



Human Capital Development Strategy for the Biodiversity Sector

Post 2020 Update

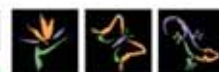


forestry, fisheries
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Department:
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SANBI

Biodiversity for Life



South African National Biodiversity Institute

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CHAPTER 1

Introduction

1.1 Background and rationale

As one of the world's 17 megadiverse countries, South Africa has a wealth of biodiversity and many endemic species. This biodiversity underpins the livelihoods of South Africa's people, both directly and indirectly. South Africa's biodiversity is also threatened by many factors including illegal trade, agricultural practices, land-use changes, pollution and waste, invasive alien species, and climate change. Protecting and sustainably using and managing the country's biodiversity requires capable and qualified managers, researchers, regulators, planners, technicians and field staff.

This strategy, covering the period 2010-2030, was produced in 2010 to drive a systemic approach to developing skills for biodiversity, in pursuit of a socially equitable and suitably skilled workforce of biodiversity leaders, professionals and technicians to optimally implement the sector's expanding and increasingly complex mandate. It was developed as a response to Strategic Objective 2 of the National Biodiversity Framework (2008) relating to *institutional effectiveness and efficiency*, which called for a national strategy to address transformation and scarce skills.

The problem to which the strategy responded in 2010, as summarised in the National Biodiversity Framework and the 2010 version of the strategy, was a shortage of research, leadership and management skills in the biodiversity sector, particularly when the need for social equity was taken into account. The shortage of skilled managers and professionals was found to be holding back the development of the sector and the achievement of biodiversity conservation goals. While a set of progressive policies to reduce the loss of biodiversity and ecosystem services was in place, the organisations tasked with implementing these policies were losing, or failing to develop, the capacity to do so. In addition, weaknesses were identified in the national skills planning and development architecture as well as in organisational-level management, human resource development planning, monitoring and evaluation. The biodiversity mandate was found to be significantly under-funded and there was insufficient political support for and public understanding of the role that biodiversity plays in the wellbeing of South Africa's economy and its people. Yet the human capacity to do this advocacy work was also lacking.¹

Research and situational gap analyses undertaken in 2009² indicated a need for more skills, greater quality of skills, more equitable skills distribution across racial and gender groups, as well as new skills. Graduates were said to come into the sector lacking the necessary high-level skills to do the increasingly

1 *Biodiversity Human Capital Development Strategy (2010)*

2 See BHCDS (2010) and Vass J, Roodt J, Wildschut A, Bantwini B and Reddy V. (2009). *Guidelines towards a Human Capital Development Strategy for Biodiversity Conservation Sector*. HSRC, Pretoria.

complex, conceptually demanding, cross-disciplinary and advocacy work required. For some skills, there were simply not enough graduates to fill positions, a situation exacerbated by the fact that biodiversity did not seem to be a sector of choice for school leavers and graduates. Even those who studied in a biodiversity field did not always choose employment in the sector. This seemed particularly to be the case among black South African graduates, who, it was thought, were unfamiliar with the biodiversity sector, may not identify with its values, or were turned away by non-competitive salaries or unwelcoming organisational cultures. These were seen as among the reasons why the sector battled to achieve racial equity in senior posts. This two-fold and partly interconnected problem - to improve the availability of suitable high-level research and management skills in the sector, and to employ more black South Africans in leadership positions - underpinned the strategy.

Strategy development was initiated by the lead agency identified in the NBF, the South African National Biodiversity Institute (SANBI), in partnership with the [Lewis Foundation](#). Besides the research and sector analysis already mentioned, the strategy was developed through an extensive stakeholder consultation process. Stakeholders involved included the (then) national Department of Environment Affairs, South African National Parks (SANParks), the C.A.P.E. partnership, research and higher education institutions, non-profit organisations (NPOs), the Environmental Impact Assessment community, conservation planners and human resource development practitioners.

In line with the intention for this to be a 'living strategy', a mid-term review process was initiated in 2020. The [Mid-Term Review](#) found that the overall vision and goals of the strategy and its systemic approach to capacity development remain highly relevant. Stakeholders felt that an updated version would be helpful, to capture the relaxing of the originally tight focus on high-level skills that occurred between 2010 and 2020, to update the policy and implementation context, and most importantly, to develop an implementation plan and priorities to address the recommendations from the mid-term review and its stakeholder engagement process. This document contains the updated strategy. The implementation plan is available as a separate document.

The strategy provides a framework through which organisations can strengthen their capacity to deliver on their biodiversity mandates and meet their capacity development and transformation objectives. Biodiversity organisations can use the framework to design internal strategies, but can also directly benefit from and contribute to the strategy. The strategy provides a means for organisations across the sector to contribute in a concerted manner to skills matters which affect them individually and collectively. It aims to strengthen existing initiatives through greater coordination and synergy, and to address gaps in the national skills planning system through sector-wide initiatives. While the interventions outlined in the implementation plan are not necessarily novel, the innovation of the strategy lies in its systemic approach, which provides mechanisms for connection, coordination and periodic evaluation across the sector as well as sector-wide initiatives (which have thus far been limited).

The goal of the strategy is a greater pool of biodiversity professionals and technicians, in particular (but not exclusively) black South Africans, to undertake biodiversity conservation, management and related natural and social science research, and play a leadership role in organisations with a biodiversity mandate. The strategy is complemented by other strategies with a broader ambit - for example, the Environmental Sector Skills Plan and Environmental Human Capital Development Strategy (ESSP, DEA 2010) which address skills needs at all levels, including entry-level skills, across the broader environmental sector.

The strategy consists of **four interconnected strategic goals** and **six strategic objectives** for achieving the vision of skilled and equitable biodiversity leadership. These address all aspects of the skills development 'pipeline', from entry into the sector through educational institutions, to retention in the workplace, and national provisions to enable institutions and organisations to be more effective in their capacity development endeavours.

In this strategy the term "skills" is used to refer to a combination of knowledge, values and skills which enable individuals to do their work. It is also used to refer to skilled personnel, and to occupations. For example, the term "scarce skills" is used to refer to particular occupations for which expertise is in



*Malachite Sunbird perched on the endemic fynbos Pincushion Protea flower in the Western Cape, South Africa.
Photo: AdobeStock, Chris Photography*

short supply, such as taxonomy. The term “critical skills” is used to refer to skills (competencies) required within an occupation and essential to that occupation, e.g. the skill of applying relevant environmental legislation within the occupation of impact assessment practitioner.

Transformation is defined broadly and encompasses:

- Transformation in terms of racial and gender equity in the sector.
- Transformation in the country’s approaches to and models for biodiversity conservation, management and research.
- Transformation of the way in which organisations in the sector function, in order to render them more effective in achieving their mandates.

The following sections look at what has changed in the policy and implementation context over the last ten years (Section 1.2) and the findings and recommendations of the Mid-Term Review (Section 1.3).

1.2 The post-2020 policy and implementation context

While the context has changed substantially since 2010, many of the changes are extensions of trends which were present in 2010 but which have become more prominent, and more urgent. The contextual overview below has been summarised from the Mid-Term Review, with updates to reflect new developments between March 2021 and the present.³

1.2.1 Biodiversity and ecosystem services continue to decline

Unfortunately the global trends in biodiversity and ecosystem services loss have continued unabated over the past 12 years, as reflected in the [IPBES⁴ Global Assessment](#) (2019) - the first since the Millennium Ecosystem Assessment in 2005. The Global Assessment concluded that nature in all its forms is undergoing a dramatic decline, with one million species at risk of extinction by 2050. This assessment was closely linked to the 2030 [Agenda for Sustainable Development](#), the [Sustainable Development Goals](#) (SDGs) developed in 2015, and the [Paris Agreement on Climate Change](#) (2015). The SDGs, set in 2015 by the United Nations Global Assembly, confirm the importance of biodiversity in that four of the goals address outcomes in the biosphere (SDGs 6, 13, 14 and 15: clean water for all; climate action; life below water; and life on land).

³ Based on analysis of policy documents and interviews with key stakeholders.

⁴ The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) was established in 2012. This global body aims to improve the interface between science and policy and is intended to play a similar role for biodiversity to the role played by the Intergovernmental Panel on Climate Change (IPCC).

The post-2020 Global Biodiversity Framework (GBF) currently being negotiated under the Convention on Biological Diversity similarly states that “Currently, the global species extinction rate is at least tens to hundreds of times higher than the average over the past 10 million years, and the rate is increasing... It will be necessary to reduce both the extinction rate and the extinction risk”⁵ Despite ongoing efforts, biodiversity decline is projected to continue or worsen under business-as-usual scenarios.

South Africa's third National Biodiversity Assessment (2018), released in October 2019, revealed that almost half the of the country's 1,021 ecosystem types assessed are threatened, with estuaries and wetlands having the highest proportion of threatened types and the lowest levels of protection. From a species perspective, 14% of all 20,401 plant and 12% of the 2,911 animal species assessed are threatened. Trends in threat status show rapid declines in some species, especially freshwater species and butterflies.

As one of the world's 17 megadiverse countries⁶, South Africa has both a responsibility to safeguard this biodiversity and a right to request global assistance in doing so. The post-2020 GBF aims to increase financial flows for biodiversity to developing countries to at least USD200 billion per year, increasing by at least USD10 billion per year to meet the needs for implementation commensurate with the ambition of the goals and targets of the framework (Action Target 19).

1.2.2 Biodiversity is increasingly being seen as foundational to economic and social wellbeing

The framing of biodiversity and ecosystem services as foundational to sustainable livelihoods and socially just development, rather than an obstacle to development, has become stronger, better supported with data, and more strident over the last 12 years.

The post-2020 GBF states: “We believe that a transition to a sustainable future should be humanity's utmost goal. Sustainability for us includes reversing biodiversity loss, ensuring nature contributes to people's needs; nature is valued, restored and used wisely, and the equitable sharing of the benefits of natural resources, as well as sharing the responsibility to protect these resources between all, but also between current and future generations. If we are able to achieve these goals, the benefit will be immense. There is no path to ending world hunger and lifting people out poverty, there is no path to preventing future pandemics, and there is no path to stopping the depletion of natural resources and resulting human conflicts, unless we choose the path of sustainability, and this includes taking actions to ensure sustainable use of biodiversity.”⁷



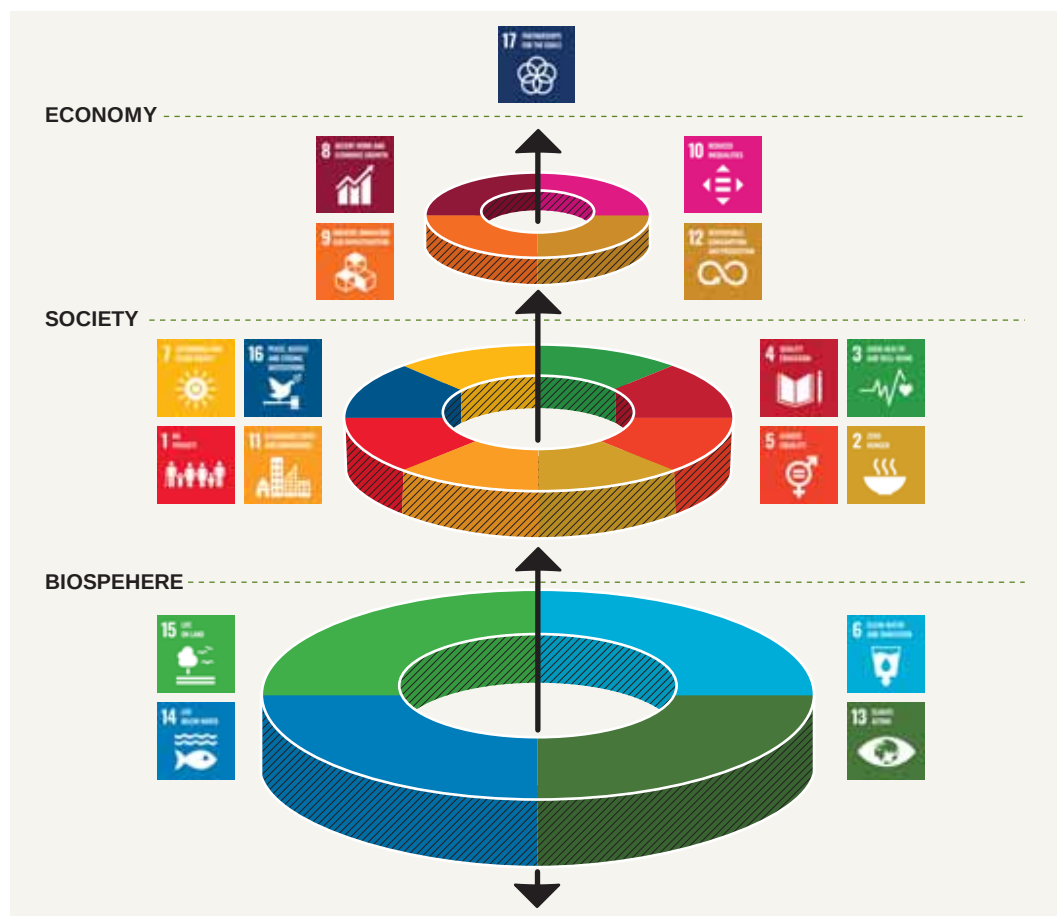
Meerkats (Suricata suricatta) are highly social mammals known for their tight-knit relationships and cooperation.

5 <https://www.cbd.int/article/first-draft-global-biodiversity-framework-one-pagers> (Goal A)

6 As defined by the World Conservation Monitoring Centre (WCMC) of the UNEP

7 <https://www.cbd.int/conferences/post2020/co-chairs-updates>

Figure 1: Economy and Society are dependent on a healthy biosphere. Source: Folke et al. (2016)



The foundational nature of biodiversity for achievement of all the society- and economy-related SDGs is well illustrated in Figure 1.

The *IPBES Regional Assessment for Africa* (2018) noted good alignment between the strategic priorities of African governments and the *Agenda 2063 (African Union) Goals*, the SDGs and the Aichi biodiversity targets. The synergies between SDGs relating to biodiversity and those relating to poverty and inequality are particularly relevant for Africa, as Africa's rich biodiversity endowment can be used to decrease inequality and poverty on the continent. Challenges include the vulnerability of Africa to climate change, as well as weak governance and lack of funding and capacity to implement strategic plans for biodiversity.

A report by the Swiss Re Institute (2020), titled "Biodiversity and Ecosystem Services: A business case for re/insurance", concluded that "Biodiversity and Ecosystem Services (BES) underpin all economic activity in our societies globally and should be part of strategy discussions across financial services" (p.3). Based on a recent BES Index, the report ranked South Africa sixth among the countries with the most fragile ecosystems, and its national economy among the most heavily dependent on this degrading natural capital (p.52).

The *South African National Employment Vulnerability Assessment* (2017) predicted that workers in mining (particularly coal mining), electricity generation, agriculture and tourism will be most severely affected by climate change. The associated Sector Jobs Resilience Plans make recommendations for *just transitions* in these sectors, including for farm workers as a particularly vulnerable group. South Africa has recently entered into an international partnership to support a just transition towards an inclusive green (low carbon) economy.⁸

8 <https://www.gov.za/speeches/presidency-international-partnership-support-just-transition-2-nov-2021-0000>

The National Development Plan (NDP), with its 30-year horizon, still applies. The NDP notes the importance of environmental management, particularly in the face of pending climate change. This theme was recently picked up by the President of South Africa, when he launched the National Climate Change Adaptation Strategy⁹. This took place during the Covid-19 pandemic which had devastating impact on precarious livelihoods of millions of South Africans, and President Ramaphosa noted that in terms of economic development,

“We should not merely return to where we were before the pandemic struck. We are instead looking at actions that will build a new, inclusive economy that creates employment and fosters sustainable growth. An important aspect of this new economy is that it must be able to withstand the effects of climate change. A climate-resilient economy is necessary to protect jobs, ensure the sustainability of our industries, preserve our natural resources and ensure food security.”¹⁰

In linking the socio-economic challenges of the country to the preservation of natural resources, and positioning them not as opposites but as two sides of the same coin, i.e. complementary objectives, Ramaphosa reflected a narrative that was around in 2010, but that has become stronger and more specific in the past 10 years. He referred, for example, to the climate-related trade restrictions that would prevent South Africa from trading with countries that may be concerned about our large carbon footprint (ibid).

To support this narrative there are now more studies quantifying the links between environmental management and job creation. This research shows that investing in biodiversity work, jobs and businesses, would help to buffer society from floods and drought, unlock opportunities for eco- and adventure tourism, secure and restore water resources, and protect food security through healthy soils and pollinators.

The National Biodiversity Assessment (2018) estimated that 418,000 jobs nationally are directly related to biodiversity conservation and management, making it a sector worth considering in terms of job creation. The assessment compared the sector to Mining which in 2017 employed approximately 430,000 people, and was a sector in decline. It also argued that there is enormous potential for further employment growth in the biodiversity sector. The Green Jobs Report of 2011 (DBSA, TIPS) indicated that, due to South Africa's extensive natural capital, job creation in natural resource management holds the biggest potential for green job creation in both the short term and the long term. It estimated a potential 45% increase in job creation in natural resource management in the short term and 50% in the long term. The biodiversity sector has proven that it can create work and income opportunities for low- to intermediate skilled workers through the successfully sustained Working for Water and other NRM related Expanded Works Programmes. A report produced by SANBI in 2017 outlined the Business Case for Biodiversity Stewardship Programmes.

Operation Phakisa is a programme that enables government to fast-track the implementation of solutions to critical development issues. Recognising the potential of South Africa's oceans and wildlife to contribute to jobs and livelihoods, focal areas include Operation Phakisa: Oceans Economy and Operation Phakisa: Biodiversity Economies.

A report produced in December 2020 by the High Level Panel of Experts for the Review of Policies, Legislation and Practices on Matters of Elephant, Lion, Leopard and Rhinoceros Management, Breeding, Hunting, Trade and Handling recognises the enormous potential of wildlife ranching, breeding, hunting and trade as an economic activity,¹¹ and that current practices promote short-term economic gain for the few, undermine ecological sustainability, are not culturally sensitive and exacerbate poverty and inequality, the report identified the need for an integrated and overarching policy on sustainable use. It argued that the current definition included in NEMBA is “too narrow in its framing, is not in line with a systems approach to sustainability, and is interpreted differently by various stakeholders” (p.279).

9 https://www.environment.gov.za/mediarelease/nationalclimatechange_adaptationstrategy_ue10november19

10 <https://www.sanews.gov.za/south-africa/sa-works-create-new-inclusive-economy>

11 especially under climate change and in areas marginal for livestock or crop farming

Building on the High Level Panel Report as well as the National Biodiversity Economy Strategy (2015), the White Paper on the Conservation and Sustainable Use of Biodiversity was subsequently developed through a consultative process and gazetted in July 2022 for public comment. This seeks to remedy the exclusion of indigenous and local communities from the wildlife economy, and also to safeguard against the potential for over-exploitation as well as reputational damage for South Africa and litigation against government, for example as a result of “canned” lion hunting and intensive breeding of rhino. The White Paper recognises that nature has value in its own right, independent of human uses, and that its intrinsic value cannot be calibrated against its economic worth.

The Presidential Jobs Fund Framework Agreement of 2018 suggested that there are also other funding mechanisms that already exist, and called for the Departments responsible for Mineral Resources, Environment and Water to work together to unlock the existing financial provisions for mining rehabilitation. Should these entities succeed in doing so, they could create millions¹² of jobs in mine rehabilitation.¹³

Natural Capital Accounting refers to the use of an accounting framework to provide a systematic, reliable and comparable way to measure and report on the stocks and flows of natural capital. Substantial work has been done on Natural Capital Accounting in South Africa since 2010, by SANBI, StatsSA and other partners, through the **Advancing Natural Capital Accounting Project** (2014-2015), the **Natural Capital Accounting and Valuation of Ecosystem Services Project** (2017-2021), the NRF Community of Practice’s **Ocean Accounts Framework** (2020-2021) and the **Ecological Infrastructure for Water Security Project** (ongoing). Resource economists have also developed accounting measures that turn land restoration investments into assets rather than expenses.¹⁴

Recently the Africa Report shared that the restoration of 350 million hectares of degraded ecosystems between now and 2030 could return USD9 trillion in ecosystem services and remove up to 26 gigatonnes of greenhouse gases from the atmosphere¹⁵. This is almost half of what the world emitted in 2019, and just one example of new studies that demonstrate the link between biodiversity, climate change resilience, and benefits for human and economic well-being. Calls for more resource economists (as a scarce skill) indicate that the links between biodiversity and social and economic benefits foreshadowed in this strategy in 2010 are now widely recognised and that skills are needed to further explore and develop them.

The post-COVID Economic Reconstruction and Recovery Plan (2020) includes green economy interventions among its priorities, noting that dedicated funding is available from international partners to support such programmes. R100 billion has been earmarked for job creation and retention as part of the Presidential Employment Stimulus, based primarily on direct public investment in employment to counteract anticipated job losses. The stimulus aims to enable the creation of a cumulative 2.5 million direct jobs by the end of the 2021/22 and 5 million jobs by 2023/2024. This broader national drive is an important part of the context in which the BHCDS will be implemented in the next 10 years.

In line with the above, the Groen Sebenza Phase II Programme is a bridging-into-work programme funded to the value of R300 million for the next three years and implemented by SANBI. The programme aims to recruit 1050 unemployed graduates (from Diploma to PhD level) and place them nationally in different organisations (government and non-governmental) where they will be incubated (trained and mentored) to further develop their competence and confidence in the management of biodiversity.

12 The Centre for Environmental Rights reports that South Africa has 6000 derelict and abandoned coal mines.

13 The Guidelines for Biodiversity and Mining, also call for concurrent restoration and end-of-project rehabilitation, as does the law and the social contract on which companies are given the license to mine.

14 E.g. Crookes, D., and Blignaut, J.N. (2019). Investing in natural capital and national security: a comparative review of restoration projects in South Africa. *Heliyon*, 5(5):e01765.

15 This does not include tree planting in former savanna ecosystems.



Dung beetle having just rolled a ball of dung has to move the dung ball to its burrow to avoid it be stolen by another beetle, Kruger National Park, South Africa. Photo: AdobeStock, Henk Bogaard

The above developments imply that investing in biodiversity skills is highly relevant from a social and economic development perspective, both in terms of direct employment creation, and in terms of biodiversity being part of the biosphere ‘base’ on which social and economic development rests. If this base erodes, many other existing and potential development opportunities and livelihoods will be lost, particularly in light of climate-related threats to water and food security in South Africa and the region.

1.2.3 Bold, systemic transformation is urgently needed

The interconnected nature of socio-ecological crises such as social inequalities, the degradation of biodiversity and natural resources, climate change, the collapse of economies on local and global scales, and failures in corporate and state governance, points to the need for connected, systemic transformation as opposed to piecemeal efforts.

The post-2020 draft Global Biodiversity Framework sets out an ambitious plan to implement broad-based action to bring about a transformation in society’s relationship with biodiversity and ensure that, by 2050, the shared vision of living in harmony with nature is fulfilled. The framework’s theory of change recognises that urgent global, regional and national policy action is needed to *transform economic, social and financial models* so that the trends that have exacerbated biodiversity loss will stabilize in the next 10 years (by 2030) and allow for the recovery of natural ecosystems in the following 20 years. It proposes that a whole-of-government-and-society approach is necessary to make the changes needed, and that governments and societies need to internalize the value of nature and recognize the cost of inaction. Biodiversity values must be fully integrated into policies, regulations, planning, development processes, poverty reduction strategies, accounts, and assessments of environmental impacts at all levels of government and across all sectors of the economy, ensuring that *all activities and financial flows* are aligned with biodiversity values.

This is a bold proposition. Proposed action targets in the draft GBF detail interventions across a wide range of sectors and practices, far beyond what has traditionally been included the “biodiversity sector”. These practices include extraction, production and supply chains, waste and overconsumption, biotechnology, human health, business reporting and financial practices, amongst others. Biodiversity is becoming part of many decisions in fields as wide-ranging as urban planning, human settlements, mining, economics, finance, corporate sustainability, insurance, infrastructure, engineering, water supply, pharmaceuticals and human health.

The [Dasgupta Review](#) (2021) provided a comprehensive synthesis of the links between biodiversity and economics and a coherent set of recommendations for how to save biodiversity, and ourselves. Interestingly it argued that fundamental changes can be achieved by transforming just two sets of institutions: the financial sector (chiefly banking), and education. These institutions are the key leverage

points for transforming society to act on a radically new understanding that nature is not external to the economy, but people and economies are embedded in nature; that new measures are needed to measure economic success (inclusive wealth); and that education is vital in achieving this transformation.

The COVID-19 pandemic highlighted the interrelationships between the health of humans, animals and the environment. An [IPBES Pandemics Report](#) in 2020 recommended a “One Health” integrated approach to averting interconnected biodiversity, climate and health crises. The One Health concept is also promoted in the [Strategy of the UN Decade on Restoration](#) (2020-2030) and the [IUCN's Nature 2030 Programme](#).

The concept of the circular economy has risen to prominence as an actionable framework for achieving the sort of transformative, systemic change that is needed for a nature-positive future, and momentum is building in business, finance and policymaking both internationally and nationally. A 2021 report by the Ellen MacArthur Foundation, [The Nature Imperative: How the Circular Economy Tackles Biodiversity Loss](#), outlines the impacts of four sectors (agriculture, the built environment, fashion and plastics) on biodiversity loss.

At a national level, the post-COVID Economic Reconstruction and Recovery Plan (ERRP) takes a strongly systemic approach. The [Framework for a Just Transition in South Africa](#) (2022) produced recently by the Presidential Climate Commission (PCC), is positioned at the intersection of the country's efforts to redesign the economy to the benefit of most citizens and the domestic response to climate change. The framework deals with managing the social consequences and economic upside of climate change mitigation and adaptation policies, while putting human development concerns at the centre of decision-making. The framework notes the urgency of the just transition and follows international thinking on the need for bold, systemic transformations that require an all-of-society, all-of-government approach. Several detailed studies have been completed outlining decarbonization pathways and options for different sectors, including the most recent one on “Agriculture, Forestry and Land Use” - although the links to biodiversity are not yet present.

1.2.4 Addressing green skills, institutional capacity and transformation is therefore more relevant than ever

In light of the above, the need to build individual, institutional and systemic capacity for biodiversity remains highly relevant. The IPBES Global Assessment (2019) positions “capacity building” as a top lever towards transformative change. The post-2020 draft GBF likewise emphasises the importance of awareness-raising, education and research for achieving equitable and effective participation in management, monitoring and decision-making which includes indigenous peoples and local communities, women and girls, and youth.

The revised [National Biodiversity Strategy and Action Plan](#) (NBSAP 2015-2025) has retained a strategic objective that speaks directly to skills and transformation: “Conservation and management of biodiversity is improved through the development of an equitable and suitably skilled workforce”. This objective “seeks to build on the work done to date through the BHCDS by ensuring the enabling conditions for the growth and transformation of the capacity in the sector are in place (Outcome 5.1), the needs of the biodiversity sector are incorporated into skills development and planning (Outcome 5.2), and institutions [notably provincial and local government agencies] are capacitated to deliver on their mandates (Outcome 5.3)” (DEA, 2015, p.53).

A recent **assessment of scientific capacity in the provinces**, with particular reference to the functioning of South Africa's Scientific Authority, identified a concerning shortage of capacity in the provincial conservation departments and agencies - the result of 20 years of underfunding. The report concluded that the primary problem is not training, equity or the availability of graduates, but rather the failure to fill posts, and provides some initial recommendations for addressing this challenge.¹⁶

16 Department of Forestry, Fisheries and the Environment 2022

The High Level Panel on Game and Hunting (2020) identified the need for capacity building, education, training, and empowerment of human capital across the wildlife sector to support the growth of the wildlife economy, and in particular recommended the development of an integrated plan that empowers provinces and state-owned entities, private sector, and traditional communities, to develop capacity through training, mentoring and upskilling of staff and workers in the sector. The panel also recommended the establishment of a Wildlife Innovation Programme, with an online sector hub where role-players can submit information, models and proposals in support of transformation and growth of the wildlife sector, such as wildlife-based enterprises, concept partnership models, empowerment programmes, financing models, development and/or improvement of localised value chains, and youth competitions.

The Mid-Term Review noted that policies and guidelines produced in South Africa's national skills sector over the past decade did a poor job of including biodiversity-related skills. The 2017 South African Country Report on Skills for Green Jobs for the International Labour Organisation was particularly scathing about the absence of references to the green economy and green or environmental skills in Department of Higher Education and Training (DHET) frameworks such as the National Skills Fund Strategic Plans and the White Paper for Post-School Education and Training (2014) among others. They pointed out that “green economy skills development does not seem to be integrated into the general framework of skills development, but is rather addressed in policy plans and documents that are green economy specific. This is despite the fact that the green economy has been identified as a key sector for job creation in various government plans” (p.25). However, there have been some encouraging developments since then.

The Just Transition Framework (2022) and the Post-COVID Economic Reconstruction & Recovery Plan (ERRP) both highlight the need to invest in people and skills to enable greater participation in the economy for a “green” recovery. The ERRP is supported by the ERRP Skills Strategy (2022) led by the DHET. The ERRP Skills Strategy identifies the skills implications of the plan as well as ways in which the post-school education and training (PSET) system will ensure that the required skills are available. It addresses both targeted education and training, and support for education to work transitions, including entrepreneurship. The strategy is demand-led, requiring coordination between the DHET Labour Market Intelligence research programme and the SETA skills plans. Since there are some overlaps with the Biodiversity Skills and Transformation Strategy, this is an important process with which to engage.



*A lioness rests during the heat of the day with her young cub, Kruger National Park, South Africa.
Photo: AdobeStock, Hal Pand*

South Africa's White Paper on Science, Technology and Innovation (2019) identifies demographic shifts, urbanisation, widening inequality and youth unemployment, ICTs and the Fourth Industrial Revolution, as well as climate change, drought and loss of biodiversity as some of the big risks that will shape policy in the near future, and aims to position the National System of Innovation as a more compassionate, responsive and ecologically sensitive system to address socio-economic challenges and respond to drivers of global change. It is argued that South Africa urgently needs to expand its science, technology and innovation (STI) capabilities to support achievement of its national development priorities as outlined in the NDP:

“In South Africa, it is necessary to improve the responsiveness of the post-school education and training system to the skills needs of the 21st century... Currently, the education level and skills base is lower than that of many other productive economies. The pool of students who can potentially access university and [other] programmes is small in comparison to the country's demand for skills.”

“The dearth of STI human capabilities has severely hampered society's ability to solve problems. The need for long-term investment in individuals and institutions ... to develop the knowledge, skills and resources to address South African developmental needs cannot be over-emphasised.” (p15).

The Department of Science and Innovation's Decadal Plan (2022-2031) is the implementation plan for the White Paper on Science, Technology and Innovation. In the wake of the COVID-19 pandemic, it is also seen as one of the instruments for implementing the country's Economic Reconstruction and Recovery Plan (ERRP). The Decadal Plan puts a strong emphasis on human capital development for STI, and has many areas of overlap with the Biodiversity Skills and Transformation Strategy. The STI priorities are: Climate change and the circular economy (biodiversity loss is addressed here); Education for the future (education and skills value chains, including ECD and TVET); Future of society; ICT's and smart systems; High-tech industrialization; Nutrition security; Water security; Health innovation; and Sustainable energy. Skills development and transformation feature prominently throughout.

The DSI Decadal Plan recognises the value of large projects, such as the Square Kilometre Array (SKA) and the Southern Ocean Carbon-Carbon Observatory (SOCCO) to serve as technological innovation systems and end-to-end human capital development platforms. A feature of the plan with important implications for this strategy is the intention to mainstream social science into all programmes and projects to address the complexity of the societal challenges faced by the country.

Implementers of the Biodiversity Skills and Transformation Strategy can draw on a range of new policies and frameworks that help guide the way regarding the kinds of skills that will be needed in the sector. These include UNESCO's Education for Sustainable Development (ESD) 2030 and the SADC-wide Sustainability Starts with Teachers initiative, which drew on Fundisa for Change experience, networks and resources. The ESD 2030 initiative is a significant drive to build on the central role of education as a key enabler of all the SDGs, as well as a goal in its own right contributing towards a more just and sustainable world. The ESD 2030 Roadmap focuses on integrating ESD and the 17 SDGs into policies, learning environments, capacity building of educators, empowerment and mobilisation of youth, and local level action. It is in alignment with the Fundisa for Change programme and the Department of Higher Education and Training's inclusion of ESD in the Minimum Requirements for Teacher Education Qualifications.

Effecting transformative change requires *inter alia* advocacy and negotiation skills, and integrated planning informed by systems understanding. In 2015 South Africa's Green Economy Learning Assessment identified the importance of combinations of technical, relational and transformational competencies for those driving transformative change.



*Family group of hippotamus, gathered together in a waterhole, Eastern Cape, South Africa.
Photo: AdobeStock, Judith Photography*

The DSI Roadmaps which outline steps towards transformation in different sectors (water, waste, human settlements, the hydrogen economy) identify skills needs and the strategic interventions needed to meet these needs. Importantly, these are well supported by the private sector, through the National Business Initiative (NBI) and Business Unity South Africa (BUSA).

A report commissioned by WWF-South Africa and the NESPF and conducted through TIPS and Wits University, called Unlocking Green Jobs in South Africa: A Catalytic Intervention (Mclean, 2018) suggested that data collection and analysis skills, policy review skills, adaptive monitoring and evaluation (M&E) skills and organisational capacity-building skills will be needed in the sector in order to effectively implement green economy initiatives.

The DSI is currently working on a tracking system for postgraduates, skills forecasting capabilities, supporting entrepreneurship, reviewing the programme and qualifications mix, and integrating the Sector Education and Training Authorities (SETAs) and state-owned enterprises in a strategic manner to build research and development skills and in-service training opportunities - all of which have overlaps with activities under the Biodiversity Skills and Transformation Strategy. Importantly, the DSI has put significant effort into building governance structures and processes to enable inter-departmental collaboration and coordination of public funding, as well as reflection and coordination across government, business, academia and civil society. These structures include the **Presidential Science & Innovation Plenary**, and the **Science & Innovation Inter-Ministerial Committee**, with the DSI acting as secretariat for both. These structures could provide opportunities for synergy in the implementation of this strategy.

Planning and feasibility studies for two new universities are currently underway. The new University of Science and Innovation will focus specifically on science and innovation subjects, including STEM subjects such as Data Science, machine-learning, artificial intelligence, blockchain, robotics, and hydrogen-powered technologies such as smart transportation and logistics systems. The second university will focus on crime detection and fighting, including wildlife-related crimes, and is expected to be built in Hammanskraal in northern Gauteng.

In conclusion, a strategy to build transformed and transformative capacity for biodiversity is more relevant than ever. Given the above context, the BHCDS needs to go beyond an emphasis on jobs, and should aim to build the skills, values and leadership needed for systemic transformation. The type of systemic change outlined above will determine the types of diverse skillsets and capacities that will be required in future.

1.3 Findings and recommendations from the mid-term review

1.3.1 Findings

The overall finding was that the implementation of the strategy between 2010 and 2020 involved a **significant amount of activity and inputs, was generally aligned with the strategic objectives and principles of the strategy, and achieved significant outcomes**. However, scarce skills and transformation challenges still remain. Stakeholders were of the view that not enough had been achieved, but that (for the most part) the strategy is still relevant for achieving the needed changes. The implementation architecture had both strengths and weaknesses, but in general implementation was held back by inadequate monitoring and evaluation, principal-agency disconnects, the absence of a steering committee and advisory group, and irregular sector-wide events to optimise synergies, grow the level of participation from a wider range of partners, and maintain momentum over the 10-year period.

The review found that organisations with biodiversity remits are still underfunded. This means not only that the strategy is likely to remain underfunded, as the case studies suggested it is, but also that the sector will continue to function sub-optimally even if it does obtain and retain more skilled personnel. Based on survey responses, in ten years there have been few to no signs that additional resources have been mobilised from the fiscus or other significant, sustained sources, for biodiversity conservation, research and management. One of the main capacity gaps is therefore the capacity to mobilise resources for the sector.

Biodiversity leaders are needed who can achieve this change both within and outside the sector, also making the boundaries of the sector more permeable, while spreading rather than diluting its vision and mandate. The theory of change is that when biodiversity leaders are more effective in 'making the case for biodiversity' with politicians, industries and communities, their organisations will also become better resourced (through better budgets and regulatory powers) and as they become more effective, they would demonstrate their value to society even more (through large scale employment, biodiversity conservation successes and widespread societal goodwill). This in turns makes it a more desirable sector in which to work, and a spiral of positive feedback loops ensues. It is a sound and inspirational principle, one to which many contributed in the development of the strategy.



*Marine biology students working on a shark dissection, KwaZulu-Natal, South Africa.
Photo: AdobeStock, Sandra Foyt*

Specific findings are presented below in a high level 'dashboard' format, in which Green indicates Well achieved; Orange indicates Somewhat achieved; and Red indicates Not adequately achieved.

1 FINDING 1: Biodiversity as a study and work choice has been promoted to young black South Africans and access into higher educational studies has significantly increased. Strategic Objective 1 of the BHCDS addresses the promotion of the sector among young people and skills system leaders in order to attract and give skilled black South Africans access into biodiversity organisations.

STRATEGIC INTENT:

Promote the biodiversity sector as a sector with a strong vision of transformation and opportunities for fulfilling work that contributes to the national development agenda, among the following groups ...

Black South African school leavers, students and graduates

Fundisa for Change programme engaging teachers and teacher educators; GreenMatter Fellowships; Imvelisi Enviropreneurs project; NRF and CATHSSETA bursaries; WWF and other internships; university & schools career guidance (WWF, SANBI and DEFF along with others and links into DHET's NCAP) engaging young black South Africans, Groen Sebenza involving 47 partners and nearly 800 placements. HEMIS data show increase in black students in biodiversity related fields, entering & graduating with Masters and PhD degrees - albeit not (only) attributed to the BHCDS.

Key decision-makers including leaders in the national skills development system

SETAs are funding green research but this is not translating into consistent and adequate funding for biodiversity skills; DHET giving recognition to sustainable development in teacher education but funding teachers to upskill for biodiversity remains a piecemeal responsibility. More favourable meta-conditions are needed. SANBI Mainstreaming Biodiversity, IPBES and other science-led activities do not engage with the BHCDS work.

2 FINDING 2: Up-skilling of existing employees and changing organisational cultures have received some but limited attention as workplaces struggle to provide appropriate training.

SO2 (UPSKILLING) STRATEGIC INTENT: Extend Existing Capacity

Promote the biodiversity sector as a sector with a strong vision of transformation and opportunities for fulfilling work that contributes to the national development agenda, among the following groups ...

Improve the skills of those already in the workplace, and under-qualified or under-skilled in a manner that contributes to social equity, a sense of belonging and pride in the sector

Mentoring capacity of organisations has improved, with mentors' training and resources produced and distributed, as part of the HRD Network, Groen Sebenza and other sector initiatives.

GreenMatter Fellowship funded upskilling programmes and built a strong sense of pride and belonging as reflected in beneficiary interviews, but on a small scale. Leadership upskilling started but not continued on a significant scale.

HRD Network to improve capacity of organisations to upskill staff was not continued or reconceptualised after limited successes in first three years; workplaces struggle to identify or find and fund appropriate training for staff with the employer survey showing that disconnects between organisational strategy and HR functions still exist.

The BHCDS implementation partners places more emphasis on new entrants into the sector, as opposed to building the capacity of existing staff and current or future organisational leaders. This needs to be reconsidered given the need for existing staff to build up organisations to a point where they can increase the number of positions for new entrants into the sector.

3 **FINDING 3: Organisation's ability to retain and deploy skilled staff was not significantly addressed in the first 10 years of implementation, which emphasized new entrants; while engagement with the national skills planning system has had limited access.**

SO3 (RETENTION) STRATEGIC INTENT:

Extend existing capacity through improved retention and effective deployment of suitably skilled people in the sector through ...

organisational design & development ...	No initiatives to improve organisational strengthening and design capacity, other than the HRD Network, which addressed this in a very limited manner before terminating.
... skills planning	National Environmental Skills Planning Forum, National Environmental Skills Summit and the Green Skills Programme engaged DHET and SETAs to improve the national system for biodiversity skills planning; outcomes have been limited and Summits have not continued on the same scale as in 2011, when they were evaluated as a strong mechanism to improve environmental skills planning. Labour market intelligence improvement by DHET has not yet show fruit and engagement with the biodiversity sector from the designated agency (DPRU at UCT) was limited to one study (Driver et al).
... human resource development processes	HRD Network to improve capacity of organisations to upskill staff was not continued or reconceptualised after limited successes in the first three years; workplaces struggle to identify or find and fund appropriate training for staff with the employer survey showing that disconnects between organisational strategy and HR functions still exist.

4 **FINDING 4: Entry into biodiversity study fields and pass rates are improving but may be at risk due to high student load and potentially decreasing capacity for curriculum innovation and quality teaching in universities, with historically black universities receiving less attention.**

SO4 (SKILLS PROVISION) STRATEGIC INTENT:

Improve the quality and relevance of training provided by universities and other training providers

Increase the relevance and quality of educational provisions by a wider range of higher education institutions (HEIs) and other providers ...	While HEI studies were undertaken and working groups established, the NRF and NSTF were engaged and providers expresses a strong interest, no curriculum innovation projects were supported. Historically black universities have participated less in BHCDS initiatives. The Work-based learning project was not continued despite a good start.
... in a manner that will improve pass rates	HEMIS data reflect a large increase in black students graduating in biodiversity related fields; however there is still a large number who enrol but do not graduate, and black women are less likely to advance into PhD studies, which has implications for leadership transformation. The growth in student numbers and simultaneous decrease in HE budgets put quality of education, skills produced, and future pass rates at risk. The Work-based learning project convened partners including the DHET to address the lack of funding for placements (which affect graduation rates of BTech students), but the impact of this initiative was not monitored and it was discontinued.
... and improve entry into the sector	HEMIS data reflect a large increase in black students entering biodiversity related fields of study; while this is part of a general trend, several initiatives address entry and access including the GreenMatter Fellowship; NRF and CATHSSETA bursaries; and careers projects. Fundisa for Change is a highly significant long term Foundation Building programme relevant to this objective.

5 **FINDING 5: A teacher education system building project is in place with a coordinator, advisory body, support from national government and implementing partners (universities).**

SO5 (SKILLS PROVISION)

Contribute to better science, mathematics, literacy and environmental learning in schools

Fundisa for Change has leveraged national and international funding off contributions from the Lewis Foundation (BHCDS) and DEA/DEFF (as part of the Environmental Sector Skills Plan). A coordinator is in place within SANBI, although the project is only part of her KPIs. Most universities have participated in the project which exposes teachers, student teachers, teacher educators and education department officials to training in the biodiversity and broader environmental content in the curriculum, to enable better qualified teachers able to better teach this content. The project has seen sustained activity and outcomes from 2011-2021.

The success of this initiative is due to strong partnerships within the sector, sustained advocacy by the sector partners themselves, the availability of funding for environment and sustainability education linked to schools, and the partners making use of the alignment between the BHCDS and the ESSP.

6 **FINDING 6: While the sector has worked hard to promote HCD initiatives, a key limitation in the strategy implementation has been sub-optimal coordination and the complete absence of shared monitoring, evaluation and reporting which also limits promotion potential.**

SO6 (META-CONDITIONS) STRATEGIC INTENT:

Increase impact through articulation and promotion

Increase the impact of the collective effort of HCD initiatives relevant to the sector ...

Skills Summits served as significant opportunities to showcase, articulate, join-up and coordinate HCD initiatives but instead of scaling them up and out as recommended after the first evaluations (2011, 2015) they were cut back. Despite a significant funding investment in a coordinating and advocacy mechanism (GreenMatter) sector partners and external evaluators found that GreenMatter remained or became mostly isolated from sector partners and did not optimise its coordinating, convening and advocacy potential. The absence of shared monitoring, evaluation and reporting (a common and critical meta-condition) further weakened this outcome.

... through articulation (connecting initiatives)

Alignment with the ESSP was optimised in the Fundisa for Change programme, but there was only isolated alignment with the Global Change Grand Challenge and other relevant HCD initiatives, contributing to a more limited scale of impact than was desired by all involved.

... and promotion

The GreenMatter brand and website was established and GreenMatter arranged or engaged in a number of promotional activities including Fellowship events. WWF and other partners also promoted initiatives, in particular those giving access to the youth. Skills Summits served as significant opportunities to showcase, articulate, join-up and coordinate HCD initiatives but instead of scaling them up and out as recommended after the first evaluations (2011, 2015) they were cut back. HCD progress was reported at the Biodiversity Research and Evidence Indaba with limited impact. SANBI and partners' efforts at mainstreaming biodiversity (e.g. with the mining sector) are strong positive developments, that have remained somewhat disconnected from the BHCDS. The impact of initiatives was difficult to quantify for promotional purposes in the absence of progress and impact monitoring, evaluation and reporting.

7 FINDING 7: *Initiatives are underway to address scarce skills needs but are hampered by a lack of monitoring, evaluation and reporting on biodiversity skills needs.*

SO7 (SKILLS PROVISION) STRATEGIC INTENT:

Produce scarce and priority skills through targeted higher education guided by ongoing skills needs and gap analyses

Increase the supply of scarce skills ...	Employers report that there are still skills gaps, including some that existed prior to 2010
... through targeted higher education in initiatives	Several initiatives address entry and access including the GreenMatter Fellowship; NRF and CATHSSETA bursaries; and careers projects.
... in priority areas identified through ongoing needs analyses	Following a skills gap analysis in 2011, no follow-ups were done to determine whether needs have been addressed and what new needs were identified. SETAs did provide funding for green skills needs analyses but none had a biodiversity focus.

In terms of whether the implementation of the strategy during its first ten years followed the principles outlined in the strategy (see Section 2.4), the following findings were made:

- **Overall, a systemic approach was reflected in the range of initiatives undertaken.** However, deeper analysis of which initiatives were sustained over the 10 years and which were not, suggested that more attention was given to the supply side of the system than to the demand side (advocacy and system building) and that a systemic approach was not entirely achieved.¹⁷ Furthermore, actions to address the risk of a diffuse approach losing focus, such as strong monitoring and evaluation, were largely absent and mechanisms to bring coherence and synergy, such as the proposed NESS, also fell away over time. These are currently among the key gaps in the implementation of the strategy, along with the absence of a Steering Committee and Advisory Group which could also assist with maintaining coherence and focus.
- **The range of initiatives undertaken reflected the “joined-up” principle.** The GreenMatter Fellowship, for example, largely focused on postgraduate bursaries in scarce skills areas, thus effectively joining up with undergraduate funding providers (such as the National Skills Fund) as well as with the universities where students study; it furthermore also connected bursary recipients with peers and other mentors, seniors in the field, career guidance and opportunities to develop job seeking skills like communication and networking skills. There were also some gaps in the joined-up approach to the supply pipeline or web. For example, the GreenMatter Fellows were not tracked into the workplace; this means not only that the success of the investment cannot be determined, but also that the ‘joined-up’ benefit or synergy of using these Fellows for advocacy purposes (a system building strategic objective) could not be achieved.¹⁸ The *Imvelisi Enviropreneurs* were taken through ideation boot camps but not connected with further value-add opportunities to establish and sustain a business (ibid). There were also few instances of joining up supply-side initiatives with demand-side initiatives.
- **The strategy promoted a sense of shared ownership initially, but this fell away somewhat over time.** The review found examples of sector-based development, notable being the Foundation Building/Fundisa for Change and Bridging into Work and Groen Sebenza programmes, in which multiple partners (several public entities, NGOs, universities) worked together to shape initiatives. These case studies showed a sense of shared ownership, to a greater or lesser extent, as well as a strong shared implementation of these initiatives. However, promotion of the strategy seems to have fallen away somewhat over time. While programmes such as the GreenMatter Fellowship or WWF Environmental Leaders programme have continued to be well promoted and communicated,

¹⁷ This was also a finding of the GreenMatter Independent Evaluation

¹⁸ GreenMatter Independent Evaluation Report



Spheniscus demersus, commonly known as the African or Cape Penguin blowing bubbles at the photographer, Western Cape, South Africa. Photo: AdobeStock, Muhammad

these promotions over time presented them less as related to an overarching strategy. There were no notable communications about the strategy itself (such as newsletters, reports or events) in recent years. This may explain why 44% of survey respondents indicated that they had “never heard of” the strategy; and an even bigger portion of the 945 individuals surveyed (87.5%) returned the questionnaire with no responses on strategy related questions - only their name.

- **The principle of building on existing strengths was successfully applied in some areas**, for example in the case of Bridging into Work initiatives, which built on experience and lessons learnt in the C.A.P.E. programme implemented by SANBI, the Table Mountain Fund with WWF, CapeNature, Rhodes University and other partners prior to 2010. The design of the GreenMatter Fellowship was also built on lessons learnt in other sectors. However, where the sector had few prior successes to draw on (e.g. engaging with Human Resource divisions around organisational strengthening), and where ‘best practice’ in other sectors seemed difficult to translate into the biodiversity sector (e.g. leadership initiatives), initiatives seemed to gain less traction. Those initiatives focusing on internships and supporting new entrants into the sector were most successfully scaled up and sustained, while those focusing on organisational strengthening were not continued.
- **While some progress was made towards racial and gender transformation, the broader transformations envisaged by the strategy were not (yet) achieved.** The strategy was transformative in execution in that project executants, GreenMatter staff and GreenMatter Board members were predominantly women and black South Africans. Both the Lewis Foundation and GreenMatter also started to employ interns.
- **The focus gradually became both narrower (e.g. the focus of GreenMatter on just three initiatives) and less coordinated (with fewer formal coordination or articulation processes).** It was initially argued that the strategy needed to be focused in order to be realistic and successful. It overcame the tension between “trying to do everything for everybody” and being narrow and exclusivist by arguing that the primary participating organisations need to be clearly identified, “to ensure that they do in fact participate”.¹⁹ This is a sound principle, illustrating a realistic perspective. While there were significant efforts to engage e.g. museums through bursaries for GreenMatter Fellow working in the scarce skills area of taxonomy, and DEA and SANBI led several ongoing attempts to engage provincial agencies (examples being hosting Groen Sebenza interns, attending Skills Summits, and participating in Green Skills training), when the spread of initiatives over time was reviewed, it was found that the implementation phase did not engage provincial agencies, museums, herbaria and others with known capacity issues on a significant scale. Given the systemic

19 BHCDS 2010, p.13

challenges in some agencies (chronically underfunded, sometimes poorly governed, and with organisational cultures sometimes described as “toxic”) it would on the one hand seem appropriate to focus on their participation; on the other hand one would then have to be realistic about the amount of effort and resources that would be required to effectively bring and keep them on board with strategy implementation. This is a dilemma that has not been resolved in the past 10 years, despite SANBI, DEA, the HRD Network and the Green Skills programme among others making efforts to engage these agencies (e.g. in the Ministerial Working Groups and hosted events).

- **The original tight focus on high-level skills was relaxed over time to also include intermediate-level skills in a wider range of study fields.** Implementation initiatives expanded over the ten years to include Honours students and entrepreneurs, as well as bursaries for other fields that impact biodiversity, such as resource economics. However, some stakeholders felt that this widening of scope had not been well communicated.
- **In 2010 the strategy represented an innovation in the sector, but there is little evidence that the innovative aspects of the strategy are being successfully carried forward in implementation.** The strategy was implemented through an innovative ‘marriage’ between a public entity (SANBI) and a private donor (the Lewis Foundation); as well as a partnership approach which was at that point not common at the scale. In bringing scientific research entities and scientists together with civil society organisations and capacity development specialists as well as government entities with skills functions, it innovated in terms of boundary crossing, as a strong mechanism for system building. Having a coherent strategy in place to which many partners were expected to contribute, was in itself an innovation, as was the ‘partnership/cause brand’ of GreenMatter. These were innovations not because they were new ideas, but because they had never or seldom been applied in the biodiversity sector. In government contexts, and also elsewhere, a silo mentality with clearly circumscribed deliverables per ‘silo’ (with little incentive to collaborate with other organisations or units) has been, and still is, a norm. Although work between 2010 and 2020 continued to articulate transdisciplinary perspectives and methodologies (e.g. the Green Skills programme with SETAs, and associated research projects), the review encountered little evidence of ongoing carry-through of the innovation. Transdisciplinary boundary-crossing initiatives are heralded as important for addressing systemic challenges. However, in a context in which there is little experience with such initiatives and many structures that mitigate against them, *they do require ongoing advocacy to articulate what they may mean in practice*, by one or more ‘lead agencies’ in the system who understand the nature of the innovation.
- **The level of available investment was not adequate (realistic) to sustain stakeholder involvement and achieve the ambition of systemic change.** The funding model involved one core ‘start-up’ donor (the Lewis Foundation) providing catalytic and base funding to get the programme of implementation going (after funding the development of the strategy as well) and guaranteeing this funding for at least the first three years. The funding was used to kick-start priority as well as ‘low hanging fruit’ projects and programmes, and for a full-time, dedicated salaried team consisting of a director, communications and marketing specialist and a fundraiser, with administrative support, *to leverage additional funding off the base funding*, in partnership with the sector. Of the total amount, just over R63 million, R22.5 million was used to employ the core team (salaries); just under R2 million for catalysing projects, and around R11 million for operating expenses. The bulk of the funding for the GreenMatter Fellowship flagship initiative was from the initial funder, with a limited return on investment as the Fellowship was not significantly been scaled up or scaled out over the nine years.²⁰ The most significant new funder was the Water Research Commission (WRC), and it is likely that the move of the GreenMatter communications and business development lead to the WRC was significant in the formation of a WRC partnership for the GreenMatter Fellowship.

20 GreenMatter Independent Evaluation Report, 2020

When looking beyond GreenMatter to the sector as a whole, it seems that base funding was effectively leveraged in other cases. For example, the *Fundisa for Change* and *Groen Sebenza* programmes are examples of partner-driven fund-raising in which the Lewis Foundation-funded fundraiser and director played a supporting role. A review of the *Fundisa for Change* programme funding gives further insight into the leveraging model. The Lewis Foundation made a direct financial input of R3.45 M into this teacher education system building programme. In comparison, sector partners raised R46.41 for *Fundisa for Change* (excluding considerable in-kind contributions). SANBI made a contribution of around R465 million to strategy initiatives in the same period, including funds raised either on its own or in partnerships.

- **The intended articulation with the country's overall development agenda was evident** in relation to the strategy's youth-directed initiatives, in that they contributed to youth development and supported youth into employment. The strategy strongly articulates with South Africa's agenda on racial transformation, as most bursary and other youth development opportunities benefitted black South Africans. The *Groen Sebenza* and WWF internships programmes were examples, as was the *GreenMatter Fellowship* and the Bridging into Work programme led by WWF. In an extension of the Environmental Leaders programme at WWF, a Green Jobs study was undertaken with Trade and Industries Strategy and Policy (TIPS) funded by the Green Trust (Nedbank). The Green Skills programme used funding from SANParks to also explore strategies for creating more employment through environmental initiatives. Although it has not been evident that the sector has succeeded in creating more jobs (a key national agenda), the intended articulation is evident, that is, the principle is being applied, but perhaps not to full effect. One issue could be that the initiatives mentioned here were not *effectively* articulated into the broader national think tanks for employment creation, despite intentions to do so, as evident for example in presentations at the 2018 Presidential Job Summit preparations by Nedlac.

Articulation with the national research (and development) agenda was evident in the bursaries provided through the GreenMatter Fellowship, in that they were formulated to address priority areas rather than randomly distributed; there was also some (limited) articulation with other funding agencies. Numerous attempts were made to articulate with the Departments of Basic Education, Higher Education and Training, and SETAs' sector skills plans.

The intention to complement and articulate with other skills development strategies was evident, mostly in relation to the Environmental Sector Skills Plan (ESSP) and less so in relation to the DST's Global Change Grand Challenge or its water and waste road map initiatives - until 2015 with the development of the *Imvelisi Enviropreneurs* project, which was funded by the DST and supported by the Water Research Commission. Advocacy engagements with the DST included the NSTF Awards - but at the level of awards for excellence, it may not fully translate into articulation. During the development of the strategy the DST was engaged for collaboration in relation to the Global Change Grand Challenge HCD Strategy implementation, and GreenMatter made attempts to collaborate with the NRF, SAASTA, ACCESS and SAEON. SANBI has successfully partnered with SABIF (South African Biodiversity Information Facility), the BiobankSA and also engaged SABI (South African Biosystematics Initiative).

Another aspect of articulation is for sector organisations to develop internal strategies aligned with this strategy. There is some evidence (survey responses) indicating that organisations which did not have strong mentoring programmes introduced these as a result of BHCDS engagements; others which already focused on mentoring reported making a strong shift from focusing only on mentoring in technical scientific skills, to situate scientific research in a broader socio-cultural milieu. SANBI developed an internal Human Capital Development strategy. In 2011-2012, there were efforts to develop an internal strategy with DEA: Oceans and Coasts in partnership with the GreenMatter programme. GreenMatter also worked for a while with SANBI on a specific strategy to address scarce skills in bioinformatics and taxonomy; SANBI later took the taxonomy capacity development forward in a focused initiative. There is no evidence that other public entities developed HCD strategies in alignment with the BHCDS, and while the DFFE is purportedly currently developing a biodiversity-focused HCD strategy, it was not shared into the review as being aligned with the BHCDS.

1.3.2 Recommendations

The review made the following **four key recommendations**:

1. **Improve coordination capacity through multiple coordination hubs** that between them can mobilise the strengths of civil society, government agencies and universities.
2. **Improve articulation and synergy across implementation initiatives**, through (1) and dedicated monitoring, evaluation, research, communications and convening platforms; strengthen the role of the NESPF or establish a more suitable platform.
3. **Mobilise more sustained and more substantial funding and political support** in line with the strategic importance of the sector for employment creation and sustainable development, and the key role of human capacity development in both.
4. **Start and fund advocacy processes** to engage key role-players and potential implementation partners both inside and outside the 'big five' of biodiversity agencies.

For coordination and advocacy, the sector has three well-established mechanisms: conferences, reporting (informed by consistent monitoring) and advisory boards or steering committees. It is recommended that these established mechanisms be used more optimally. For example:

- Fund coordination hubs with clear, realistic and agreed upon deliverables to overcome the principal-agency dilemma. This should include a coordinating hub with responsibility for the National Environmental Skills Summit which should be held annually.
- Institutionalise a shared monitoring, evaluation and reporting function as a vital coordination and advocacy function; drawing on the existing frameworks developed for the strategy, and potentially linked to the DFFE Biodiversity Research and Evidence Indaba, UJ Africa Evidence Centre, or Wits CLEAR-AA.
- Conduct regular, guided evaluations and tracer studies for strategic and communication purposes (the sector has much to boast about); this function could potentially be situated in another coordination hub.
- Communicate the achievements, remaining capacity challenges and possibilities of the sector as part of a renewed BHCD drive for the 2021-2030. Draw on key developments like the Dasgupta report; Decade of Restoration; ESD 2030; SDGS; CBD; and more to create a sense of urgency around the extent to which South Africa is losing its biodiversity, ecological infrastructure and ecosystem services, and a sense of optimism and opportunity around the extent to which biodiversity can contribute to jobs and livelihoods. Use this to leverage more substantial financial, human, and institutional resources and political support.
- Appoint a steering committee for the strategy's implementation.
- Appoint an advisory board for the strategy's implementation.

The following specific areas to address were also mentioned:

1. Track the impact of DHET MRTEQ and support where necessary (significant new opportunity).
2. Track the number of conservation work-integrated learning students funded to completion, in relation to sectoral needs.
3. Track the percentage of the SET undergraduate pool going into university.
4. Drive career guidance for students across faculties.
5. Continue postgraduate bursary programmes (and link with career guidance, as well as other national initiatives).
6. Continue to share benefits of mentoring and internship know-how.
7. Start a high-level forum / think tank called *Biodiversity Leaders of Transformation - New and Old*.
8. Continue to engage national skills intelligence systems to focus on biodiversity related skills needs, given the importance of the sector in the economy and its growth potential.
9. GreenMatter to continue running but also *monitoring* the Fellowship.
10. Conduct an advocacy drive and engage DFFE Provincial Agencies and SANParks to invite proposals on how they would like to be involved in the next 10 years of implementation.
11. Do the same for organised labour, NEDLAC, DHET and SETAs, as well as for industry, the Departments of Water and Sanitation and Science and Innovation, and the WRC.



Biodiversity careers can provide opportunities to spend time outdoors in many different settings.
Photo: AdobeStock Photography

CHAPTER 2

Vision, Strategic Goals and Objectives

2.1 Vision

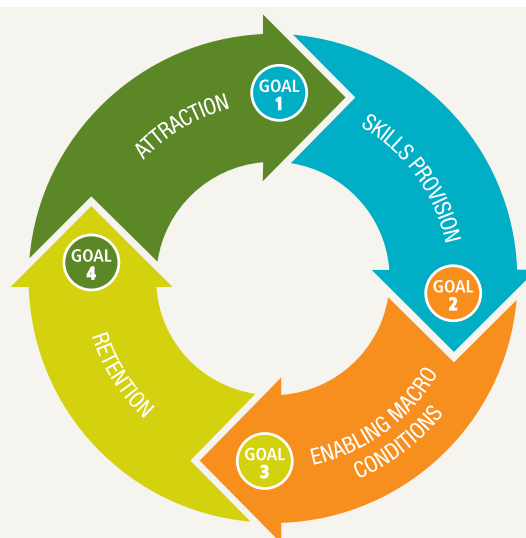
The vision pursued by the human capital development strategy for the biodiversity sector is a socially equitable²¹ and suitably skilled workforce of biodiversity leaders, professionals and technicians to optimally implement the sector's expanding and increasingly complex mandate.

2.2 Strategic goals

The vision is pursued through **four connected strategic goals**:

Figure 2: Four connected strategic goals of the Biodiversity Skills and Transformation Strategy

1. To increase the number of talented black South Africans **attracted** to working in the biodiversity sector.
2. To improve the **quality, levels and relevance of skills** for the sector.
3. To improve the retention and **effective deployment** of suitable individuals in the sector.
4. To create **enabling macro-conditions** for skills planning, development and evaluation.



²¹ A socially equitable workforce is one in which discrimination on the basis of the social classifications of gender and race has been eradicated, so that the workforce is representative of society at large.

The rationale for these goals and the groups of people on which they primarily focus, are summarized in Table 1.

Table 1: Four strategic goals - rationale and target groups

GOAL	PROBLEM STATEMENT	PRIMARY TARGETS
ONE Increase the number of talented black South Africans attracted to the sector.	The pool of talented young people, particularly black South Africans, with an interest in careers in the biodiversity sector, is relatively small.	Black South Africans, particularly those in school and university, and those who work with them.
TWO Improve the quality, levels and relevance of skills available to the sector.	There is a lack of required skills (scarce skills), both established and new, and unacceptably low levels of skills in organisations (under-qualified staff).	Employees; as well as universities and other providers of training for the sector.
THREE Improve the retention and effective deployment of skills in the sector.	Suitable individuals leave the sector, or are unable to use their skills, because of workplace conditions and cultures.	Employees and employing organisations - senior management and human resources/HR development staff.
FOUR Create enabling conditions for skills development and evaluation for the sector as a whole.	The biodiversity sector is all but absent in national planning for skills provisioning.	The national skills planning and development system - DHET, DBE, DL, QCTO, SAQA, SETAs, StatsSA and others.

The strategic goals reflect the systemic approach followed in the strategy. The connections between the goals are also addressed (Figure 1, Figure 2). The Strategy is based on a systemic approach to capacity development. This is contrasted with a linear perspective which is often associated with the terms 'human capital' (with reference to Vass *et al.* 2009) and 'skills pipeline'. Instead of just focusing on individuals' qualification levels, its perspective is also on the system as a whole and on the *quality* of skills. It is worth noting that the syndicates which worked on aspects of the strategy after the mid-term review endorsed this systemic approach.

Four problem analyses that underpinned the Strategy when it was developed in 2010 (Vass *et al.* 2009²²; Rosenberg *et al.* 2009 a²³, b²⁴, c²⁵) showed that there was a range of reasons for inadequate skills and lack of transformation in biodiversity organisations. Collectively, this "web of interacting factors" indicates a systemic problem. For example, the research revealed organisational cultures that were not always welcoming to new recruits, in particular to newly qualified but also more experienced black scientists and other professionals. Research also indicated that quality of skills was as relevant as quantity, as it was vital to the effectiveness of organisations. This meant that higher education institutions were also

- 22 Vass J, Roodt J, Wildschut A, Bantwini B and Reddy V. 2009. Guidelines towards a Human Capital Development Strategy for the Biodiversity Conservation Sector. HSRC, Pretoria.
- 23 Rosenberg E, Nsubuga Y, Burt J. 2009a. Quality and Relevance in South African Schooling: Implications for human capital development in the environmental sector. Rhodes University, Grahamstown.
- 24 Rosenberg E, Ramsarup P, Burt J, Ellery K, Raven G. 2009b. Higher Education and the Environmental Sector in South Africa: Quality and relevance of provisioning. Rhodes University, Grahamstown.
- 25 Rosenberg E, Raven G, Nsubuga Y, Mosidi S, Ramsarup P, Burt J. 2009c. How about a ... Biologist? A short report on environmental career guidance for school leavers. www.greenmatter.co.za

Figure 3: Four strategic areas and connecting considerations



relevant to the strategy. The school and community contexts of South Africans also shape young people's values, interests and choices of study and career paths, and the quality of the academic skills with which they enter higher and further education. A systemic approach is also reflected in strategies in other sectors (e.g. philanthropic organisations who argue for 'wrap-around' support for individual bursary recipients).

There are many advantages to a systemic approach and a holistic, long-term initiative over piecemeal short-term interventions. A systemic approach however also has limitations. It can be harder to show quick results, to evaluate progress, or to keep focus. To show results and keep focus, **a systemic approach requires high levels of attention to coordination and alignment**, and areas of focus which would have to be articulated and joined-up. It is therefore appropriate that the BHCDS also has alignment, articulation and focus as principles, which address the challenges of a systemic approach, and enable the benefits to be achieved.

2.3 Outcomes

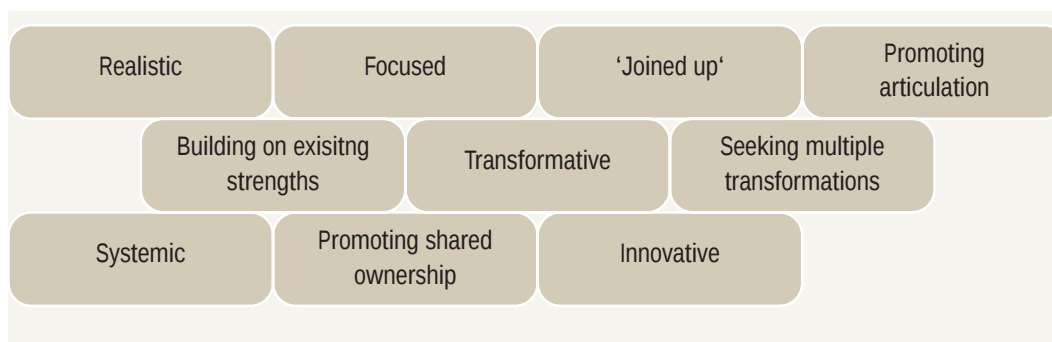
The six intended outcomes are listed below with the strategic goals to which each is linked (Table 2) in what is a non-linear, potentially recursive and self-reinforcing approach. These outcomes cover the same ground as the seven "strategic objectives" in the 2010 version of the strategy, but have been consolidated and roughly aligned with the areas of work of the six syndicates.

Table 2: Outcomes and their links to the four strategic goals

OUTCOMES	LINKS TO STRATEGIC GOALS
OUTCOME 1: Coordination Effective institutional arrangements and coordination mechanisms are in place to support the strategy's implementation	GOAL 4 - enabling conditions
OUTCOME 2: Advocacy The strategy has increased and sustained funding and political support, in line with its strategic importance for employment creation and sustainable development	GOAL 4 - enabling conditions
OUTCOME 3: Organisational Strengthening Organisations have increased capacity for attracting and retaining skilled staff	GOAL 4 - enabling conditions GOAL 3 - retention and effective deployment
OUTCOME 4: Skills Intelligence Enhanced understanding of skills supply and demand through a skills intelligence system aligned with existing and emerging national skills systems	GOAL 4 - enabling conditions GOAL 3 - retention and effective deployment GOAL 2 - quality, levels and relevance of skills GOAL 1 - attraction
OUTCOME 5: Pathways to Employment and Livelihoods Through investment in a range of strategic programmes and think tanks, viable pathways to employment have been unlocked which stimulate the economy and individual livelihoods	GOAL 4 - enabling conditions
OUTCOME 6: Education and Training The quality and relevance of skills produced for the sector is improved, and talented black South Africans are attracted to the sector	GOAL 2 - quality, levels and relevance of skills GOAL 1 - attraction

2.4 Guiding Principles

The following ten principles inform the strategy and should be kept in mind as implementation activities are formulated, executed and evaluated. They should also be evident in the communications and funding development plans.



PRINCIPLE 1: Realistic

The Human Capital Development Strategy needs to make a material difference in the sector. It cannot simply be a paper strategy. An important consideration is the availability of funding and institutional arrangements that will enable effective funding, advocacy, coordination and implementation.

PRINCIPLE 2: Focused

A degree of focus is needed for the Strategy to be realistic and successful. A balanced approach seems necessary; it cannot try to “do everything for everybody”, but it should also not be exclusivist. It needs to be clear who the primary participating organisations are, to ensure that they do in fact participate. In order to be realistic, the strategy is directed at high to intermediate-level skills, from Diploma, first degree and Honours degree graduates upwards. This is where the critically scarce skills are, and the greatest need for transformation. It is also at the management level where there are high turnover rates, and where biodiversity organisations find it most difficult to retain staff, in the face of competition from commercial companies and other organisations. High skills refer to qualified personnel at levels 7-10 on the South African National Qualifications Framework (Bachelor's degree and above); intermediate skills refer to qualified personnel at levels 2-6 on the National Qualifications Framework (Grade 9, FET and diploma qualifications).

This aspect of the strategy could be contended, as it excludes direct support to those with lower skills levels, who might arguably need more support. The argument is that if there are limited resources to achieve systemic benefits, the investment is best used for higher-level skills, in order to unlock the broader benefit for biodiversity and for society. These benefits would include strengthening the effectiveness of biodiversity organisations, which is the broader strategic goal being addressed, in line with the NBSAP and NBF's 'theory of change' that higher level skills, and transformation at these levels, will achieve greater organisational and therefore sector effectiveness.

PRINCIPLE 3: 'Joined Up'

'Joined up' is a buzzword in strategy development, for good reason. The scope of skills development is tremendous. Not only is the 'pipeline' from primary school to professor or chief executive officer long, it is also permeable and influenced by many socio-economic, cultural and historical factors (see Figure 5). So too is the workplace, for the 'pipeline' actually has no end. The strategy therefore cannot address aspects (such as scholarships) in isolation from other factors (such as demand in the workplace, the family responsibilities of students or the quality of schooling). Its investments must, where feasible, 'join up'.

For example, if a once-off bursary is offered to a school leaver and a first degree achieved, without any further support a first-generation graduate may exit the skills system and find work outside the biodiversity sector to support family, rather than continue their studies. The undergraduate bursary would then be 'wasted' as far as the sector is concerned (although still beneficial for the individual). The undergraduate bursary needs to join up with a postgraduate bursary (if the goal is high-level skills). Furthermore, if the graduate has no idea where to apply for work, she might also exit into another sector, or remain unemployed; hence bursary schemes need to be 'joined up' with career guidance, networking and mentoring.

Figure 4: Theory of change for investing in high-level skills



PRINCIPLE 4: Promoting Articulation

The strategy aims to articulate with the country's overall development agenda, the national research and development agenda, national human resource development priorities and the national planning and skills development landscape. The strategy also articulates with key policies in the biodiversity sector itself, such as the NBSAP (2015), and the Environmental Sector Skills Plan (DEA, 2010). It should also be promoted as a means of guiding organisations with their internal human resources, skills and transformation plans, which should be aligned where possible for maximum impact.

PRINCIPLE 5: Innovative

The strategy will be implemented in an environment where many needs compete for resources, and it seeks to address a complex problem of some duration. To succeed, it cannot simply promote 'more of the same'. The strategy aims to be innovative in terms of boundary crossing, as a strong mechanism for system building, by bringing together government entities, scientific research entities, civil society organisations and capacity development specialists. However, in a context in which there is little experience with such initiatives and many structures that mitigate against them, ongoing advocacy is required to articulate what they may mean in practice, by one or more 'lead agencies' in the system who understand the nature of the innovation.

PRINCIPLE 6: Building on Strengths

While innovation is a principle, the strategy must also not ignore existing initiatives. Much can be learnt from them about what works or does not work well, when and why. Often, existing initiatives can be successful or more successful if they are taken to scale, or linked with others, or re-oriented around their particular strengths, within a more strategic framework. Opportunities to do this should constantly be sought during implementation and further development. This may necessitate evaluations of existing initiatives.

PRINCIPLE 7: Transformative in Execution

The vision of the strategy involves transformation in the biodiversity sector. As such it also needs to bear transformation in mind in its execution. This means that when stakeholders, advisors or project staff are selected for contributions to strategy implementation and further development, equity and the opportunity to build skills should be strongly considered.

PRINCIPLE 8: Seeking Multiple Transformations

Transformation is a key focus of the strategy. The strategy embraces a three-fold approach to transformation, which encompasses:

- The need to improve racial equity in the sector.
- The global and national changes in the approaches to and models for biodiversity conservation, management and research.
- The need to transform the way in which organisations function, in order to render them more effective in achieving their mandates.

The complex mandate (reflected in the NEMBA, NBF, NBSAP, GBF and the NDP) is one in which biodiversity must be both sustained and used for the development of the country and its people, in terms of job creation, livelihoods and well-being. This is theoretically possible and while there are some practical examples of how this can be achieved, there are many more normative beliefs and practices that position development as fundamentally extractive, and 'nature conservation' as fundamentally anti-development. Shifting this entrenched worldview with tangible evidence at scale, and with the small portion of the fiscus apportioned to the environmental sector, is indeed a complex and demanding undertaking.

Biodiversity leaders are needed who can achieve this change both within and outside the sector, also making the boundaries of the sector more permeable, while spreading rather than diluting its vision and mandate. The theory of change is that when biodiversity leaders are more effective in 'making the case for biodiversity' with politicians, industries and communities, their organisations will also become better resourced (through better budgets and regulatory powers) and as they become more effective,

they would demonstrate their value to society even more (through large scale employment, biodiversity conservation successes and widespread societal goodwill). This in turns makes it a more desirable sector in which to work, and a spiral of positive feedback loops ensues. It is a sound and inspirational principle, one to which many contributed in the development of the strategy.

PRINCIPLE 9: Systemic

This has echoes in several earlier principles. Skills development cannot simply focus on the individual at study, or on the aggregate of skills which the nation can build individual by individual. It needs to give equal attention to the capacity of the institutions which provide the training, and to the capacity of the workplace (biodiversity organisations) where these skills are to be deployed, retained and optimally utilised. A systemic approach to capacity development would aim to strengthen individuals, training providers and employing institutions (see Figure 3).

PRINCIPLE 10: Promoting Shared Ownership

The strategy must belong to agencies across the biodiversity sector. Sector-wide ownership will be facilitated by ongoing stakeholder-based development and refining, proactive communications and the appropriate promotion of the strategy, and shared means of implementation.

2.5 Scope of the strategy

2.5.1 Participating stakeholder organisations

To some extent, most organisations can be said to have some bearing on biodiversity. Again, however, for the purposes of the strategy, a focus is necessary. Taking the lead of the NBF, a decision was made to specifically target primary biodiversity organisations, but not to exclude secondary stakeholders.

Primary Stakeholders have a specific mandate or significant focus on biodiversity-related conservation, management, research, or skills provisioning. These are the organisations with the biggest say in what the skills needs are, and with a major role to play in addressing them, therefore they need to be the primary participants. They are:

- National government entities with a specific biodiversity mandate - DFFE and SANBI.
- National government entities with a focus on skills development - DSI and DHET.
- Conservation agencies - SANParks, provincial departments with a conservation role and provincial conservation agencies (parastatals).
- Research institutes with a focus on biodiversity - SANBI, CSIR, SAEON, SAIAB, NRF.
- Local government, where protected area management and mainstreaming of biodiversity concerns in development planning, as well as compliance, are relevant.
- NPOs whose work includes biodiversity-related objectives.
- Higher education institutions - comprehensive and academic universities and universities of technology.
- Sector Education and Training Authorities (SETAs).

Secondary Stakeholders also employ people with biodiversity-related roles, but biodiversity is not their central mandate or business; alternatively, they play a secondary (though still important) role in providing skills for the sector. This group includes (not exclusively):

- Department of Agriculture
- Agricultural Research Council
- Department of Water Affairs
- Water Research Commission
- Private sector employing biodiversity managers, researchers, conservators
- Mining industry and Department of Mineral Resources and Energy
- Department of Defence
- Department of Basic Education

- Biodiversity-related professional bodies - South African Council for Natural Scientific Professions (SACNASP), International Association for Impact Assessment (IAIA-SA), Environmental Assessment Practitioners Association of South Africa (EAPASA), South African Institute of Ecologists and Environmental Scientists, Academy of Science in South Africa.
- Biodiversity-related societies and groups - South African Association of Botanists (SAAB), Zoological Society of South Africa (ZSSA), Custodians of Rare and Endangered Wildflowers (CREW).

Tertiary Stakeholders are groups and individuals who will not necessarily participate in the implementation of the strategy, but who need to be aware of it, mostly because they may have some bearing on its effectiveness, however peripheral. This includes a range of government departments (such as Treasury and the National Planning Commission) and the general public.

All three of these stakeholders groups are targets for the communication plan that must support the implementation of the strategy. These groups will need different ‘messages’, and different responses will be required from them.

2.5.2 The skills development “pipeline”

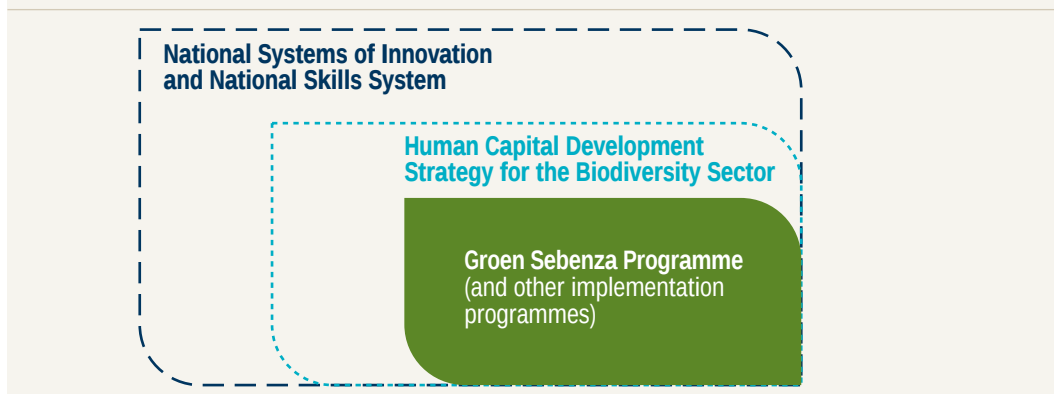
Whether people take up a leadership role in a biodiversity profession, with the necessary skills, depends on a range of influences. These are not necessarily reflected in the term ‘pipeline’, as they go beyond a demarcated educational path through school and higher education into a job. For example, the values and attitudes in the communities where a child grows up to make career and study choices, often influence those choices, as does access to information.

The pipeline concept also does not emphasise the role of conditions in the workplace in determining whether the arriving biodiversity professional stays or works effectively. Organisational culture, attitudes

Figure 5: Alignment of the Human Capital Development Strategy (BHCDS) with other relevant national strategies



Figure 6: Positioning of the Human Capital Development Strategy as a framework within which shorter-term programmes such as Groen Sebenza fall, and as a sector initiative that articulates with other policies and strategies within the broader national skills system and the national system of innovation (NSI)



towards transformation, the presence or absence of inspiring mentors, and HRD practices are among the many factors influencing retention and the effective deployment of skills.

The Human Capital Development Strategy encourages us to keep in mind the entire web of interacting factors (Figure 5) which shape South Africans' pathways through school, higher education, the workplace, and lifelong learning. While not all these factors can be addressed in a focused strategy, it is wise to bear them in mind. Neglecting any one of these factors (including the more intangible ones) could result in the reduced efficacy or failure of highly targeted interventions.

2.6 Alignment with other strategies

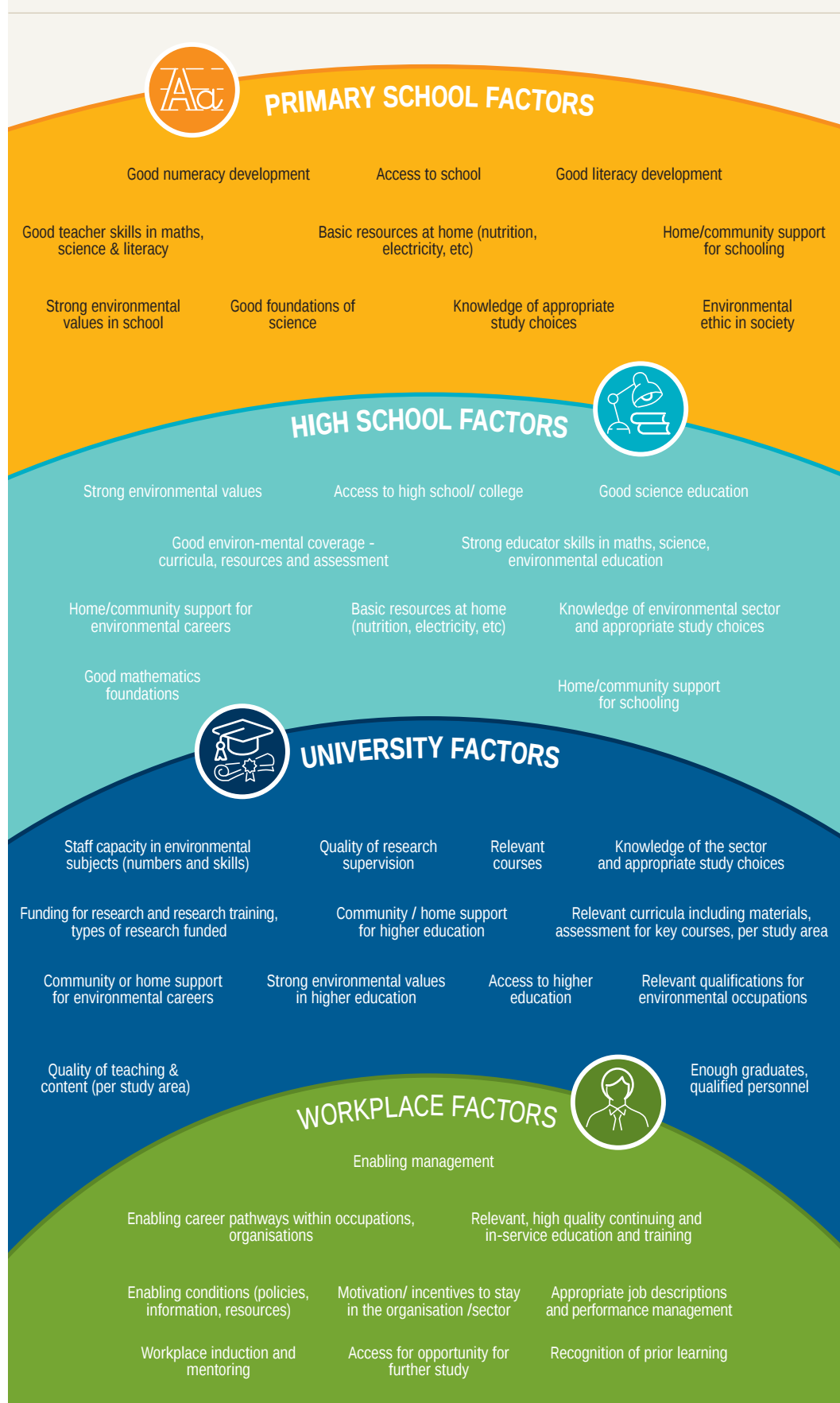
The Human Capital Development Strategy sits at the intersection of a range of other biodiversity-related and skills-related strategies, and also with other national policies and strategies, as outlined in Section 1.2. The key strategies with which it articulates are illustrated in Figure 5.

Among biodiversity-related strategies, the main guiding strategy is the National Biodiversity Strategy and Action Plan (NBSAP). The National Biodiversity Economy Strategy and the recent White Paper on Conservation and Sustainable Use of Biodiversity are important because of their intention to develop and transform the wildlife economy. These strategies link to the National Development Plan and the Economic Reconstruction and Recovery Plan as well as more specific strategies addressing Just Transitions and Science, Technology and Innovation.

The Environmental Sector Skills Plan (ESSP) is a core skills planning guide for the environmental sector as a whole, and the Biodiversity Skills and Transformation Strategy is closely aligned with the principles and directions advanced in the ESSP. The strategy also drew on the human capital development strategy (HCDS) associated with the (then) Department of Science and Technology's Global Change Grand Challenge in 2010. Other important skills strategies include the DSI's Decadal Plan, the Economic Reconstruction and Recovery Skills Plan, and the UNESCO Environment for Sustainable Development Roadmap currently being developed for the country and the SADC region. The High Level Panel on Game and Hunting also provided recommendations on skills and transformation in the sector, which were taken into account during the update of this strategy.

In summary, the BHCDS is a "sector" strategy within the broader National System of Innovation and the National Skills System. While it draws on the ESSP (2010), it is more focused and now with this update, more responsive to recent developments in the policy and implementation landscape than the ESSP. Implementation initiatives, such as the Groen Sebenza Programme and others, fall under the overarching guidance of the strategy (Figure 5). While these initiatives may be used as vehicles to drive the systemic changes envisaged by the strategy, it is important to remember that the strategy covers a longer time frame than specific implementation initiatives.

FIGURE 7: Web of interacting factors in biodiversity skills development





CHAPTER 3

Coordination and Means of Implementation

3.1 Background

The implementation architecture for the Biodiversity Human Capital Development Strategy developed in 2010 was funded for the first three years (July 2010 to June 2013) by the Lewis Foundation. The implementation architecture aimed to combine the benefit of ownership across the sector, with the benefit of a central coordinating mechanism that would be accountable for ensuring that the strategy was implemented and progress monitored and evaluated.

The first director of the BHCDS Programme was based at SANBI (2011-2012). Other “core staff” including a fundraiser and communications and business development lead (employed in 2011), were based at the Lewis Foundation’s offices. To match the strategic shared ownership approach, the Lewis Foundation guided and supported the communications and business development lead to develop a cause or partner brand. The brand “GreenMatter” was developed, with stakeholder consultations, to be used by all implementation partners. In practice, however, it became most strongly associated with the “core staff” funded by the Lewis Foundation and situated at the Foundation’s premises. A new director, appointed in 2013 to lead and support implementation, was also based at the Lewis Foundation premises with the other core staff, now collectively and exclusively referred to as “GreenMatter”. Despite the intention to be known as a partnership initiative with a shared cause brand, GreenMatter came to be viewed as an entity, and as separate from other role-players in the implementation of the strategy.

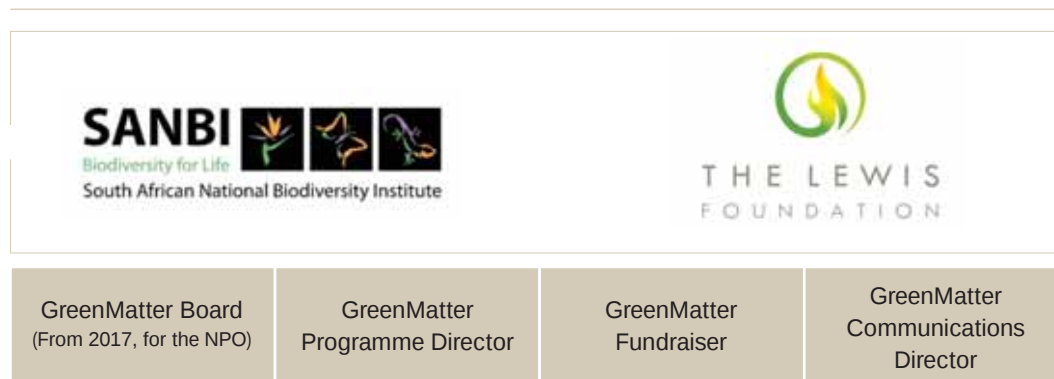
In 2012 the Lewis Foundation raised its intention with SANBI that at the end of the 3-year MOU period, it would remain committed to funding the BHCDS implementation, but would no longer play an active implementation role. The partners agreed on a careful process of sector engagement to establish the best vehicle for the GreenMatter programme. Although it was not universally supported, a decision was made in 2015 to register GreenMatter as a non-profit organisation (NPO) to enable GreenMatter to maintain organisational independence and hopefully improve its fundraising ability. The difficult change management process was finally completed by 2017. Not long after the NPO was established, however, the (second) director departed and the NPO did not employ a fundraiser. The strategic intention of a programme that was “for the sector and by the sector” was over time less and less evident in practice. The current team does mainly project management for three ‘flagship’ projects, the *GreenMatter Fellowship*, *Imvelisi Enviropreneurs* and *Fundisa for Change*.

SANBI stepped in to sustain the *Fundisa for Change* project, by funding a National Coordinator position which it later incorporated into an Assistant Director position in its structure. This position was initially funded by the Lewis Foundation, and in this respect, this particular project amounts to a success story as far as the implementation structure is concerned, because a coordinator is in a permanent, government-funded position from where she should be able to drive advocacy and partnership building as well as coordination. One challenge with the model is that she also has other Assistant Director duties.

3.1.1 Mid-term review findings relating to the implementation architecture and funding model

Interviews suggested that the initial institutional mechanism that was established (Figure 8) was aligned to the strategic intent of achieving sector-wide impact. It reflected an approach that sought to achieve economies of scale through taking advantage of the rich and diverse capacities and good will that existed within the sector. It would seem, though, that common interest and goodwill alone were not enough to sustain the original institutional design in this case.

Figure 8: Initial implementation architecture for the strategy



The absence of an Advisory Group representing the sector and the opportunities it could have offered was a shortcoming in implementation, as it could have assisted the GreenMatter staff and the strategy more broadly to be more strongly embedded in the sector. Advisory Boards traditionally play a role of providing some oversight, but also of opening up networks and other opportunities for the programmes and individuals they advise. Similarly, the absence of both a Steering Committee and a monitoring and reporting framework meant that performance could not be assessed and improved, and expectations could not be adjusted either up or down based on clear information.

Organisations are often brought together in partnerships and/or alliances not because they abandon their respective missions, goals and other strategic intents in the interest of the collective good, but more often because they perceive in these relationships opportunities to pursue their missions and achieve their goals. When some or all of these expectations were not met in this case, the result was a search for an alternative institutional design that promised to remedy the perceived weaknesses while retaining the relationships. The chosen solution, of an independent NPC, amplified the principal-agent dilemma that must have always been inherent in the GreenMatter partnership model.

The *principal-agent* dilemma²⁶ is a well-researched phenomenon in management science representing a conflict in priorities between an entity that has certain responsibilities or interests (*the principal*) and another (*the agent*) that acts on its behalf in return for some incentive. Such an arrangement can incur huge costs for the principal ("agency cost") for example when the agent fails to apply itself to the principal's interests, and also presents challenges for the agent (e.g. when it has multiple principals or expectations are unrealistic). The agent might be forced or inclined to pursue its own agenda and ignore the interest of the principal, thereby leading to the principal-agent problem. Solutions to this common dilemma include the informativeness principle, close monitoring and information sharing, performance management, or choosing agents that are themselves committed to the 'cause' in the same way as the principal(s), i.e. fellow principals. This seems to some extent to be the case among the implementation partners in the Fundisa for Change and Groen Sebenza programmes, among others. Further details are available in the Mid-Term Review Report.

26 Wikipedia (https://en.wikipedia.org/wiki/Principal%E2%80%93agent_problem) provides a useful introduction to the principal-agent or agency dilemma, along with references to the solutions proposed in various contexts (e.g. performance management, the informativeness principle including relative performance evaluations that compares the agent's performance with that of others in similar circumstances. Some recommendations are somewhat narrowly focused on financial aspects, e.g. the monitoring principle is presented as a "costly" solution for the dilemma, but in partnership-based initiatives (i.e. multiple principals, multiple agents) monitoring would serve multiple purposes, thus increasing benefit compared to cost, especially if cost is also shared.

Groen Sebenza is an example of a verifiable programme that confirms the validity of the view that with better coordination, the attainment of the vision of 'a socially equitable and suitably skilled workforce of biodiversity leaders, professionals and technicians to optimally implement the sector's expanding and increasingly complex mandate' is within reach.

In summary, the review findings suggested a strategy with a well-reasoned but ambitious systemic approach and sound principles, that was challenging to implement, and also weakened by some obvious mistakes, such as failing to appoint a sector-representative advisory board, failing to consistently draw on a steering committee, and failing to put in place measures to proactively manage the principal-agent dilemma. At the same time, much seems to have been achieved. Some core funding was available, and some strong partnerships and organisational commitments were leveraged. Innovation and synergies were achieved by bringing a mix of stakeholder together. However, despite a dedicated investment (in time, finances and personnel) in a core capacity to drive, advocate for and coordinate the implementation of the BHCDS, leading to the desired growth in scale and impact, this capacity was not evident at the end of the first ten years of implementation.

4.1.2 Stakeholder Proposals Relating to Coordination, Advocacy and M&E

The following points emerged from the stakeholder discussions associated with the mid-term review and the work on coordination subsequently carried out by Syndicate 5:

- **The DFFE is a natural coordinator of this work:** Reasons given included the clear mandate of the department and its existing involvement in the Environmental Sector Skills Plan (ESSP), the National Environmental Skills Planning Forum (NESPf), the National Biodiversity Strategy and Action Plan (NBSAP), and the National Biodiversity Planning, Research and Monitoring Indaba. The DFFE also has the ability and is well positioned to secure involvement of municipalities and provinces, through the existing model with MinMEC and other working groups and sub-committees. These structures are highly active, and different Chief Directorates take responsibility for different areas of work and drive coordination and leadership, including coordination with other departments, provinces and role-players. It was argued that it would be better to use existing forums rather than to create new ones. With reference to the concern mentioned by the DDG around erosion of scientific skills, it was felt that positioning the coordination within DFFE would produce good alignment and opportunities for advocacy. It would also help to create sustainability and allow for long-term planning.



A kelp forest with sea bamboo (*Ecklonia maxima*), with its tall stalks reaching the ocean surface and short *Laminaria pallida* (split-fan kelp) leaves swaying in surge off False Bay, Cape Town, South Africa. Photo: AdobeStock, M Wolf

- **Learning from past experience:** Stakeholders felt it was important to learn from past experiences with coordination of the strategy. A major failing in the past was the absence of a vibrant and involved steering and advisory committee to create a sense of shared ownership. The requirements of the Coordinator position were noted: this is a full-time position at a high level of experience, which requires innovative thinking and a creative approach towards building influence and engagement. As such, a high level of funding would be required. Some concerns were expressed about whether DFFE is in a position to create and resource such a high-level position, and how long this might take. Based on experience so far, whatever coordination structure is chosen, it should be adequately resourced to be able to drive a Forum and Summit on an annual and biannual basis respectively.
- **The experience of the Fundisa for Change Programme was noted.** This is one of the longest-running programmes under the BHCDS, and the fact that it found a space and a “home” with stable coordination within a government department (DFFE, SANBI) was seen to be a key reason for its success, because it allowed for long-term stability, advocacy and the ability to convene different departments and entities.
- Other partners that were identified as potentially important for coordination of the strategy are **SANBI** (particularly through the Groen Sebenza Phase II Programme, which has been deliberately aligned to address as many aspects of the Post-2020 Strategy as possible), the **Department of Science and Innovation (DSI)** and the **Department of Higher Education and Training (DHET)**. The DHET is important as the core department dealing with skills in the post-school sector in South Africa, but implementers did not previously find a champion in the department.
- The DSI has done valuable work on governance structures and processes to support science and innovation, in line with the Decadal Plan (these include an Inter-Ministerial Committee on Science, Technology and Innovation, an Innovation Compact, and a Budget Coordination Mechanism).

The following responsibilities/functions were suggested for the coordinating body:

- Ensuring renewed commitment and maintaining momentum from stakeholders
- Scanning for and bringing in best practice from other sectors
- Connecting to other relevant initiatives
- Ongoing horizon scanning across sectors relating to biodiversity
- Identifying gaps, key research needs and shifts in the landscape
- Driving ongoing evaluation and learning relating to the strategy itself
- Maintaining both electronic and actual platforms for coordination and engagement
- Co-ordinating working groups
- Creating and engaging with Advisory and Steering Committees/bodies
- M&E and reporting
- Advocacy

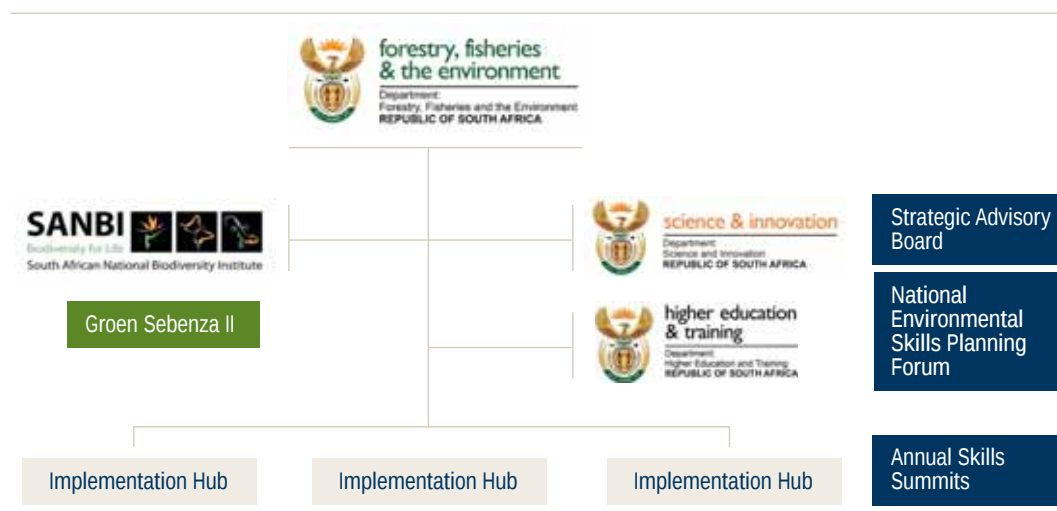
These findings and recommendations, as well as the lessons from past experience, have been taken into account in the proposed coordination structure going forward. These lessons and experiences have shown just how critical it is to get the institutional arrangements right. Some initial steps and commitments have been taken through a series of engagements between the review team and the SANBI Board and CEO as well as the relevant DFFE Deputy Director General, including a process led by the SANBI Board to engage with key DFFE and DSI senior staff. The DFFE, DSI and SANBI have committed to set up structures to drive the institutional arrangements forward.

3.2 Institutional arrangements for implementing the strategy to 2030

The proposed institutional arrangements are summarized in Figure 9. The Department of Forestry, Fisheries and the Environment (DFFE) will provide an institutional home for the strategy. This will allow the strategy to articulate with processes already underway to address the depletion of scientific capacity within the provinces, and to support capacity development within local government as well as capacity development for the oceans and wildlife economies. As the key policymaker in the biodiversity sphere, the DFFE is an appropriate home for a sector-wide biodiversity skills and transformation strategy. The DFFE's Sector Education and Training Directorate also plays an important role, currently chairing the National Environmental Skills Planning Forum (NESPF), providing career guidance support to educational institutions and facilitating work-integrated learning opportunities for students from Universities of Technology.

The South African National Biodiversity Institute (SANBI) will play an important advocacy role, promoting the uptake and use of the strategy within government, including the Department of Science and Innovation (DSI) and the Department of Higher Education and Training (DHET), which are key players in the national skills planning system.

Figure 9: Proposed institutional arrangements for implementation of the strategy to 2030



SANBI has been a strong supporter and leader of the strategy since 2010. In 2023 and 2024, SANBI's involvement will be channeled through the Groen Sebenza Phase II Programme, funded by National Treasury and initiated in 2022; this programme has already been aligned with the Skills and Transformation Strategy (see the following section). SANBI has committed to making the Skills and Transformation Strategy a standing item at both its Board and Human Resources Remuneration Committee meetings going forward.

SANBI is also a leading implementation partner in other initiatives under the strategy, such as the Fundisa for Change Programme, and is putting in a proposal to the DSI to form a Centre of Excellence, in which a skills intelligence system could possibly be located. SANBI also brings strengths in communications and synthesis of policy and evidence, as a key implementer of the DFFE's National Biodiversity Research and Evidence Strategy.

The DSI brings experience of integrating skills and transformation issues into the Decadal Plan and the Roadmaps for different sectors, and also of developing appropriate governance structures for implementation of these plans. The DSI has also worked more closely with the DHET, for example on the Economic Reconstruction and Recovery Plan Skills Strategy, which is linked to the DHET Master Skills Plan. The DSI is committed to engaging with the SETAs and the State-Owned Enterprises to build internal research and development skills in areas aligned to the priority areas in the Decadal Plan (which include climate change and environmental sustainability).²⁷ The Department has oversight

²⁷ Presentation by the DSI Director: High-End Skills, 7 September 2022

responsibility over a number of flagship human capital development initiatives implemented through the National Research Foundation (NRF). These include the South African Research Chairs Initiative (SARChI), the Centres of Excellence and the Internship Programme. The DSI is currently considering the feasibility of “re-landscaping” the Science, Technology and Innovation landscape by establishing new research institutes, beyond the Research Chairs and Centres of Excellence.

To address the shortcoming identified in the mid-term review, it is proposed that oversight will be provided on three levels:

- **A Strategic Advisory Board** - A combination of a steering committee and an advisory board, made up of high-level members from human resources and national skills development contexts, conservation and research agencies and higher education institutions. It should play a strong role in advocacy as well as advising the coordination staff and lead organisations on strategic matters regarding the implementation of the strategy. This group will not have executive powers. It will meet at least once a year for consultative purposes and to comment on progress, as reported by the core team.
- **The National Environmental Skills Planning Forum or NESPF** - An sector forum established in 2010, open to all active parties who represent organisations with a national interest in driving or supporting national environmental skills planning initiatives (e.g. government departments and parastatals, NGOs, institutes and universities).
- **Annual skills forums** - Events for broader sector participation, information-sharing and engagement around skills, capacity development and transformation, facilitating articulation with national processes and processes in other sectors.

Implementation hubs are made up of organisations or groups of partners who lead the implementation of different programmes under the strategy, in collaboration with others. These may include NGOs, universities, research institutes, conservation agencies, local government or private companies across the sector. They may volunteer to participate, or may be approached to participate. A project executant will be responsible for implementing one or more projects under the strategy. One organisation may be involved in more than one project, and may house more than one project executant. Executants will be responsible for the implementation, day to day general and financial management, as well as monitoring of their specific projects, which they may implement with colleagues within or outside the organisation. Where necessary, there will be a suitable financial arrangement with the partner organisations to ensure that executants dedicate adequate time to the projects. Projects must fit the partner organisation's mission and mandate and will ideally benefit the partner directly.

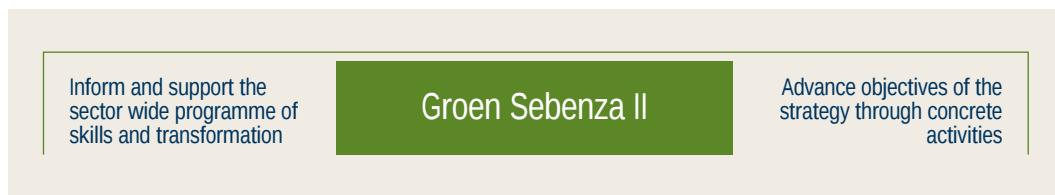
The communications function will be shared among partners and personnel. Communications should be approached as a mechanism for stakeholder engagement as well as promotion of the strategy, and should involve a range of media (e.g. press, television, conferences, printed media, website and e-newsletters) to reach a range of stakeholder groups (from the youth to portfolio committees).

The monitoring and evaluation (M&E) function is dealt with in Chapter 4.

Formal arrangements for the above proposed arrangements still need to be put in place, including Memoranda of Agreement and designation of focal points (people) within each organisation. These actions have therefore been included in the Implementation Plan (Section 6). It should be noted that the institutional arrangements may continue to be modified over time. This process should be supported with ongoing monitoring, evaluation, reflection and learning.

3.2.1 The Groen Sebenza Phase II Programme as a vehicle for implementation of the strategy

Groen Sebenza Phase II is a three-year bridging-into-work programme being implemented by SANBI together with other partners, from 2022 to 2024. It is funded to the value of R300 million. The aim is to recruit 1050 unemployed graduates (from Diploma to PhD level) and place them nationally in different organisations (government and non-governmental) where they will be trained and mentored to further develop their competence and confidence in the management of biodiversity.



At the National Environmental Skills Summit in 2021, the Organisational Strengthening syndicate proposed mobilising all the work of the syndicates around the Groen Sebenza Programme to achieve as many of the objectives of the Skills and Transformation Strategy as possible. SANBI has therefore mobilised the syndicates and their respective actions in support of this sector wide programme.

The Groen Sebenza Programme is guided by the following principles:

- **Partnership-based:** Drawing on SANBI's existing relationships as well as new ones, with a special focus on municipalities and provinces/entities with scientific capacity shortages, NGOs and CBOs to unlock opportunities for Diploma holders, universities for research, and the private sector for job creation.
- **Incubation-enabling:** Drawing on the lesson learned from Groen Sebenza Phase I and other mentorship programmes in the sector, the programme will ensure a reasonable mentor-mentee ratio, have a funded Training and Development Plan, and include mentor training.
- **Demand driven:** The programme will focus on skills in high demand.

The programme addresses the objectives of the strategy in various ways (see Chapter 6), including:

- **Creating sustainable jobs and career paths:** Commitment to at least 50% placement, recruitment against vacancies.
- **Organisational strengthening:** Building mentoring capacity and transforming organisational cultures.
- **Transformation:** In terms of demographics as well as organisational cultures.
- **Research:** The programme will partner with research organisations to conduct relevant research, starting with a study to better understand the demand for skills.
- **'Live' Skills Intelligence System:** Initiation of a track-and-trace system, a coordination and networking hub, and balancing supply of and demand for skills.
- **Monitoring and Evaluation:** M&E interns will be supported and trained to monitor, evaluate and report on the programme.

The coordination and governance structures that are in place for the Groen Sebenza Programme will need to articulate with the coordination of the strategy, to allow for a smooth transition and preservation of institutional memory after the Groen Sebenza Programme ends in 2024.

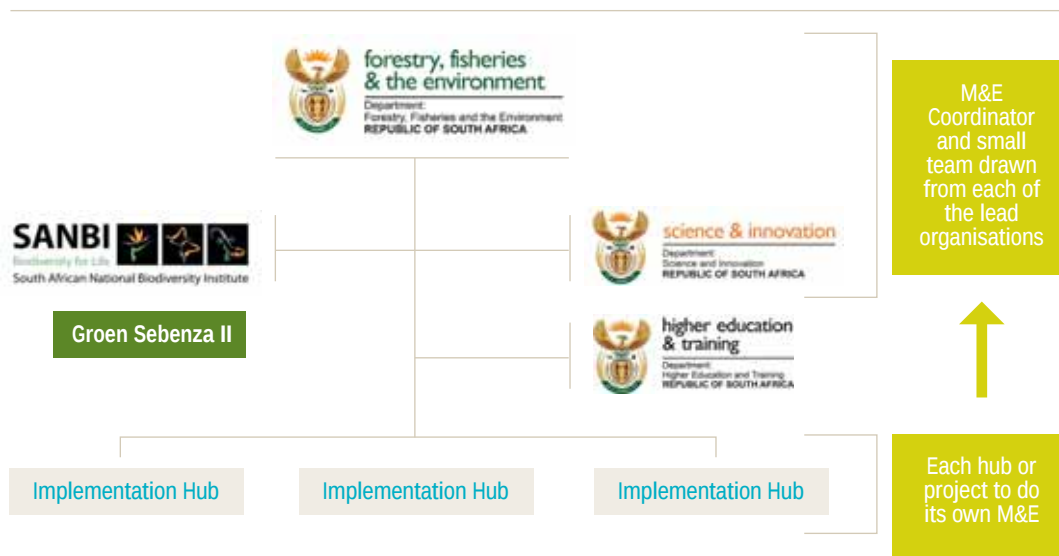
CHAPTER 4

Monitoring and Evaluation Guidelines

This chapter provides guidelines for the formative monitoring and evaluation of the processes, outcomes and impacts of the strategy. The mid-term review found the absence of effective monitoring and evaluation to be a major shortcoming in the implementation of the strategy so far. The reasons for the failure to implement effective M&E systems were not explored in the review, but one possibility was the fact that there were no dedicated M&E staff within the original coordinating team (which later became the GreenMatter NPO), which was where the M&E function was supposed to be located.

The proposed institutional arrangements for M&E are summarised in Figure 10.

Figure 10: Proposed institutional arrangements for monitoring and evaluation to 2030



The M&E Coordinator is most appropriately located within one of the lead organisations, and would ideally be supported by a small team drawn from the three (or four) lead organisations. This M&E coordination team will need to work together to develop a manageable set of indicators - not more than 20 - to monitor the overall progress towards outcomes. These indicators may be a mixture of quantitative (e.g. number of internships provided) and qualitative (e.g. the quality of teacher training programmes). Indicator data should be accompanied by narrative reporting on aspects of the strategy that are less amenable to being measured using indicators, such as advocacy efforts and organisational transformation. Monitoring data should be reported to the sector at least annually, for example at the annual skills summit.

The role of the M&E Coordinator and coordinating team should encompass the following:

- **Liaising closely and frequently** with the people responsible for overall strategy coordination, communications and advocacy (who may be located in different organisations or departments), for example through regular meetings. The M&E Coordinator should be considered a key member of the core coordinating team. This will enable both monitoring and evaluation of the coordination and advocacy functions, and support of these functions - for example through providing evidence of progress, content for communications and advocacy purposes, and enabling an adaptive management approach.
- **Developing good relationships** with project leads and/or M&E staff at partner organisations and implementation hubs.
- **Liaising with project leads and implementation hubs** to share and collate M&E data. This may include attending partner events or meetings to stay updated with what is happening in the sector.
- **Sharing, and facilitating** reflection on, M&E data with the sector, at annual skills summits or other suitable events.
- **Periodically assessing the indicators** and data collection practices and modifying if necessary.
- **Interfacing with other M&E staff and processes** within their own organisation or department, to ensure alignment and synergy.

The M&E Coordinator should be familiar with the sector, have an interest in skills and transformation, have a collaborative learning mindset rather than a compliance mindset, and be able to interface comfortably with project and strategy leads. They should have not only technical skills, but also relational and transformational skills (Rosenberg & Kotschy, 2020).

A full evaluation of programme implementation and impact should be undertaken in 2030, either internally or by an external evaluator. This should be done through wide stakeholder involvement, and should take potentially changing contexts into account.

For additional guidelines on monitoring and evaluation, see the [HSRC report](#) (Vass *et al.*, 2009).

The following focus areas and metrics were developed in 2012 for monitoring communications and marketing efforts as part of the strategy's Marketing and Communications Strategy, and may still be useful.

Internal Communication

Initiative	Examples of Metrics
Communication Audit	Target: E.g. 60% awareness E.g. 50% key information/messaging retention Actual:
Newsletter	Target: Placement e.g. 5 progress article and 2 themed article per quarter in targeted sector publication Target: Distribution e.g. 10% increase in newsletter subscription per annum Actual:
Partner web placements	Target: E.g. 10 article placements on partner web sites per annum Actual:
E-Platform	Target: E.g. 10% increase in mentors registered per annum E.g. 80% placement rates of jobs advertised

Media

Initiative	Analysis and Metrics
Media coverage (excl editorial placements)	POSITIVE, NEUTRAL, NEGATIVE Coverage What is the external perception trend? Which media platforms/journalists are ambassadors of the programme? Which media require additional effort and relationshiping?
Major Milestone Media Event attendance	Who has attended? Who has covered this event? What were the key coverage trends? Did media coverage meet the event objectives?
Media requests for information	What messages are most popular? What do we add/change to the planned communication themes?
AdSpend Value	To be measured prior to each phase, guiding the next phase level and intensity of initiatives. Which list of media is providing the most value for money?

Marketing and Advertising

Initiative	Analysis and Metrics
E-Platform	– Number of visitors to the site – Number of registered users/members – Mapping of click throughs' – Increase in % of matches made
Facebook	– Facebook measured activity (active and passive users) – Communication themes coming across
Linked In	– Number of queries received and attended to – Types of queries received
Return on Investment	– ROI Campaign Measure
Brand Equity	– Baseline exercise to be undertaken in 3 years to determine brand/cause value.
Advertising	– Advertising Reach – Message Circulation and Frequency

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