the Durban promenade have started blocking sea views, which has sparked opposition from tourism stakeholders and in some cases have led to dunes being destroyed.^u

s Department of Environmental Affairs, '2nd South Africa Environmental Outlook. Chapter 9: Oceans and Coasts', 2016, https://www.environment.gov.za/sites/default/files/reports/environmentoutlook_chapter9.pdf.

t WWF, 'State of Management of South Africa's Marine Protected Areas', 2009, <http://awsassets.wwf.org.za/downloads/mpastateofmanagementreport04nov2009webblowerdpi.pdf>.

u iSimangaliso Wetland Park, 'South Africa's largest wetland rehabilitation project achieves an important milestone', 2017, <https://isimangaliso.com/newsflash/south-africas-largest-wetland-rehabilitation-project-achieves-important-milestone/>.

In addition, some EbA projects also lack the broader coordination and strategic planning necessary to contribute to the broader outcomes of EbA. To ensure that such issues are addressed in future, the EbA Strategy seeks to align existing initiatives, many of which involve projects implemented by NGOs. The EbA Strategy also highlights several opportunities for EbA project implementation in South Africa. One example is the Isimangaliso Wetlands Park (see Box 3), which shows how legislative instruments (ie, marine protected areas, or MPAs) can provide a catalyst for effective management, if coupled with effective institutional arrangements and technical expertise. The case also illustrates the challenges and opportunities of EbA, such as addressing socio-economic issues through ecosystem services.

There are, therefore, opportunities to learn from previously implemented EbA projects, in both terrestrial and coastal environment. This will ensure that South Africa is able to align and leverage existing experience and strengthen expertise, where necessary, ensuring that the country can deliver the range of co-benefits that EbA offers. Added to this, while

EbA can be implemented through the alignment of existing resources and strategic coordination, additional resources would strengthen the practice of EbA by unlocking the capacity needed to speed up and scale up these pilot projects, improve coordination and communication, and promote learning and research activities.⁵⁵ Given the current economic climate, alignment is particularly important, as the resources for implementation are limited (activities in support of this are included in the EbA Strategy). Not taking this approach would result in numerous lost opportunities,⁵⁶ particularly regarding knowledge transfer.

BOX 3 CASE STUDY: ISIMANGALISO WETLAND PARK

The iSimangaliso Wetland Park is situated in northern KwaZulu-Natal and encompasses the adjoining St Lucia and Maputaland MPAs (where Sodwana Bay is located). The coastline of the iSimangaliso Wetland Park is 190km long and the two MPAs collectively make up about 145km of this – extending from the border of Mozambique to 1km south of Cape Vidal. Both MPAs are of international and national significance and are World Heritage Sites, while the turtle beaches and coral reefs of Tongaland have been declared a Ramsar site.^a

The iSimangaliso Wetland Park supports a diverse array of marine habitats, including mangrove swamps, seagrass meadows, intertidal reefs, deep-water canyons and some of the world's southernmost coral reefs (at Sodwana Bay). The MPAs are important for marine conservation as they contain a high diversity of marine species, form sanctuaries for breeding populations of endemic fish species, and provide important nesting areas for loggerhead and leatherback turtles.

In addition, the MPAs are popular recreational fishing and diving destinations and have immense economic potential through tourism. The areas included in the MPAs are also of importance to traditional fishers and inter-tidal harvesters living in and around the park. The MPAs are, however, located in areas with socio-economic challenges. At Sodwana Bay, for instance, eco-tourism activities are very formal, and therefore have largely benefitted the wealthy to the exclusion of local communities – there are few opportunities for the poor to offer services to the tourists visiting the bay. Similarly, iSimangaliso Wetland Park is unaffordable for local communities, and employment opportunities are limited.

The MPAs are also exposed to climate change impacts, particularly extreme seasonal water variability at the Mfolozi River (in the iSimangaliso Wetland Park). In addition, the river's flow is negatively impacted by upstream water users, especially commercial agriculture. This was amplified by an ineffective engineering intervention to 'manage' the flow of the river. Corrective EbA measures have since been taken to restore the flow of the river and estuary.

⁵⁵ DEA & SANBI, 2016, *op. cit.*

⁵⁶ *Ibid.*

The St Lucia Estuary rehabilitation project was implemented to remove a large amount of sand that was artificially placed in the uMfolozi River course. The sand had been installed in a bid to protect the estuary from the possible damaging effects of farming upstream. The intervention, however, interfered with the natural flow of the river, impacting ecosystems in the estuary.

After the removal of the artificial sand, the natural flow of the river and the estuary were restored. Satellite images (Figure 6) show progressive improvements in the estuary water levels. Not only has the lake's surface area increased but the water depth has also increased to approximately 1–1.2m throughout the system. Salinities remain low with fresh water continuously flowing through the estuary. St Lucia Estuary's lifeblood has returned, which places the system in a good position during dry winter months when there are low water levels owing to evaporation.^b

Figure 6 Landsat images of Lake St Lucia, February 2016 and 27 May 2017



Note: The first Landsat image was taken at the height of the drought in February 2016, when only 10% of Lake St Lucia had water. The second image was taken on 27 May 2017, showing the entire surface area of the lake's system covered in water.

Source: iSimangaliso Wetland Park, 'South Africa's largest wetland rehabilitation project achieves an important milestone', 5 June 2017, <https://isimangaliso.com/newsflash/south-africas-largest-wetland-rehabilitation-project-achieves-important-milestone/>, accessed 16 May 2019

These conservation efforts have also established a safe haven for nurseries, benefitting small-scale fisheries located upstream of the river mouth. This has provided ecosystem services to the surrounding local communities, through the regulation of water (fresh/salt balance) and the provision of a more sustainable fish supply. The project has therefore benefitted the environment and the people, while also providing climate adaptation benefits (ie, regulating seasonal water levels and providing effective water quality management).

- a Tunley K, 'State of Management of South Africa's Marine Protected Areas', WWF (World Wide Fund for Nature) South Africa, 2009, <http://awsassets.wwf.org.za/downloads/mpastateofmanagementreport04nov2009webblowerdpi.pdf>, accessed 20 May 2019.
- b iSimangaliso Wetland Park, 'South Africa's largest wetland rehabilitation project achieves an important milestone', 5 June 2017, <https://isimangaliso.com/newsflash/south-africas-largest-wetland-rehabilitation-project-achieves-important-milestone/>, accessed 16 May 2019.

Innovation funding mechanisms

South Africa is particularly vulnerable to droughts, floods and storm-related events such as strong winds, coastal storms and hail. There is also a growing risk of infrastructure damage from extreme weather events, which are likely to be exacerbated by climate change. As climate-related disasters increase, so will the cost of responding. South Africa's Second National Communication under the UNFCCC calculated that extreme events had a financial cost of about ZAR⁵⁷ 1 billion (\$67.7 million) a year between 2000 and 2009. In 2011 climate response costs were more than ZAR 3 billion (\$203.2 million).⁵⁸ Acting now on climate change will minimise negative climate-related impacts and adaptation costs in the long term.

Although EbA can often be considered a low-regret climate adaptation option, funding EbA interventions is often a challenge

Although EbA can often be considered a low-regret climate adaptation option, funding EbA interventions is often a challenge. (This is despite the fact that EbA can be funded through climate adaption, biodiversity, conservation and social-development funding sources.) As with most countries, this is also true for South Africa. This is a hindering factor to climate adaptation efforts, as finance for EbA interventions and climate adaptation falls below the volumes required.

International and national sources of finance

South Africa currently sources most of its climate adaptation project funding from international funders. This includes the [Green Climate Fund \(GCF\)](#), a global finance mechanism that aims to mobilise finance in support of low-carbon and climate-resilient global development, and the [Adaptation Fund](#), which was established under the Kyoto Protocol of the UNFCCC to fund climate change adaptation and resilience activities. South Africa is also receiving funding from institutions such as the Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH (GIZ), the International Climate Initiative, and other donor agencies.

In 2011 SANBI was accredited as South Africa's National Implementing Entity (NIE) for the Adaptation Fund. SANBI has also been accredited as an entity of the GCF in South Africa

⁵⁷ Currency code for the South African rand.

⁵⁸ DEA, 2017, *op. cit.*

(together with the Development Bank of Southern Africa and Nedbank).⁵⁹ The main aim of the NIE is to deliver tangible results through the implementation of projects, including EbA projects, that address climate change adaptation in vulnerable communities in South Africa. NIE projects include the uMngeni Resilience Project and the Community Adaptation Small Grants Facility (SGF) project. (Box 4 gives a detailed overview of this facility.)

Locally, under the auspices of the Biodiversity Finance Initiative (BIOFIN) of the UN Development Programme (UNDP), the BIOFIN Biodiversity Finance Plan for South Africa (2017)⁶⁰ was developed and is being implemented by DEFF in collaboration with the UNDP Country Office, SANBI, SANParks, National Treasury and Statistics South Africa.⁶¹ The plan aims to identify and support the implementation of innovative finance solutions that augment existing sources of funding from the government, private sector and others. A systematic process and detailed analyses were used to identify and prioritise 15 finance solutions, each of which has a significant impact on aligning incentives, increasing financing, and improving cost effectiveness and service delivery.⁶² At the time of publication, the BIOFIN plan was awaiting approval by Parliament.

Existing national and international sources of financing are insufficient to meet the funding needs of marine and coastal EbA. To fill the funding gap, it is crucial that existing sources of finance that are not targeted at EbA projects are also tapped into. This includes unlocking funding/budgets for conservation, agriculture, water management, poverty reduction or service delivery (at local, provincial and national level), etc. By highlighting the multifaceted benefits of EbA projects, it is possible to target applicable funding sources (for instance, an EbA project that improves water quality and subsequently fisheries and small-scale fisheries can obtain funding from water management, fisheries/farming or poverty reduction funding sources). These funding sources can be restructured or adapted to meet EbA needs, or guidelines can be provided to project implementers on how to access these funding sources for EbA projects.

BOX 3 CASE STUDY: SMALL GRANTS FACILITY

The SGF is a ZAR 29 million (\$1.9 million) four-year community-based adaptation project. It aims to ensure that vulnerable rural communities in two project target areas (Namakwa District in the Northern Cape and Mopani District in Limpopo) have reduced vulnerability and increased resilience to the anticipated impacts of climate variability and change.^a The SGF is funded by the Adaptation Fund and project oversight is provided by SANBI (as the NIE).^b

59 DEA & SANBI, 2016, *op. cit.*

60 For more information on the BIOFIN Biodiversity Finance Plan for South Africa (2017) see UNDP (UN Development Programme), BIOFIN, 'South Africa', <http://www.biodiversityfinance.org/south-africa>, accessed 16 May 2019.

61 *Ibid.*

62 DEA, October 2018, *op. cit.*

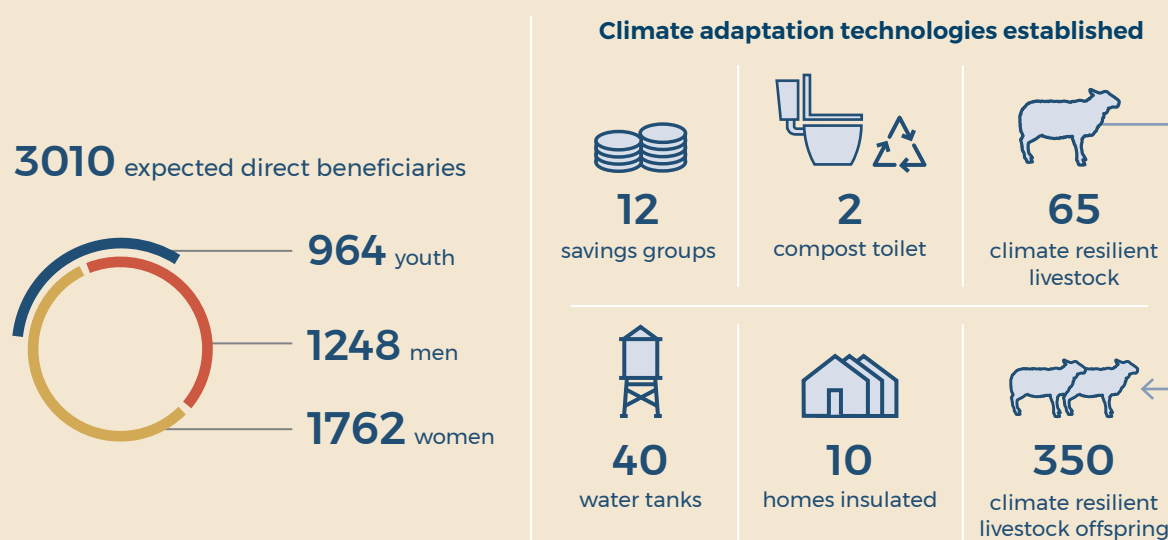
The SGF is piloting a small granting mechanism known as ‘enhanced direct access’, which allows civil society organisations to access climate finance to implement locally relevant adaptation projects at the community level in at least one of three investment windows: climate-smart agriculture, climate-resilient livelihoods and climate-proof settlements.^c The objective is to incorporate climate adaptation response strategies into local practices so that assets, livelihoods and ecosystem services are protected from the climate-induced risks associated with expected droughts, seasonal shifts and storm-related disaster events. The project aims to do so through three main components:

- providing small grants to vulnerable communities that deliver tangible and sustainable benefits;
- empowering local institutions to identify and implement adaptation response measures; and
- compiling and sharing lessons learned to facilitate future scaling up and replication of small grant-financing approaches.^d

The intended outcome of this project is to develop and implement a small grant finance mechanism in the context of climate finance, to deliver direct and tangible adaptation benefits with a view to scaling up and replicating this model.^e

As of February 2019, the SGF has approved 13 small grants to the total value of ZAR 18 million (\$1.2 million). Current successes of the facility are highlighted in Figure 7.

Figure 7 Impact achieved with the Small Grants Facility by February 2019



Source: SouthSouthNorth, 'Taking Adaptation to the Ground: A Small Grants Facility for Enabling Local Level Responses to Climate Change', https://southsouthnorth.org/wp-content/uploads/2019/02/SGF_brochure_final_v2_pages-2.pdf, accessed 14 May 2019

While the bulk of the projects funded by the SGF have been terrestrial EbA projects, recently a project that supports the safety of small-scale fishers at sea and ensures that fishing cooperatives are more resilient to climate change was funded. To ensure that communities that rely on South Africa's coastal and marine environments are more resilient to climate change and its impacts, it is essential that the SGF increasingly targets marine and coastal EbA projects.

- a SouthSouthNorth, 'Taking Adaptation to the Ground: A Small Grants Facility for Enabling Local Level Responses to Climate Change', https://southsouthnorth.org/wp-content/uploads/2019/02/SGF_brochure_final_v2_pages-2.pdf, accessed 14 May 2019.
- b *Ibid.*
- c *Ibid.*
- d Adaptation Fund, 'Project Proposal to the Adaptation Fund', <https://www.sanbi.org/wp-content/uploads/2018/03/sa-nie-community-adaptation-sgffull-project-proposalapproved-oct-14.pdf>, accessed 14 May 2019.
- e SANBI, 'The Community Adaptation Small Grants Facility', <https://www.sanbi.org/biodiversity/science-into-policy-action/nie-adaptation-fund/small-grants-facility/>, accessed 14 May 2019.

Exploring innovative funding mechanisms

To meet South Africa's funding gap for EbA, lessons can be drawn from national and international EbA projects that have been financially supported by innovative local/national budgeting processes.⁶³ For instance, coastal cities such as the eThekweni Municipality and the City of Cape Town fund their own EbA projects through internal budgeting processes. Since this is often insufficient, both cities source additional external funding from national (eg, SANBI) and international sources (eg, GIZ, USAID, C40).⁶⁴

In addition, there are also opportunities for EbA project implementers to explore non-traditional sources of funding to supplement required funding. Innovative approaches to climate finance are key to ensuring that sufficient and sustainable funding is available. Such sources include payments for ecosystem services,⁶⁵ as well as incentive schemes⁶⁶ that can encourage the uptake of EbA implementation (see Box 5).

Lastly, there is increasing recognition of the need to engage and form partnerships with the private sector through private-public partnerships. For instance, private sector finance

63 Chevallier R, 'Promoting Marine and Coastal Ecosystem-based Adaptation', SAIIA Policy Insights, 56, 2018, <https://saiia.org.za/research/promoting-marine-and-coastal-ecosystem-based-adaptation/>, accessed 16 May 2019.

64 Swanepoel E & S Sauka, *op. cit.*

65 Payments for ecosystem/environmental services (PES) refer to the concept of external service beneficiaries making direct, contractual and conditional payments to local landholders in return for adopting land use practices that secure environmental conservation and restoration. The broader umbrella may include, for example, product eco-certification, park entrance fees, and tradable development rights. A narrower definition, based on Wunder S., 'Payments for Environmental Services: Some Nuts and Bolts', CIFOR, Occasional Paper No.42, 2005: 'A voluntary transaction in which a well-defined environmental service (or a land use likely to secure that service) is bought by a service buyer from a service provider if and only if the provider continuously secures the provision of the service.'

66 Incentive schemes for local projects and communities include direct financial support to coastal rehabilitation and conservation, or rewards for socially and ecologically sustainable practices.

can be mobilised for new business opportunities and for projects that reduce business-related risks. The public sector can play a major role in encouraging the private sector to become engaged in the implementation of EbA actions by providing relevant information, incentives and economic signals.⁶⁷

BOX 5 CONSERVATION STEWARDS PROGRAM IN NAMAQUALAND, SOUTH AFRICA

Conservation International is implementing a Conservation Stewards Program (CSP) which provides incentives for communities for protecting natural resources. The CSP works with communities who agree to protect their natural resources, as well as the socio-economic benefits they provide, in exchange for a steady stream of compensation from investors. Since 2005, the conservation agreement approach has promoted the protection of 1.5 million hectares and the improved livelihoods of 35,000 people. In South Africa, the project is currently working with small-scale farmers in Namaqualand (Northern Cape), but there are plans to expand the project to include small-scale fisheries (as is the case in Colombia).

Challenges and opportunities

Over the last three to five years, the governance and implementation of EbA in South Africa has seen significant advances. There is currently considerable focus on and investment in creating and implementing appropriate policy and legislative interventions, positively influencing several aspects of marine and coastal environments. Such interventions have included the expansion of MPAs, the creation of operational estuarine management plans, the implementation of the Working for Coasts programme, improved implementation of the ecosystem approach to fisheries, the establishment of water quality guidelines, the creation and implementation of species management plans, and a significant increase in the spend on ocean and coastal research and monitoring.⁶⁸

Importantly, South Africa recently developed the EbA Strategy and EbA Guidelines, which are intended to guide the governance and implementation of EbA. However, the country still experiences various challenges, particularly at the local level.⁶⁹ It is critical that these challenges are addressed and supported by strong policies, sound technical understanding and operational capacity. Local, provincial and national governments will need to embrace

67 GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit), 'Learning Brief: Financing Ecosystem-based Adaptation', 2017, <https://www.adaptationcommunity.net/wp-content/uploads/2018/01/giz2017-en-learning-brief-financing-eba-low-res.pdf>, accessed 16 May 2019.

68 DEA, 2016, *op. cit.*

69 Swanepoel E & S Sauka, *op. cit.*

climate adaptation by identifying and putting into effect appropriate policies and measures that are well coordinated and credibly motivated.⁷⁰

Integrated planning has been central to oceans and coastal governance in South Africa. There has been progress in the development and implementation of a more integrated, fully representative and broader approach to oceans and coastal environmental management. For instance, improved management measures, including the development and implementation of ocean- and coastal-specific cooperative governance structures, as well as tools specific to integrated coastal management, such as coastal setback/management lines, show a positive trajectory. These measures should start to address the reported deterioration and improve the overall state of the ocean and coastal environment.⁷¹

Integrated planning has been central to oceans and coastal governance in South Africa

To ensure this, the pinnacle of international governance on climate change, ie, the Paris Agreement, emphasises the need to build global adaptation capacity. South Africa's National Development Plan articulates the need for building skills in terms of building resilience to climate change. It also notes that building resilience rests on achieving other non-climatic conditions, such as lowering poverty and inequality levels, improving education and healthcare services, creating jobs and enhancing the integrity of ecosystems. Therefore, it is critical that training and capacity building helps decision makers and implementers better understand the linkages between climate change, biodiversity and socio-economic development, and how to best align understanding and action in initiatives. This is critical for building resilience.⁷²

Research has highlighted knowledge gaps that, if addressed, would improve the successful implementation of future EbA projects, particularly in the marine and coastal EbA environment. Among these gaps is a lack of sound monitoring mechanisms that could assess the effectiveness and cost-efficiency of EbA projects in comparison to other adaptation approaches. Since EbA activities have focused primarily on river basin management and terrestrial conservation instead of marine and coastal EbA, South Africa needs to learn lessons from those projects already implemented. By acknowledging the lessons that have been learnt, transferring skills and knowledge, and making provisions to

⁷⁰ National Planning Commission, *op. cit.*

⁷¹ DEA, 2016, *op. cit.*

⁷² DEA, 2017, *op. cit.*

fill the identified knowledge gaps, there are likely to be opportunities to replicate and/or expand EbA implementation.⁷³

Lastly, the literature indicates that South Africa requires a better understanding of how EbA projects can contribute to sustainable development in different social, political and financial contexts. Vulnerability assessments are also needed to direct EbA towards those areas that are most at risk. EbA projects would also benefit from improved communication to encourage peer learning, capacity building and improved policy relevance.⁷⁴

Conclusion

The coast is an area where various pressures are converging, creating significant challenges. Managing these challenges requires a balance between addressing socio-economic issues, on the one hand, and protecting ecosystems, on the other. Therefore, implementing EbA is a social and institutional process that requires cooperation across sectors through partnerships with a clear focus on implementing interventions that deliver co-benefits in an evolving context.⁷⁵

EbA has proven to provide multiple benefits for coastal ecosystems and populations. However, it is worth remembering that there are limits to what EbA can be expected to achieve. While EbA is a powerful mechanism to address a number of climate change, biodiversity and socio-economic issues, it needs to be integrated with other approaches to address the complexities of natural and human systems. In particular, there are crucial thresholds to ecosystem resilience that need to be considered, beyond which adaptation is unlikely to be successful.⁷⁶

The full integration of EbA approaches in decision-making will require long-term commitment and patience from all stakeholders. With increased financial and human resources, knowledge and information, ownership, and stakeholder engagement and partnerships, there are opportunities to improve the level of mainstreaming and implementation of EbA. This will not only improve South Africa's ability to adapt to climate change impacts but also increase the resilience of coastal communities.⁷⁷

⁷³ DEA & SANBI, 2016, *op. cit.*

⁷⁴ *Ibid.*

⁷⁵ *Ibid.*

⁷⁶ *Ibid.*

⁷⁷ Swanepoel E & S Sauka, *op. cit.*



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