



SYNTHESIS REPORT JUNE 2021

Biodiversity Human Capital Development Strategy Mid-Term Review 2020-2021

Commissioned by The Lewis Foundation and The
South African National Biodiversity Institute (SANBI)

Review Team:

Rosenberg, Ngeleza, Mukute, Jenkin & Kotschy

Table of Contents

TABLE OF CONTENTS	2
EXECUTIVE SUMMARY.....	7
PURPOSE AND PROCESS FOLLOWED FOR THE REVIEW	7
FINDINGS	8
RECOMMENDATIONS	13
OTHER SPECIFIC AREAS TO ADDRESS INCLUDE:	14
RECOMMENDATIONS FROM THE MARCH 2021 MINI ENVIRONMENTAL SKILLS SUMMIT.....	15
1. INTRODUCTION: PURPOSE AND SCOPE OF THE REVIEW.....	16
1.1 INTRODUCING THE STRATEGY.....	16
1.2 TERMS OF REFERENCE FOR THE REVIEW.....	16
1.3 RELATIONSHIP TO THE GREENMATTER REVIEW.....	18
1.4. THE ROLE AND FORMAT OF THIS REPORT	19
2. METHODOLOGY FOLLOWED FOR THE REVIEW.....	20
2.1 INTRODUCTION TO THE CHOSEN METHODOLOGY	20
2.2 KEY INFORMANT INTERVIEWS.....	21
2.3 GRADUATE TRENDS ANALYSIS	22
2.4 EMPLOYER SURVEY: SAMPLE AND PROCESS	24
2.5 CASE STUDIES.....	26
2.4.1 SELECTION CRITERIA FOR CASE STUDIES	26
2.5.2 DATA SOURCES FOR CASE STUDIES.....	27
2.5.3 CASE STUDY ANALYSIS FRAMEWORK	27
2.6 CONTEXTUAL ANALYSIS	28
3. RELEVANCE OF THE STRATEGY - KEY FINDINGS.....	30
3.1 INTRODUCTION TO CHAPTER 3.....	30
3.2 POLICY RELEVANCE OF THE BHCDS IN 2010.....	30

3.3 BROADER BIODIVERSITY SECTOR RELEVANCE IN 2010	31
3.4 POSITION OF A MULTI-AGENT STRATEGY IN SANBI WITH THE LEWIS FOUNDATION.....	32
3.5 NICHE IN RELATION TO OTHER SKILLS STRATEGIES IN 2010	33
3.6 THE 2020 CONTEXT AND THE RELEVANCE OF THE BHCDS.....	34
3.7 SURVEY RESPONSES ON THE RELEVANCE OF THE BHCDS.....	37
3.8 SUMMARY OF FINDINGS ON RELEVANCE OF THE STRATEGY AS DEVELOPED.....	38
<u>4. PERSPECTIVE, APPROACH & METHODOLOGY - KEY FINDINGS</u>	<u>39</u>
4.1 INTRODUCTION TO CHAPTER 4.....	39
4.2 PERSPECTIVE REFLECTED IN PRINCIPLES AND OBJECTIVES	40
4.2.1 PRINCIPLES OF THE BHCDS	40
4.2.2 STRATEGIC OBJECTIVES OF THE BHCDS.....	47
4.3 THE PARTNERSHIP APPROACH	49
4.3.1 OVERVIEW OF SOME KEY PARTNERSHIPS.....	49
4.3.2 PARTNERSHIP GAPS.....	50
4.3.3 PARTNERSHIP BRAND - GREENMATTER.....	52
4.4 IMPLEMENTATION ARCHITECTURE (METHODOLOGY)	53
4.4.1 DESCRIPTION OF THE IMPLEMENTATION ARCHITECTURE	53
4.4.2 THE FUNDING MODEL	55
4.5 ANALYSIS OF THE IMPLEMENTATION ARCHITECTURE AND ITS IMPLICATIONS	58
4.5.1 REFLECTION ON THE IMPLEMENTATION ARCHITECTURE AND FUNDING MODEL	58
4.5.3 STRENGTHS OF THE IMPLEMENTATION ARCHITECTURE	60
4.5.3 WEAKNESSES OF THE IMPLEMENTATION ARCHITECTURE AND FUNDING MODEL.....	61
4.6 SUMMARY OF FINDINGS ON PERSPECTIVE AND IMPLEMENTATION METHODOLOGY.....	62
<u>5. EXECUTION - FINDINGS ON IMPLEMENTATION</u>	<u>63</u>
5.1 INTRODUCTION TO THE CHAPTER	63
5.2 OVERVIEW OF INITIATIVES, PARTNERSHIPS & ASSOCIATED ARRANGEMENTS	63
5.2.1 IMPLEMENTATION OVER TIME	63
5.2.2 NESS (NATIONAL ENVIRONMENTAL SKILLS SUMMIT).....	65

5.2.3 GREENMATTER FLAGSHIP PROJECTS AND ADVOCACY	66
5.2.4 WWF - BRIDGING INTO WORK AND ORGANISATIONAL STRENGTHENING.....	67
5.2.5 GREEN SKILLS PROGRAMME - UNIVERSITIES, SETAS, DEA AND DBSA	68
5.2.6 SANBI OTHER BHCDS INITIATIVES	69
5.3 CASE STUDIES OF IMPLEMENTATION	69
5.3.1 <i>FUNDISA FOR CHANGE</i> PROGRAMME - FOUNDATION BUILDING.....	69
5.3.2 <i>GROEN SEBENZA</i> AND WWF INTERNSHIPS	72
5.3.3 HUMAN RESOURCES DEVELOPMENT (HRD) NETWORK.....	76
5.3.4 NESPF (THE NATIONAL ENVIRONMENTAL SKILLS PLANNING FORUM).....	79
5.4 ANALYSIS OF EXECUTION / IMPLEMENTATION.....	80
5.4.1 RELEVANCE AND ALIGNMENT WITH STRATEGY PRINCIPLES, APPROACH	80
5.4.2 TRENDS IN IMPLEMENTATION OVER TIME	82
5.4.3 SCOPE OF PARTICIPATING ORGANISATIONS - ANALYSIS.....	82
5.5 SUMMARY OF FINDINGS ON IMPLEMENTATION.....	83
<u>6. OUTCOMES AND IMPACT - KEY FINDINGS</u>	<u>84</u>
6.1 INTRODUCTION TO THE CHAPTER.....	84
6.2 STRATEGIC GOAL 1 OUTCOMES AND IMPACTS.....	85
6.2.1 ASSOCIATED STRATEGIC OBJECTIVES	85
6.2.2 SUPPLY OF BLACK BIODIVERSITY GRADUATES	85
6.2.3 SUMMARY OF TRENDS IN SUPPLY OF BLACK GRADUATES.....	96
6.2.4 IMPROVING GRADUATION / COMPLETION RATES	97
6.2.5 TRANSITION TO POSTGRADUATE STUDIES.....	97
6.2.6 IMPROVING QUALITY IN SCHOOLS.....	98
6.2.7 CONCLUSIONS	99
6.3 SG2: IMPROVE QUALITY, LEVELS AND RELEVANCE OF SKILLS FOR THE SECTOR	100
6.3.1 RELEVANT STRATEGIC OBJECTIVES AND INITIATIVES.....	100
6.3.2 OUTCOMES AND IMPACTS OF INTERNSHIPS.....	101
6.3.3 CONCLUSIONS	104
6.4 SG3: IMPROVE RETENTION AND EFFECTIVE DEPLOYMENT OF SUITABLE INDIVIDUALS	104

6.4.1 RELEVANT OBJECTIVES AND INITIATIVES FOR THIS STRATEGIC GOAL	104
6.4.2 FINDINGS.....	104
6.4.3 CONCLUSIONS	111
6.5 SG4: CREATE ENABLING MACRO-CONDITIONS FOR SKILLS PLANNING, DEVELOPMENT AND EVALUATION.....	111
6.5.1 STRATEGIC OBJECTIVES AND INITIATIVES RELEVANT TO THIS GOAL	111
6.5.2 FINDINGS - OUTCOMES AND IMPACTS	111
6.5.3 FINANCIAL ANALYSIS	114
6.5.4 CONCLUSIONS	115
<u>7. IMPLEMENTATION GAPS</u>	<u>115</u>
7.1 INTRODUCTION TO CHAPTER 7.....	115
7.2 REMAINING CHALLENGES BASED ON SURVEY	116
7.2.1 VACANCIES IN THE SECTOR.....	116
7.2.2 SKILLS GAPS.....	117
7.2.3 LEADERSHIP	119
7.2.4 TRANSFORMATION (Q21).....	120
7.2.5 REASONS FOR REMAINING CHALLENGES (Q21)	120
7.2.6 CONCLUSIONS ON REMAINING CHALLENGES FROM SURVEY FINDINGS.....	121
7.3 GAPS BASED ON CASE STUDIES.....	122
7.3.1 GAP ANALYSIS OF FUNDISA FOR CHANGE	122
7.3.2 GAP ANALYSIS OF THE HRD NETWORK.....	123
7.3.3 GAP ANALYSIS OF THE NESPF.....	123
7.3.4 GAP ANALYSIS OF THE INTERNSHIP PROGRAMMES REVIEWED.....	124
7.4 SUMMARY HIGH LEVEL GAPS IN IMPLEMENTATION	125
7.4.1 GAPS IN THE STRATEGY	125
7.4.2 SCARCE SKILLS GAPS	125
7.4.3 OVERALL STRATEGIC IMPLEMENTATION GAPS.....	126
7.4.4 MONITORING AND REPORTING LIMITATIONS	127
7.4.5 FUNDING	127
7.5 CONTEXTUAL CHANGES AND ANALYSIS	128

7.5.1 SURVEY RESPONSES	128
7.5.2 ANALYSIS OF NATIONAL AND INTERNATIONAL TRENDS	131
8. OUTCOMES OF THE MINI SKILLS SUMMIT MARCH 2021	137
9. RECOMMENDATIONS	169
9.1 RECOMMENDATIONS - PROGRAMME SPECIFIC	169
9.1.1 FUNDISA FOR CHANGE RECOMMENDATIONS.....	169
9.1.2 INTERNSHIPS PROGRAMME RECOMMENDATIONS.....	170
9.1.3 HRD RECOMMENDATIONS	171
9.1.4 NESPF RECOMMENDATIONS	172
9.2 OVERALL RECOMMENDATIONS.....	173
9.2.1 FOUR KEY RECOMMENDATIONS	173
9.2.2 HOW TO ACHIEVE THE ABOVE.....	173
9.2.3 OTHER SPECIFIC AREAS TO ADDRESS	174
9.2.4 RECOMMENDATIONS FROM THE MINI ENVIRONMENTAL SKILLS SUMMIT.....	174
APPENDIX 1 DOCUMENTS REVIEWED FOR THE CONTEXTUAL ANALYSIS	176
APPENDIX A: SUPPLY ANALYSIS - FIELDS OF STUDY	178
APPENDIX A1: CESM CATEGORY DIFFERENCES BETWEEN THE BASELINE AND THE MID-TERM REVIEW	178
APPENDIX A2: AGRICULTURAL EXTENSION - DETAIL OF CESM DIFFERENCES BETWEEN THE BASELINE AND MID-TERM REVIEW.....	180
APPENDIX B: ASSUMPTIONS USED TO DERIVE THE NUMBER OF ENROLMENTS .	181
APPENDIX C: SURVEY DETAIL (QUESTIONNAIRE).....	182
APPENDIX D: ORGANISATIONS SURVEYED	1
APPENDIX E: STAKEHOLDER MAP.....	1

EXECUTIVE SUMMARY

Purpose and Process followed for the Review

The Biodiversity Human Capital Development Strategy (2010-2030) aims to drive a systemic approach to developing skills for biodiversity and transformation, 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’*¹.

This vision is being pursued through four strategic goals, viz.

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

The Biodiversity Human Capital Development Strategy is a response to Strategic Objective 2 of the National Biodiversity Framework (2007), which called for a national strategy to address transformation and scarce skills, and remains a priority in *South Africa’s Second National Biodiversity Strategy and Action Plan 2015-2025* (DEA, 2015). Its development was initiated by the South African National Biodiversity Institute (SANBI) with a core funder, the Lewis Foundation (www.thelewisfoundation.co.za), and several implementation leads and partners in the broadly defined biodiversity sector. In 2019 a group of sector organisations proposed a mid-term review for the implementation of the BHCDS and set up a steering committee for the review. The Terms of Reference were compiled by the steering committee in September 2019, following which a call was put out for a team to undertake the review. The Environmental Learning Research Centre (ELRC) at Rhodes University submitted a proposal in response to the call, which was accepted. The review was undertaken during 2020-2021 using a strategy evaluation methodology approved by the steering committee, and both primary and secondary data. Methods consisted of key stakeholder interviews, a broader employer survey, analysis of skills supply and financial data, a stakeholder analysis, and case studies of implementation programmes. Several existing evaluations were utilised including two GreenMatter evaluation reports. The review aims to inform the further implementation of the strategy in the next 10 years, and to renew and expand commitment to biodiversity skills and transformation among relevant organisations, through stakeholder participation. Hence the review outcomes have been discussed and the recommendations further developed with stakeholders at a Mini Environmental Skills Summit in March 2021, to shape future priorities, and potentially revising implementation structures.

Draft reports took the form of a report-and-respond instrument, which creates space for stakeholders to write into the report, to provide consenting or dissenting views and further details. These inputs were taken into account in the finalisation of the report, which also

¹ *A Human Capital Development Strategy for the Biodiversity Sector 2010-2030*, SANBI and the Lewis Foundation, 2010, p.52.

include the Summit outcomes. Although not all views might be captured, we believe that the best available information was used to construct the report.

The Executive Summary provides a high-level view into findings aligned to the seven strategic objectives of the Strategy, and recommendations. Readers are referred to the body of the report and appendices for details and elaboration.

Findings

Overall Finding: More is needed and gaps exist

The implementation of the Biodiversity Human Capital Development Strategy (BHCDS) 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, stakeholders were of a view that *not enough* had been achieved, that scarce skills and transformation challenges remain, and that (for the most part) the BHCDS was still relevant for achieving them. The implementation architecture had both strengths and weaknesses, but implementation had been held back by inadequate monitoring and evaluation, principal-agency disconnects, the lack 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.

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*.

Finding 1: Biodiversity as a study and work choice has been promoted to young black South Africans and access into higher education 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.
---	---

This information is available in the following sections of the review report:

Section 6.2 (Strategic Goal 1 Outcomes and Impacts); Section 5.3.1 (*Fundisa for Change* Programme case study) and Section 5.3.2 (*Groen Sebenza* and WWF Internships case study). This information is available in the following sections of the review report:

Some transformation issues remain, as reflected in the *South African Journal of Science* paper declaring that black students are not interested in wildlife related studies, causing indignation among black scientists; more limited support in the *GreenMatter Fellowship* for students from historically black universities; and interviews with black graduates.

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 (Up-skilling) Strategic Intent: Extend existing capacity	
Improve the skills of those already in the workplace, and underqualified 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.

This information is available in Sections 6.3 to 6.5 (employer survey data); Section 5.3.2 (*Groen Sebenza* and WWF Internships case study) and Section 5.3.3 (Human Resources Development (HRD) Network case study).

The BHCDS implementation partners placed 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.

Finding 3: Organisations' 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 success

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 development 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.

Find this information in Sections 6.3 to 6.5 (employer survey data); Section 5.3.4 (National Environmental Skills Planning Forum case study) and Section 5.3.3 (Human Resources Development (HRD) Network case study).

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 Higher Education Institutions (HEIs), 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	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

institutions (HEIs) and other providers ...	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 <i>graduating</i> 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 <i>entering</i> 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.

This information is available in Sections 6.2, 6.3 and 6.5 (Outcomes and Impacts) and Section 5.3.1 (Fundisa for Change case study).

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	<i>Fundisa for Change</i> 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 Environmental Sector Skills Plan (ESSP). This information is available in Section 5.3.1 (*Fundisa for Change* case study).

Finding 6: While the sector has worked hard to promote Human Capital Development (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 <i>Fundisa for Change</i> 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.

This information is available in Section 5.3.4 (National Environmental Skills Planning Forum case study); Section 6.5 (Create enabling macro-conditions for skills planning, development and evaluation) and Section 7 (Gaps and Recommendations).

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.

S07 (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.

This information can be found in Section 7 (Gaps and Recommendations).

In addition to the achievements and risks outlined above, the review identified implementation gaps which could improve the level and scale of impact, were they to be addressed. The recommendations below are aimed at addressing these gaps, while maintaining and upscaling the outcomes achieved.

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.

The above could be undertaken through the following actions:

- 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.
- 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 to start with, following on

the March 2021 Mini Skills Summit, in which syndicates (working groups) were established to take the BHCDs remit and review recommendations further.

- Institutionalise a shared monitoring, evaluation and reporting function as a vital coordination and advocacy function; drawing on the existing frameworks developed for the strategy.
- 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 period. Draw on key developments like the Dasguptha 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 BHCDs implementation.
- Appoint an advisory board for the BHCDs implementation.

Other specific areas to address include:

1. Track impact of DHET MRTEQ and support where necessary (significant new opportunity)
2. Track the number of conservation WIL students funded to completion, in relation to sectoral needs
3. Track % of SET undergraduate pool going into university
4. Drive career guidance for students across faculties
5. Continue postgraduate bursary programme (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 DEFF and Provincial Agencies, SANParks to invite proposal on how they would like to be involved in the next 10 years of implementation. Do the same for organised labour, NEDLAC, DHET and SETAs; and for industry and the Departments of Water, Science and Innovation, and WRC.

Recommendations from the March 2021 Mini Environmental Skills Summit

Several specific but undeveloped proposals emerged from each of the syndicates' discussions. In general, there was overlap between these, so the syndicates should plan future activities collaboratively, so as not to duplicate effort. Key areas of overlap include:

1. Work on a skills intelligence system – the most detailed proposals for this came from Syndicate 3, but it was also mentioned by Syndicate 1 and Syndicate 6.
2. Tracer studies to track graduates and past interns – Syndicates 1 and 4.
3. Attracting young people to the sector and promoting field-based experiential learning – Syndicates 1 and 4.
4. Compilation of case studies for advocacy and communication purposes – specific proposals for a book were made by Syndicate 6, but they should work with Syndicate 5 since creating a coordinating hub or hubs will include the advocacy and communication functions.

Syndicate 2 (Organisational Strengthening) should perhaps be dropped. Although reviving the HRD network was a key recommendation of this review, there was little interest in this at the Mini Skills Summit. Several of the work areas for Syndicate are covered by other Syndicates, particularly Syndicate 4 (organisational cultures) and Syndicate 1 (mentorship and career development plans). An alternative way forward for Syndicate 2 could be to carry out an evaluation study of the Theory of Change for organisational strengthening in the BHCDS. It is possible that the reasons for the lack of success in creating more jobs and increasing budgets within organisations may not be related to leadership, but may lie within the context. Such an evaluation could produce a revised theory of change, and criteria for evaluating “effective organisations” and “organisational strengthening” in the next 10 years of the BHCDS. This would produce a stronger basis on which to focus the work of organisational strengthening.

There was general consensus that when the BHCDS is updated, its scope should be broadened beyond the current focus on universities and so-called higher level skills, to reflect the trend that has already started during the past 10 years of implementation of BHCDS programmes. Another key consideration was that the biodiversity sector should not just run in parallel to other sectors, but as an underpinning to and across all other sectors, with external and internal skills demands intersecting. In concluding the Summit it was argued that organisations need to *make the case for human capital in the biodiversity sector anew*, and more compellingly, showing that the benefits would not only be for a narrowly defined sector, but clearly link to the economy, broader social challenges and people's everyday lived reality.

1. INTRODUCTION: PURPOSE AND SCOPE OF THE REVIEW

1.1 Introducing the Strategy

The Biodiversity Human Capital Development Strategy (BHCDS, 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*³.

This vision is being pursued through four strategic goals⁴, viz.

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

The BHCDS is a response to Strategic Objective 2 of the National Biodiversity Framework (2007⁵), related to *institutional effectiveness and efficiency*, which called for a national strategy to address transformation and scarce skills. 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 (www.thelewisfoundation.co.za). In the past 10 years a range of implementation actions have been undertaken by multiple implementation partners under the ambit of the BHCDS. In June 2019 SANBI and the Lewis Foundation convened sector organisations to scope a mid-term review of the implementation of the BHCDS and form a steering committee for the review. The Terms of Reference were compiled by the steering committee in September 2019, following which a call was put out for a team to undertake the review. The Environmental Learning Research Centre (ELRC) at Rhodes University submitted a proposal in response to the call, which was accepted.

1.2 Terms of Reference for the Review

The call for proposals outlined that broadly, the review would need to:

- unpack a nuanced understanding of the context and changes to context that have unfolded during the BHCDS implementation process to date;
- take a systemic, consultative and engaged approach (these being some of the guiding principles of the development of the Strategy);
- use a robust methodology that involves both quantitative and qualitative approaches;
- use a diverse toolbox for engaging stakeholders, which at a minimum must include focused interviews, self-assessment by the key players, and the convening of a [Mini](#)

³ A Human Capital Development Strategy for the Biodiversity Sector 2010-2030, SANBI and The Lewis Foundation, 2010, p.52. Hereafter the document containing the strategy will be referenced as (BHCDS, 2010)

⁴ Ibid, p.52

⁵ https://www.environment.gov.za/sites/default/files/gazetted_notices/nemba_biodiversityframework_g32474gon813.pdf

Skills Summit to update stakeholders on review progress and engage on the way forward.

Table 1.1. Objectives of the Review and Key Considerations outlined in the Terms of Reference

Review Objectives	Key Considerations (from the Terms of Reference)
<p>1. Conduct an analysis of the implementation process associated with BHCDS.</p> <p>This objective requires an overview/map of the initiatives, projects, partnerships, institutional and governance arrangements that have given effect to the BHCDS implementation process.</p>	<p>In providing this overview the following will need to be considered:</p> <ul style="list-style-type: none"> • A contextual analysis of what the intention of the BHCDS was and how this may have been interpreted and/or evolved. • What the definition of the biodiversity sector was and how it may have evolved over time. • An overview of all stakeholders involved in the implementation process (mandated agencies, other stakeholders). • Level of participation of mandated agencies in the BHCDS implementation and if not active participants, then why not? • Level of participation of other stakeholders (NGOs, HEIs, etc.) those who did not participate and why not? • An assessment of the roles and institutional arrangements of SANBI, the Lewis Foundation and GreenMatter in terms of strategic implementation and oversight and how they evolved over time. • An overview of the main partnerships driving the implementation of the Strategy: Institutional arrangements including governance, coordination, reporting and funding mechanisms. • Who has responsibility for overseeing the high-level strategic implementation of the BHCDS, does it need to be deliberate and how should this be achieved? • An assessment of the extent of the deliberate strategy to create shared ownership through the implementation process. • An assessment of how synergised and systemic these interventions have been.
<p>2. Evaluate the achievements and impacts of the BHCDS.</p>	<p>Drawing on the Objective 1 analysis, this requires an evaluation of:</p> <ul style="list-style-type: none"> • Outcomes against strategic goals of the Strategy. • Analysis of the resources leveraged for implementation. • Analysis of initiative alignment/ scope creep. • Assessment of the shifts that have been driven by the BHCDS implementation (e.g. changes in the policy context, landscape change and discursive shifts) and the extent to which the BHCDS has influenced systemic change.
<p>3. Provide a gap analysis of implementation to date.</p>	<p>Drawing on the evaluation in Objective 2, identify the critical gaps in the implementation of the BHCDS to date.</p>
<p>4. Provide a set of recommendations on the way forward with the BHCDS implementation process.</p>	<p>At a minimum this will require input on:</p> <ul style="list-style-type: none"> • The vision for the BHCDS going forward taking into account the changed context. <p>The importance of maintaining the networked model of shared ownership and enable shared planning, reporting and evaluation.</p> <ul style="list-style-type: none"> • Advise on who the lead coordinator/s in the system should be. • A view on whether implementation going forward will need a dedicated coordination team/capacity or not. • A re-assessment of the key role players that need to be involved going forward. • Most relevant funding and resourcing opportunities going forward.

Furthermore, the following (agreed or advised by the steering committee and captured in the Inception Report) should be noted as backdrop to the report:

- The review is in the first instance of the *implementation* of the BHCDS, not of the Strategy itself. At the same time, the review should investigate the current context and the strategic objectives achieved, in order to determine whether a change in strategy is needed.
- In engaging biodiversity stakeholder organisations, not only those who participated actively in implementation, but also those who did not, should be included.
- The organisations and individuals who take an active interest in building capacity for the biodiversity sector as a whole, constitute a relatively small population, which means that some individuals have multiple roles in the current review. It is noted that the review lead, Prof Rosenberg, was also the lead in the development of the BHCDS and a strategic advisor during the first years of its implementation. It is important to draw on deep knowledge of the field and its skills needs to guide and undertake the review, and this knowledge should not be set aside for the sake of neutrality. At the same time, fresh 'outside' or partly 'outside' perspectives are valuable, as in the composition of the full review team (Rosenberg, Ngeleza, Mukute, Kotschy and Jenkin).
- Greater objectivity can further be achieved through inter-subjectivity, by means of member checking and deliberation opportunities and methodological principles of participatory evaluations, such as deliberately seeking out alternative views and alternative explanations for commonly held views; and where possible, making comparisons with comparable initiatives in other sectors. (An example may be the Global Change HCD Strategy led by the Department of Science and Technology).
- Recommendations that may benefit one organisation more than others, should be vigorously deliberated with multiple parties. The stakeholder event (planned Mini Skills Summit) and the lead-up to it, should provide such opportunities.

1.3 Relationship to the GreenMatter Review

Coinciding with the BHCDS review was an evaluation of GreenMatter. Prior to its status change to an NPO in 2017, GreenMatter was established (in 2012) as a mechanism for catalysing the implementation of the BHCDS (see Section 4.4). GreenMatter as role-player in the implementation architecture will therefore receive attention in the BHCDS review (albeit not the sole focus), and the GreenMatter Self Evaluation (2020) and GreenMatter Independent Evaluation (2020) reports were both consulted for the review. Synergies between the two review processes were actively sought with Prof Shafika Isaacs, at the time the Executive Chair of GreenMatter. This resulted in the two reviews focusing on different case studies and survey populations between them, with GreenMatter sharing its findings (which were ready first) and Prof Rosenberg giving an overview of the BHCDS review to the GreenMatter independent evaluation panel. Efforts were made to avoid duplication; e.g. the *Fundisa for Change* Project executants were asked to conduct a self-evaluation, but they had also been evaluated independently before; this review includes a case study on *Fundisa for Change* but is based entirely on existing reports.

Table 1.2 Division of data sources and methods between GreenMatter and BHCDS evaluators

	GreenMatter Evaluation	BHCDS Review
Surveys	Survey of GreenMatter Fellowship beneficiaries	Survey of employers and broader stakeholders
Case Studies	<i>Imvelisi Enviropreneurs</i> GreenMatter Fellowship <i>Fundisa for Change</i>	National Environmental Skills Planning Forum <i>Groen Sebenza</i> and WWF Internships Human Resource Development Network <i>Fundisa for Change</i>

1.4. The Role and Format of this Report

This report synthesises the findings from the BHCDS review. It presents a review of:

- Implementation processes and impacts (responding to ToR Objectives 1 and 2), and
- Gap analysis and recommendations (responding to ToR Objectives 3 and 4).

This report follows on from a mid-way (“progress”) report which shared interim findings in August 2019. Feedback from the Review Steering Committee was taken into account in the structure and formulation of this Synthesis Report. This near-final synthesis serves to inform the stakeholder consultation. It will be finalised following the stakeholder consultation during the Mini Skills Summit scheduled for 24-25 March 2021, by adding the outcomes of the consultations and refining the recommendations in a Consolidated Final Report. The Consolidated Final Report will then be used by post-Summit syndicates working on implementation initiatives.

In order to prepare for the Mini Skills Summit, and to seek dissenting and additional inputs as outlined above, this Synthesis Report has a set of summative statements and questions to engage stakeholders at the end of each chapter (3-7). Thus, the document takes the form of a Report-and-Respond instrument (Stronach, 1997⁶). It is both a draft synthesis report, and an intention to gather further information, along with feedback on the findings, interpretations and recommendations in the draft report.

⁶ Stronach I. 1997. Can the mothers of invention make virtue out of necessity? An optimistic deconstruction of research compromises in contract research and evaluation. In Stronach I. and MacLure M. 1997. *Educational Research Undone. The postmodern embrace*. Open University Press, Buckingham.

2. METHODOLOGY FOLLOWED FOR THE REVIEW

2.1 Introduction to the chosen methodology

The main evaluation approach used was strategy evaluation (Patton & Patrizi⁷, 2010), which encompasses evaluating five dimensions of strategy: (i) position/niche, (ii) perspective, (iii) effectiveness and impact, (iv) adaptation, and (v) execution. We used selected dimensions of Patton & Patrizi's strategy evaluation approach to address the review objectives.

There are a number of advantages to using this methodology, which was co-designed by the international evaluation specialist Michael Quinn Patton. One advantage is that it serves the dual functions of critically appreciating the intended *and implemented* strategy, and presenting new strategic options where necessary. The strategy evaluation methodology draws on strategy theory from the business world (e.g. Minzberg), and the field of social development as practised e.g. by philanthropic foundations. It recognizes that the *realised* strategy is not the same as the *intended* strategy, and that this may be either good or bad. It thus recognizes the value of learning and adaptation during strategy implementation. It also highlights that the strategy position or niche (what it sets out to do and the landscape in which it aims to do so, in relation to what others do) is an important starting point for evaluators, which should be distinguished from other important dimensions such as perspective (what organisations identify with and how they relate to the intended strategy). This allows for immanent critique and principle-focused⁸ evaluation - evaluating implementation against the strategy's own (qualitative) 'benchmarks', rather than against an imposed framework that may be out of step with what was intended. This is particularly important in the case of a strategy that was intentionally designed based on both prior research (e.g. Vass et al. 2009⁹) and stakeholder consultations.

The Terms of Reference outlined in Chapter 1 required a participatory process. The review team needed to engage BHCDS stakeholders in the review and mobilise their participation for the phase following the review, when recommendations are taken forward. The participatory aspect was achieved through the following four processes:

- In-depth interviews with key stakeholders including implementation partners and core organisations that should have participated more in the BHCDS programme, but did not
- An online survey to engage a wide group of current and potential stakeholders, *and* alert respondents to the upcoming Mini Skills Summit
- The Mini Skills Summit, scheduled for 24-25 March 2021 (via online meeting to accommodate Covid-19 protocols)
- The report-and-respond format of this document.

These four processes were designed to work together. The survey included a question to stakeholders on whether they would like to be invited to the Summit. While 73 respondents

⁷ Patton, MQ & Patrizi, PA. 2010. Strategy as the focus for evaluation, in Patrizi, PA & Patton, MQ (Eds) *Evaluating Strategy. New directions for evaluation*, 128, 5-28.

⁸ Patton, M. Q. 2018. *Principles-Focused Evaluation - The Guide*. Guilford Press, New York.

⁹ 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.

indicated that they would like to see the review outcomes, only 45 indicated that they would like to participate in the Summit to deliberate the future implementation of the BHCDS.

The Summit will be used to discuss the review findings, towards both the shared formulations of the way forward and the uptake of those recommendations into implementation. The report-and-respond format of this Synthesis Report is aimed at encouraging and enabling readers to participate in the report, to reflect on findings in a dialogic manner, and to start to co-construct recommendations, in preparation for further deliberations at the Summit. The time spent engaging with the report is hence already preparation for the Skills Summit. At the Summit, syndicates will be established to work together on taking recommendations into action.

2.2 Key informant interviews

In-depth, one-on-one telephonic interviews with key stakeholder in the BHCDS were conducted at the start of the review, focusing on achievements, issues from their perspective, and the institutional set-up of the BHCDS. The information from these interviews was complemented by an archive of historical strategy development and implementation documents made available by the interviewees. The interviews were conducted with:

- SANBI
- The Lewis Foundation
- GreenMatter
- Department of Environment, Forestry and Fisheries (DEFF¹⁰)
- Department of Science and Innovation¹¹
- Rhodes University, and
- NCC Environmental Services.

As SANParks was also a potential lead agency according to the National Biodiversity Strategy and Action Plan (2005), a senior person who engaged with the BHCDS while based in SANParks was also interviewed. Other key stakeholders such as WWF and DEFF were interviewed during the case studies.

Current senior staff from SANParks, the former director of GreenMatter and the former Chief Executive of SANBI were not available for interviews despite attempts to set these up.

The interview findings were synthesized, analysed with reference to the review questions and with a particular view to the institutional set-up, and recommendations were formulated. These findings and recommendations are found in Chapters 4 and 7.

¹⁰ Over the 10-year review period, some national government departments underwent name changes. In this report we refer to departments by the name in use at the time. DEFF was previously known as the Department of Environmental Affairs (DEA) and before then, the Department of Environmental Affairs and Tourism (DEAT).

¹¹ The Department of Science and Innovation (DSI) was previously known as the Department of Science and Technology (DST).

2.3 Graduate trends analysis

The analysis of trends in skills supply relevant to biodiversity was done using the most recent (2018) available data in the database of the Department of Higher Education and Training (DHET), namely the Higher Education Management Information System (HEMIS)¹². The 2018 data was compared, where feasible like for like, with the baseline produced for the BHCDS by the Human Sciences Research Council (HSRC¹³). The HSRC baseline was in turn based on 2000 HEMIS data. Trends were assessed by comparing the best comparable 2018 HEMIS data with the 2000 data (as presented by the HSRC in 2007; particularly in chapter 4 of Vass et al. *ibid*). In most instances, a third data set (for 2007) was also compiled to get a better sense of the trends over the 10-year review period.

Definitions are important for clarifying what is included or excluded in a dataset and for interpreting findings presented. The following definitions taken directly from the HSRC baseline study, were used in the current review, to select and group the study fields for analysis:

1. *Primary biodiversity fields of study* relate to the core professional occupations that are key to fulfilling the mandate of the biodiversity sector. (This includes Geography.)
2. *Secondary fields of study* are important, but supplementary, and relate to the direct and indirect impact of atmospheric changes; chemical content in water; geological processes; anthropological findings; physics; earth and space science; human societies, economic activities and the impact of engineering planning on biodiversity.
3. *Computer-science and data processing* is included due to the demand for computer scientists and related capacity challenges in mapping spatial areas.
4. *Generic fields of study* are ancillary and supportive to the efficient functioning of the sector, and demand may change in response to changing legislative and policy demands. [Examples may be Human Resource Management (HR)]

Interpretation of the HEMIS data relating to CESM categories

The following has relevance for interpreting the review data (and findings presented in Chapter 6). HEMIS data is grouped by study field (groups of related courses) offered at universities. These study fields are arranged in a system of Classification of Educational Subject Matter (CESM) categories¹⁴. In 2010 DHET revised the CESM categories. As such, the second-order fields of study identified and used as biodiversity-relevant fields for this review, are now somewhat different to the HSRC baseline (2000-2007). Every effort was made to identify equivalent courses. Appendix A(1) compares the list of courses included in the HSRC baseline with those used to interpret the data for this review.

¹² HEMIS is DHET's Higher Education Management Information System mechanism through which it collects and produces data for quality assurance, higher education planning, and the allocation of funds. Universities report annually on their approved qualifications and fields of study; the courses they offer; courses for which each student is registered; and the fields in which academic staff are active. Various annual databases can be accessed [here](#).

¹³ Vass et al. 2009 (*ibid*).

¹⁴ The CESM system aims to ensure that each Higher Education institution reports against the same set of fields of study and courses. It has three classification levels. Each level is referred to as an Order. The first order involves 22 categories of subject matter e.g. Agriculture, Agricultural Operations and Related Sciences. The first order categories are broken down into second order categories, and each of these are broken down into third order classifications. The first and second order data is publicly available on the HEMIS website. This level of data was used in the HSRC baseline, and the same level was adopted for the mid-term review (Department of Education, CESM Classification of Educational Subject Matter, 2008).

The main discrepancies in the CESM categories used in the HSRC baseline versus the 2020 review (2018 CESM) are:

1. Courses in Fisheries, Wildlife and Oceanology were listed in HEMIS in 2007, and captured in the baseline; however, in 2018 these courses were no longer listed in CESM. No similar courses or name changes could be identified (e.g. we could not find Ichthyology). Therefore, we assumed that Fisheries and Wildlife are now included in the 2018 categories of Animal Sciences or Zoology / Animal biology; and that Oceanology is now under Geography & Cartography.
2. The course Agricultural Extension appeared in the 2007 baseline, but not in 2018. An assumption had to be made as to which agricultural courses in the HEMIS 2018 dataset were comparable to Agricultural Extension in 2007. See Appendix A(2) for the decisions made.
3. The course Outdoor Recreation was listed in 2007, but not in 2018. The comparable course in 2018 was Parks, Recreation and Leisure Facilities Management. However, an amalgamation of subjects in 2018 would have contributed to the observed increases in the review data and should therefore not be interpreted as having any other meaning.

In an overview of comments from Higher Education Institutions on the *Draft Report of the Department of Education on the Classification of Education Subject Matter*¹⁵ (2007), it was noted that commentators on the proposed new CESM Level 2 classifications were concerned that certain fields were no longer or not adequately covered by the revised CESM classification. These concerns included the following fields, which are relevant to this review: Agricultural Extension; Nature Conservation; Environmental Science and Environmental Management; Plant Ecology and Phytosociology. While these exclusions in the revised list were noted by the DHET, they were not reinstated in the revised fields of study when published in 2010.

Amalgamation of Technikon and University data

In addition to the CESM changes, it should also be noted that the 2000/2001 HEMIS data reported Technikon and University data separately. We assumed the HSRC amalgamated the Technikon and University data for the total Higher Education figure for the baseline. In 2018, HEMIS treated Technikon data as University data.

Assumptions used to derive the number of enrolments by specific fields of study

To derive equitable and comparable data between the HSRC baseline, the mid-way point of 2007, and the most recent records from 2018, the data had to be reviewed and assessed in terms of how it was categorised. This resulted in either amalgamating and/or assuming certain CESM categories fell within a recognizable yet distinct categorisation which allowed for data between the years to be categorised. E.g. courses falling into Agriculture & Renewable Resources, or Zoology & Animal Sciences. Appendix B shows how the different datasets were aligned with a useable set of amalgamated categories.

¹⁵ HESA (September, 2007). Overview of Higher Education Institutions on the Draft Report of the Department of Education on the Classification of Education Subject Matter. https://www.usaf.ac.za/wp-content/uploads/2017/07/2007_HESA_Report-on-CESM-Overview_Commentary.pdf

2.4 Employer survey: Sample and process

An online survey was conducted to gather information from employers and other stakeholders. The survey focused on 5 areas:

- Awareness of and involvement in the BHCDS
- Evaluation of the BHCDS' success and relevance
- Insights on the changing context over the past 10 years
- Recommendations for strategy improvements over the next 10 years
- To garner interest in the review findings, and/or attendance at the Mini Skills Summit.

The full list of questions asked in the Survey is in Appendix C.

The survey was conducted online using SurveyMonkey™ between September and November 2020. A database was developed by drawing on extensive lists of contacts provided by Rhodes University's Environmental Learning Research Centre (ELRC) and the review team members. In addition, a search via Google was undertaken to capture a broader spread of contacts, for example those involved in biodiversity-related businesses.

The questionnaire was emailed to a total of 945 individuals (approximately 320 organisations), of whom 174 responded in some form or another; from providing their name only, to full completion of the questionnaire. This is a 18.4% return rate which is usually deemed adequate, as is the 12.5% who provided enough information in their responses to contribute towards the analysis. The types of organisations surveyed included a broad spectrum of business / industry, government departments (national, provincial, local), civil society (e.g. NGOs) and academia / research associations¹⁶. A survey tracker was used to monitor the return rate and to inform the process of follow-up and re-engagement. Reminder emails were sent to improve the return rate. In addition, key individuals were identified and invited by telephone to complete the survey. Both these activities proved successful in ensuring key informants provided input, and a good diversity of organisations was represented in the results (Table 2.1). In a few instances, phoning individuals led to more in-depth interviews. Table 2.1 shows the number of responses received from different types of organisations (not the number of organisations - some organisations like SANBI and SANParks sent several responses).

¹⁶ See Appendix D for a list of entities to which the survey was sent

Table 2.1 Range of Organisations Responding to the Survey

NGO	29	responses from NGOs
Universities	21	responses from universities
Business	21	mostly consulting firms and wildlife industry
Provincial government	16	responses from provincial government
National government	11	mostly DEFF
Local government	6	
Foundations, Trusts	16	
SANBI	13	from a range of different positions and levels
SANParks	10	
Research institutes	12	(not SANBI or universities; some are affiliated)
SETAs	5	5 responses from 3 SETAs
Professional bodies	3	
Community association	1	
United Nations	1	
Self-employed and other	7	
Organisation Types Combined:		
NGOs, CBOs, Trusts and Foundations	46	
Government all 3 tiers	33	
Universities and research institutes	33	
SANBI and SANParks	23 (Govt + Parastatals = 56)	
Businesses	20	
SETAs and Professional bodies	8	
Other	8	

The majority of those who completed the survey were in senior and middle management positions (Table 2.2), suggesting that they would have a reasonable view of the field of biodiversity and what is needed with regard to skills and capacity development.

Table 2.2 Employment Levels of Survey Respondents

Senior executives:	67
(DDG, director, deputy director, CEO, COO, MD, etc)	
Middle management:	86
(research, HR and operational conservation managers)	
Entry level & office managers:	9

It was also important to consider the extent to which those responding to the survey had relevant knowledge to comment on the BHCDS itself. A question was included to establish level of familiarity with and involvement in the BHCDS (results in Table 2.3).

Table 2.3 Knowledge of the BHCDS among Survey Respondents

Some 16% (23 respondents) indicated that they were “very familiar” with the BHCDS. A further 40% (57) had some knowledge of it. Combined, 56% of respondents (80 people) knew (of) the BHCDS.

The remaining 44% (62 respondents) were not familiar with it. They were asked to skip questions pertaining to the strategy and answer only broader, sector related questions.

Around 46% of respondents stated they were “not involved” in the BHCDS. This means some 2% of respondents were aware of the BHCDS but not involved in it. Among these, some gave details of aligned activities they were undertaking in their organisations.

2.5 Case Studies

2.4.1 Selection criteria for case studies

Based on the need to contain the mid-term review to what was practically manageable within timeframe and budget while at the same time achieving its purpose, the following criteria were applied in the selection of case studies. This was done with the Review Steering Committee and included in the Inception Report; it was then further refined with GreenMatter when its evaluation was designed (see Section 1.3), in order to achieve synergy:

- Case studies should span the strategic objectives of the strategy (from Foundation Building through Bridging into Work, Higher Education Innovation, Organisational Strengthening and National Advocacy)
- Between them, cases should exemplify different ways in which different organisations (e.g. WWF, DEA, SANBI, SANParks, provincial conservation agencies, private employers, WESSA, Rhodes and other universities) have attempted to achieve these objectives and implement the BHCDS
- Include cases that can be regarded as successful in terms of being sustained over time (*Fundisa for Change*; Internships); and others than can be regarded as not or only partially successful, in that they have not been (fully) sustained (HRD Network; Higher Education Innovation; NESPF; National Environmental Skills Summits).
- Choose cases for which there is available data such as tracer studies and other evaluation reports (*Fundisa for Change* has been evaluated in several studies, as has *Groen Sebenza* and WWF internships); a meta-evaluation complemented with new interview data would optimally use and extend the existing studies.

The need to contain the scope of the review meant that some case examples that met the above criteria could not be included. The *Imvelisi Entrepreneurs* project meets the above criteria, but in the meeting with Prof Isaacs (see Section 1.3) it was decided that it would be evaluated by GreenMatter. GreenMatter findings will be referred to here, without repeating that evaluation.

The data for the chosen case studies are outlined next. Given the need for confidentiality in some instances, details of interviewees will not be disclosed.

2.5.2 Data sources for case studies

Internship Programmes

This case study used (i) secondary data, in the form of existing documented information, and (ii) primary data from interviews. Selection of informants was purposive and stratified to ensure representation of women and men; and mentors, interns and internship programme coordinators from the two programmes working in the public sector, NGOs and the private sector. We generated primary data with 13 people comprising:

- Two internship programme coordinators,
- Five mentors,
- One who has been both a mentor and an intern,
- Five former interns who are now employed.

National Environmental Skills Development Planning Forum

This case study also used (i) secondary data, which carries evidence of the work done by and/or to which the NESPF contributed, and (ii) in-depth interviews with four leading members of the NESPF. We shared the findings with the Review Steering Committee, who provided two rounds of feedback that were taken into account for amendments to the case studies.

Human Resource Development (HRD) Network

This case study, too, utilised two main sources of data: (i) in-depth interviews with five leading members of the HRD Network, and (ii) secondary data from documents, consisting of six HRD Network workshop reports and the toolkit produced in the HRD Network.

Fundisa for Change

This case study utilised three main sources of data: (i) an external evaluation report¹⁷ of the *Fundisa for Change* programme based on interviews with 12 active members of the programme and document analysis, (ii) notes on the interviews conducted for the evaluation, (iv) earlier evaluation reports of the programme ; and (iii) a self-evaluation report by four members of the *Fundisa for Change* Advisory Committee¹⁸. Against this background, there was no need for primary data generation.

2.5.3 Case study analysis framework

The case studies were analysed using the strategy evaluation approach introduced in Section 2.1. Table 2.3 shows how this approach was used to address the objectives of the review, as outlined in the Terms of Reference.

¹⁷ Mukute and Mandikonza, March 2020

¹⁸ Lotz-Sisitka, Misser, Malema & Dzhugudzha, June 2020

Table 2.3: Links between the review objectives and the five dimensions of strategy evaluation in the case study analysis

Review objectives (from the Terms of Reference)	Strategy evaluation approach (Patton & Patrizi, 2020)
1. Describe and contextualise the case study	Position/niche occupied by the case studied, and the systems that it seeks to influence, including how they have been evolving.
2. Conduct an analysis of the implementation process associated with the case study	Perspective , the values, principles, approaches, theories, methods and processes of implementing the case. Execution , which describes organisation of work, and financial resources invested to implement the case. Adaptation , the learning and improvements (adaptive management) that took place (and needed to take place) and how, in the course of implementing the case.
3. Evaluate the achievements and impacts of the case study	Effectiveness and impact , which discusses the outcomes and impact that have been generated as a result of the intervention.
4. Provide a set of recommendations on the way forward with implementation	Recommendations are shaped by attention to (a) perspective (a large area), (b) execution and (c) adaptation, as these comprise the implementation process.

2.6 Contextual Analysis

The contextual analysis was based on the strategy evaluation framework, in particular its elements of position, niche and perspective. It is referred to in Chapter 3, and in particular in Chapter 7, where recommendations regarding the continued relevance of the strategy are made. The list of documents reviewed for the contextual analysis (Table 2.4) was based on those recommended in the Terms of Reference, with some further additions.

Table 2.4: Documents Reviewed

BHCDS Strategy (SANBI and The Lewis Foundation, 2010) http://www.greenmatterza.com/uploads/9/1/5/3/91536866/biodiversity-hcds-august-2010.pdf	Chapter 3 and through-out
BHCDS 2015 Draft M&E Framework 2012	Referred to in Chapter 7
<i>National Biodiversity Strategy and Action Plan</i> (NBSAP) https://www.environment.gov.za/documents/strategicdocuments/national_biodiversitystrategy_actionplan and updated version (see DEA, 2015, below)	Chapter 3
<i>National Biodiversity Framework</i> (NBF) https://www.environment.gov.za/sites/default/files/gazetted_notices/nemba_biodiversityframework_g32474gon813.pdf	Chapter 3

DEA. 2015. <i>South Africa's Second National Biodiversity Strategy and Action Plan 2015-2025</i> . Linkd Environmental Services. Government of South Africa, Pretoria. https://www.cbd.int/doc/world/za/za-nbsap-v2-en.pdf	Chapter 3
<i>Environmental Sector Skills Plan</i> (DEA, 2010) https://www.environment.gov.za/documents/strategicdocuments/environmentsector_skillsplan	Referred to throughout
<i>White Paper on Science and Technology</i> https://www.dst.gov.za/index.php/legal-statutory/white-papers/2775-white-paper-on-science-technology-and-innovation . Published in 2019 it sets the general direction for South Africa's 10-year science plan. It underlines South Africa's success in growing a strong science system with a threefold increase in publications, significant growth in the participation of black people and women in the R&D workforce, and a rise in doctoral graduation rates. However, the country's science remains "not fully inclusive".	Chapter 7
An initial assessment of biodiversity related employment in South Africa Driver, Mukhadi & Botts, 2019; produced with the DPRU, UCT. africaportal.org	Chapter 3
Skills for Green Jobs – OneWorld https://oneworldgroup.co.za/wp-content/uploads/2018/10/20170915-ILO-Skills-for-Green-Jobs.pdf	Chapter 7
SANBI's Biodiversity Science and Policy Advice External Review - https://www.sanbi.org/wp-content/uploads/2018/12/Review-Report.pdf	Chapter 7
National Development Plan https://www.gov.za/issues/national-development-plan-2030	Chapter 3
Speeches past and current of the relevant minister, <i>White Paper on Post-School Education and Training</i> http://www.dhet.gov.za/SiteAssets/Latest%20News/White%20paper%20for%20post%20school%20education%20and%20training.pdf	Chapter 3, Chapter 7
<i>Groen Sebenza</i> Monitoring and Evaluation Report	Case study
National Employment Vulnerability Assessment (NEVA) study	Chapter 7
Sector Jobs Resilience Plans (SJRP)	Chapter 7
Nedlac (2018) Presidential Jobs Summit Framework Agreement http://nedlac.org.za/wp-content/uploads/2018/10/PRESIDENTIAL-JOBS-SUMMIT-FRAMEWORK-AGREEMENT-4-October-2018.pdf	Chapter 7
Unlocking Green Jobs in South Africa (DBSA, dti and TIPS, 2018) https://www.tips.org.za/research-archive/sustainable-growth/green-economy/item/3509-unlocking-green-jobs-in-south-africa-a-catalytic-intervention-synthesis-report October-2018.pdf	Chapter 3

The BHCDS review also drew on two reports produced in the GreenMatter evaluation, namely its Independent Evaluation Report (2020) and the Self Evaluation report (2020). The GreenMatter Self Evaluation included a case study of the *Imvelisi Enviropreneurs* project and the GreenMatter Fellowship (as well as another case study of the *Fundisa for Change* programme).¹⁹

¹⁹ See <http://www.greenmatterza.com/greenmatter-independent-evaluation.html>

3. RELEVANCE OF THE STRATEGY - KEY FINDINGS

3.1 Introduction to Chapter 3

This chapter reviews the relevance of the Biodiversity Human Capital Development Strategy as reflected in the published strategy (hereafter referred to as BHCDS, 2010), and as interpreted by the stakeholders consulted.

The framing for determining relevance, as guided by the strategy evaluation methodology, is to look at the position or niche of the strategy. As noted in Section 2.1, this focuses on what is done and the territory (landscape, space) in which it is done, as an important starting point for evaluators which directly speaks to relevance.

The following discussion is based on:

- Document analysis of the published strategy and related policies
- Data from the key stakeholder interviews
- The employer survey
- Analysis of current context using the documents listed in Table 2.4.

3.2 Policy Relevance of the BHCDS in 2010

The BHCDS comprises four strategic goals:

1. Increase the number of talented black South Africans attracted to working in the biodiversity sector²⁰
2. Improve the quality, levels and relevance of skills for the sector
3. Improve the retention and effective deployment of suitable individuals in the sector,
4. Create enabling macro-conditions for skills planning, development and evaluation.

Was a strategy with these goals relevant in 2010?

The BHCDS is positioned in published documents and in presentations as the confluence between a response to a policy framework and a priority identified through sector consultation. This suggests high relevance of the BHCDS, in both the policy sphere and the implementation sphere. This relevance has been confirmed by the present review.

South Africa's first *National Biodiversity Strategy and Action Plan* (NBSAP, 2005) was developed (between 2003 and 2005) as a requirement of the Convention on Biological Diversity (CBD), of which the country is a signatory (see Article 6 of the CBD, *General Measures for Conservation and Sustainable Use*). The NBSAP (2005) included a strategic objective (SO2) related to *institutional effectiveness* (p.80) with two strategic objectives:

²⁰ The biodiversity sector is described in the BHCDS (2010) as "all organisations involved in biodiversity conservation, research and management in South Africa" (p.iv) and as including conservation agencies, research institutes, national, provincial and local government, private companies and not-for-profits with a biodiversity mandate, responsibility or focus. There is a recognition that in some ways this applies to a very wide range of organisations, and the BHCDS further distinguishes between primary or core, secondary and tertiary biodiversity stakeholders, in alignment with the National Biodiversity [Implementation] Framework (BHCDS, 2010, pp.10-11).

- SO 2.1: *The biodiversity sector is transformed and representative of South African society.*
- SO 2.2: *Institutions with biodiversity-related responsibilities are effective and adequately capacitated.*

The NBSAP was taken further in the *National Biodiversity Framework* (NBF), which is a requirement of NEMBA (National Environmental Management Act: Biodiversity Act; Act 10 of 2004, Chapter 3). The NBF (published 2007/8, gazetted 2009) provided an implementation framework to *inter alia* coordinate and align the efforts of the many role-players involved in biodiversity management and conservation. It focused attention on the top priority actions and targets for biodiversity management and conservation for the period 2008–2013. Together, the NBF and the NBSAP formed the medium-term and long-range strategic plans for biodiversity management in South Africa. The relevance of the BHCDS in the policy context is evident in it being named in these strategic plans, as below:

4.2 SO 2: *Enhanced institutional effectiveness and efficiency*

Twenty-year objective: *Enhanced institutional effectiveness and efficiency ensures good governance in the biodiversity sector.*

Of the *Top Priority Actions* for 2008 to 2013 [numbering as per gazetted NBF, p.48], Action 7 is: *Establish and implement a human capital development strategy for the biodiversity sector to address transformation and scarce skills.*

The indicator for success was: *A national human capital development strategy for the biodiversity sector reflecting specific employment equity targets for all key research and implementing agencies in the sector, has been developed and is being implemented.*

From the perspective of national government, therefore, the strategy was a gazetted strategic objective and highly relevant.

3.3 Broader Biodiversity Sector Relevance in 2010

The NBSAP (2005) and NBF (2007/8/9) arguably reflect the priorities of government and the scientists who inform such policies, as well as guidelines like the Convention on Biological Diversity. What did other sectoral stakeholders including civil society prioritize? In 2008-2009 a stakeholder consultation was undertaken on behalf of the Lewis Foundation²¹, to determine what role-players with conservation interests regarded as top priorities. This consultation was to inform a more strategic and impactful use of the Lewis Foundation's resources. It concluded that *capacity development* for biodiversity was a key priority for role-players in the sector. The Foundation engaged the South African National Biodiversity Institute as part of these consultations. SANBI was mindful of its HCD-related policy directive as outlined in the NBSAP and NBF, and found in the Lewis Foundation a partner with a shared interest in capacity development and transformation of the sector's skills base. This led to the development of the BHCDS, positioned within SANBI and funded in the first

²¹ <https://thelewisfoundation.co.za/>

instance by the Lewis Foundation. The strategy was shaped by the NBSAP/NBF framework, both in terms of how it was named (i.e. referenced to human capital development, rather than skills or capacity development), and where it was focused (on transformation and scarce skills at a graduate level, with a view to strengthening the effectiveness of organisations in the core sector).

Beyond these policies and perspectives that are ‘internal’ to the biodiversity sector (as defined) it is instructional to consider South Africa’s *National Development Plan 2030* which, despite some internal inconsistencies, has been widely regarded as a reflection of South African society’s needs. The National Development Plan²² is clear that (a) there is a need to strengthen the capacity of the State to act more successfully on its given mandates, (b) skills (developing, upskilling and reskilling) are a critical part of building governance capacity, (c) civil society and government need to work together, and (d) environmental protection is important, for society and economy. The Plan aims to eliminate poverty and reduce inequality by 2030, by “drawing on the energies of its people, growing an inclusive economy, building capabilities, enhancing the capacity of the state, and promoting leadership and partnerships throughout society” (p.24).

In conclusion then, based on this analysis, the BHCDS was a highly relevant initiative, both from a policy perspective and from a wider sector perspective.

3.4 Position of a multi-agent strategy in SANBI with the Lewis Foundation

Was the positioning of the BHCDS with SANBI appropriate? SANBI was not the only public entity named in the NBF in relation to the BHCDS and associated strategic objectives. The NEMBA, NBSAP and NBF were published by the (then) Department of Environment Affairs and Tourism (DEAT²³) as the national department which funds SANBI (as well as other public entities including SANParks, the South African Weather Services and provincial environmental departments and conservation agencies). The NBF named a number of “lead agents” for its strategic actions (2009, p.14), including DEA itself, but also the Department of Water Affairs and other public entities. For the BHCDS’ establishment and implementation, the NBF lists SANBI as the first of the “lead agents²⁴”, followed by others namely (p.14):

SANBI, DEAT, SANParks, provincial conservation authorities, tertiary education institutions, relevant SETAs.

Hence the positioning of the BHCDS with SANBI as a lead agent was clearly appropriate, but it is also noteworthy that it was a lead agent, rather than a sole agent. It is therefore also appropriate that the BHCDS was positioned as a partner-based strategy during implementation (see Section 4.3).

²² *National Development Plan 2030: Our future - make it work*. Office of the Presidency and the National Planning Commission, 2012, www.gov.za

²³ Name changes are explained in Chapter 1.

²⁴ The Departments of Education and Labour (now the Department of Basic Education and the Department of Higher Education and Training) were not mentioned.

At the same time its “implementation architecture” (BHCDS, 2010, p. 70) was to be funded by the Lewis Foundation for the first three years of implementation, and “housed by SANBI”. Was its funding by the Lewis Foundation appropriate? Here it is worth briefly reviewing the Lewis Foundation’s position with regard to the BHCDS.

The Lewis Foundation was in 2008 better known for funding smaller projects, with a strong focus on wildlife conservation and animal welfare. The Trustees recognised that the Lewis Foundation had accrued a significant endowment that it could use more strategically for conservation priorities. Following stakeholder consultation, the Trustees made the decision to fund the development of the BHCDS and its first three years of implementation. In the sense that the Foundation thus supported a national initiative with a policy mandate and the participation of numerous individuals and organisations (including further contributions in kind or in funds raised from elsewhere) the BHCDS was an appropriate investment for the Foundation.

Whether the broad perspective of the BHCDS, beyond wildlife conservation and animal welfare, and a strong policy derived focus, sat well with the Lewis Foundation, is further worth considering. Similarly, whether SANBI as a public entity had the perspective for this and other partnerships in implementing the strategy, is an important consideration that speaks to position, but also to perspective.

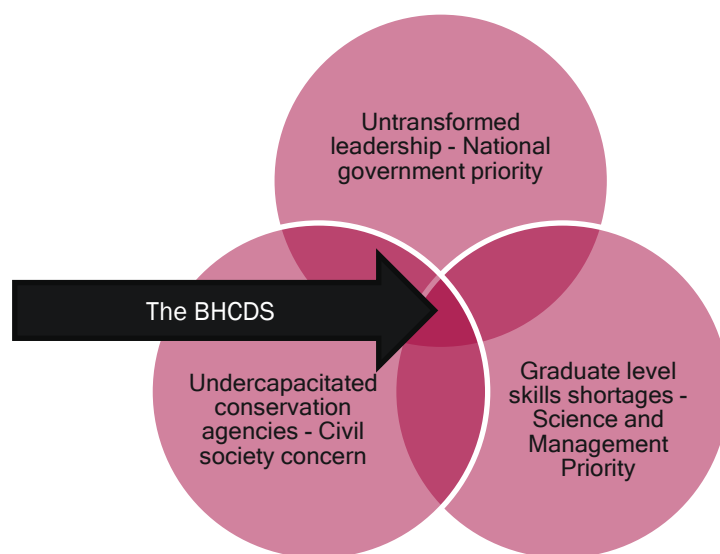


Figure 3.1 Position of the BHCDS in overlapping institutional priorities

Next, we explore the particular niche that this strategy fulfilled in terms of the scope and focus of its strategic objectives and in relation to other initiatives. This is an elaboration on the position and hence the relevance of the BHCDS.

3.5 Niche in relation to other Skills Strategies in 2010

The BHCDS was positioned, in the strategy document (BHCDS, 2010, p.5) and in presentations to stakeholders at National Environmental Skills Summits, as “aligned” with and complementary to other environmental skills-related strategies developed at the time. The Environmental Sector Skills Plan (DEA, 2010) was broader, and its lead agent was

DEA, but the two strategies also shared a focus. The Department of Science and Technology developed the Global Change Grand Challenge (GCGC), with an associated HCD strategy. ACCESS (the Applied Centre for Climate and Earth Systems Sciences) was established, with support from the DST and the National Research Foundation (NRF), to attract graduates into that field of study and work. ACCESS is a “consortium of agencies, researcher councils, research programmes, universities and research groups who have combined efforts to deliver a range of outputs aligned to the GCGC” (www.access.org). DST further developed a number of ‘road maps’ to guide capacity development in areas like waste management and green economy innovations. The Department of Water Affairs had over time invested in various skills strategies to address chronic water-related skills shortages. For that reason, the BHCDS (and the ESSP) intentionally did not cover water-related skills needs.

It was noted that many sectors were competing with the environmental sector for a relatively small pool of black South African school leavers with the academic background to undertake graduate studies that require mathematics and science (as many biodiversity qualifications do). These sectors, such as Finance and Accounting, had for years invested in focused ‘wrap-around’ HCD strategies to attract, nurture and deploy talented individuals.

While on the one hand one could question whether the country or at least the environmental sector could afford so many graduate-level strategies for the environmental sector, it was argued that the environmental sector was diffuse, in some ways not a sector at all (Vass et al. 2009), and that a certain level of focus (e.g. on biodiversity) was necessary in order to effectively ‘compete’ with these other, more focused sectors (such as the financial sector). At the same time, alignment among the various environmental skills or HCD strategies would be necessary to avoid duplication and competition that environmental agencies could ill afford. This will be explored further in relation to how the strategy was conceived and implemented (Chapter 4) and in recommendations (Chapter 7).

Here it is also important to note that after extensive deliberations on the scope of the BHCDS, it was decided that the term “biodiversity sector” should be avoided, and the strategy should address skills needs “for biodiversity”, given that organisations across sectors (including in industry and local government, for example) require biodiversity-related skills. Nonetheless, the BHCDS refers to primary, secondary and other organisations; and the NBF refers to “all key research and implementing agencies”.

3.6 The 2020 Context and the Relevance of the BHCDS

This section casts an eye to the current policy context and to recent assessments on the state of biodiversity, as well as the economy²⁵. What insight do these provide on whether the BHCDS is still relevant?

The National Development Plan, with its 30-year horizon, and its calls for strengthening government and government capacity, still applies. The Plan 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*

²⁵ The contextual driver analysis is taken further in Chapter 7.

*Climate Change Adaptation Strategy*²⁶. 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”*²⁷

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. The National Biodiversity Assessment (2018²⁸) 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. Other studies that support this assertion include Maia et al. (2011); this Green Jobs report indicated that, due to South Africa’s extensive natural capital, job creation in natural resource management holds the biggest potential for green jobs 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. It is important to note, however, that these environmental practices cross elementary, intermediate and high skills levels; while the BHCDS has a focus on high-level skills. See “Focus on high skills” in Section 4.2.1, for the argument the BHCDS made regarding the relevance of a high-skills focus for unlocking jobs.

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

The Global Sustainable Development Goals (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, 15: clean water for all; climate action; life below

²⁶ https://www.environment.gov.za/mediarelease/nationalclimatechange_adaptationstrategy_ue10november19

²⁷ <https://www.sanews.gov.za/south-africa/sa-works-create-new-inclusive-economy>

²⁸ www.sanbi.org/wp-content/uploads/2019/10/NBA-Report-2019.pdf

water; life on land). The IPBES²⁹ Global Assessment (2019³⁰) concluded that nature in all forms is undergoing a dramatic decline, with one million species at risk of extinction by 2050.

Other global reports suggest that South Africa must attend to biodiversity as a critical dimension of ecosystem services: 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 revised NBSAP (2015-2025³¹) has retained a strategic objective that speaks directly to skills and transformation:

- *SO5. Conservation and management of biodiversity is improved through the development of an equitable and suitably skilled workforce*

The NBSAP (2015-2025) refers directly to the role of the BHCDS, SANBI and The Lewis Foundation, as well as GreenMatter, and presents a Strategic Objective (5) that:

“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).

The NBSAP (2015-2025) further states that: “*GreenMatter is largely donor-funded, which is not sustainable and national level coordination is required to help identify and address blockages preventing the effectiveness of HCD initiatives. Priorities for the NBSAP include the ongoing implementation of the BHCDS, the development of an effective and sustainably funded national level coordinating mechanism for capacity development, and the development of improved mechanisms to effectively evaluate HCD initiatives*” (ibid).

In the revised NBSAP (2015-2025) the role of coordinating national biodiversity HCD is shifted towards the DEA and the National Research Foundation (NRF), with SANBI in a support role, as evident in the extract from the 2015 document in Table 3.1.

²⁹ 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 global assessment report (IPBES, 2019) was the first global assessment of biodiversity since the Millennium Ecosystem Assessment in 2005.

³⁰ <https://ipbes.net/global-assessment>

³¹ DEA. 2015. *South Africa's Second National Biodiversity Strategy and Action Plan 2015-2025*. Government of South Africa, Pretoria. <https://www.cbd.int/doc/world/za/za-nbsap-v2-en.pdf>

Table 3.1 NBSAP (2015-2025) indicators, targets, activities and agencies for the BHCDS

5.1 Macro-level conditions enabled for skills planning, development and evaluation of the sector as a whole				
INDICATOR	An effective national mechanism is in place and capacitated to coordinate national HCD strategies and priorities	TARGET	By 2016, cross-partner mechanism in place	
	A monitoring and evaluation programme is in place		By 2017, M&E framework and evaluation initiated	
	The BHCDS programme of implementation is funded		By 2020, funding support to increase from an average of 2% per annum to at least 30%	
Activities		Lead	Support	Priority
5.1.1	Incorporate the Human Capital Development needs of the biodiversity sector into national skills development systems (e.g. NSDS, DHET and SETAs)	DEA	SANBI	High
5.1.2	Develop an effective national mechanism for coordinating biodiversity and other green skills capacity development planning, initiatives and skills intelligence, within the sector and sectors impacting on biodiversity management.	DEA (through NESPF)	SANBI, NESPF, DST, DWS, DBSA, DPME	High
5.1.3	Develop and/or integrate existing mechanisms for the monitoring and evaluation of BHCDS initiatives	DEA (through NESPF)	SANBI, NESPF, DST, DWS, DBSA, DPME	High
5.1.4	Ensure that national strategies receive adequate funding support	DEA	Treasury, DST, Provinces,	High

We return to the relevance of implementation agencies in Chapters 4 and 6. In Chapter 7, we further review new drivers in the sector in order to inform recommendations for the future positioning and implementation of the BHCDS.

3.7 Survey Responses on the Relevance of the BHCDS

The review consulted employers and other biodiversity stakeholders through an online survey as outlined in Section 2.4. Although the survey did not ask respondents directly whether they thought the BHCDS was a relevant strategy, several were of a view that it was.

Firstly, in relation to a question as to why they became involved in the BHCDS, if they did, 46 respondents gave reasons that speak directly to the reasons for establishing the BHCDS, as follows:

Summary (total responses = 46)

The most common reasons ³² for getting involved with the BHCDS were:

- To **influence the availability of skills** needed by organisations or businesses in the sector (17 responses – 37%)
- To **fulfil a given mandate** or because they were involved in developing the BHCDS (15 responses – 33%)
- To **promote racial/gender transformation** in the sector (10 responses – 22%).

It would seem that these respondents became involved with the BHCDS in an effort to influence skills and transformation in the sector, reflecting a sense that these were necessary for sustainability of their own organisations and the sector more broadly.

When respondents were asked to describe current features of their organisational context that might have bearing on the BHCDS, their responses (see Table 3.2) reflected challenges that speak to the BHCDS' continued relevance:

³² Other reasons for getting involved were: Having experienced value in skills development programmes (5 responses); a sense of obligation to "pay back" for personal opportunities received (3 responses), to learn and share learnings (3), to help align the training offered by the organisation to sector needs (3), and to promote inclusive development and the green economy more generally (2).

Table 3.2 Survey Responses Regarding Current Organisational Contexts

Current organisational contexts relevant to biodiversity skills development as identified by survey respondents
<ol style="list-style-type: none"> 1. Shift of student enrollment away from biodiversity research and towards areas with more employment/career opportunities (such as data and computer science, climate) 2. Many promising junior staff are lost due to perceived lack of opportunities for growth 3. Continued loss of expert knowledge 4. Lack of permanent positions 5. Moratoria on filling of new posts 6. Staff “are not able to deliver on their critical workload objectives, and train new incumbents, as additional workload is added to scientists as incumbents leave and the posts get frozen, and work ‘realigned’ to those who remain behind.” 7. Bureaucratic processes around HR and the public sector administrative system 8. Lack of long-term funding, unstable funding situation (including higher education subsidies, shrinking government grants and budget allocations) 9. A move towards private-sector led initiatives 10. COVID-19 related challenges

The organisational challenges reflected in Table 3.2 indicate that challenges that require a BHCDS, still remain. Whether the BHCDS had any success in reducing these challenges over the past 10 years, as intended, is discussed in Chapter 6 (Outcomes and Impact).

3.8 Summary of Findings on Relevance of the Strategy as Developed

The BHCDS was found to be relevant from a national policy perspective in the sense that it responded to a clear mandate; it was written into the gazetted National Biodiversity Framework (2009) which in turn drew its mandate from the National Biodiversity Act and the National Biodiversity Strategy and Action Plan (NBSAP) of 2005. When the NBSAP was revised in 2015, the BHCDS again featured, indicating that it was still relevant, although the agencies listed as lead agents changed. In the current consultation with stakeholders the BHCDS also emerged as relevant, both then and now. This was evident in survey findings.

However, from the key informant interviews (Chapter 4) there were also some concerns about the *scope* of the strategy, for example:

- The BHCDS was perhaps too *narrowly* framed (focusing on biodiversity only, and graduate level skills only), making it harder to fund and find implementation support for it;
- The BHCDS was perhaps too *broadly* framed, making it harder to give it focused attention and show progress.
- While there are merits to a longer-term initiative, particularly when issues are systemic and protracted in nature, a 20-year planning horizon may have been too long. In the past ten years some issues have stayed the same, some have been amplified and new urgent actions have become apparent, that could have been prioritised in a five - or 10-

year strategy. A shorter period may also better maintain the momentum to deliver and monitor progress.

Finally, the BHCDS was positioned as a policy directive, and neither legislated nor funded by government. Thus the sector, SANBI and implementation partners had to continue fund raising for the BHCDS, rather than implement it with a dedicated fiscal endowment. This may explain why the revised NBSAP (2015-2025) positioned DEA (now DEFF) as the lead agent for the BHCDS; this will be an important consideration for the way forward.

The next chapters review the manner in which the strategy was implemented (Chapters 4 and 5), and its outcomes and impacts (Chapter 6). Chapter 7 follows with a detailed review of new drivers in the sector, thereby shaping recommendations for the future positioning and implementation of the BHCDS.

4. PERSPECTIVE, APPROACH & METHODOLOGY - KEY FINDINGS

4.1 Introduction to Chapter 4

While the broad relevance of the BHCDS' position and niche is evident from Chapter 3, it is also important to consider whether the approach and methodology of the BHCDS were appropriate. These aspects relate to what the strategy evaluation framework refers to as the *perspective* of the strategy, that is, *how* something is done and the manner in which a programme works with its participants and partners (Patton & Patrizi, 2011, p.13). This starts to speak to Objective 1 of the review (see Table 1.1), which is to review the implementation process. The implementation process is also further reviewed in Chapter 5.

This chapter contributes to the review through the following questions:

- What is the *perspective* of the BHCDS, as reflected in its principles, strategic objectives and theory of change? Here the *systemic* approach emerges as a key feature of the strategy, in relation to the skills pipeline, a broad definition of transformation, and the integration of biodiversity management and societal development. The manner in which the principles were addressed in the strategic objectives of the BHCDS, and the theories of change that link them, will be reviewed.
- What is the *approach* promoted by the BHCDS, as also reflected in its principles and in its institutional arrangements? Here the *catalytic and partnership approaches* emerge as key features.
- What is the *methodology* that was followed? This section will explore *the implementation architecture* of the BHCDS in some depth.

The data sources for this chapter are as follows:

- ... documents
- ... key stakeholder interviews
- ... case studies
- ... survey responses
- ... GreenMatter Evaluation Reports.

4.2 Perspective reflected in principles and objectives

4.2.1 Principles of the BHCDS

This section of the review draws on the BHCDS document (2010, pages 8-15) and diverse findings from the review. By examining what the principles of the BHCDS are, it allows an immanent critique, that is, for evaluating implementation against the strategy's own (qualitative) benchmarks. This is a form of principle-focused evaluation, nested within the broader strategy evaluation framework used in the review.

A systemic approach

The BHCDS document notes that the strategy is based on a systemic approach to capacity development. This is contrasted with a linear perspective which is said to be associated with the terms 'human capital' (with reference to Vass et al. 2009) and 'skills pipeline'. The theory of human capital development implies investing in the qualification levels of a population as a means to stimulate economic growth. The BHCDS used the term, but was explicit that it did not share this perspective on HCD; instead of economic growth its goal is "to better meet biodiversity goals" (BHCDS, 2010, p.8). Furthermore, instead of just focusing on individuals' qualification levels, its perspective is also on the system as a whole and on the *quality* of skills. The reason for this perspective was explained in terms of four problem analyses that underpinned the strategy. These studies (Vass et al. 2009³³; Rosenberg et al. 2009 a³⁴, b³⁵, c³⁶) 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 (BHCDS 2010, p.12). 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 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

³³ 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.

³⁴ 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.

³⁵ 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.

³⁶ 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

further education. The BHCDS argued that these factors could not be ignored. This argument 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 of a systemic approach and a holistic, long-term initiative like the BHCDS, 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 would address the challenges of a systemic approach, and enable the benefits to be achieved.

Overall, a systemic approach *is* reflected in the range of initiatives undertaken (Section 5.2). However, a deeper analysis of which initiatives were sustained over the 10 years and which were not, including the GreenMatter Independent Evaluation, suggest 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. 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 (see Chapter 7) which could also assist with maintaining coherence and focus.

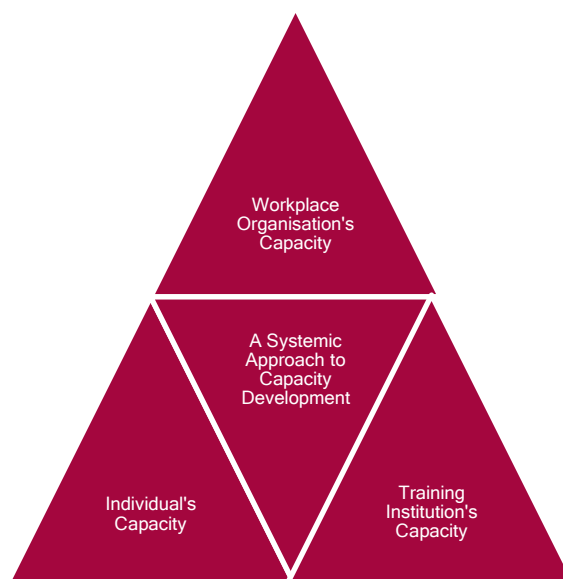


Figure 4.1. A representation of the systemic perspective of the BHCDS (2020, p.9)

A “joined-up” approach

The BHCDS (2010, p.12) argues that “the ‘pipeline’ from primary school to professor or CEO” of a biodiversity organisation is long, and also permeable, with many “socio-economic, cultural and historical factors” affecting the success or failure of the individual who may eventually contribute to the success and transformation of the sector, or not. 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, then the undergraduate bursary is '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.

Section 5.2 suggests that the range of BHCDS initiatives does reflect this joined-up principle. The GreenMatter Fellowship, for example, largely focusses 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 these 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 (GreenMatter Independent Evaluation Report). 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 also have been fewer instances of joining up supply-side initiatives with demand-side initiatives. This will be discussed further in Chapter 5 and Chapter 7.

Focus on high skills

This aspect of the BHCDS could be contended, as it excludes direct support to those with lower skills levels, who might arguably need more support. The BHCDS does however argue that it needs to be realistic (p.13) and 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 (see Figure 4.2).

It is also at the higher skills levels where the sector was struggling to compete for black staff. At entry-level positions, the biodiversity sector was already providing work to many black South Africans (e.g. as labourers and service staff in protected areas, or through temporary employment in the Expanded Public Works Programmes, where EPWPs with a natural resource management focus were the best sustained among all the EPWPs). The argument is that higher-level skills in biodiversity agencies would unlock many more employment opportunities³⁷ which would then also benefit lower-level skills with more employment

³⁷ As outlined by Maia *et al.* 2011 (*ibid*)

opportunities. The *Groen Sebenza* programme made the same argument to the National Jobs Fund (see Case Study 5.3.2). Chapter 6 reviews the achievement of this impact.

A focused approach

The BHCDS argues that it needs to be focused in order 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 overcomes the binary by arguing that it needs to be “clear who the primary participating organisations for the strategy ideally are ... to ensure that they do in fact participate” (2010, p.13). This is a sound principle, further illustrating the realistic perspective. 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).

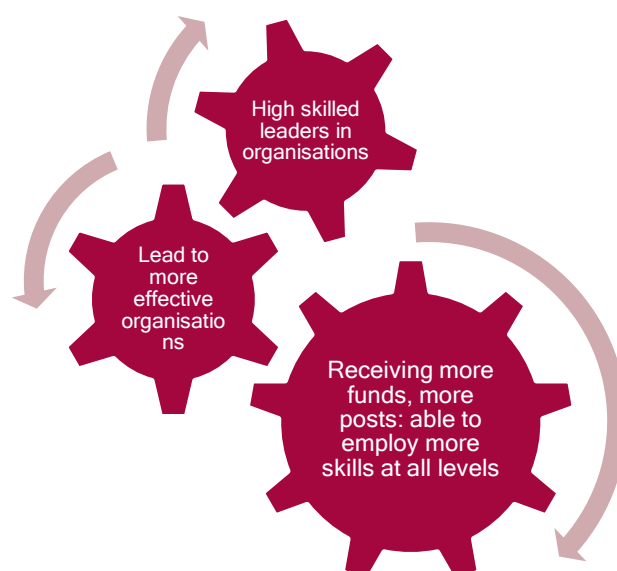


Figure 4.2 Theory of Change associated with investing in high skills

However, when the spread of initiatives over time is reviewed (Section 5.2), it suggests that 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). In contrast to the intent to focus on key organisations, the implementation phase over time did not engage provincial agencies, museums, herbaria and others with known capacity issues on a significant scale. Given the systemic 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).

A realistic approach

The BHCDS (2010, p.13) states that the strategy “needs to make a material difference in the sector. It cannot simply be a paper strategy”. This was coupled to the availability of funding for implementation. The commitment from the Lewis Foundation to fund the first years of implementation (2011-2013), including staff who could do further advocacy and fundraising, in order to sustain implementation beyond 2013, was key in mobilising stakeholders behind the strategy, given that in 2009 there *were* existing capacity development initiatives that were regarded as inadequate. Ten years later, however, some contributors to this review suggested that the *level* of available investment was not adequate (realistic) to sustain stakeholder involvement and achieve the ambition of systemic change (as flagged in the previous paragraph). This is discussed further in Section 4.2.3 and Chapter 7; Section 4.4.2 presents a basic analysis of the funding model.

Promoting articulation

The BHCDS (2017, p.14) states that it aims to articulate at a number of levels with other complementary agendas and initiatives. This is essential within a systemic approach.

The intended articulation with the country’s *overall development agenda* is evident in particular in relation to the BHCDS’ youth-directed initiatives, in that they contributed to youth development and supported youth into employment. The *Groen Sebenza* and WWF internships programmes (case study in Section 5.3.2) are examples, as is the *GreenMatter Fellowship* and the Bridging into Work programme led by WWF (Section 5.2). 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 is evident in the bursaries provided through the GreenMatter Fellowship, in that they have been formulated to address priority areas, rather than randomly distributed; there is also some but limited articulation with other funding agencies. Numerous attempts have been made to articulate with the Departments of Basic Education, Higher Education and Training, and SETAs’ sector skills plans (see Case studies 5.3.1 and 5.3.4).

The BHCDS perhaps most strongly articulates with South Africa’s agenda on racial transformation, as most bursary and other youth development opportunities benefit black South Africans. This is discussed further under “Seeking multiple transformations”.

With regards to other HCD strategies, the intention to complement and articulate with these was evident, mostly in relation to the Environmental Sector Skills Plan (ESSP) and less so in relation to DST’s GCGC 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 (see 5.2.3) but at the level of awards for excellence, it may not fully translate into articulation. During the development of the BHCDS the DST was engaged for collaboration in relation to the Global Change Grand Challenge HCD Strategy implementation, and GreenMatter has made further attempts during implementation 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). The GCGC includes initiatives around Marine Science and the Bioeconomy, and it would be worth working together in setting targets and monitoring their achievement.

Another aspect of articulation is for sector organisations to develop internal HCD strategies and to align these with the BHCDS. 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 (discussed further in Chapter 6). SANBI developed an internal HCD strategy in alignment with the BHCDS. In 2011-2012, there were efforts to develop an internal HCD 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 DEFF is purportedly currently developing a biodiversity focused HCD strategy, it has not been shared into this review as in alignment with the current BHCDS.

An innovative approach

In 2010 the BHCDS itself presented an innovation in the sector, through the ‘marriage’ between a public entity (SANBI) and a private donor (the Lewis Foundation); as well as the partnership approach which was at that point not common at the scale (C.A.P.E.³⁸ perhaps being a comparable prior initiative, and *Groen Sebenza* taking it further). In bringing scientific research entities and scientists together with civil society organisations and capacity development specialists in the same research entities, 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. Such transdisciplinary boundary-crossing initiatives are heralded as an important strategy to address systemic challenges. However, in a context in which there is no to little experience with such initiatives and many structures that mitigate against them, they do require ongoing advocacy to

³⁸ C.A.P.E. (Cape Action for People and the Environment) was one of the first significantly funded programmes with a strong capacity-development focus in South Africa’s biodiversity sector; it was funded by the Global Environmental Fund and implemented through a multi-partner methodology in the Western and Eastern Cape biomes. It had a strong coordination base in SANBI.

articulate what they may mean in practice, by one or more 'lead agencies' in the system who understand the nature of the innovation.

Although work continued to articulate transdisciplinary perspectives and methodologies (e.g. the Green Skills programme with SETAs, and associated research projects) the review encountered limited evidence that the innovative aspects of the BHCDS are being successfully carried forward in implementation.

Building on existing strengths

The strategy aims to build on existing HCD initiatives, bringing innovation, scale and greater articulation to them. This principle has been successfully applied in the case of Bridging into Work initiatives, where they built on experience and lessons learnt regarding internships, mentoring, skills needs and organisational challenges, in the C.A.P.E. (*ibid*) 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.

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), the BHCDS initiatives seemed to gain less traction, as evident in the map of BHCDS implementation initiatives (Section 5.2, Table 5.1): those initiatives focusing on internships and supporting new entrants into the sector have been most successfully scaled up and sustained, while those focusing on organisational strengthening have not continued.

Being transformative in execution

The BHCDS aims to be transformative in its execution as well; this is explained (2010, p.14) as an intent to select stakeholders, advisors and project staff with a view to equity and the opportunity to build skills. This principle has been applied, e.g. project executants, GreenMatter staff and GreenMatter Board members have been predominantly women and black South Africans. Both the Lewis Foundation and GreenMatter started to employ interns as well.

Seeking multiple transformations

The BHCDS seeks three dimensions of transformation. It explains that (i) racial transformation, while a priority, is not the only dimension of transformation being pursued. The other two are (ii) transformed approaches to conservation and biodiversity management (potentially informed by new entrants into the sector with a wider scope of perspectives) and (iii) transformation in "the way in which organisations function, in order to render them more effective in achieving their mandates" (p.14). The BHCDS' 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" (p.52) reflects these multiple dimensions of transformation.

The complex mandate (reflected in the NEMBA, NBF, NBSAP, CBD 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.

Promoting shared ownership

This principle states that while SANBI has been positioned as the agency to lead the development and coordinate its implementation, several others were named in the NBF, and indeed the strategy should “belong to agencies across the sector” (p.15). It is suggested that this could be achieved through:

- Sector-based development of an ongoing nature
- Promotion of the strategy through pro-active communications
- Shared means of implementation.

This 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. The case studies (Chapter 5) showed a sense of shared ownership, to a greater or lesser extent, as well as a strong shared implementation of these initiatives.

Promotion of the BHCDs seems to have fallen away somewhat over time. While programmes such as the GreenMatter Fellowship or WWF Environmental Leaders programme have still been well promoted and communicated, these promotions over time presented them less as related to an overarching strategy. There have been no notable communications about the BHCDs itself (such as newsletters, reports or events) in recent years. This may explain why 44% of survey respondents who completed the questionnaire indicated that they “had never heard of” the BHCDs; and an even bigger portion of the 945 individuals surveyed (87.5%) returned the questionnaire with no responses on BHCDs related questions - only their name.

4.2.2 Strategic objectives of the BHCDs

In the BHCDs document (pp.52-55) the relationships between the strategic vision, goals and objectives are presented. They hang together coherently, are aligned with the chosen principles; and the document convincingly makes the case for these being the most strategic objectives, with reference to the research and consultations that informed it (Vass et al. 2009; Rosenberg et al. 2009a, b, c). The strategic objectives reflect the systemic perspective of the BHCDs; they also clearly speak to the strategic goals (Chapter 3) and vision, although

there is not a one-to-one relationship between them; some SOs intentionally address more than one strategic goal in what is then a non-linear, potentially recursive and self-reinforcing approach. The seven strategic objectives are listed below with the strategic goals to which each objective contributes, in brackets.

SO1 (Promotion: Attraction and meta-conditions): Promote the biodiversity sector among key decision-makers and all South Africans especially black South African school leavers, students and graduates, and leaders in the national skills development system, as a sector with a strong vision of transformation and opportunities for fulfilling work that contribute to the national development agenda.

SO2 (Up-skilling) Extend existing capacity: Improve the skills of those already in the workplace, and underqualified or under-skilled, in a manner that contributes to social equity, a sense of belonging and pride in the sector.

SO3 (Retention) Improve retention and effective deployment of suitably skilled people in the sector through organisational design, skills planning, development and human resource development processes.

SO4 (Skills provision) Increase the relevance and quality of educational provisions by a wider range of HEIs (higher education institutions) and other training providers, in a manner that will improve pass rates and entry into post-graduate studies.

SO5 (Skills provision) Contribute to better science, mathematics, literacy and environmental learning in schools with adequate management capacity

SO6 (Meta-conditions) Increase the impact of the collective effort of HCD initiatives relevant to the sector, through articulation (connecting initiatives) and promotion.

SO7 (Skills provision) Increase the supply of scarce skills through targeted higher education in initiatives in priority areas identified through ongoing needs analyses.

Comparing the strategic objectives with the systemic perspective of the BHCDS indicates that all seven have some system building intention; that there is a balance between developing *demand* for biodiversity skills and conditions for better using them, on the one hand, and on improving the quality and relevance of the skills *supply* on the other; and there is a dedicated objective for *coordination* (SO6) in order to create synergy and increase the impact of activities that address the other objectives. It reflects an ambitious strategy for deep systemic change.

In Chapter 5 it becomes clear that the execution of the strategy started with a balance of supply, demand and coordination initiatives. It would appear that those initiatives that received more partner and funding support, and lasted longer, address the supply side, rather than demand or coordination. However, on close scrutiny these 'supply side' initiatives - the *Fundisa for Change* project, *Groen Sebenza*, GreenMatter Fellowship and other internships initiatives - also potentially have system and demand building dimensions; the *Imvelisi Enviropreneurs* project perhaps less so, unless it develops a more strongly articulated advocacy dimension. In Chapter 6 (Outcomes and Impact) the review will explore the extent to which these aspects have been successfully addressed thus far; they are also summarised in the Executive Summary.

4.3 The partnership approach

4.3.1 Overview of Some Key Partnerships

The BHCDS positions itself as a partnership-based strategy. A review of the strategy document and archive of records as well as key informant interviews indicate that this approach has been evident from the start. The research and consultations that informed the strategy were guided through the early stages by the partnership between SANBI and the Lewis Foundation, and many organisations showed a willingness to contribute to the consultation, with the promise of a long-term funding partner for capacity development in the sector being a significant drawcard. Working Groups were established, out of which several new partnerships emerged and existing ones were strengthened.

The Stakeholder Map in Appendix E graphically illustrates the identified partners and partnerships in the implementation of the BHCDS.

The partnership between SANBI and the Lewis Foundation was formalised with a memorandum of agreement in which the Lewis Foundation agreed to fund the first three years of strategy implementation (2011- 2013); the agreement was later extended. A steering committee was established with representatives of the lead partners (but did not remain in place). There was also an intention to establish an advisory group with members from the wider sector (see Section 4.4 and Figure 4.3), but while there is evidence of preparations done towards this, the planned sectoral advisory group was not established. *Thus a potentially important mechanism for maintaining links with a wide range of biodiversity stakeholders, was missing from the implementation process.*

In the first years of implementation, contractual partnerships were established with Rhodes University and WWF (World Wide Fund for Nature), who led the first implementation initiatives (Foundation Building - Rhodes University; Bridging into Work; Organisational Strengthening - WWF), with a significant part of their remits being advocacy to help grow the number of partners in the BHCDS. The Stakeholder Map in Appendix E indicates that these organisations did have or establish a variety of partnership connections which were used to situate the implementation initiatives (such as Fundisa for Change and the Work-integrated Learning projects) among a range of new partners, including other universities and other NGOs.

While the private sector participated through e.g. internship placements (in partnership with WWF) few private sector entities have participated more fully in implementation thus far, as evident in the Stakeholder Map. The consulting company NCC (Nature Conservation Services) became a notable implementation partner, as did the Endangered Wildlife Trust.

Partnerships were key to the *Groen Sebenza* project, which required 47 organisations including the Wildlife and Environment Society of South Africa (WESSA), small NGOs like Gondwana Alive! and others to sign contracts with SANBI under the stipulations of National Treasury for this Jobs Fund project, committing themselves to mentor unemployed youth and eventually employ them permanently. Some of these partnerships had been established in earlier SANBI GEF (Global Environmental Fund) initiatives like the C.A.P.E. programme mentioned in Section 4.2.1. More informal partnerships between implementing stakeholders also seem highly significant. WWF's Environmental Leadership programme (case study in

Section 5.3.2) drew on the organisation's partnerships with civil society, government and business, some of which were developed through BHCDS initiatives. *Lead partners and project executants brought their partnerships to the BHCDS 'table', and the BHCDS helped to strengthen and extend these. This seems to be a significant outcome.*

The partnerships between the lead agencies in the BHCDS and the ESSP (who were stakeholders in both initiatives) have endured: DEA's Sector Education, Development and Training Unit has financially and in kind supported a number of BHCDS implementation initiatives including the HRD Network (Case study 5.3.3) and the National Environmental Skills Summits, complemented with contributions from the Lewis Foundation; DEA still supports *Fundisa for Change* (Case study 5.3.1) and the National Skills Planning Forum (Case study 5.3.4). Rhodes University also remained a partner, playing a pivotal role in ensuring the sustainability and impact of *Fundisa for Change*, a product of both the Environmental Sector Skills Plan and the BHCDS, and significantly strengthened by this dual 'home'. Other universities participated and benefitted, e.g. through participation in *Fundisa for Change*, the GreenMatter Fellowship, the Work-Integrated Learning and Career Guidance initiatives, but to a more limited (short-lived) extent and degree; no university other than Rhodes has thus far *led* an implementation initiative. Wits University's Centre for Researching Work and Learning (REAL) became a national lead (with Rhodes) in the Green Skills Programme, which (like *Fundisa for Change*) had a broader remit than biodiversity, but which is highly relevant for the strategic system building objective of the BHCDS.

The HSRC is included in the Stakeholder Map as an example of a potentially valuable implementation partner which made a contribution at some point, but did not continue its involvement. The HSRC conducted the baseline research for the BHCDS (Vass et al., 2009), but due to mostly cost considerations, did not feature in further research, or evaluation during strategy implementation. The HSRC research was complemented by a range of 'quality and relevance' studies by Rosenberg et al. (2009a, b, c) which were funded by DEA in the partnership with Rhodes University, which in 2008-2009 conducted the stakeholder engagement and research that resulted in the Environmental Sector Skills Plan. The partnerships with Rhodes and DEA (now DEFF) have continued into the present, both contractual and non-contractual, and have been an important context for implementation of *Fundisa for Change*, the National Environmental Sector Skills Plan and *Green Skills* projects, all of which have broader remits than biodiversity.

The partnership-building benefits of linking to broader environmental initiatives was also evident in the *Imvelisi Enviropreneurs* project, which expanded the BHCDS activities to the water sector and resulted in a relationship between GreenMatter and the Department of Science and Innovation, the Water Institute of South Africa (WISA) and its Young Water Professionals initiative (YWP-ZA), and the Water Research Commission.

4.3.2 Partnership Gaps

Whilst the BHCDS initiative managed to build cohesion and bring partners together, some stakeholders are asking whether the partners brought together were the right partners and whether the choice of partners was appropriate for such an ambitious undertaking.

In answering this question, the starting point is an appreciation of the level of ambition expressed in the vision and strategic goals of the strategy. The achievement of these at a

systemic level requires coordination and management of a complex set of inputs and influences that cannot be confined within the bounds of any one sector. With this in mind, a view of some interviewees is that a more inclusive and expansive approach was required. For instance, it may seem that some of the so-called secondary stakeholders were not actively engaged. The list below indicates where attempts to engage secondary partners have been successful, and where they have not:

Some successful partnerships:

- Private sector (although the NCC participated actively, and corporates hosted interns in partnership with WWF)
- Water Research Commission (became a partner through the *Imvelisi Enviropreneurs* and the *GreenMatter Fellowship*)
- Department of Basic Education (advocacy engagements in *Fundisa for Change* over an extended period of time resulted in DBE now being a project partner and serving on its Advisory Committee, with DEFF and others)

No partnerships:

- Department of Water Affairs
- Department of Agriculture
- Agricultural Research Council
- Mining industry
- Department of Mineral Resources, and
- Ministry of Defence.

Local governments in South Africa are often difficult entities with which to partner, and this is also evident in the BHCDS. However through *Groen Sebenza* a number of municipalities participated in and benefitted from the BHCDS implementation. Some smaller municipalities (two in the Free State being a specific example) were for the first time enabled to deliver on their biodiversity mandate through the placement of *Groen Sebenza* “pioneers”. Metros such as Nelson Mandela Bay, Tshwane and Midvaal also participated in this programme.

There was a risk of pursuing sector cohesion in a manner that leads to inwardly focused relationships and the development (or perpetuation) of an insular network. A more expansive view of stakeholders that goes beyond the *sector*, but that rather focuses on the *ecosystem* for biodiversity human capital development may have resulted in a wider reach and more impact. The latter focus could have allowed, amongst others, for the involvement of organisations whose focus and specialty are on capacity enhancement, leadership development and culture change broadly, all of which are critical elements for the system change and organisational strengthening that the BHCDS seeks to achieve. Industries using and/or impacting on biodiversity services and products, e.g. the mining and chemical industries are another group still absent from the BHCDS implementation. While the review was tasked in finding out why some organisations with a clear biodiversity remit did not participate in the BHCDS, we have not been able to obtain the necessary data on this.

4.3.3 Partnership Brand - GreenMatter

The first director of the BHCDS Programme was based at SANBI (2011-2012). Other BHCDS Programme “core staff” including a fundraiser and communications & 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 & business development lead appointed by them, to develop a cause or partner brand. The brand “GreenMatter” (Figure 4.4) 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 the implementation of the BHCDS, 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 BHCDS. The strategic intention of a programme that was “for the sector and by the sector” was over time



less and less evident in practice, even before the “GreenMatter staff” with the Lewis Foundation’s support formed an NPC (Not-for Profit Company) in 2017. This development is discussed next, with further reference to the partnership approach of the BHCDS.

Figure 4.4 The GreenMatter logo initially developed as a partnership brand

4.4 Implementation architecture (methodology)

4.4.1 Description of the implementation architecture

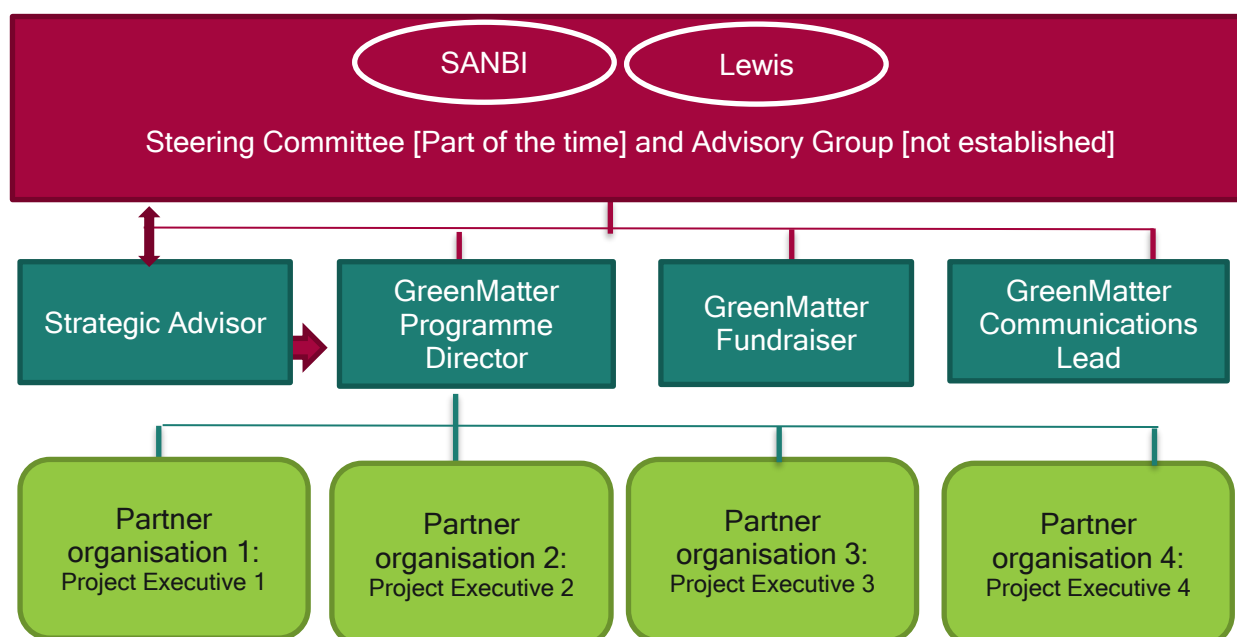


Figure 4.5 Intended implementation structure for the BHCDS (Adapted from: BHCDS, 2010, p.70)

Figure 4.5 is adapted from the BHCDS document and is a mix of what was intended and what transpired. Most notably, the Advisory Group was not established, and the Steering Committee was not consistently in place, although a Joint Management Committee (representing SANBI and the Lewis Foundation) was. Over the years there were two programme directors, and two fundraisers, and they were not consistently in position either.

The 2010-2013 period saw high levels of goodwill, enthusiasm and ‘can-do’ associated with the widespread sector support and the opportunity to make a significant difference. There were multiple lines of interaction between the organisational and individual role-players, and often divergent perspectives and expectations from those coming from government, corporate and academic backgrounds. The various skills sets and experiences in the ‘transdisciplinary’ hub made for a rich and vibrant project ideation environment, but the associated tensions also needed much mediation.

The third row from the top in Figure 4.3 represents the implementation partners who were to lead the roll-out of the strategy in the sector, with projects aligned to the BHCDS framework conceptualised, initiated and funded either by themselves or the Lewis Foundation (usually both). The first project executants were Rhodes University and WWF, with EWT, the NCC and a range of consultants also providing funded implementation support. Executants were chosen to lead projects in which they had experience, for example, the WWF project executant drew on her internship, mentoring and ‘organisational strengthening’ experience in the C.A.P.E. programme. Rhodes University was appointed as project executant for the Foundation Building project *Fundisa for Change* based on its experience in teacher education, and it brought its partner network and links with DEA, DBE and DHET to the role.

Both WWF and Rhodes were influential in conceptualising the respective projects they led, and both further fundraised for the initiatives, as was intended. However, these role-players in implementation also had an expectation that through the BHCDS there would continue to be some core funding and/or coordination and advocacy support, rather than for the projects they were leading to become largely their responsibility to sustain.

The core BHCDS team in the middle layer (what came to be known as “GreenMatter”) had the task to extend the number of projects and executants with more core funding, that they would raise, with a view to also sustain itself once the Lewis Foundation started to phase out the core funding. There was also an expectation that the sector partners would take responsibility for providing or raising project funding themselves (sometimes leading to contrasting expectations among role-players).

The Lewis Foundation also expected SANBI to carry more of the financial responsibility, and to fully take over implementation support once the three-year memorandum of agreement had run its course. SANBI had identified the development and implementation of the BHCDS as a key lever to deliver its HCD mandate. However, SANBI did not initially have funds to carry out the implementation of the BHCDS which has been an unfunded policy directive rather than a legislative mandate. Thus, while SANBI expressed a strong commitment to capacity development, with its CEO driving the establishment of the BHCDS, it had no initial budget allocation from DEAT/DEA/DEFF for executing the policy directive. (See Section 4.4.2 for more on the funding model).

The GreenMatter team found themselves in a high stakes situation with divergent expectations from their funder and sector organisations that were challenging to meet. For example, they experienced difficulties in finding suitably capacitated sector partners willing and able to take up lead implementation roles, and few donors willing to fund coordination without implementation. The GreenMatter team became project executants of the *GreenMatter Fellowship* and later took up an implementation role in the *Imvelisi Enviropreneurs* project. The Lewis Foundation funding had a limited lifespan, and sector organisations knew they eventually had to sustain projects themselves. That is, the funding was to be catalytic, as reflected in the mission statement of the Lewis Foundation:

“Guided by our board mandate of conservation and animal welfare as defined in the Deed of Trust, we provide catalytic financial support to strategic initiatives, leveraged through collaboration and partnerships”. <http://thelewisfoundation.co.za>

This meant that the GreenMatter team also had a big ‘advocacy’ role to keep partners on board, and to show the value-add there would be for individual organisations, by taking on BHCDS initiatives. Chapter 5 suggests that few significant new partner leads were mobilised, beyond the initial project executants; most notably the Department of Science and Technology as the funder of the *Imvelisi* project (GreenMatter Self Evaluation Report, 2020).

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 current team does mainly project management for three 'flagship' projects, the *GreenMatter Fellowship*, *Imvelisi Enviropreneurs* and *Fundisa for Change*. The GreenMatter entity is therefore at the time of this review at a cross-roads in terms of its future configuration and this also puts the BHCDS at a cross-roads in terms of its implementation architecture.

4.4.2 The Funding Model

The funding model of the BHCDS alluded to above 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. Table 4.1 reflects the Lewis Foundation's funding inputs over time. 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.

Table 4.1 Core Funding from the Lewis Foundation 2009-2020

Implementation	Datum	Funding	Application of Funds
Year 0	2009	R1 000 000	Strategy development (prior to implementation)
Year 1	2010	R1 825 000	Core, catalysing programmes, director recruitment
Year 2	2011	R3 471 901	Core, catalysing programmes, fundraiser and communications recruitment, team building
Year 3	2012	R7 866 618	Core, catalysing programmes
Year 4	2013	R7 525 790	Core, catalysing programmes, recruitment of new director
Year 5	2014	R7 436 000	Core, catalysing programmes, stakeholder consultation on directions for GreenMatter
Year 6	2015	R8 889 153	Core, catalysing programmes
Year 7	2016	R8 879 764	Core, catalysing programmes, governance and strategy, resource mobilisation capacity development
Year 8	2017	R6 690 000	Core, catalysing programmes, GreenMatter NPO/NPC registration
Year 9	2018	R5 600 000	Core, catalysing programmes
Year 10	2019	R2 558 580	Core, catalysing programmes
Year 11	2020	R2 899 491	Core, catalysing programmes and additional funds to boost against COVID-19 impacts
Core funding total		R63,642,298	Excludes strategy development

Was the Lewis Foundation investment successful in catalysing additional resources?

The amount raised by the GreenMatter team was not available at the time of completing this report. It is also important to consider that this fundraising was to be done, and would always be most successful, in partnership with sector organisations which had the projects, standing and experience in the sector that the GreenMatter team perhaps lacked. Thus it is not necessarily easy to attribute certain amounts raised, to certain agencies and not others.

Considering the funding sources of the GreenMatter Fellowship may be useful for comparative purposes. They are given in Table 5.2 (data sourced from the GreenMatter Self Evaluation Report, 2020).

Table 4.2 Funders of the GreenMatter Fellowship Bursaries (2012-2020)

Funding Source	
The Lewis Foundation	35
Water Research Commission	16
Other	31
Total Number of bursaries 2012-2020	82

The Fellowship's model is to supplement the bursary with mentoring and networking opportunities and the development of relational skills to access employment opportunities. This value-addition was funded by the Lewis Foundation. The bulk of the funding for this GreenMatter flagship initiative was therefore from the initial funder, with a limited return on investment as the Fellowship has not significantly been scaled up or scaled out over the nine years (GreenMatter Independent Evaluation Report, 2020). 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.

When looking beyond GreenMatter to the sector as a whole, it seems that base BHCDS funding was effectively leveraged in other cases. For example, Table 5.2 (in the next chapter) shows that sector partners continued with and started new initiatives beyond the Lewis Foundation's catalytic programme contributions. Table 4.3 shows that SANBI made a contribution of around R465 million to the BHCDS in the same period, including funds raised either on its own or in partnerships, mostly to continue initiatives started as part of the BHCDS.

Table 4.3 SANBI Funding Contributions (2010-2020)

Initiative	Amounts contributed or raised by SANBI for BHCDS initiatives
Careers Programme for Universities	R300 000
Careers Programme for Schools	R900 000
Groen Sebenza 1	R300 000 000 (Treasury/National Jobs Fund)
Groen Sebenza 1	R75 000 000 (partner contributions)
Groen Sebenza II	R8 000 000 (DEA/DEFF funding)
SANBI internship programmes	R9 070 696 (not Groen Sebenza)
Work-integrated Learning	R3 987 600 (partner contributions)
WWF Internship Programme	R566 295 (SANBI contribution)
Postgraduate student bursaries	R47 898 553
Training for Assistant Education Officers & interns (e.g. from Gauteng Department of Agriculture & Rural Development, City of Tshwane, South African Agency for Science & Technology Advancement)	R18 760 800
TOTAL (2010-2020)	R464 483 944

The *Fundisa for Change* programme (case study 5.3.1) and *Groen Sebenza* (case study 5.3.2) 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 (Table 4.4) sector partners raised R46.41 for *Fundisa for Change* (excluding considerable in-kind contributions, e.g. project development, implementation and advocacy time of university-based teacher educators).

Table 4.4 Fundisa for Change Funding

Contribution and Source	Amounts	Ratio
Lewis Foundation catalytic funding	R3,450,000	1
Partners' financial contributions and further funding raised for research, implementation, advocacy and coordination	R46,409,130	13,45

A number of points should be considered:

- GreenMatter and the Lewis Foundation also contributed to the partners' leveraging of additional funds for *Fundisa for Change*, especially when GreenMatter had a fundraiser³⁹ who worked with sector organisations on funding proposals. Project partners indicate that they however undertook the bulk of the fundraising. Rhodes University on its own (for example) raised R3 million for the programme during 2013-2016.

³⁹ GreenMatter no longer has a fundraiser.

- Significant funding is available for human capital development.
- This funding was raised not solely for the BHCDS, but in partnership with DEA/DEFF and in alignment with the Environmental Sector Skills Plan (as the programme also gives expression to the ESSP objectives). This gave Fundisa for Change a *broader framing* than biodiversity, which allowed for partners with interests in water (like the Department of Water and Sanitation) and climate change (VVOB for the Government of Flanders) to support the Foundation Building initiative that ultimately also benefits biodiversity.

4.5 Analysis of the Implementation Architecture and its Implications

4.5.1 Reflection on the Implementation Architecture and Funding Model

The ability to fundraise and increase the resources available for biodiversity human capital development is dependent on a number of factors. There has been a strong expectation from both sector organisations and the Lewis Foundation that investment in GreenMatter was an investment in the sector's capacity to leverage more resources. The salaries of the GreenMatter director and later CEO, fundraiser and communications and marketing team were significant, precisely because of the high expectations of what they would deliver, and in recognition that this would not be an easy task.

The absence of an Advisory Group representing the sector and the opportunities it could have offered, was a further shortcoming in implementation, as it could have assisted the GreenMatter staff and the BHCDS programme 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.



Figure 4.6 Implementation structure, reflecting the implementation methodology

Interviews suggested that the initial institutional mechanism that was established to coordinate the implementation of the BHCDS 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 exist 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. This is an indication that 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, real and/or imagined opportunities to pursue their missions and achieve their goals. When some or all of these expectations were not met, the result in this case was a search for an alternative institutional design that promised to remedy the perceived weaknesses, whilst at the same time 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 Lewis Foundation has been a key principal agent providing significant funding to the BHCDS, through the MoA with SANBI (2011-2013) and funding for the BHCDS development and implementation, and then for and through GreenMatter. The Lewis Foundation signalled intent to withdraw as an organisational host of GreenMatter in 2012/13, and committed increased funding for three years (2013-2015; see Table 4.1) but also indicated the need for partners and in particular the GreenMatter team to leverage further funding to ensure sustainability.

GreenMatter therefore had a reasonable (although clearly short-term) funding base from which to raise further funds, not only to sustain its core staff, but also to support sector initiatives, at the same time giving attention to high level advocacy and coordination. From 2017 this model involved the NPO to raise funds and channel them to sector partners for implementation of the BHCDS, whilst retaining responsibility for reporting back to donors as the main recipient of the funds. This *principal-agent* arrangement proved unworkable. For example, it was reportedly difficult for GreenMatter to hold sector partners accountable for the delivery of outputs and submission of reports. The *principal-agent* dilemma⁴⁰ 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

⁴⁰ 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.

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.

When GreenMatter started to operate as a NPO and increasingly engaged directly in implementation, this further affected its role within the sector. Some organisations began to view it as more of a competitor for limited funding than a partner. Its coordinating and advocacy role, which had already been reducing, seemed to wane further. Key role-players interviewed perceived no impact by GreenMatter towards the BHCDS' strategic goals over the past 5 years. The former director /then CEO departed in 2019, amid tensions around the extent to which he and his team had succeeded in attracting more funding for the BHCDS, or at leading sectoral advocacy and system building.

GreenMatter support to some projects was then greatly reduced. 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 of the BHCDS is concerned; 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.

4.5.3 Strengths of the Implementation Architecture

Interviews with key role-players suggest that the development and implementation of the BHCDS produced a unity of purpose and practice amongst biodiversity sector role-players and a renewed commitment to human capital development. It initially managed to enhance and spur collaboration on this subject which had not existed before. While biodiversity sector role-players regularly collaborate around biodiversity related matters, e.g. science or management, they seldom do so around capacity development. Through the BHCDS, biodiversity sector role-players got to know each other and what each was doing more intimately. Some of the networks and collaborations that were created have continued despite the growing absence of structured and systematic coordination.

The interactions that took place during the development of the BHCDS and thereafter resulted in the sharing of lessons within the sector, which amongst other positive consequences, contributed to the formation of structures such as the National Environmental Skills Planning Forum (Case study 5.3.4). Chapter 6 will also provide evidence of progress on skills delivery and mentoring capabilities available to the biodiversity sector following the development and implementation of the BHCDS. Issues of transformation in the sector are firmly on the agenda with different role-players focusing on this, with clearer guidance on how to address it, and more skilled young people to draw on. There is also increasing appreciation of the importance of the bio-economy to national development, and Groen Sebenza has created a lasting legacy, evident in several government initiatives that are now funding follow-up phases, with the job creation connection featuring strongly.

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.

4.5.3 Weaknesses of the Implementation Architecture and Funding Model

Reconfiguring GreenMatter as an independent NPC, responsible for raising its own core funding as well as supporting a sector-wide initiative, perhaps made it difficult for it to focus on coordination and networking. As GreenMatter started focusing more and more on raising funds for its own programmes, in competition to sector role-players that it was supposed to coordinate, the result was a weakening of its ability to coordinate and mobilise the sector to come together on human capital development. However, there could also be other reasons for its limited achievements. These are put forward here given the need to potentially consider an alternative implementation architecture for the BHCDS.

The core investment in salaries and running expenses from the Lewis Foundation (Table 4.1) considerably outweighs the salary and running expenses budget of a university-based director or professor. Yet an NRF-funded Chair (professor) at Rhodes University is able to raise around R80 million over five years above the core investment into salaries and running expenses, some R2-R2,5 M per annum of this amount being for bursaries for post-graduate study (i.e. around 15 PhD bursaries per annum). This fundraising is done in addition to teaching, research, programme management and advocacy in the field. The contribution from the GreenMatter team by comparison is (based on the Fellowship example and in the absence of other figures) much less.

However, the SARChI chair leverages funding in the context of an institutional home with dedicated financial management and HR functions, a research office, funded staff to help implement projects, and an established brand name. Moreover, this fundraising capability (including track record and networks) was developed over a 30-year period. The GreenMatter team has had to deliver a similar "return on investment" in a shorter space of time and without the benefit of an established institutional home (although several organisations could have provided such a home). GreenMatter also did not form strong and lasting connections with partner organisations which could have given them better institutional leverage (as was done by sector partners in the case of *Groen Sebenza*, or *Fundisa for Change*). The Fellowship and perhaps other GreenMatter initiatives, remained isolated from the sector - including the wider environmental sector - and this could have been a significant reason for not being able to raise more funding.

Having to rely on continuous fundraising for implementing a strategy aimed at system building is undoubtedly challenging. Government recognised this and in 2015 the NBSAP stated that:

"GreenMatter is largely donor-funded, which is not sustainable and national level coordination is required to help identify and address blockages preventing the effectiveness of HCD initiatives. Priorities for the NBSAP include the ongoing implementation of the BHCDS, the development of an effective and sustainably funded national level coordinating mechanism for capacity development, and the development of improved mechanisms to effectively evaluate HCD initiatives" (ibid).

Another limitation of the implementation architecture is certainly that planned structures such as a Steering Committee and an Advisory Board, were not put in place by the two principal

partners and the agent, GreenMatter. This meant that the Lewis Foundation had perhaps a disproportionately large role in the implementation of the BHCDS, a role in which it had no prior experience or systems in place to implement a programme of this complexity and size.

4.6 Summary of findings on perspective and implementation methodology

The findings underpinning Chapter 4 of the review suggests 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 10 years of implementation.

An exploration is needed as to whether the positioning of this capacity, as first a cause brand and eventually an NPC, was appropriate. Some key stakeholders strongly indicated that it would have been better situated within a sector organisation, while others also indicated the drawbacks (such as limited ownership) associated with one single entity being seen as the custodian of the national strategy. Any one organisational home will have some strengths and some drawbacks; e.g. a government home may have credibility but limited flexibility and a high compliance load; an NGO may have more flexibility but less credibility. These stereotypes are however not inevitable.

Chapters 5 and 6 elaborate on the various roles and contributions of partners, and the extent to which a coherent implementation drive nonetheless emerged, or not.

5. EXECUTION - FINDINGS ON IMPLEMENTATION

5.1 Introduction to the chapter

The Terms of Reference of the mid-term review required **an analysis of the implementation process** including an overview/map of the initiatives, projects, partnerships, institutional and governance arrangements that have given effect to the BHCDs implementation process. Institutional and governance arrangements were reviewed in Chapter 4. This chapter will focus on implementation initiatives, projects and partnerships.

The chapter describes how the BHCDs was executed through a range of activities (shorter-term projects and longer-term programmes and networks). The guidance from the Terms of Reference was that the review should describe what was done, with a time line, the names of the initiatives, projects, networks, how they were executed, and by whom. Selected case studies were undertaken to explore the implementation methods and processes in more depth. Presenting the cases and the detail required by the ToR makes for a lengthy report, and some details were left out in order to make the document less unwieldy. Some of the information that is not included may well be regarded as important, and should be flagged (with good reason) by stakeholders, in the R&R section (Section 5.7). The same applies to corrections to details that may be inaccurate.

Here we refer to some achievements, as well as some implementation challenges, but the outcomes and impacts of these initiatives are reviewed in full in Chapter 6. Following the selected case studies, we analyse the implementation activities for their relevance and alignment with the strategy principles; and the scope of the participating organisations involved in implementation. Chapter 3 dealt with the relevance of the intended strategy as a whole, while this chapter deals with relevance of activities undertaken. Chapter 4 focused on the spread of lead partners, while Chapter 5 reviews the wider range of organisations involved in implementation.

The data sources for this chapter are the ...

- ... BHCDs programme archive of data and reports
- ... key stakeholder interviews undertaken for this review
- ... case studies undertaken for this review
- ... employer survey undertaken for this review
- ... GreenMatter Independent Evaluation Report 2020
- ... GreenMatter Self Evaluation Report 2020.

5.2 Overview of initiatives, partnerships & associated arrangements

5.2.1 Implementation over Time

Table 5.1 maps the start and continuation or end of projects, programmes and formal networks established or supported as part of the BHCDs strategy development and implementation. Basic details of these initiatives are then reviewed, with a focus on the partners involved, the implementation methodology and budget sizes where available.

Outcomes and Impacts are discussed in Chapter 6, but some mention of their sustainability will also be made here.

Table 5.1 BHCDS Implementation Initiatives 2010-2020 with 2009 Working Groups

Initiative	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
NESPF /Skills Forum*	WG											
NESS / Skills Summit												
HRD Network*	WG											
GreenMatter **		BHCDS	BHCDS						NPO status			
Fundisa for Change*	WG											
WWF internships*												
GreenMatter Fellowship**												
Groen Sebenza*												
Imvelisi ** Enviropreneurs												
Higher Education Innovation	WG			Study done								
Work-based Learning												
Career Guidance	WG											
Green Skills Programme												

Key 1 - the main strategic focus of the initiative (some address more than one strategic focus)

Coordination and Advocacy	Organisational Strengthening - Retention, Upskilling
Youth - Access & Quality of Skills	System building & Quality of skills

Key 2 - initiatives with stars were case studies in this review", or in the GreenMatter Self Evaluation**

Key 3 - WG represents working groups that were established in 2009 during the aligned development of the BHCDS and the Environmental Sector Skills Plan, through stakeholder consultations led by DEA, Rhodes University and the SANBI - Lewis Foundation partnership.

Notable is the establishment of sector-wide working groups that were established during the consultations for the development of the strategy; as in the case of the Environmental Sector Skills Plan development, these working groups created considerable momentum and often resulted in the formation of projects that were taken into the implementation phase (e.g. HRD Network, Fundisa for Change; Careers Group). In addition to the implementation initiatives, a number of research reports were commissioned and produced to further inform implementation (following the research conducted by the HSRC and Rosenberg et al. for the development of the BHCDS). These implementation-focused reports included:

- Leakages and Blockages in the University Human Capital Development (HCD) Pipeline
- Internship Survey report

- Biodiversity Leadership Programme Report
- Priority Skills Report,
- Higher Education Innovation Report, and
- Monitoring and Evaluation Frameworks (for individual programmes, like the Universities Career Guidance Initiative with WWF, and the programme overall).

It is further of interest to consider the extent to which the implementation projects were being driven and funded by GreenMatter and the Lewis Foundation, or by partners. Table 5.2 shows a sample of three productive years, in which 10 initiatives were underway.

Table 5.2 Portion of initiatives funded by Lewis versus Partners

Year	Initiatives funded by Lewis Foundation	Initiatives funded by others
2012	9	1
2015	8	2
2018	4	6

Another significant observation from Table 5.1 is that:

- the number of BHCDS initiatives grew over time
- most of them were sustained for the duration of the 10-year period
- a popular perception that activity has tapered off, is therefore not accurate.

What can be observed, is that more of this activity is being driven by sector stakeholders than by the GreenMatter team, despite the GreenMatter team receiving the bulk of the core funding, as indicated in Table 4.2.

5.2.2 NESS (National Environmental Skills Summit)

NESS is the National Environmental Skills Summit. The prototype of this event was the launch of the BHCDS in 2009, which brought biodiversity role-players together to discuss capacity development, perhaps for the first time. The first summit titled NESS, which convened the same biodiversity role-players along with broader environmental sector and other relevant stakeholders, was held in March 2011; the second in September 2012; the third in March 2015; and the most recent, a 'Mini Environmental Skills Summit' in March 2018. These events were funded by the Lewis Foundation and DEA, with the Lewis Foundation funding tapering off over time and the relative contribution from DEA increasing. The budget per event varied considerably but peaked just below R1,000,000.

At the start the BHCDS Programme initiated the Summit, and until 2015 GreenMatter was a lead partner in convening it, with DEA, Rhodes University and later Wits University also assisting in hosting. The NESS brought together around 200 participating individuals and organisations per event including SETAs, provincial environmental agencies, organised labour, a limited range of industries (including mining), training providers, NGOs and more. It presented a unique opportunity for biodiversity and other environmental agencies, as well as skills agencies, to come together around capacity and skills development for the sector. The purpose was in particular for the various HCD strategies and programmes started in 2010, and associated initiatives and partners, to review and share progress; identify remaining challenges; and co-design plans for the way forward. It therefore had both a monitoring and

evaluation role, and a coordination and advocacy role. NESS reports indicate that each event was concluded with the conclusion that: coming together like this is important; it needs to be done again/ more often; and, *participation should be extended to more organisations* who also should be role-players in this space. Unfortunately, as Lewis Foundation support and GreenMatter's coordinating capacity reduced, and no other agency committed adequate resources to drive the process, the event was not held every second year as envisaged. The 2020 event will be held in March 2021 over two days on an online platform (due to the COVID-19 pandemic). Its focus will be the BHCDS review outcomes and recommendations (this report). The Lewis Foundation has committed funding towards its organisation and follow-up deliberations.

Summits served as opportunities to launch and distribute resources, especially when these were accompanied by a presentation or workshop to mediate the resources into use. DEA often supported the printing of such resources.

The National Environmental Skills Planning Forum was an outflow of the ESSP and the BHCDS and complemented the Summits. It is reviewed as a case study (Section 5.3.4).

5.2.3 GreenMatter Flagship Projects and Advocacy

The BHCDS programme staff in 2012 took on the partner brand name of GreenMatter, as explained in Chapter 4, and started with implementing projects, at the same time as they were appointing field-based executants to lead Lewis Foundation-funded projects with other partners. A project conceptualised as a flagship for GreenMatter was the Fellowship, which is reviewed in depth in the GreenMatter Evaluation Report.

Coming on stream as early as 2012, and sustained since then, it consisted of post-graduate full bursaries and short course programmes in scarce skills areas, with additional value-add for bursary recipients ("fellows") in the form of mentoring and networking opportunities and communication skills development. Fellows were groomed as ambassadors for the sector and the theory was that they would both serve as advocates for the sector, and help to unlock further resources (e.g., they would speak with passion and clarity and launch events, to which potential new funding partners would be invited). The Fellowship funding and implementation drew on a range of partnerships, many generated by the Lewis Foundation, e.g. the Hans Hoheisen Trust, the Harry Crossley Foundation, Inyathelo, Nedbank and the Mapula Trust. The Cannon Collins Trust initially provided a bursary management system.

In nine years a total of 175 graduates and young professionals have benefitted from the programme, of whom 132 are black. All recipients as well as hosts or employers (e.g. SANParks) spoke highly of the initiative when questioned. One critique from the GreenMatter Independent Evaluation Report is that the Fellowship has not yet been taken to scale. Changes in the NRF's funding regulations, and COVID-19 related funding cuts, may make post-graduate funding even harder to come by. Another critique, confirmed in the Self-Evaluation Report, is that there is no tracking system in place, to track where Fellows go after they exit the programme, and whether they are playing the envisaged advocacy role for the sector. This seems like a good opportunity not optimally used, and could be related to GreenMatter's loss of capacity over time, and/or lack of attention to the strategic goals. Over

time, advocacy may have become more about supporting fundraising, than about supporting the sector, for reasons outlined in Section 4.5.

The second flagship project that GreenMatter initiated and is still implementing is the *Imvelisi Enviropreneurs* project, which is also reviewed in the GreenMatter Self Evaluation and referred to in the Independent Evaluation. This initiative (2015 - ongoing) extended the BHCDS partnerships into the water sector through the YWP-ZA (Young Water Professionals of South Africa) and the Water Institute of Southern Africa (WISA), the Department of Science and Technology (now DSI) as the funder, and the Water Research Commission among a large number of contributors including, University of Johannesburg, SAREBI, GreenCape and the Innovation Hub. A GreenMatter intern provides programme support in tandem with the YWP-ZA. The programme has benefitted a smaller number of individuals, supporting them with the ideation phase of enterprise development through boot camps and sessions at the Innovation Hub. The ideation phase of business development is presented as a current gap, and indeed ideas for biodiversity related businesses could potentially be highly transformative. Critiques have been the small number of participants thus far, and a reported failure to connect participants, following the ideation phase, with other initiatives that can assist with taking a concept into a viable business, and help to sustain it, since these phases are also known to be very challenging. The COVID-19 pandemic forced the boot camps to go online and according to the GreenMatter Self Evaluation Report, this could lead to implementation innovations.

The *Fundisa for Change* programme started in 2011 and is one of the longest running initiatives that GreenMatter has supported, with a funding, project management and coordination role that shifted over time. The project is reviewed as a case study (Section 5.3.1). From 2011-2013 partners raised in the region of R10 million, some R2.2 million of which was contributed by the Lewis Foundation through SANBI. Rhodes University has been the lead implementing agency and the number of partners involved is a notable feature, along with its longevity, its relevance to the Foundational Building Strategic Goal of the BHCDS (and the broader ESSP). Chapter 7 shares national impacts (of this and other advocacy drives in the teacher education space) such as the uptake of environment and sustainability education into minimum standards for teacher education by DHET.

The GreenMatter core team / NPC has been working on various fronts on advocacy, e.g. from 2016—2018 it sponsored the GreenMatter Awards for Excellence in Biodiversity Science, as part of the NSTF (National Science and Technology Forum) Awards; and it contributes displays, presentations and think pieces to other forums such as the National Business Awards and Science Forum South Africa (see GreenMatter Evaluation Report, 2020, p.72).

5.2.4 WWF - Bridging into Work and Organisational Strengthening

WWF-SA has been a lead partner in the implementation of the BHCDS. It was involved in the Human Resource and Organisational Development Network that was initiated in 2009, in order to address the systemic organisational issues that emerged in the research informing the BHCDS and the ESSP. This included better quality internship programmes and mentoring, as well as learning pathways and occupational pathways into recognised areas of work (see HRD Network Case study, Section 5.3.2). WWF was well placed to act as project executant because of the project lead's experience in the C.A.P.E. programme, and

her experience in running internships, which WWF has been doing since 2011. When *Groen Sebenza* (Case study, Section 5.3.3) came on stream, WWF was an implementing partner. Subsequent to *Groen Sebenza* it continued to run internship programmes that benefitted not only WWF, but its corporate and other partners as well. In this it has support from partners like Rhodes University and DEA, who helped to produce induction and mentoring materials, which were then made available to the sector with DEA's support,

WWF took a lead with Bridging into Work and Organisational Strengthening goals in the BHCDS, with catalytic funding from the Lewis Foundation for a three-year period. WWF convened a project (including a series of workshops) on work-based or work-integrated learning (WiL) with a focus on aligning supply-and-demand and strengthening the quality and availability of WiL, in partnership with several universities e.g. CPUT, UNISA, TUT, NMMU and others. The Lewis Foundation funded this project from 2013-2016 and the GreenMatter Self Evaluation Report mentions a biodiversity universities forum that was established in its wake, to continue this work. There is no detail on this forum and the extent to which it carries forward the BHCDS goals.

WWF also designed and implemented a careers project in association with the NESPF and GreenMatter, again with catalytic funding support from the Lewis Foundation. This project was informed by a study by PACE and detailed career guidance materials development supported by GreenMatter. It targeted universities, a place in the 'pipeline' where there had at the time been very little careers information on biodiversity careers. A set of interactive resources were developed and career day exhibitions held at several universities; subsequent to the completion of the project with GreenMatter, WWF continued the careers work under the auspices of and in partnership with other organisations in the NESPF, notably DEA, SANBI, Wits, Rhodes, UNISA, provincial departments and to some extent, the DHET. When the new Minister of Environment, Forestry and Fisheries the Hon. Barbara Creecy called in 2019 for DEA to establish an environmental skills portal in order to help reduce youth unemployment, the WWF-NESPF materials seemed a very appropriate contribution. Notable is that this 'environmental careers' work goes broader than biodiversity, but has a strong biodiversity component. Also notable is that the careers activities into universities have been continued and expanded by SANBI.

Contributions to mentoring capacity will be discussed in the next two case studies (*Groen Sebenza* and HRD Network). Chapter 6 will show that mentoring is regarded as one of the areas in which the sector has seen a significant improvement in the past 10 years.

5.2.5 Green Skills Programme - Universities, SETAs, DEA and DBSA

In 2015 a consortium of partners under the auspices of the HRD Network (5.3.3) and led by Rhodes University were granted funding from DEA's Green Fund via the DBSA, for a Green Skills National System Building Programme. The programme consisted of university partners (Wits REAL was a co-lead with Rhodes, and UCT's African Climate Development Institute also participated) undertaking studies to determine green skills needs in various sectors, with further funding from a number of Sector Education and Training Authorities (SETAs) - PSETA, Mining Qualifications Authority and CHIETA. This built on earlier studies at Rhodes, funded by CATHSSETA. The Green Fund contribution of R5,9 million was for a three-year period, 2015-2018. In 2019, when a book was published on the cases and the methodology that have been developed, with the aim of "building a new knowledge field", i.e. motivating

and supporting a wider community of practice to undertake coherent and connected green skills studies across sectors. Another green skills study supported through Rhodes and the NESPF was the *Green Economy Learning Assessment for South Africa*⁴¹, which drew on partnerships established and insights gained during the development of the BHCDS and ESSP. This assessment was funded by the United Nations Institute for Training and Research and endorsed by DEA, DHET, DST (now DSI) and dti.

Following the work of Maia *et al.* (2011) studies to determine the scope of green jobs creation were supported and undertaken by Nedbank's Green Trust, TIPS, WWF, SANParks, University of Stellenbosch and others. The Green Skills Programme worked with DEA to host a Mini Skills Summit in 2018 in order to bring some cohesion and scale to these studies. At this time, GreenMatter was no longer playing its former role in convening skills summits, and it also did not contribute to national tracking of green skills related skills intelligence, scarce skills studies, or monitoring and evaluation of the success of the various widespread initiatives, even though this was of importance to the BHCDS as a shared ownership / partnership initiative. The *Green Skills* coordinators and partners (Rhodes, WWF) engaged with Nedlac and the Presidential Jobs Summit to "make the case" for water, rehabilitation and biodiversity-related job creation; and also used DEA's annual Biodiversity Research and Evidence Indaba to make an attempt to keep BHCDS on the national agenda and reflect on progress as well as challenges.

5.2 6 SANBI other BHCDS initiatives

SANBI, in addition to being a key partner in the setting up of the BHCDS implementation programme, GreenMatter and the *Fundisa for Change* Programme, and the lead agency and implementation partner in the *Groen Sebenza* project, also initiated several internal BHCDS initiatives, notably a project to address the shortages in skills in systematics and taxonomy, while also hosting NRF interns on an annual basis with the support of its HR division. SANBI staff undertook a biodiversity jobs study (Driver, Mukhadi and Botts, 2019⁴²) in association with the DPRU (Development and Policy Research Unit) at UCT.

5.3 Case studies of implementation

The following case studies provide deeper insight into the implementation methodology of the BHCDS; what was done, by whom, and how. Readers will appreciate that case studies require some indulgence for detail. The review was done by Dr Mukute, in all four cases using the strategy evaluation framework described in Chapter 2.

5.3.1 *Fundisa for Change* Programme - Foundation Building

Position, Niche and Perspective

The *Fundisa for Change* Programme was an early initiative of the BHCDS but also the ESSP; it grew out of a long history of environmental educators engaging with the national school system. As a BHCDS and ESSP initiative the project was taken up and also spearheaded by lead partners like Rhodes University, SANBI and DEA, to respond to a

⁴¹ https://www.un-page.org/files/public/green_economy_learning_assessment_south_africa.pdf

⁴² Driver A, Mukhadi F & Botts, EA. 2019. An initial assessment of biodiversity related employment in South Africa. Africaportal.org

long-standing need to address: (i) fragmented environmental content in national curricula at primary and secondary school levels, (ii) poor quality or absence of environmental education in many schools and some university education faculties, (iii) gaps in teachers' competences to teach 'new' environmental aspects of the curriculum, and (iv) inadequate capabilities and skills of school leavers to participate in professional environmental and biodiversity careers. The problem analysis conducted for the ESSP and used for the BHCDS as well (Rosenberg et al., 2009a, b) indicated that challenges in post-school education to produce the level, quality and relevance of skills needed in higher skilled environmental occupations, was affected by the academic readiness of school leavers who were often interested in environmental issues, but also held "shallow" concepts that did not bode well for success at university or in the workplace. It was also assumed that greater quality environmental education in schools could encourage more of the stronger learners to choose environment as a further study and career path. While the BHCDS also suggested direct support for certain school-level initiatives, the *Fundisa for Change* project was aimed at strengthening the environmental education component of teacher training in universities.

Against this background, the objectives of *Fundisa for Change* are:

1. To develop teacher education capacity, which in turn will be oriented towards teacher capacity development for transformative environmental learning in the schooling system, guided by the national curriculum and its requirements.
2. To enhance national uptake of environmental learning within the national system of teacher education through policy influence and advocacy.
3. To expand the network of providers and the community of practice engaged in transformative environmental learning through teacher education and building a national system of engagement.
4. To strengthen the quality, progression and validity of existing curriculum knowledge and its representation in the national curriculum system.
5. To provide the 'underlabouring' structural coordination, systemic implementation support, monitoring and evaluation necessary for realizing the above objectives.

The project has multiple roots but as a BHCDS initiative, *Fundisa for Change* was initiated to influence and improve environmental education outcomes from school (Foundation Building) through the teacher education system. Its niche lies at the point where these systems interact. The BHCDS in particular sought an intervention in higher education, as a more systemic and impactful activity: to encourage more universities to include environmental education in their curricula, to better prepare student teachers (and teachers seeking upskilling opportunities at universities) to teach the environmental content already in the curriculum. This 'system building' approach to improving the foundations of environmental learning in schools included an advocacy component with both the Department of Basic Education (DBE) and the Department of Higher Education and Training (DHET), as it was understood that the practical and ultimately the policy support of these entities were important. The DBE had to be constantly engaged around the presence and quality of the environmental content in the curriculum and associated resources, and around the need to give teachers permission to do environmental education studies; while the DHET (and the South Africa Council of Educators, SACE) were important to approve, endorse and certificate environmental and biodiversity education for teachers.

The Programme uses the following intervention strategies or methodology: (i) capacity building, (ii) advocacy and policy influence, (iii) development and provision of learning and teaching support material (LTSM), and (iv) building a national system of engagement. The implementation mechanism consists of a Community of Practice model for professional development of educators in tandem with local and regional education officials (subject advisors). The model comprises all the partner organisations: three government departments, four parastatals, eight NGOs and 10 of the country's 26 universities. An Advisory Committee governs and conceptualises the programme. A National Steering Committee, which was meant to spearhead policy engagement, has not been established.

A coordination hub has been responsible for programme implementation. GreenMatter served as coordinating hub (specifically for the Fundisa for Change project) from 2011 to mid-2018; in the process of changing to a NPO between 2015 and 2017 its coordinating role was significantly reduced, according to several partners. From GreenMatter's perspective, it is still coordinating the programme. This reflects different understandings of what is involved in 'coordination', with partners expecting a stronger national advocacy, partner convening and enabling role, and GreenMatter focusing mostly on funding and reporting management. The programme had no formal coordination for six months in 2018. Towards the end of 2018, SANBI created a *Fundisa for Change* Coordinator position which it has hosted since 2019.

Fundisa for Change was initially funded by the Lewis Foundation, additionally and thereafter by DEA/DEFF, the Murray & Roberts Chair of Environmental Education at Rhodes University, the NRF (for a teacher education research component), GIZ, VVOB (the Keep it Cool Climate Change project), and through SANBI and the Lewis Foundation, the Rand Merchant Bank, and in-kind support from partner organisations in the CoP.

Achievements and Lessons Learnt

Fundisa for Change showed significant achievements over its years of implementation. Firstly, being sustained for nearly 10 years is a significant achievement in itself.

Secondly, it exposed all South African universities with Education Faculties to the programme, and nearly half (10) have remained involved. It has been running environmental education training for teachers and officials in nine provinces through a network of partnerships. This involved an intersection of DBE/environmental sector and Teacher Education partners. *Fundisa for Change* enjoyed strong support from the leading environmental education centre in the country (Rhodes ELRC) and the ETD unit at DEA / DEFF. It has produced teacher educator and teacher training materials spanning a range of environmental topics. It stimulated teacher education research with an environmental education focus, and has case studies of teachers who changed their teaching practices after benefitting from the programme. The programme sought and achieved SACE endorsement for its courses, and has had some of its courses certificated by at least four other universities. Recently, the Department of Higher Education and Training announced that education for sustainable development was henceforth to be a minimum required in all pre-service teacher training.

Lessons learnt were:

- The partnership model, while a great strength of the project, requires extensive coordination, mediation, liaison, guidance, and careful attention to contracting such

that courses and resources produced remain common property, while giving the originators, who also often work in multi-organisational teams, fair acknowledgement.

- Course accreditation is critical for encouraging committed and relevant participation, and giving official recognition to the teacher development.
- A decentralised funding model was adopted to assist in distributing DEA funding to partners across the programme, and encourage more partners to mobilise and contribute resources. This resulted in funds from a variety of sources awarded for a number of purposes; it also creates a significant reporting burden, which, unlike the funding, is often centralised. Multiple funding regimes also complicate contracting and partnership arrangements.
- When programme implementers realised that research was an important part of university faculty's agenda, it resulted in the establishment of a multi-institutional research initiative and mobilisation of NRF funding for the programme. The resultant substantive research led to high-level capacity building for teacher education research. This was an innovation in the implementation methodology, as it was not included in the original design.
- It has also proved the ability to appropriately resource a partnership programme with both financial inputs from different sources, and human resources sitting in various organisations. The fact that human capacity is distributed across SANBI, Rhodes and other universities, smaller contracted NGOs and GreenMatter; and funds are sourced from SANBI (salary), DEFF, VVOB and Rand Merchant Bank channelled to GreenMatter via the Lewis Foundation, makes the management of the project highly complex, but shows that it can be achieved

5.3.2 *Groen Sebenza* and WWF Internships

Position/Niche

Groen Sebenza (*Groen* = Afrikaans for green and *Sebenza* = isiZulu for work) was established in 2013 as a youth employment 'incubator'. Led by SANBI in partnership with 47 public, private and non-governmental organisations, it was implemented from 2013 to 2015, after a concerted and coordinated effort saw the sector under SANBI's leadership and with support from GreenMatter and the Government Technical Advisory Centre (GTAC), succeeded in obtaining significant funding (R300 million) from National Treasury's Jobs Fund. There is also a *Groen Sebenza II* with funding support from the Department of Environment, Forestry and Fisheries' Natural Resource Management (NRM) division. This case study focused on the first round.

Like other internship and Bridging into Work initiatives in the BHCDS programme of implementation, the *Groen Sebenza* incubator sought to bridge the gap between education and job opportunities in the biodiversity sector. It aimed to enable young black and women, matriculants and graduates, and in particular those from rural backgrounds, to develop competencies and confidence to work in the biodiversity sector with support from experienced professionals. It trained 955 youth comprising unemployed graduates and matriculants. By 2018, **658 (69%) of the graduate interns had permanent jobs** in the biodiversity and broader environment sector, 3% were self-employed and 7% were doing further studies. Over 80% and over 50% of the interns were blacks and women respectively.

WWF-South Africa was a partner organisation in *Groen Sebenza I*, hosting 29 interns (mostly Bachelors and Honours graduates). It also had a separate internship programme, focused on Masters graduates. Implemented since 2011, the WWF internship programme had trained 128 youth by August 2017, 85 (66%) of them being women. Of the 128, **82% obtained employment** (60% in the biodiversity sector and 22% outside the biodiversity sector), with another 5% doing further studies. Of 77 intern graduates employed in the biodiversity sector, 49% are in the private sector, 21% in NGOs, 16% in research organisations and the remaining 14% in government.

Both these programmes were guided by the vision of the BHCDS, i.e. *“a socially equitable and suitably skilled workforce of biodiversity leaders, professionals and technicians to optimally implement the sector’s expanding and increasingly complex mandate.”* The BHCDS internship programmes’ niche lay in: (i) bridging the world of education and the world of work, (ii) skilling and upskilling interns, (iii) creating employment opportunities in the biodiversity sector, and (iv) addressing social equity issues in the employment profile of the sector.

Groen Sebenza was proposed to the National Jobs Fund as an opportunity to create more biodiversity jobs; the theory of change was that biodiversity agencies would become more effective through employing these young people and mentoring them, in the process promoting the sector as a significant role-player in the country’s economy (‘making the case for biodiversity’); as the sector became more successful as a result of both these outcomes, it would be able to attract more political goodwill, more funding, and, create more jobs. It was therefore not the internships of the 955 youth that was the endpoint of the project, but what could be achieved through this initial employment, in terms of advocacy and eventually further job creation. For the Jobs Fund, the creation of immediate permanent employment opportunities was the only important indicator, along with the carefully regulated control of expenditure. The programme therefore carried a significant compliance burden at both organisational and programme level; at the same time SANBI and the participating entities needed to innovate and collaborate in order to create new jobs. This was a challenging mix of goals for all involved. While synergies were achieved in e.g. mentoring and training, it was harder to do so with regards to the creation of new jobs.

A key to both of the internship programmes was a partnership approach. In the case of *Groen Sebenza*, for example, the application to the National Jobs Fund required a strong partnership base. SANBI took a lead, drawing on a partnership base that was shaped inter alia by the C.A.P.E. programme, and GreenMatter contributed through its fundraiser, who led the writing of the proposal on behalf of all the partners. The existence of the BHCDS provided a framework and evidence for the proposal. The stakeholder based approach followed for the development of the BHCDS created a heightened awareness of the need for coordinated HCD initiatives and laid the groundwork which potentially enabled the partnership of 47 organisations to come together. In the case of the WWF programme, as a relatively small NGO it is able to place a larger number of internships because it has or forms partnerships with other organisations; some of these are partnerships with corporates that have a strong two-way flow; the corporate may fund WWF, but WWF also provides technical support and marketing value/green credentials to the corporates. In these cases, the principal-agent dilemma described in Chapter 2 does not seem to exist.

Perspective

The internship programmes' main perspective comprises a transformational approach, which is characterized by a commitment to changing the status quo, and the development of transformational competences that enable interns to become agents of change. As illustration, in *Groen Sebenza* the youth asked to be called "pioneers" rather than interns. The transformational intent includes the ambition to improve racial equity in the sector as well as to transform how organisations function so that they are better able to deliver on their mandates, and then in turn, attract more funding and create more jobs.

The programmes were planned with a multi-pronged implementation approach which included (i) assessment and placements for fit; (ii) mentorship development to ensure the availability of competent and dedicated mentors to provide support, guidance and opportunities for interns' growth; (iii) mentoring; (iv) training in courses and other opportunities, focusing on generic aspects of work readiness and employability, as well as confidence, motivation and a sense of belonging in the sector; (v) training on skills in high demand, and (vi) exposing the youth to social and professional networks that open doors for future employment and career development. This was the essence of the incubator models in both programmes. In addition, *Groen Sebenza* worked with the job placement model to help pioneers to secure jobs. The fulfilment model was also evident, in that employed graduate interns were expected to leverage their skills to enable growth in the biodiversity sector.

The mentorship approach in BHCDS internship programmes has been shaped by a diversity of mentorship theories at sector, organisational and individual levels. Human capacity development theories have shaped it at sector level, while organisational design, business and management studies, and sociology of work have shaped it at organisational level. The role of the mentor in the BHCDS internship programmes has been diverse and situational, covering being: an ally and supporter, coach and teacher, role model and champion, catalyst and navigator, advocate and advisor. It was informed by earlier work in the C.A.P.E. programme, the Organisational Strengthening initiative run by WWF, and a dedicated mentoring capacity building project.

Execution

The implementation arrangements of the country-wide, multi-partner *Groen Sebenza* adopted a partnership and co-operation structure. The structure comprised of (i) a Project Steering Committee chaired by SANBI's CEO and consisting of representatives from most partner organisations and members of the SANBI Programme Management Committee, (ii) Programme Management Committee made up of the Project Director, Manager and three Regional Coordinators and an HR officer, all SANBI staff, and (iii) three Task Teams responsible for recruitment, selection and placement; mentoring and training; and monitoring and evaluation. Within each partner organisation, managers and mentors were responsible for liaison with SANBI, participating in national coordinating events, managing and reporting on funding, taking care of the interns and their development, ensuring they had the necessary equipment and resources with which to do meaningful work, creating customised learning opportunities for them, trouble shooting, and ensuring that they have a permanent position at the end of the three-year period. Many partners buckled under the inflexibility of the requirements.

At a smaller scale the WWF internship programme's implementation arrangements have been less complex, being headed by a national coordinator in WWF who worked with one assistant (a former intern) in liaison with mentors in sub-national structures of WWF and partner organisations.

Adaptation & Lessons Learnt

The implementation process of internship programmes had a strong action learning component to enable learning and adaptive changes within the programmes and for future programmes. Both programmes have conducted internal and external evaluations. At micro-level, both internship programmes conducted ongoing monitoring and improvement of the mentoring activity. We identified the following internship programme design and implementation process lessons:

a. Relevance and responsiveness: Relevance and responsiveness to sectoral skills demands is a critical design consideration for the effective bridging of skills development and use, i.e. matching an intern with a viable employment opportunity. It also helps reduce the risk of upskilling for saturated jobs. Clear articulation of the focus and scope of each internship programme is necessary at the beginning of recruitment so that applicants have a good idea of what the internship programme covers. Time spent reviewing applications and even interviewing applicants is well spent, as it helps to achieve 'fit' for the placement. This is however a phase easily skipped, given that most internship programmes are hugely oversubscribed, and programme managers receive literally thousands of applications.

b. Time allocation: Time is an important design consideration in internship programmes. Internship programmes that last at least one year and preferably two years, increase the intern's potential learning and development opportunities. Within that period, it is also essential to provide for adequate contact time with the mentor(s). This creates space for more structured and appropriate learning to take place. It is also essential to provide interns with time to meet and interact, learn from and motivate one another and develop a broader understanding of the sector.

c. Mentors are effective if they have the capacity to support human capacity development: Not every seasoned professional is a good mentor, they need the time to support the intern, an interest to develop others, to appreciate the potential of the intern and to communicate clearly. However, it is important for organisations to understand that mentor capacity can be developed, and that if mentors have clear tools for the job, they are also more likely to find/make the time to do it. With this view a mentor's toolkit with basic resources like meeting scheduling tools, workplan development templates, performance assessment tools, etc. has been developed (in partnership with the HRD Network). New mentors' capacities to perform their role adequately, can be improved through formal training, support from more experienced mentors and peer learning processes. Mentors have a critical catalytic role in shaping the kinds of leaders the sector will have in the future.

A systems perspective to mentorship is necessary as it locates mentorship within the broader sector and organisational systems and practices. Organisational human capacity development policies and strategies that have been found useful to support mentors include: (i) an Internship and Post Graduate Student Internship Policy, (ii) Learning and Development Policy, (iii) Employee Attraction and Retention Policy, (iv) Strategy for Accelerating Employment Equity for Scarce Skill Positions, and (v) Human Resources and Transformation Strategy.

d. Intern's self-development and value creation: Designing for intern's self-development has emerged as an important lesson from the internship programmes. This entails planning for the intern to not only appropriate new technical knowledge and soft skills, but also to solve practical and difficult real work challenges. This compels them not only to push their intellectual boundaries, but also to build relationships with colleagues – relational agency⁴³ – to solve complex work tasks that they cannot solve without the help of others. Designing for the trainees' self-development has also been found in designing for future-oriented thinking, especially through career development sessions.

e. Intern exposure to wider workplace learning contexts: Intern exposure to a variety of work places and potential employers outside the host organisation is an important consideration. This helps the intern to appreciate different work contexts, get known and increase their chances of finding employment. In addition, specialised training from outside the host organisation needs to be provided for. Some of this training could be on technical skills such as ICT or practical skills such as driving and photography. Some organisations, however, resent 'losing' interns (or staff) in whom they invest time and resources, when they take up employment elsewhere. A sector-wide perspective is helpful here.

f. Sub-national implementing and action learning structures: We also identified a lesson specific to large, coordinated and multi-partner internship programmes like *Groen Sebenza* I. Besides the governing committee, management committee, task teams and regional coordinators, it also required an intermediate multi-stakeholder implementation coordination structure to play a bridging role between the national and provincial levels (alongside the regional coordinators). That is, a lot needs to be invested in coordination functions (alongside adequate support for implementation) if partnership initiatives are to succeed.

g. Build on the strengths and address underlying structural issues: Coordinated multi-stakeholder internship programmes can be difficult and rewarding at the same time. Under these circumstances, it is necessary to identify and build on the strengths and tackle the structural issues that underlie the difficulties.

Groen Sebenza has been one of the most influential initiatives undertaken in the BHCDs. Its uptake by national government, shows that it has had a significant impact nationally.

5.3.3 Human Resources Development (HRD) Network

HRD Network Position/Niche

The HRD Network project sought to address three interrelated challenges, namely: (i) lack of adequate connection between human resources development (HRD) and human resource management (HRM) systems, structures and processes, on the one hand, and organisational strategy, design and development on the other (ii) excessive focus of HRD and HRM at the operational level at the expense of the strategic level; and (iii) lack of interaction between line management and HRD. All of these challenges resulted in biodiversity managers and organisational leaders often experiencing their organisation's HR staff to be working against, rather than with them. Associated challenges are inability to fill

⁴³ See *Green Economy Learning Assessment South Africa: Critical competencies for driving a green transition*. PAGE, 2015, https://www.un-page.org/files/public/green_economy_learning_assessment_south_africa.pdf

posts, inappropriate appointments, lack of suitable training opportunities for staff, inappropriate training, inadequate training budgets, and more. At a more systemic level, environmental organisations struggled to raise funding from SETAs because their job occupations and training needs were not well reflected in the national systems against which such funding is disbursed. Against this background the objectives of the HRD Network Initiative were:

- To convene periodic interactions amongst HRM, HRD and operational staff in the environment, conservation and natural resource management sectors.
- To support the development of strategic organisational design and development, HR management and development and training responses for implementation at both a sector and institutional level.
- To support the development of HRM and HRD capacity across the environment, conservation and natural resource management sectors.
- To provide a lobby for the sector to address strategic HR management and development issues in broader contexts.

The niche of the HRD and OD Network was the biodiversity sector workplace, in relation to the BHCDS' strategic goal of Organisational Strengthening as well as wider Enabling Structures. This is based on its background and objectives and on its broader intention to influence the HR systems of the organisations in the biodiversity sector as well as the national environmental Occupational Learning System (OLS). The human resource systems that the HRD Network sought to improve are: staff retention and deployment, skills planning and development for employees, performance appraisal and management and career progression that integrates racial diversity. The HRD Network sought to influence the national OLS through contributing to the national Organising Framework for Occupations (OFO) focusing on occupations needed in the environment and biodiversity sector. The OFO is a classification system based on skills levels and specialization (competences), which sorts occupations into major groups, and layers of sub-major groups, and provides a framework for job performance management systems and occupational planning.

Using the OFO in the biodiversity sector has potential to increase alignment between internal skills planning and development to the broader national context of skills planning and development; to increase funding from SETAs for biodiversity related training; and to ensure that suitably qualified people are appointed to and supported in the right jobs.

Perspective and Execution

The HRD Network has been organised around a multi-stakeholder approach to tackling HRD issues in the sector. This has meant the utilisation of the collective and distributed knowledge and experience of HR and other professionals in the biodiversity sector to address the institutional and sectoral HR challenges in the sector. In this regard, the HRD Concept Note states:

Professionals also agree that across organisations there is significant expertise, competence and experience in organisational design, human resource management and development and training, as a collective ... A suggested approach amongst a group of professionals to addressing these multiple challenges, is to harness this collective of expertise, competence and experience in organisational design, human resource management and development and training to explore strategic responses

at both a sector and institutional level. This key strategic objective is being fostered through the establishment of and interactions amongst professionals in the Human Resource Network Initiative for the environment, biodiversity and natural resource management sectors.

The collective learning was supported by expert input from people working on OFOs in the country as well as by research to map the occupations in the sector. The main strategies that the HRD network used to implement its work were:

- Co-learning and co-design workshops involving HR managers (middle and senior) and line managers (to a lesser extent). The workshops were supported by expert input on relevant topics (see below), and supported by relevant research where this was necessary (e.g. mapping of occupations). Hosting of the workshops was distributed between and among different organisations. The workshops were held in different parts of the country. In total, the HRD Network conducted eight workshops over the three years. The workshops identified, refined and developed strategies to address HR challenges for the sector.
- Identifying HRD priority issues in the sector and developing specific responses to each through a Human Resource Toolkit. The toolkit covered the following topics:
 - *Working well with SETAs*
 - *Improving workplace skills planning*
 - *Using the OFO to do skills planning and development*
 - *Increasing the relevance and quality in training*
 - *Engaging diversity in the South African workplace*
 - *Improving performance appraisal and management, and*
 - *Fostering the recognition of prior learning.*
- Mapping of occupations in the conservation sector to identify the contemporary occupations and job titles. Consequently in 2012 the HRD Network mapped 260 conservation job titles to 49 OFO occupations, and recommended to the Department of Higher Education and Training (DHET) the amendment of six occupations and the addition of two new job titles in the national OFO.

HRD Network Lessons Learnt

Based on interviews, the review identified the following lessons learnt:

- The human resource development context is evolving and skill needs for the future are likely to be different from the ones established earlier. There is therefore need for periodic reviews of human resource development needs.
- The space occupied by senior management HR professionals in South Africa has been narrow and largely confined to administrative and not strategic roles. This puts serious limitations on the potential of the HR system to transform itself and to influence the broader system within which it works.
- The transformation of the HR system in the conservation sector is likely to benefit from the intellectual input of HR specialists from other sectors in planning the way forward. The HR specialists from other sectors would bring important lessons and perspectives.

The limited time of implementing the HRD Network (three years) has made it difficult for the lessons learnt to be implemented.

5.3.4 NESPF (the National Environmental Skills Planning Forum)

Position/niche of the NESPF

The NESPF's policy influencing and advisory forum mandate covers the whole environmental sector, of which the biodiversity sector is a component. It was created to foster green skills development in the country given the absence of a dedicated SETA for the environmental sector. It plays this role through addressing the following objectives:

- To create an enabling framework for environmental skills planning in South Africa towards increasing the supply of people with appropriate skills to work at all levels in the environment sector and the emerging green economy.
- To strengthen skills planning and development in the environmental sector, in order to address reactive, insufficient, *ad hoc* and fragmented skills development across the broad environmental sector.
- To support partners in the environment sector to implement their HCD strategies.

The NESPF was conceptualised to maintain progress, momentum and coordination between Skills Summits. In the absence of Skills Summits, it takes on some of the functions that the Summits would have played, albeit at a smaller and lower scale than necessary.

NESPF implementation process

The Forum uses the following strategies to address the above role: (i) lobbies for adequate provisioning of skills needed in the sector through the national SETA system, (ii) lobbies for the inclusion of environmental skills needs in the National Skills Development Strategy (NSDS) and Human Resource Development Strategy (HRDS), (iii) lobbies for improved national statistics on biodiversity occupations, (iv) positions the environmental sector within the revised SETA landscape and (v) provides a regular platform for organisations involved in environmental HCD initiatives, to regularly convene, inform and update each other about progress with ongoing HCD initiatives; raise opportunities, challenges and needs such as the aforementioned advocacy and policy engagement needs and opportunities; and plan joint initiatives.

The Forum is currently convened on a quarterly basis by the DEFF Sector Development, Education and Training Unit. WWF provides a video conference facility and a face-to-face meeting is hosted at its premises simultaneously in both Cape Town and Johannesburg, with partners in other locations like Rhodes University, either travelling to one of these venues, or dialling in. The meeting is chaired by DEFF and partners report against a standing agenda, and/or bring new items to the agenda. From time to time visitors are invited, e.g. DHET was invited to join the career guidance discussions. Working Groups and Task Teams are established to address particular needs identified in or brought to the Forum. In practice a small number of partners (individuals) are responsible for this activity.

NESPF Adaptation and Lessons Learnt

Through interviews, the review identified that the main lesson learnt and implemented by the Forum is that green skills development does not succeed through the pursuit of a sectoral

approach; in fact, it requires a cross-sectoral approach. This is why the Forum has had to work with academic and research institutions, government departments, SETAs responsible for other sectors, and funders such as the Green Fund and Lewis Foundation.

Other lessons learnt are that:

- The leadership needs to have broader representation to reflect the cross-sectoral nature of the Forum's work
- A supportive operational budget is needed to enable the forum's steering group to periodically meet, review work, plan ahead and mobilise resources for the implementation of its agenda
- A coordinating mechanism with full-time staff is needed, to serve as the secretariat of the forum, mobilise resources and facilitate the implementation of the forum's agenda on a daily basis,
- Young people have not been recruited into leadership positions to prepare them to lead the forum in future
- Progress is much deterred when the envisaged bi-annual National Environmental Skills Summits do not occur. The constraint in convening these is not just budget, but also personnel with the time, capacity and understanding of the role of the Summits, to convene them. This function could potentially be added to a full time NESPF secretariat.

5.4 Analysis of Execution / Implementation

5.4.1 Relevance and Alignment with Strategy Principles, Approach

The review considered whether the implementation activities as reflected in the case studies and other data, have been aligned with the BHCDS principles and approach.

Innovative Approach

There are signs of innovation such as the *Imvelisi Enviropreneurs* project which brings a still novel dimension of enterprise development and business ideation to the sector, which does have a relatively high number of businesses, but comprising high-skill consulting services to industry and government, and therefore less likely to provide extensive employment (NCC being an exception and an example of an innovative company in the conservation sector).

The internship case study alerted us to the potential to stifle much needed innovation to achieve synergy and the ability to 'make the case' for biodiversity (both a conceptual and practical-political or *realpolitik* innovation) when organisations have to preoccupy themselves with narrow compliance requirements. Groen Sebenza carried a high compliance burden as a narrow measure to ensure deliverables (permanent jobs) are met; by contrast the WWF internship created more permanent appointments with less bureaucracy. This observation is one of the factors raising concern about positioning the BHCDS coordination role within government, where it is more likely to be usurped by bureaucratic requirements that could potentially close the space for innovation. This is not inevitable, however, as the *Imvelisi* project is partnered by government (DSI).

A systemic approach

Implementation initiatives do reflect a systemic approach in that they cover the spectrum from Foundation Building (strengthening teachers' ability to teach environmental and

biodiversity education, in *Fundisa for Change*), through internships and post-graduate bursary programmes (*Groen Sebenza*, WWF and other Internships and *GreenMatter Fellowship*) all the way to strengthening biodiversity organisations' ability to attract, mentor, retain and effectively deploy skills (HRD Network). A systemic approach is also evident in initiatives that directly addressed the strategic goal of Enabling Conditions, such as the National Environmental Skills Planning Forum and the National Environmental Skills Summit. Of concern is an emerging gap in the spectrum of initiatives, with the bulk of time and resources being on supply side initiatives (with youth and initial training) with far less time and resources on demand side and systemic enabling initiatives, such as work-based training, HR and OD, and advocacy at a policy level.

A joined-up approach and Promoting articulation

A systemic approach with a wide-ranging spread of initiatives must prioritize a joined-up approach and promote articulation. The review did not find much evidence that this was happening optimally. The potential was there, particularly in the early stages, with initiatives like the HRD Network addressing issues like mentoring and engaging SETAs for work-based training, that articulated with the work-based learning initiative, and produced resources and know-how that could be used in the *GreenMatter Fellowship*, *Groen Sebenza* and other internship programmes. *Imvelisi* was criticised for failing to connect the first stage of business development with ensuing stages, possibly by forming more partnerships. The Skills Summits provided an important national platform for sharing the resources and know-how and invite broader participation. With both the HRD Network and Skills Summits falling away as BHCDS initiatives, and GreenMatter's coordination role being found wanting, these principles of the strategy are not given optimal effect.

Focus on High Skills

This focus has been maintained in some initiatives like the Fellowship and WWF Internships, but organisations have also adapted and expanded where it seemed appropriate to do so; e.g. the *Groen Sebenza* included matriculants, and the HRD Network looked at training and occupations at lower levels as well, as these were often the preoccupations in organisations. This adaptation seemed appropriate, particularly given that the HRD Network, NESS and the NESPF addressed a broader range of HCD strategies with broader remits, but if the focus on high skills still seems appropriate (see Chapter 6 for Outcomes and Impacts in this regard) it would be important to ensure adequate activities to address the need for high skills, including associated work-based and leadership education.

Building on Strengths

This principle has been applied and seems to have been vital; it is in those areas where project implementers could draw on pre-existing skills, like teacher development, internships, mentoring, that they had most traction and managed to sustain initiatives. Initiatives that were not sustained had little pre-existing experience on which to build. Despite several attempts to bring in expertise from outside the biodiversity sector to support leadership development, HR development and organisational development, these initiatives found less traction in the BHCDS programme of implementation.

Transformative Intent

The review shows that the intent to develop, attract, mentor and support black graduates for and into the biodiversity sector was the prime focus for several initiatives. Transformation at

other levels was also addressed; e.g. the HRD Network did not simply do technical training on what HR staff are already meant to do, but aimed to transform organisations' understanding of mentoring and work-based training completely; it also aimed to change the national OFO to better reflect biodiversity jobs. These are profound systemic transformation intents. Chapter 6 will review the extent to which this intent, in this and other initiatives, was achieved.

Shared Ownership

This is addressed in 5.4.3.

5.4.2 Trends in Implementation over Time

As noted a few times, including in relation to Table 5.1, there has been a trend over time in the implementation of the BHCDS to sustain supply-side initiatives, more than demand-side and system-enabling and advocacy initiatives. This puts the systemic nature of the BHCDS at risk. While supply-side initiatives are important, they require systemic initiatives for optimum and lasting impacts. We can produce thousands of graduates, but if they are unable to find work in functioning organisations, or unwilling to work there, the investment might be lost. The outcomes and impacts reported in Chapter 6 will suggest that the supply of graduates is just one part of the context that needs attention, and perhaps not the most important part.

It should be noted that even 'supply side' initiatives like *Fundisa for Change* have a strong systemic (system building) focus, provided this is maintained. With a growing range of funders being drawn on to support the *Fundisa for Change* programme, diverse agendas start driving programme activities, which may detract from the systemic mission. For example, multiple funders may drive the need to do more and more *ad hoc* teacher training events run by a range of NGO-based training providers, rather than engaging with education faculties to ensure high quality teacher training 'at source' in the institutions mandated to do teacher training.

Similarly, there has been a trend in GreenMatter to focus more on promotion of and fundraising for its core activities, and less on coordination and advocacy on behalf of the sector. Its reduced role in the NESS is an example, and the infrequent hosting of NESS has significantly contributed to the observed trends of a loss of coordination capacity in the BHCDS implementation programme.

Another trend reflected in Table 5.2 is that a greater proportion of implementation initiatives were being funded by sector organisations, compared to those funded by the starting donor, the Lewis Foundation. This is in keeping with the intended strategy of a phased-out approach of catalytic funding.

5.4.3 Scope of Participating Organisations - Analysis

Here we reviewed two aspects. First, to what extent did core biodiversity organisations participate and responded to the deliberate shared ownership strategy? The review of cases and other projects show that SANBI and DEFF have both been active in implementation. SANParks on the other hand has been less involved in initiatives under the BHCDS

umbrella. It has been running its own mentoring and induction programme, called Groom and Grow, among other more informal but long-standing traditions such as inviting new staff on field trips to get to know colleagues and organisational cultures. SANParks was well aware of the BHCDS, and was invited to participate in *Groen Sebenza*. Some SANParks staff (young professionals) benefitted from the GreenMatter Fellowship and were very positive about the experience, as were their SANParks mentors. In attempts to ascertain why SANParks has not played a stronger role in the BHCDS, no clear insight emerged, other than that the organisation (as perhaps a coveted employer for any biodiversity graduate) may have been satisfied with its own skills base, and/or its own programmes that support this skills base.

Provincial agencies are also 'core biodiversity organisations' and did participate to some extent, with CapeNature and the Gauteng Department of Agriculture and Rural Development (GDARD), for example, being active in several BHCDS initiatives, and East Cape Parks playing a strong role in the HRD Network. LEDET (Limpopo Economic Development, Environment and Tourism) participated in *Groen Sebenza*. However, by all accounts the participation of provincial environmental agencies in the BHCDS implementation, and their ability to benefit from it, is not adequate, given their significant capacity issues and needs.

The second aspect is the extent to which organisations beyond the core biodiversity entities participated. Here a very long list of civil society organisations, big and small, government entities, institutes, universities, other training providers and research institutes, some industries, consulting firms, and more, have been involved in one way or another. Most often, and with some significant exceptions (DST/DSI, WRC and YWP-ZA and universities joining *Fundisa for Change*), the involvement has been short lived and these organisations have not become long-term implementing partners. This is an important gap that requires attention if the next 10 years are going to make an impact.

The ability to form new partnerships may need special attention and resourcing. Currently the 'ownership' of the BHCDS implementation process as reflected in levels of commitment beyond being funded to produce some deliverable, seems to rest with a small number of organisations, being its founding partners, the DEFF and initial project executants (WWF and Rhodes University) outlined in the implementation architecture.

5.5 Summary of Findings on Implementation

Chapter 5 presented 20 pages of information and insight regarding BHCDS implementation. It does not claim to include all the relevant initiatives, as in 10 years much HCD activity has taken place, but we believe we have covered most of the most prominent BHCDS initiatives.

There is much that can be said in summary, but the points in Section 5.4 are perhaps the most pertinent to the review. There is also a need to open up the conclusions reached in both the case study reports, and the analysis in Section 5.4, for comment. Several of the conclusions drawn could be contentious.

6. OUTCOMES AND IMPACT - KEY FINDINGS

6.1 Introduction to the Chapter

In this chapter the outcomes and impact of the BHCDS over the past ten years are evaluated against the strategic goals and objectives of the BHCDS, as defined at its inception in 2010.

First, a re-cap of the main features of the problem the BHCDS aims to address is presented. This will both indicate what impacts and outcomes are necessary, and why they are of a systemic nature, rather than just a case of employment targets or equity targets met. The BHCDS (2010) argued that a simple supply-demand analysis is not an adequate tool for skills planning in the sector. The reasons for this are summarised below; they are also the key features of the sector's capacity and transformation challenges:

- Low levels of growth in employment (in 2010) were based on inadequate foresight and/or planning for the skills needs associated with growing and increasingly complex mandates.
- Several national reviews had found that the biodiversity mandate was under-funded, and staff budgets tended to be inadequate compared to the size and complexity of the tasks required by new policies and legislation. There were not enough posts for the work that was needed.
- In addition, there was an average vacancy rate of 22% in public biodiversity agencies, which went up to 37% among nature conservation professionals, 41% in other nature and oceanographic occupations, and 51% in nature conservation technicians.
- Some skills were regarded in the sector as scarce (e.g. taxonomy and resource economics), but this was not reflected in vacancies as the required posts did not always exist. This was one reason for the national skills planning system not being able to accurately determine environmental skills targets.
- Skills were often not available (or appointed) at the required level, and there had been a decline in qualification levels in the sector.
- Equity candidates were not available (in particular black graduates and post-graduates).
- When suitable graduates and postgraduates were available, the biodiversity sector did not always compete well for them with other employers (conditions of employment e.g. salary, location).
- When suitable skills were attracted to the sector, organisations at times failed to retain them, through a lack of suitable career paths, salary packages, diversity management, talent management, or enabling working conditions.
- Among professional staff and managers (including HR) there had been big fluctuations, some of which can be attributed to 'churning' (moving between organisations in the sector). This contributes to organisational instability and lack of leadership for coherent long-term planning and implementation.

The BHCDS features four strategic goals (Section 3.2) and seven objectives (Section 4.2.2) to address these issues. To what extent has its programme of implementation been successful in addressing these goals and objectives, and the above challenges? This chapter attempts to answer this question. In the process it provides a higher education trends update; a transformation update and a (limited) scarce skills update.

The data sources for this chapter are...

- ... the case studies undertaken for this review and the GreenMatter evaluation
- ... analysis of HEMIS data (comparing with the 2009 baseline study of the HSRC)
- ... employer / stakeholder survey undertaken for the BHCDS review (see Chapter 3).

6.2 Strategic Goal 1 Outcomes and Impacts

6.2.1 Associated Strategic Objectives⁴⁴

Strategic Goal 1: Increase the number of talented black South Africans attracted to working in the biodiversity sector. (Attraction and Meta-Conditions)

SO1: Promote the biodiversity sector among key decision-makers and all South Africans, especially black South African school leavers, students and graduates, and leaders in the national skills development system.

SO4: Increase the relevance and quality of educational provisions in a wider range of higher education institutions and other training providers, in a manner that will improve pass rates and entry into post-graduate studies.

SO5: Contribute to better science, mathematics, literacy and environmental learning in schools with adequate management capacity.

6.2.2 Supply of black biodiversity graduates

The graphs in this section present the *outcomes* achieved by South African universities as BHCDS implementation partners. They will show that *there has been an increase in the pool of black graduates over the past 10 years*. This change cannot be attributed solely or perhaps at all to the BHCDS, since there was also a concomitant increase in black graduates across all study fields. However, they are important higher education system outcomes, and the associated trends are important for interpreting the outcomes and impacts of certain BHCDS initiatives and for decisions about future initiatives, and are therefore presented in some detail here.

First, we consider the trend in the number of graduations in all study fields regarded as relevant to biodiversity work (Appendix A gives the break-down of which study fields are regarded as relevant). Table 6.1 shows that there has been big increases, including in Computer science and data processing, which had experienced shortages 10 years ago. Table 6.2 shows an increase in the average annual growth rate for biodiversity-relevant study fields when comparing the HSRC's 2007 data and their 2000 baseline, with the growth rate from 2007 to 2018 i.e. the period of this review.

⁴⁴ An assessment of the extent to which the BHCDS has promoted the sector to high level decision makers is made in relation to advocacy, and not discussed here.

Table 6.1 and Table 6.2 suggest a 42% increase in the number of graduations (across all qualification levels) over the past 10 years in the primary biodiversity-relevant fields of study. The growth rate is increasing, but it is also notable that there are even bigger increases in graduations in secondary and generic (still potentially relevant) fields of study, and the increase in graduations *overall* is of an even greater magnitude. It is therefore difficult to discern whether the increase in biodiversity-related graduations has been at all affected by the BHCDs, given an increase in graduations overall.

Table 6.1: Number of graduations across all qualification levels⁴⁵ in biodiversity-relevant study fields

	2007	2018	% change
Primary fields of study	5,882	8,328	up 41.58%
Secondary fields of study	6,621	11,769	up 78%
Computer science & data processing	3,941	7,682	up 95%
Generic fields of study	1,833	6,638	up 262%
Total	18,277	34,418	up 88%

Sources: HSRC's 2007 baseline and HEMIS, 2018 (calculations by Jenkin)

Table 6.2: Growth rate increases in graduations in biodiversity-relevant study fields⁴⁶

	2000-2007	2008-2018
Average annual growth rate for graduations across all qualification levels in biodiversity-related study fields	6%	14%

In fact, Table 6.1 shows that growth in graduations in primary biodiversity-relevant fields is less than the growth overall.

What is further worth noting is the possibility that the dramatic increase in graduations could be putting strain on higher education institutions, affecting their ability to invest time and resources into curriculum innovations, or quality assurance, that are required by sectoral needs. This could be affecting the completion rates, which are significantly below enrolments (Figure 6.6).

Whether the observed growth in the primary biodiversity fields of study is adequate or not, should also be considered in relation to the specific qualification *levels* of interest to the BHCDs, which are not first degree level skills, but post-graduate skills (Honours, Masters, PhDs). Figure 6.3 indicates that the proportions of PhD and Honours/Masters level qualifications achieved have stayed constant in the last 10 years. A positive trend however, is that a greater number of black women and men are now graduating with these post-graduate qualifications (Figure 6.7).

⁴⁵ Graduation levels included are: Undergraduate diplomas and certificates (1, 2 and 3 years); Bachelor's degrees (3 years and 4 years or more); Bachelor of Technology (1 year); Advanced diplomas; Post-graduate certificates in education; Post-graduate certificates, diplomas and DIPs; Post-graduate bachelor's degrees and advanced bachelor degrees; Honours, National higher diploma, Higher education qualification sub-framework (HEQSF) post-graduate diploma; Masters, Masters diploma (research and non-research); Doctorate (research and non-research).

⁴⁶ Taking CESM course classification changes into account, as outlined in Appendix A2.

In 2018 more than 13,000 students were studying in Botany, Zoology, Biological and the Life sciences (excluding the Health sciences) combined, and 14,000 more in Geography and related fields.

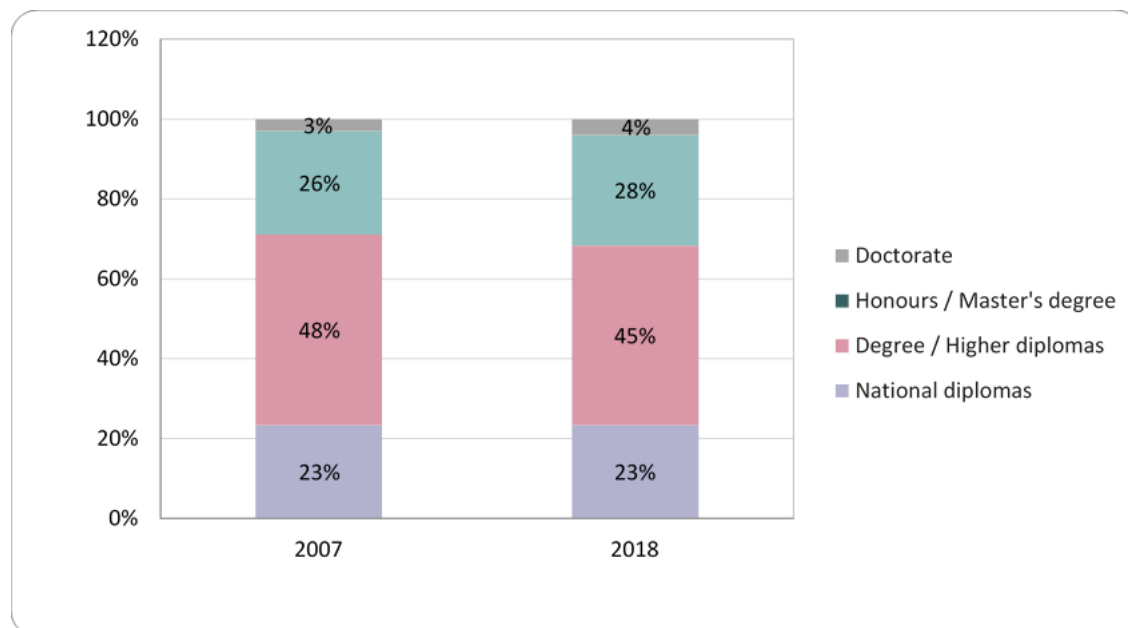


Figure 6.3: Spread of qualification levels of graduates in primary study fields

Source: HSRC baseline (Fig 4.3, HSRC, 2009) and HEMIS 2018; analysis by Jenkin

Figure 6.4 shows trends in enrolments for different fields of study⁴⁷. The data is indicative of significant increases in enrolments in Geography and related fields (including Environmental science), with some smaller changes in the Agriculture & renewable resources, Plant sciences & Botany, Veterinary medicine & sciences and Soil sciences (the latter having been identified as a scarce skill in 2009).

On the other hand, *there has been a decrease in enrolments in the fields of Biological sciences and Life sciences*. This may become significant in time, particularly as the Health Sciences will in the post-Covid future most likely draw more Life Sciences students.

⁴⁷ Due to changes in CESM categories in 2010, there may be some disparities; see Appendix A1. To reduce potential discrepancies in interpretation of study fields, the fields for all years investigated were consolidated into themes for a more reliable trend analysis. The Parks, recreation & leisure facilities data is skewed, and it should probably be disregarded.

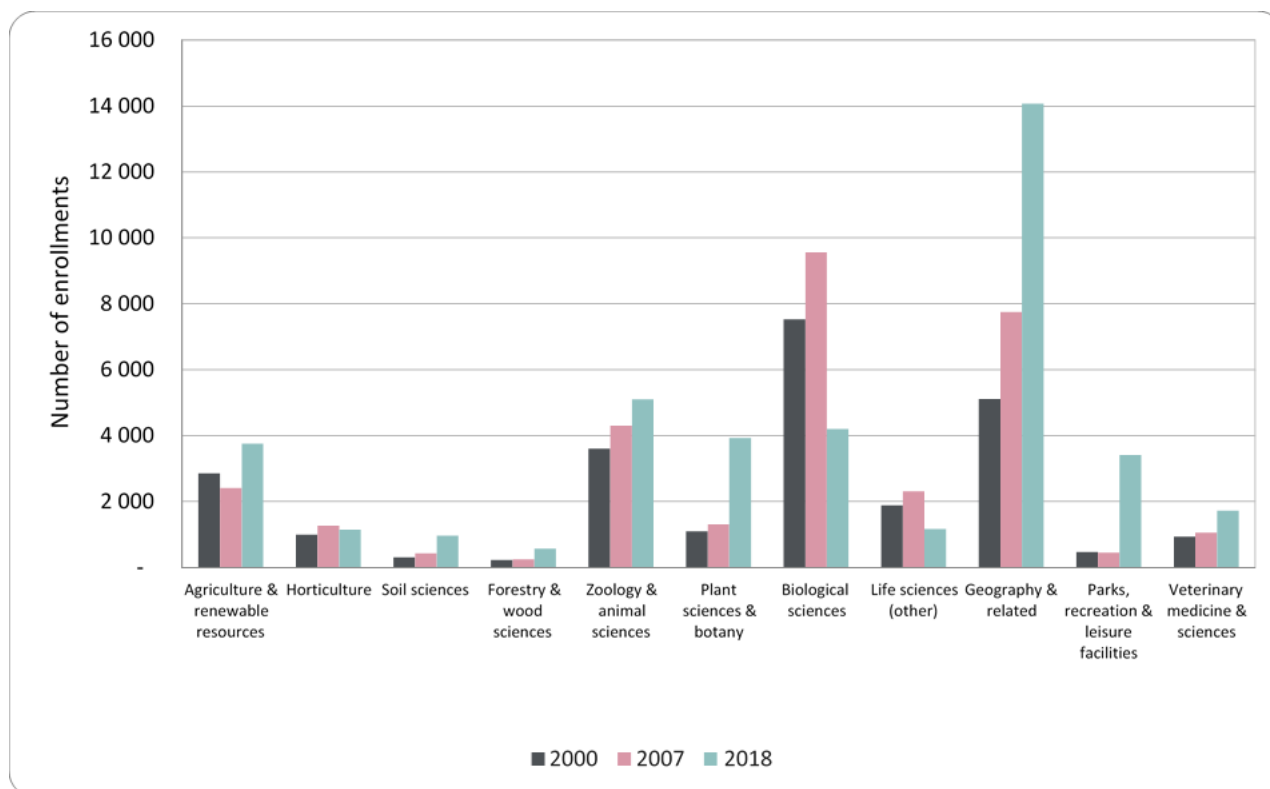


Figure 6.4: Enrolments at all qualification levels in primary biodiversity-related study fields

Source: HEMIS 2000, 2007 and 2018; Jenkin

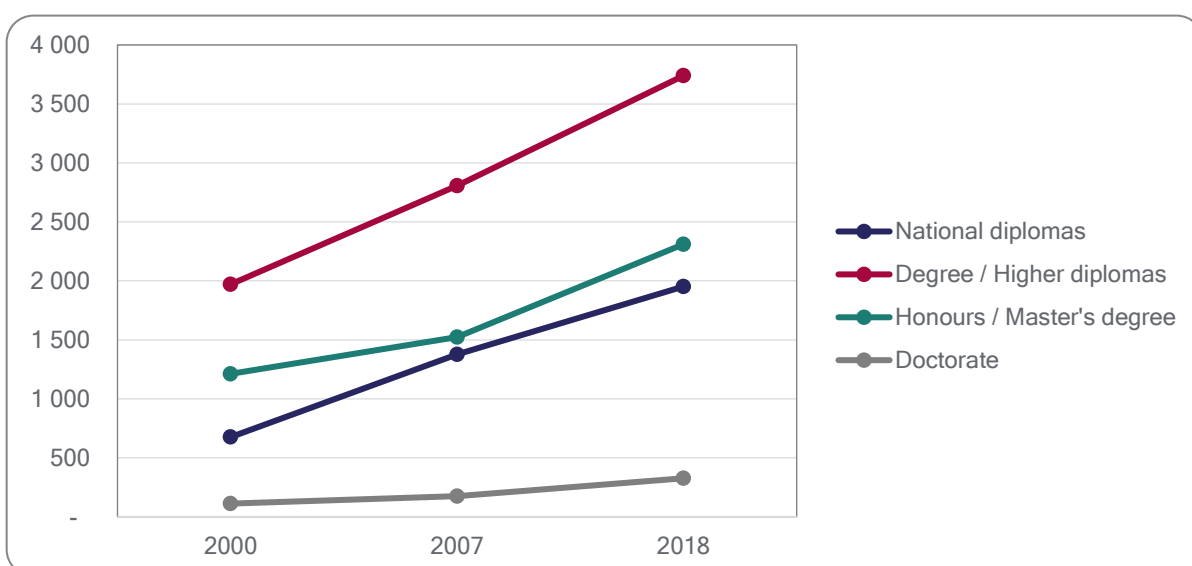


Figure 6.5: Number of graduations by qualification level in primary study fields

Source: HSRC baseline (Fig 4.3, 2000 and 2007 data); HEMIS 2018; Jenkin

Figures 6.5 and 6.6 show that there have been increases in the number of graduations in biodiversity-relevant fields at all qualification levels, with the increase in PhD graduations unfortunately the smallest. For the BHCDS the PhD is a focus, along with the Masters level -

where there *has* been an increase. Compare also the actual number of graduations at these levels, in Figure 6.12.

The slower increase for *graduations compared to enrolments* (Figure 6.6) is partly attributed to the necessary lag between enrolment and graduation, and potentially to strained institutional capacity. The fiscal budget allocations to universities have in real terms been decreasing, and have generally not matched the demand to enrol more students, the majority of whom depend on grants that are not always timeously paid out; furthermore #FeesMustFall has led to a cap on fee-based income. Universities may thus not have expanded staff numbers to match expanding student numbers, with potentially an impact on throughput and completion rates. Research with Sector Education and Training Authorities (SETAs) identified another cause of low completion rates to be inconsistent funding, caused by metrics that incentivise entities to fund more students, but for shorter periods, often only for one year of a three-year degree.

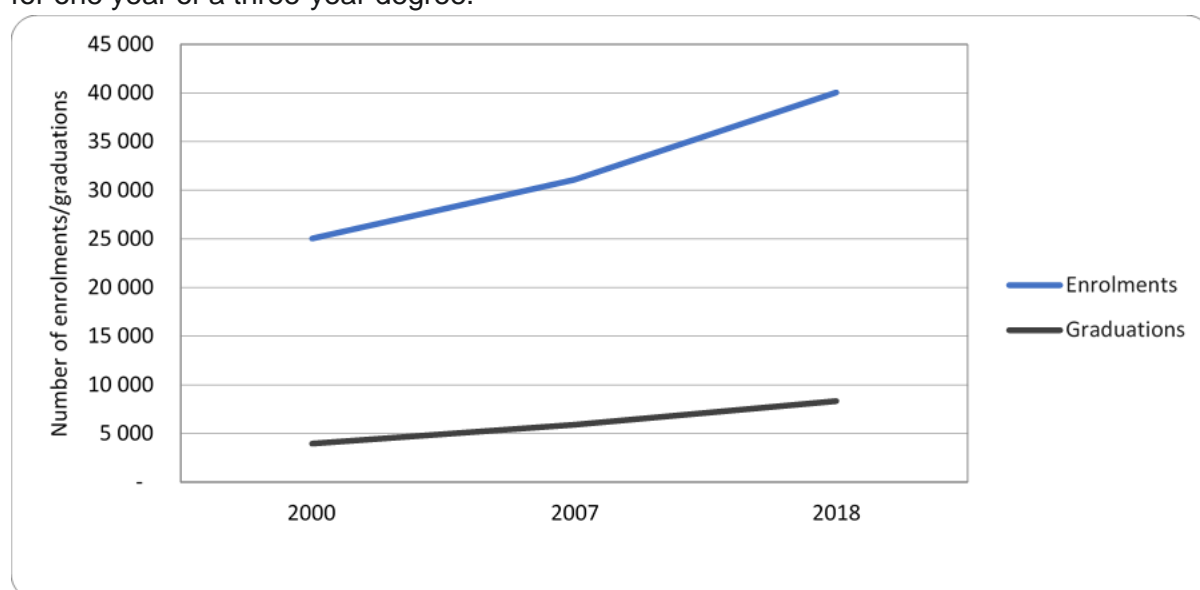


Figure 6.6: Number of enrolments and graduations across all qualifications in primary study fields

Source: HEMIS 2001, 2007 and 2018; Jenkin¹

Demographic trends

Given the BHCDS' focus on equity among racially classified South Africans⁴⁸ in the sector, and the HSRC's findings that women are underrepresented in the sector (Vass et al., 2009), the review included demographic data i.e. the race and gender profiles of the biodiversity graduates.

⁴⁸ The HEMIS figures for 'black' students refer as far as we can establish to black *South Africans* specifically. For the most part we have treated black African, Coloured and Indian groups all as black; but the HSRC has not always done so and we needed to match their calculations, for comparative purposes. The HSRC baseline, when referring to race, only presented results for Black [African in HEMIS] and White even though HEMIS presents data for Coloured and Indian groupings.

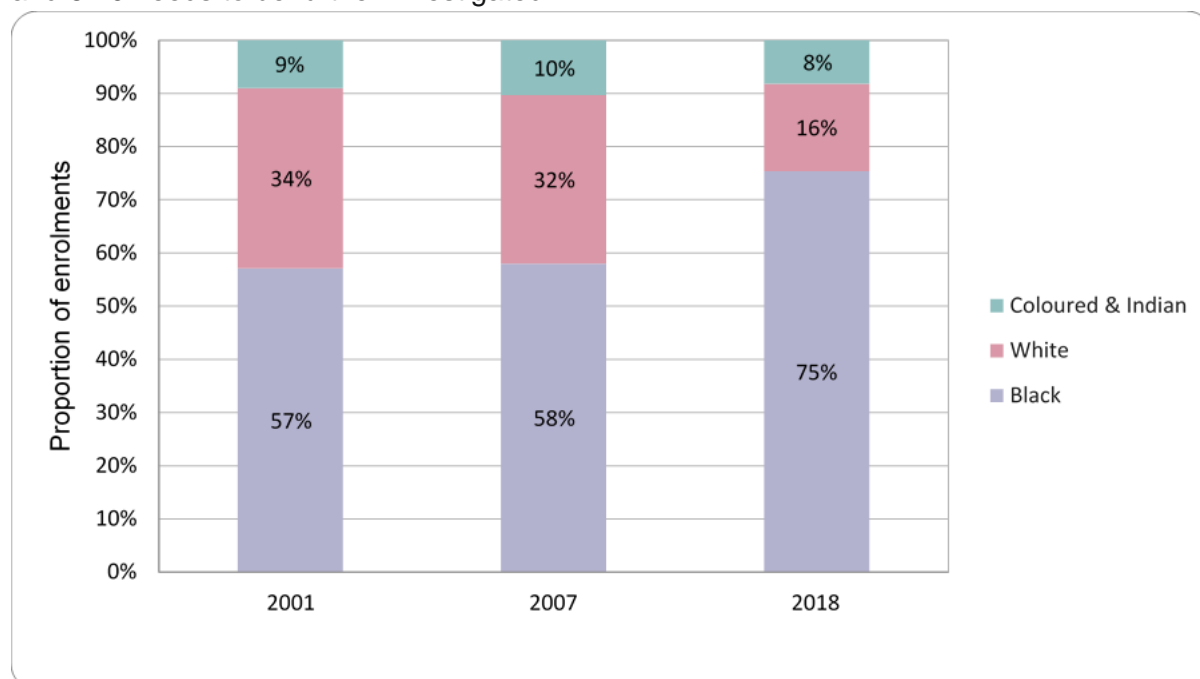
Table 6.3 Source data for Figures 7-9

	2001	2007	2018
Black men: Enrolments	7,228	8,551	13,305
Black women: Enrolments	7,067	9,472	16,870
White men: Enrolments	4,114	4,796	3,050
White women: Enrolments	4,382	5,039	3,544
Totals	22,791	27,858	36,768

Source: HEMIS 2001, 2007, 2008, Jenkin's calculations

Both the actual number and the proportion of black students enrolled in biodiversity-related study fields have increased significantly over the review period. When combining the various groups politically defined as 'black', the figure is 81% of total *enrolment* in 2018 compared to 66% in 2001. The *graduations* among black students are slightly lower than the enrolment, at 79% of all graduations.

Figures 6.9 - 6.11 present an analysis according to binary gender and race. Figures 6.10 and 6.11 show that the greatest increase in graduates in biodiversity-relevant study fields have been black women, followed by black men. Figure 6.11 shows that the increase in black women graduating has been across all qualifications at undergraduate levels. The big discrepancy between the number of enrolments and number of graduations in Figures 6.9 and 6.10 needs to be further investigated.

Figure 6.7: Demographic trends in enrolments across all qualifications in primary study fields

Source: HEMIS 2001, 2007 and 2018; Jenkin's calculations

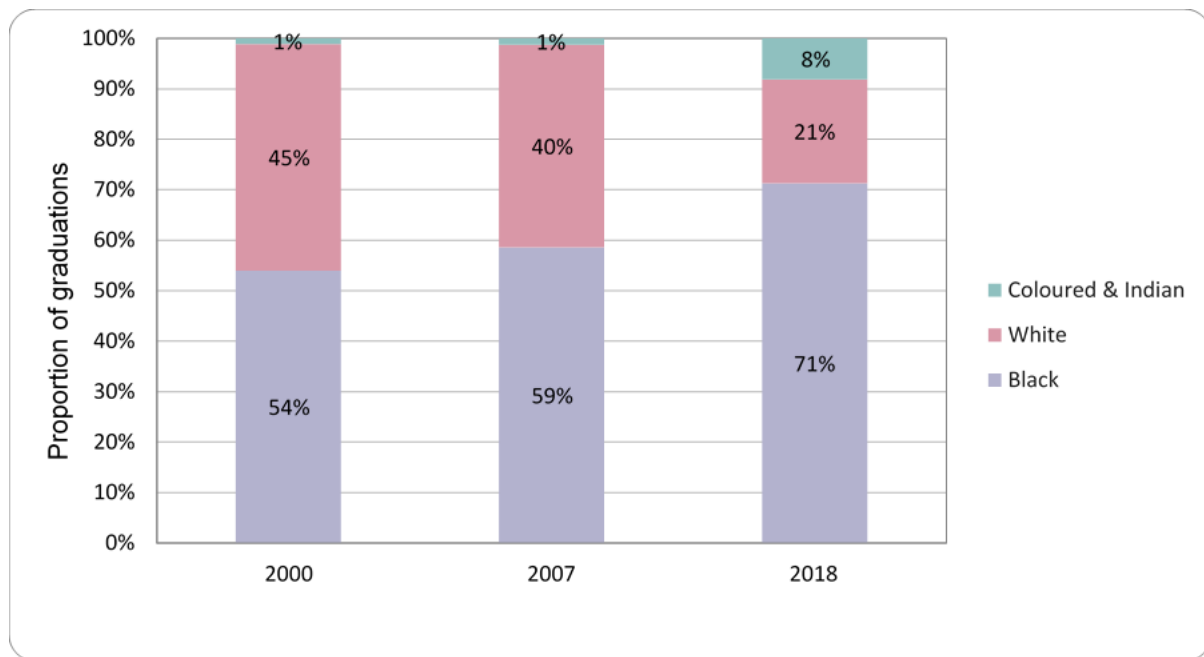


Figure 6.8. Demographic trends in graduations across all qualifications in primary study fields

Source: HSRC Baseline, HEMIS 2018; own calculations

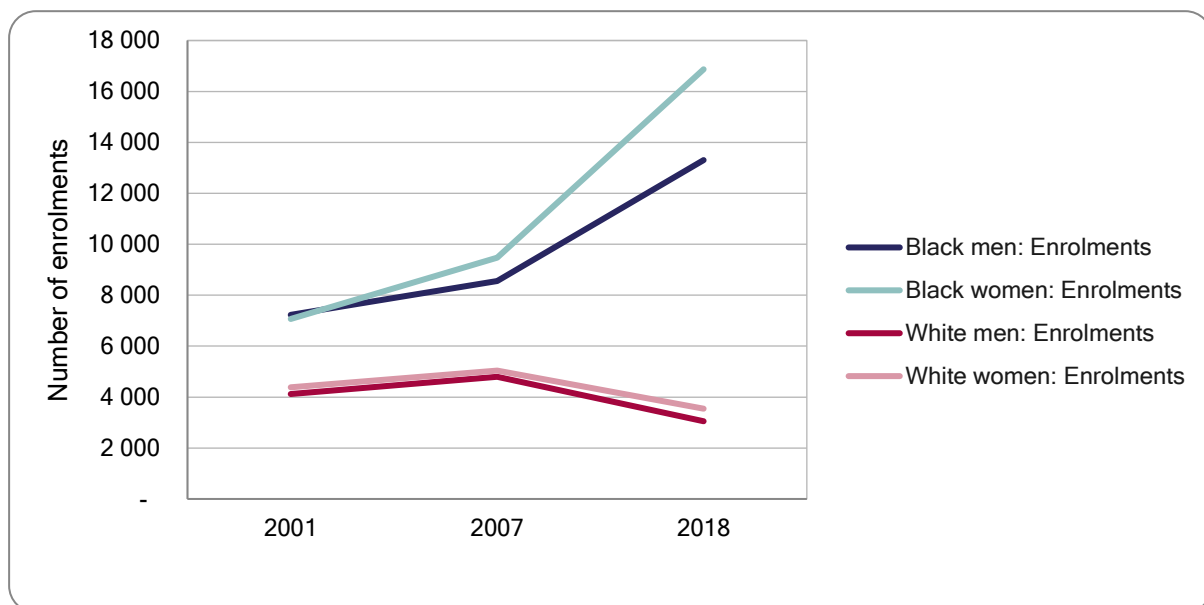


Figure 6.9: Demographic trends in number of enrolments by population group and gender across all qualifications in primary study fields

Source: HEMIS 2001, 2007 and 2018; own calculations

Figure 6.10 indicates that 3,500 black women and 2,400 black men graduated in 2018, across qualification levels, in biodiversity-related study fields (5,900 in total).

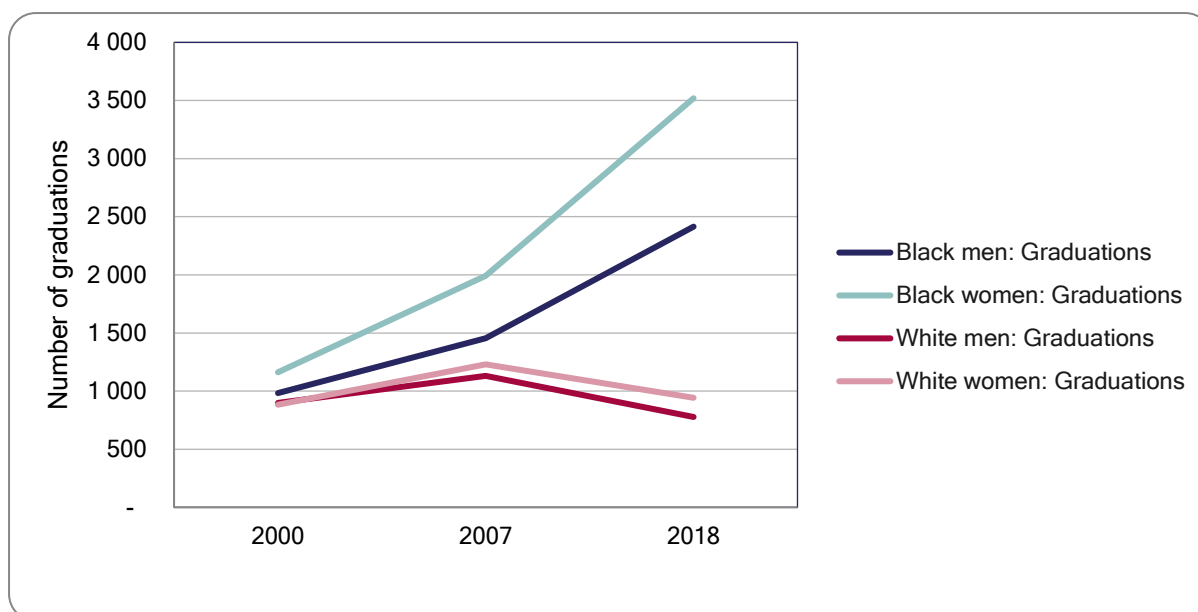


Figure 6.10: Demographic trends in number of graduations by population group and gender across all qualifications in primary study fields

Source: HSRC baseline; HEMIS 2018; Jenkin's calculations

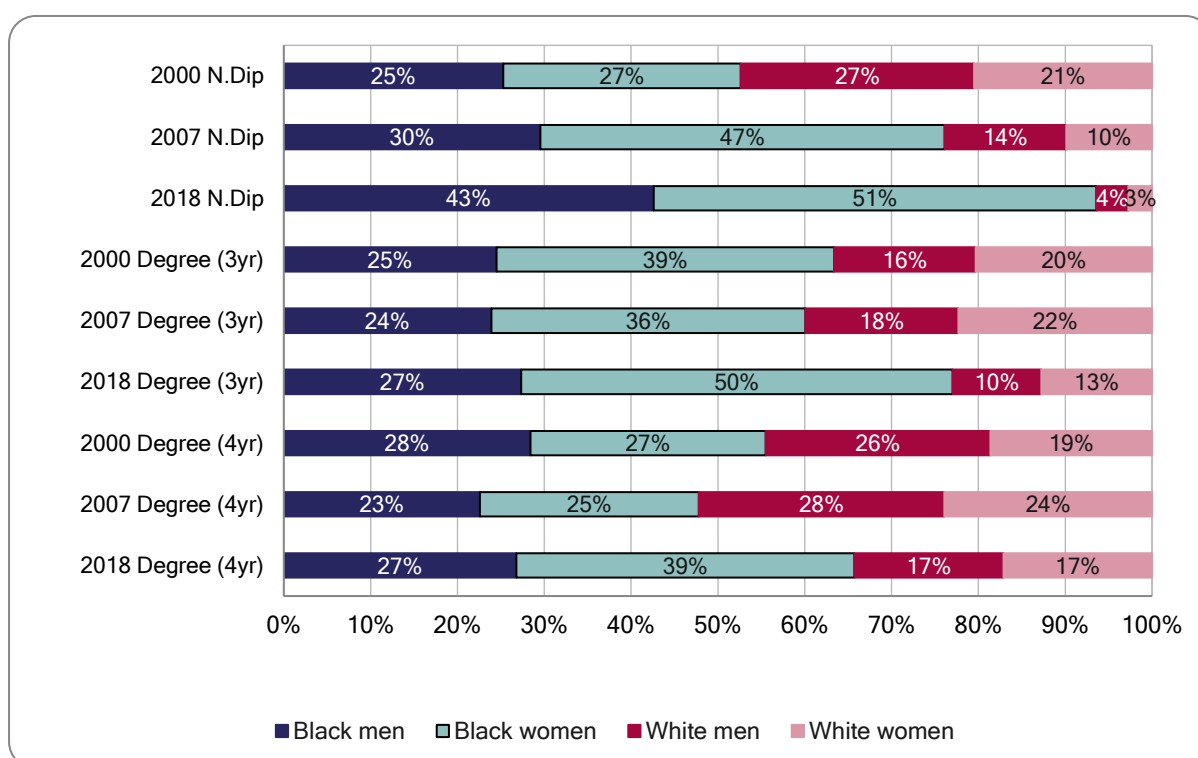


Figure 6.11: Undergraduate graduations in primary study fields, by population group & gender

Sources: HEMIS 2018; HSRC baseline; Jenkin's calculations

While undergraduate trends are significant because they feed the postgraduate pipeline, for the BHCDs trends at the postgraduate level are even more relevant. Figure 6.12 shows that there has been an increase in the number of black students graduating with Masters and to a lesser extent, PhD degrees, and a *bigger proportion of the total number of graduations* are

now at the postgraduate levels. This too, is a positive outcome with regards to ensuring that there is an adequate pool of graduates from which the biodiversity sector can make appointments. Furthermore, the proportion of black South Africans in this pool is growing.

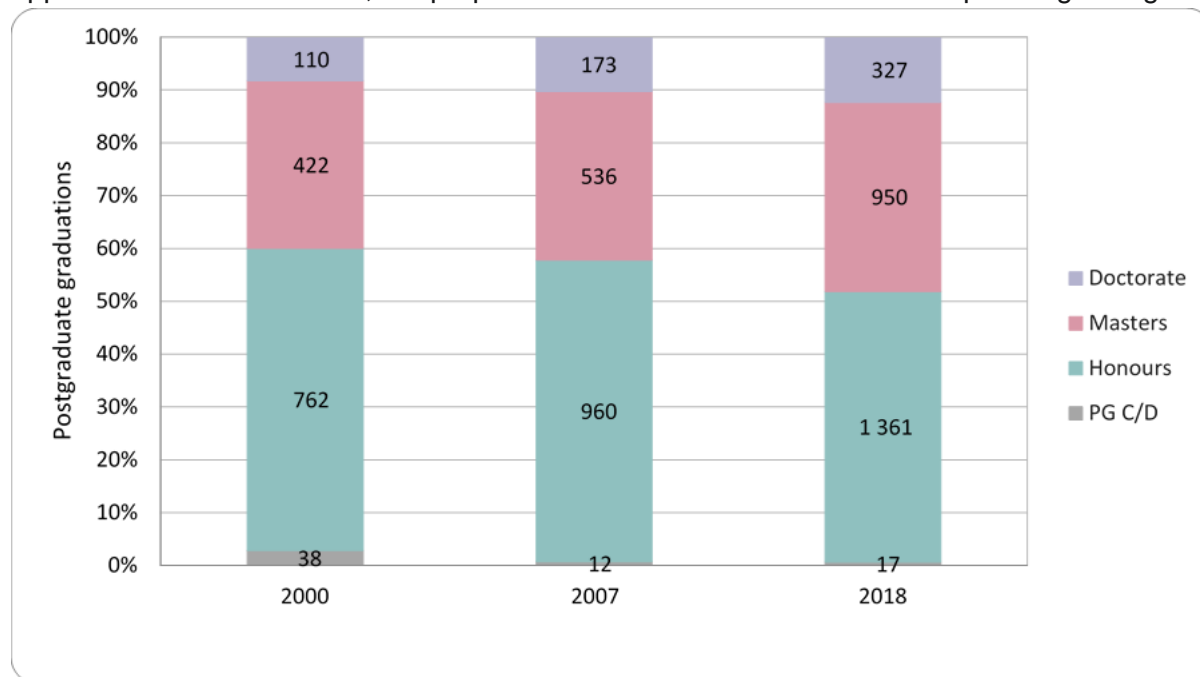


Figure 6.12: Number of postgraduate graduations in primary biodiversity-related study fields

Source: HEMIS 2018; HSRC baseline pg. 178; Jenkin's calculations

The differentiated data in figures 6.14 to 6.16 suggest that while primary biodiversity-relevant study fields have not seen the same increases in black students enrolling in *undergraduate* programmes as seen in higher education overall, *they had the same levels of increases in postgraduate qualifications achieved across all study fields*, and the same demographic trends, i.e. an increase in the number of black women and men now graduating with a Masters or a PhD degree, with the proportion of graduations across race groupings increasingly reflecting the population as a whole.

The increases in black students graduating with postgraduate qualifications in the primary study fields have matched the increases across the board, and while this is a positive observation, it is therefore not possible to suggest that they may have been due to BHCDS interventions (such as career guidance or the GreenMatter Fellowship). However, it is positive that the supply of skills is growing at the postgraduate level for meeting biodiversity-related scarce skills and transformation goals.

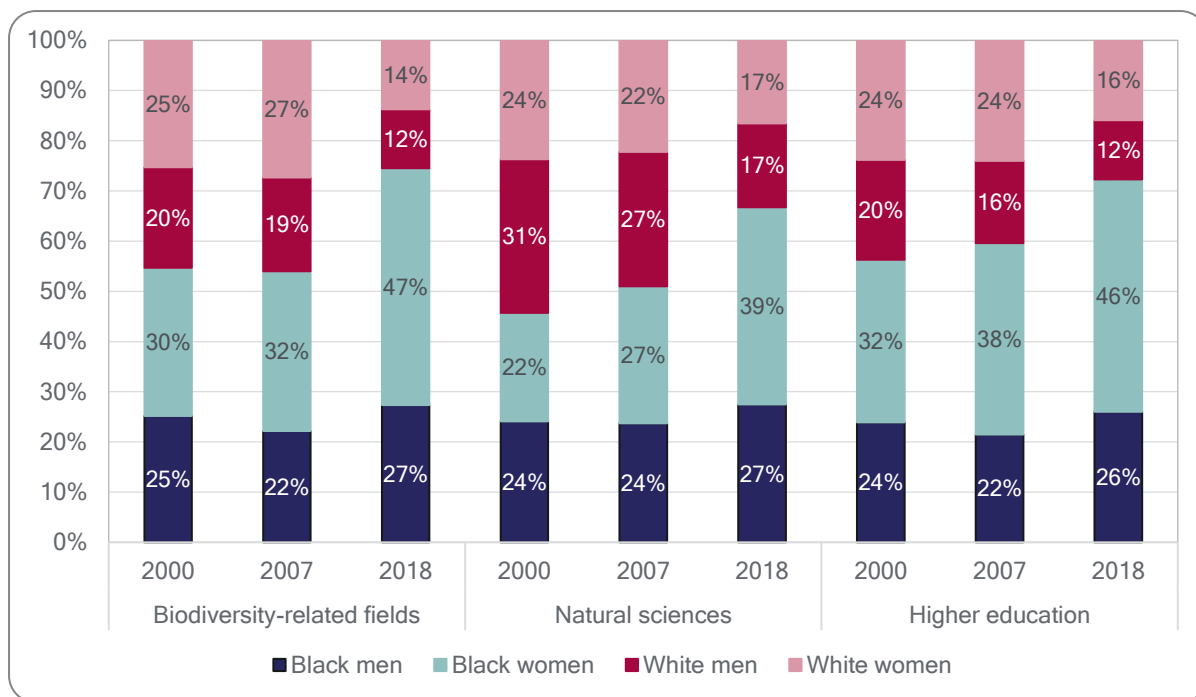


Figure 6.13: Honours graduations by study fields, population group & gender

Sources: HSRC baseline pg. 181, various gender/race HEMIS 2018 sheets; Jenkin's calculations¹

Black women now comprise nearly half (46%) of all biodiversity-related graduations at Honours level (2018 data) compared to less than a third (30%) in 2000 (Figure 6.16).

The finding of more black women studying in and graduating with higher degrees is very positive for the BHCDS and should be regarded as an achievement not only for each individual student involved, but for the universities involved, and for the funding agencies. Research (e.g. Dotwana, 2014, in the CATHSSETA supported programme reported in Chapter 5) found that black women were less likely to move on to further degrees due to a number of gender-related systemic constraints. The HEMIS review suggests that many young women are now starting to overcome those constraints and that institutions are playing their part successfully.

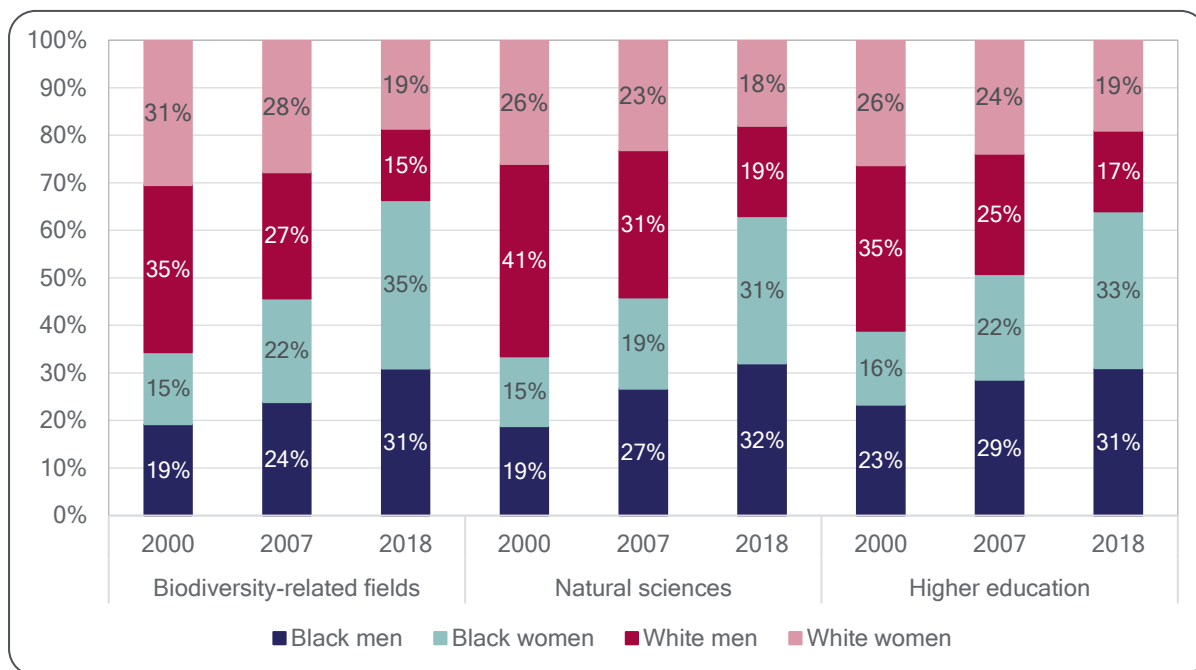


Figure 6.14: Masters graduations by study fields, population group & gender

Sources: HSRC baseline pg. 181, various gender/race HEMIS 2018 sheets; Jenkin's calculations.

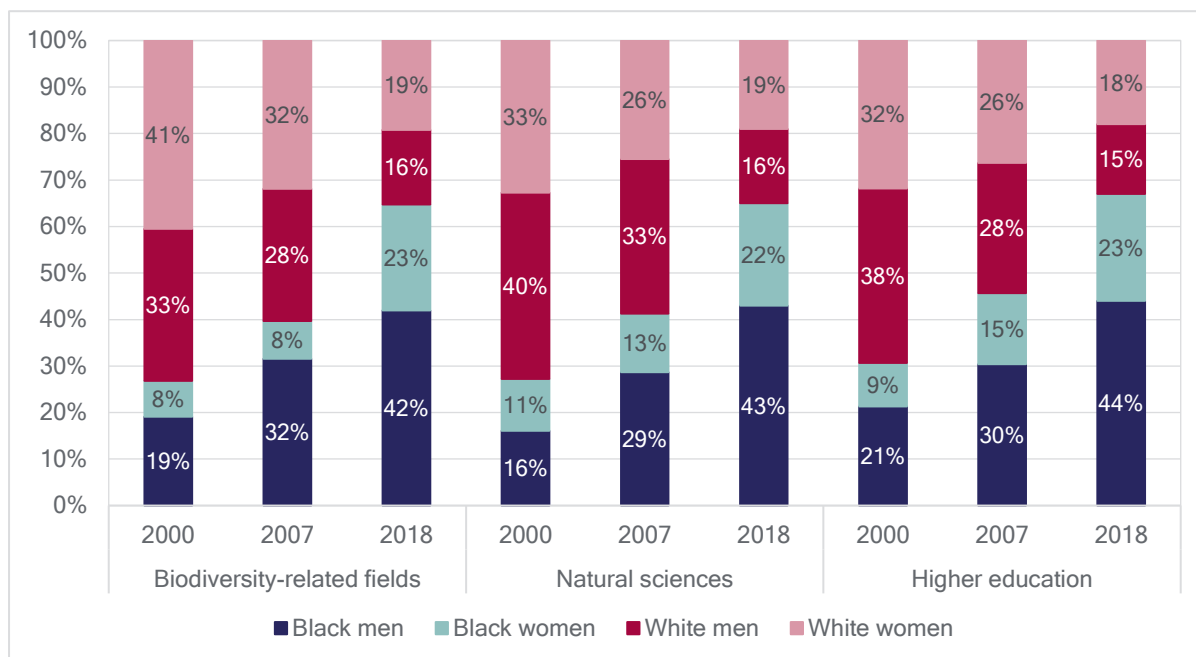


Figure 6.15: PhD graduations by study fields, population group & gender

Sources: HSRC baseline pg. 184, various gender/race HEMIS 2018 sheets; Jenkin's calculations

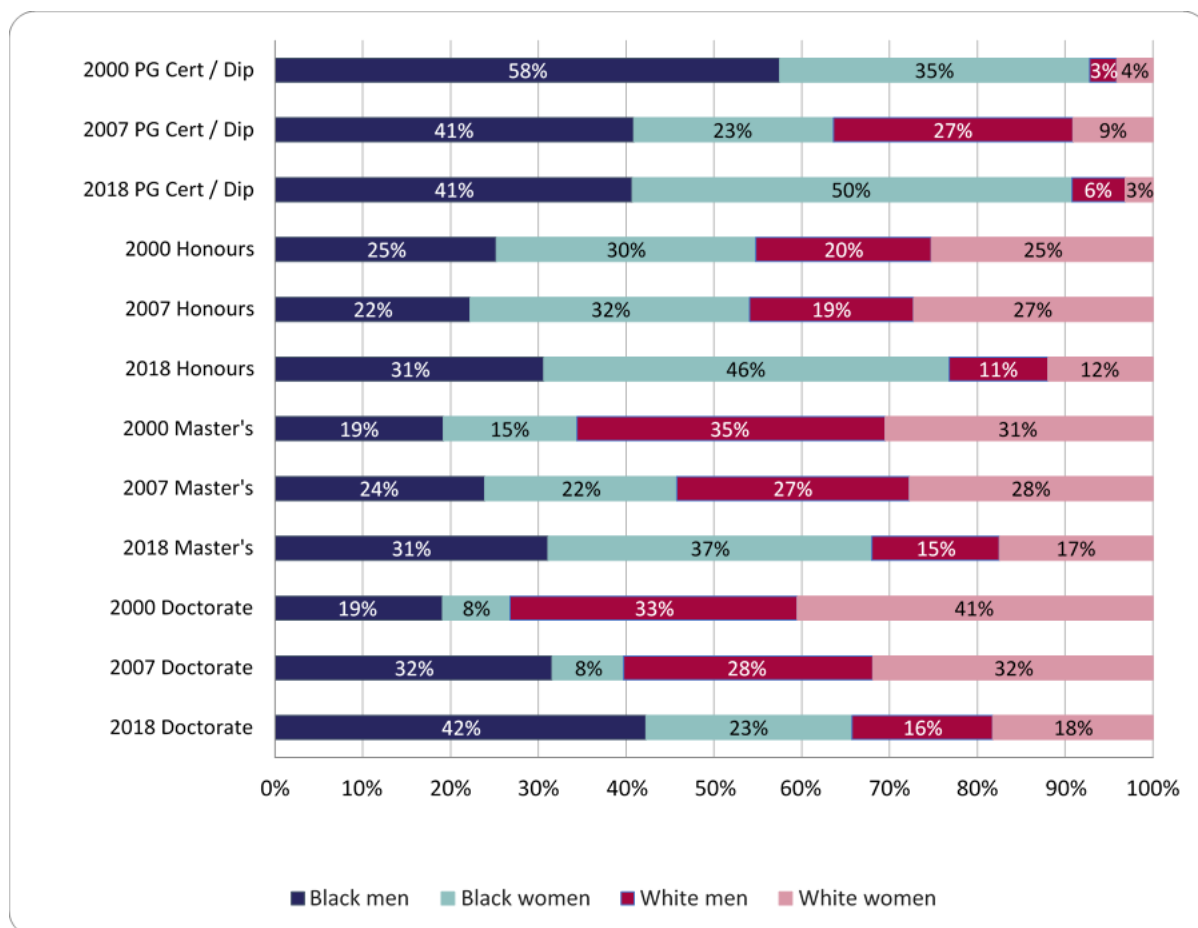


Figure 6.16: Proportions of postgraduate graduations in primary study fields, by population group & gender

Sources: HSRC baseline pg. 186, HEMIS 2018; Jenkin's calculations

6.2.3 Summary of trends in supply of black graduates

1. There is an increase in enrolments across the board in higher education in general and in particular in black students enrolling, and enrolling for higher degrees, with the PhD however showing the least growth.
2. Graduations are not keeping pace with enrolments, suggesting problems with throughput and completion, possibly due to university staff shortages; and/or funding constraints experienced by individual students, in part due to perverse incentives to fund more students for shorter periods of time; and/or students enrolling for inappropriate courses that do not match their aptitude and interest. This suggests that more needs to be done to ensure the success of those who do enroll at university (see Section 6.4.2)
3. There is a very positive growth in the proportion of black women enrolling and graduating at all levels, including Masters, with the PhD showing an increase as well, but not the same rate of increase as other levels. Black men convert more readily to the PhD than black women. Overall, the change in the demographic profile is in line with the BHCDs goals.
4. DHET has changed the classification of study fields and a number of CESM codes relevant to the biodiversity sector are no longer used; if related occupations (such as Agricultural extension) are regarded as scarce skills, this should be further investigated.

5. Biodiversity-related fields are keeping up with other study fields but are not capturing more of the available pool of potential students than others; the sector must still consider how best to compete for the best talent, provided it has employment opportunities to match. This may be especially important in the post-Covid period, when the Health Sciences will most likely attract more of the available funding, science and technology graduates. Section 6.2.4 looks at BHCDS initiatives to improve graduation rates, transitioning into postgraduate studies, and improving the quality of skills produced in schools.

6.2.4 Improving graduation / completion rates

The high discrepancies between graduation rates and enrolment rates, suggest that many who enrol for (and are most likely funded during) undergraduate courses never graduate. This is a loss for individuals and for the system. The problem can be addressed through a number of interventions. The BHCDS proposed curriculum interventions in universities (improving quality and relevance of curricula); this has not been taken forward as yet. Instead, it focussed on what emerged as a particularly strategic point in the BHCDS pipeline, where there was a clear leakage: the failure of universities to provide work-integrated learning (WiL) placements for conservation students in their final year. This was addressed through the WiL project convened by WWF as part of the BHCDS Bridging into Work stream of projects. The WiL project brought universities with WiL programmes (like UNISA, TuT, CPUT, DUT) together and engaged the DHET's WiL directorate around the systemic problems (including chronic underfunding of higher education in general and WiL in particular) causing the 'leakages'. The initiative was strongly supported by the participating universities and DHET engaged. However, this review did not establish whether the completion rate of WiL students in the sector has improved, as this component of Bridging into Work has not been continued, and there has been no tracking of its longer-term outcomes.

6.2.5 Transition to Postgraduate studies

The HEMIS analysis shows an improvement overall and in the biodiversity-related study fields in the number and also the proportion of students who convert from graduate level to postgraduate studies. The BHCDS implementation featured several initiatives which supported this process. Chief among them is the GreenMatter Fellowship, which inter alia provides bursaries in specific study areas, related to scarce skills needs in the sector, to encourage postgraduate studies in these fields. The Fellowship takes into account research findings indicating that in addition to the funding, networking opportunities, mentoring and 'soft skills' development are also important. It is therefore a highly strategic implementation initiative, provided it is informed by actual skills needs. Thus far (from 2012 - 2020) it has funded 175 Fellows, of whom 132 are black. While the number of beneficiaries per annum could perhaps be increased, e.g. by linking with more funding agencies, this is perhaps best seen as a targeted rather than large-scale initiative; it addresses scarce skills, provides quite in-depth additional skills development opportunities besides the funded studies, and it aims to build a network of 'ambassadors' for the sector. Fellows have been asked to great effect to share the stories of their journeys into the sector at fundraising and promotional events. It is a significant gap that the tracking of these Fellows have not been sustained, as it potentially reduces the impact they could have had in the sector, had the BHCDS programme been able to keep connecting with them.

Another relevant initiative here is the career guidance project led by WWF as part of Bridging into Work. Most environmental career guidance initiatives (such as those developed by DEFF and SETAs) aim at school children. The BHCDS-WWF initiative was aimed at university students, in order to help them transition into biodiversity careers or postgraduate studies. The underlying, pioneering research into biodiversity careers was undertaken by PACE, and funded by the Lewis Foundation. Innovative activities and interactive resources were developed, and used to present the biodiversity sector to students on several campuses (including Stellenbosch, UWC, Wits, Rhodes, UJ, UKZN, DUT) during career days and at career centres. This included students from other study fields like Commerce, many of whom expressed an interest. The initiative was well received by university career / orientation offices and students alike, who indicated that there has never been a similar initiative, and that more is needed. This project has been catalytic, with the following *outcomes*: DHET incorporated environmental careers information into the National Career Advice Portal (NCAP or *Kheta*) and materials are available for future use. Some are being put forward to be shared via DEFF's proposed Skills Portal, a development requested by the Minister of Environment. SANBI has continued using the resources and approaches in extended career guidance with schools and universities.

6.2.6 Improving quality in schools

The BHCDS suggests a combination of focused interventions in some schools (township schools that already have strong school management, Math and Science capabilities) and a systemic intervention at the level of teacher education institutions. The former initiative has not been taken up in the period under review. The latter has been taken up on a significant scale in the form of Fundisa for Change, which has been described in Chapter 5. The outcomes and impact of Fundisa for Change are reviewed here, based on the case study which had access to several evaluation reports.

The Fundisa for Change programme has contributed to SO5 in a number of ways.

Enhanced teacher and teacher educators' ESD capacity

Fundisa for Change has enhanced the capacity of over 2,000 teachers and teacher educators in environment and sustainability content, assessment and teaching practice, and they evaluated the programme very positively. It has also "helped in waking up the teacher in me" and "brought joy back to teaching", to quote participants. This has been achieved through the development and implementation of: (i) Ten teacher and teacher educator courses endorsed by SACE, (ii) SACE-commended teacher education materials that integrate environment and sustainability, and (iii) research processes and products that inform environment and sustainability content and pedagogy. The following Fundisa for Change courses have been SACE-endorsed: **Life Sciences**: (i) Teaching Healthy living in Life skills, Grades R to 3; (ii) Teaching Biodiversity in Life Sciences, Grades 10 to 12; and (iii) Teaching Marine Biodiversity in Life Sciences, Grades 10 to 12; **Social Sciences**: (i) Teaching Water in Social Sciences, Grades 4 to 6; (ii) Teaching Water is in Social Sciences, Grades 7 to 9; and **Natural Sciences**: (i) Teaching Life and Living in Natural Science and Technology: Grades 4 to 6; (ii) Teaching Indigenous knowledge in Natural Science and Technology: Grades 4 to 6; and (iii) Teaching Climate Change in Natural Science: Grades 7 to 9. Ten universities have integrated these teaching materials in their pre-service courses,

i.e. in Bachelor of Education, Bachelor of Education Honours, Advanced Certificate in Education, and Post Graduate Certificate in Education (PGCE).

Enhanced the conditions and uptake of environmental learning in the national teacher education system

Fundisa for Change has developed and implemented a potentially scalable concept and approach for integrating biodiversity education and broader education for sustainable development (ESD) in teacher education, built on the idea that ‘sustainability starts with teachers’. This has been achieved through training a network of trainers who can offer and run Fundisa Training of Trainers programmes around the country and who are now also contributing to mainstream teacher education programmes. The cadre of trainers is playing a catalytic role in promoting ESD in teacher education.

Furthermore, the *Fundisa for Change* Programme has influenced the uptake of environmental learning through (i) establishing and operationalising a National Professional Community of Practice for environmental learning and a Teacher Development Network, (ii) enabled the recognition of *Fundisa for Change* courses by SACE, (iii) inspired several universities to implement *Fundisa for Change* courses, and (vi) co-designed and mobilised resources for a VVOB funded *Keep It Cool* Climate Change Education project that focuses on developing teachers’, teacher educators’, and school leadership’s capacity for CCE teaching and research, and involves five universities in three provinces. These achievements are resulting in the integration of the BHCDs into the national schooling system and teacher education practice. A new initiative, funded by Rand Merchant Bank, is a new online Green Economy course for teachers in Business Studies and Economics and Management Sciences.

At the southern African level, Fundisa for Change has shaped the conceptual framing of UNESCO Regional Office for Southern Africa (ROSA) Sustainability Starts with Teachers (SST) project, which is being implemented in SADC Member States, with technical support from Rhodes University.

These are all catalytic outcomes of the project. In terms of policy impact, it is not certain that Fundisa for Change directly contributed to the integration of ESD in the new Minimum Requirements for Teacher Education Qualifications (MRTEQ), a teacher education policy instrument. However, it is likely that it did, as it is primarily through Fundisa for Change that senior educators engaged with the national Deans Forum, DHET and the DBE and did a significant amount of advocacy work in the past 10 years. This is a potentially huge achievement, as it will ensure that all universities offering pre-service teacher education, must have ESD capability. Fundisa for Change has developed the resources and networks with which to support this important development.

6.2.7 Conclusions

There is a positive upward trend in the number of students and in particular black women and men entering and graduating in biodiversity-related study fields at South African universities. Whether the interventions of the BHCDs have in fact, increased the number of black South Africans attracted to working in the sector is uncertain. While it is true that there are more blacks working in the sector now than 10 years ago, particularly more black women, this could be due to the growth of graduates in general. The fact that the growth in graduation numbers has been lower for biodiversity-related skills than the growth in

graduations in general, suggests that the biodiversity sector is still not attracting students as much as other fields. Conversion from first degree to postgraduate studies has improved, and the GreenMatter Fellowship is well positioned to keep supporting this transition.

Some significant systemic interventions (*Fundisa for Change* and Career Guidance materials) have been put in place and have yielded very positive outcomes and impacts e.g. the integration of green career guidance in some national portals, and the integration of ESD as a required competence in initial teacher training.

The discontinuation of the career guidance initiative on campuses seems to be a significant gap and a loss of the potential of the developed materials and activities. This seems particularly important to receive future attention, given that the biodiversity sector is still not attracting graduates as much as other fields. It also seems particularly important, given that the Health Sciences are likely to receive an important boost in the post-Covid period, and will therefore compete more strongly for school leavers with good Math and Science marks, or graduates in these fields. The GreenMatter Fellowship plays a related role and could potentially be connected to the Careers outreach.

The increase in the number of enrolments is staggering and given reductions in university budgets, it is likely that these institutions are now understaffed. This puts the ability to graduate a reasonable portion of those who enter universities, at risk. Improving graduation rates to be a significant area for future investment in the BHCDs. The WiL programme, which has been the only initiative addressing this critical pipeline issue, has not continued.

6.3 SG2: Improve quality, levels and relevance of skills for the sector

6.3.1 Relevant Strategic Objectives and Initiatives

Strategic Objective 2 (Up-skilling)

Extend existing capacity: 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.

Strategic Objective 4 (Skills Provision)

Increase the relevance and quality of educational provisions in a wider range of higher education institutions and other training providers, in a manner that will improve pass rates and entry into post-graduate studies.

Strategic Objective 5 (Skills Provision)

Contribute to better science, mathematics, literacy and environmental learning in schools with adequate management capacity.

Strategic Objective 7 (Skills Provision)

Increase the supply of scarce skills through targeted higher education initiatives in priority areas identified through ongoing needs analyses.

In this section we review the outcomes and impacts of two internships, mentoring initiatives associated with the Organisational Strengthening stream of the BHCDs programme; and the NESPF, as these are all relevant to Strategic Goal 2. The case studies on these initiatives

will be used for this section of the review, as well as survey findings reflecting stakeholders' perceptions of improvements in this regard. The Fundisa for Change outcomes and impacts are also relevant, and will be mentioned where this is the case.

6.3.2 Outcomes and Impacts of Internships

The Internships case study evaluated the outcomes and impact of three BHCDS implementation initiatives: the Groen Sebenza Jobs Fund project, WWF Internships and the GreenMatter Fellowship (which included funding for skills programmes for employed young professionals). These address SO 2: *To improve the skills of those already in the workplace in a manner that contributes to social equity, a sense of belonging and pride in the sector.* The majority of beneficiaries of all these initiatives were young black South Africans. In this section we present *outcomes* related to the quality and relevance of the skills developed through these internship programmes.

Increased job preparedness, employability and career development

The internships programmes were an opportunity for young people to get training and workplace experience through performing job tasks while at the same time receiving mentoring and coaching from seasoned professionals. The Groen Sebenza pioneers, WWF interns and GreenMatter Fellows reported that they developed technical and soft skills, and got to know the work cultures of host organisations. This helped them develop an understanding of jobs and associated tasks, and get more grounded in the multiple realities, needs and ecosystems of the sector. This, the programmes improved the employability of graduates. Some of the many positive quotes from beneficiaries of these programmes are shared here.

"The programme provided us with an opportunity to develop holistically ... develop content knowledge but also the softer professional skills which are so essential when entering the formal job market ... The internship provided me with much needed work experience and laid the professional foundation upon which I built my career... My work ... straddles the science-policy interface and the socio-ecological thinking that was instilled in me during my internship places me in a better position to deal with the complex issues that I deal with daily."

"In my current role, I am both a scientist and a coordinator. I work mainly in the terrestrial technical sector, but also work where terrestrial meets marine, estuarine, and freshwater ecosystems and the specialists from these groups ... Hence the cross-sector knowledge I gained during the internship helps me better understand cross-sector issues now".

"I was able to transition into a permanent role in another cluster of the bank with a good understanding of the governance structures in place and was able to hit the ground running."

"The internship enables us to identify young talent and place suitable candidates in key positions."

The BHCDS Organisational Strengthening initiative contributed to the quality and relevance of skills in the sector through a project, led by WWF, for improving mentorship capacity. Mentoring training and materials were well received by senior science and management professionals from a range of organisations (e.g. SANBI, DEA Oceans and Coasts,

Department of Water Affairs & Sanitation, South African Institute for Aquatic Biodiversity (SAIAB). In the survey, mentoring stands out as one of the definite perceived improvements in the sector (see Item 6.16 below).

The Fundisa for Change Programme is also indirectly relevant here, through its role in developing the skills foundation (at school level) that will be needed in the biodiversity sector. The outcomes of this programme were discussed in 6.2.4.

Scarce skills needs and skills gaps have been addressed

Around two-thirds of the 31 survey respondents felt that scarce skills needs and gaps had been substantially addressed (68%). Others felt that this issue had only been partly addressed, or not addressed (Figure 6.17).

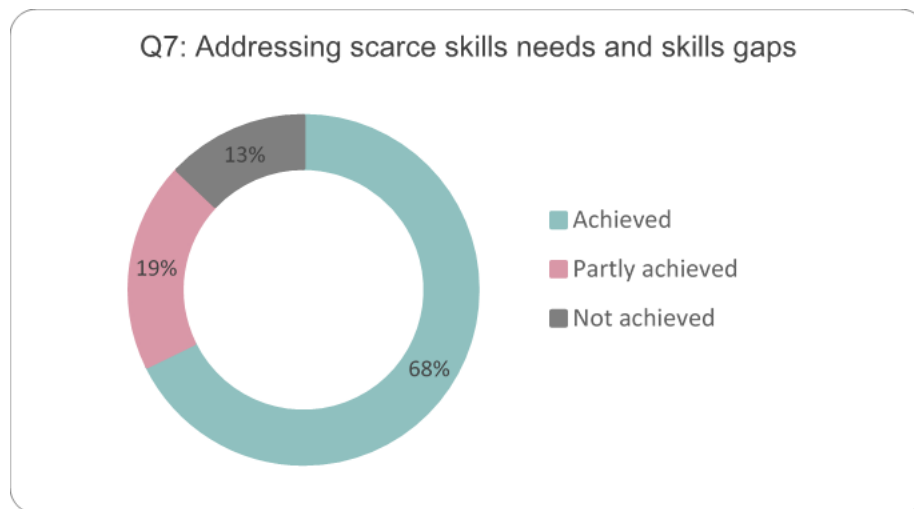


Figure 6.17 Summary of responses to the survey question “What has been achieved in addressing scarce skills needs and gaps?”

When asked to compare the current situation to the situation ten years ago (Figure 6.18), most survey respondents felt there had been some improvement or that the situation had remained more or less the same (a slightly less optimistic picture than that shown in Figure 6.17).

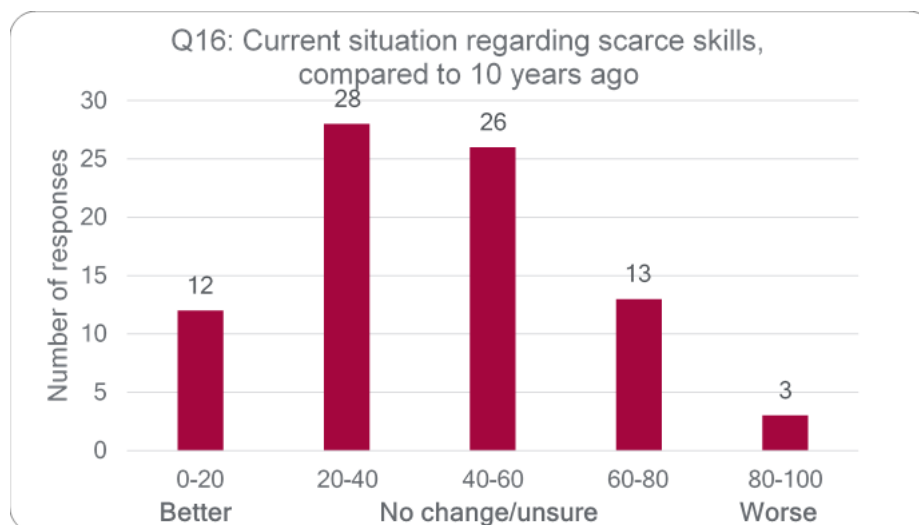


Figure 6.18: Perceptions of scarce skills gaps

Score: 43 on average (Median = 43)

The range and quality of graduate skills and courses has improved

Employers felt that the knowledge and skills of graduates today are similar to or slightly better than what they were ten years ago (Figure 6.19). Around two-thirds of respondents felt that the range of biodiversity-related courses on offer at South African universities today is better or substantially better than it was ten years ago (Figure 6.20). Nobody felt the situation has become substantially worse. In terms of vacancies (Figure 6.21), survey respondents reported a slight improvement or little change. However, more respondents felt it has improved than felt it has gotten worse over the last ten years. The number of unfilled vacancies reflects (in part) skills in short supply.

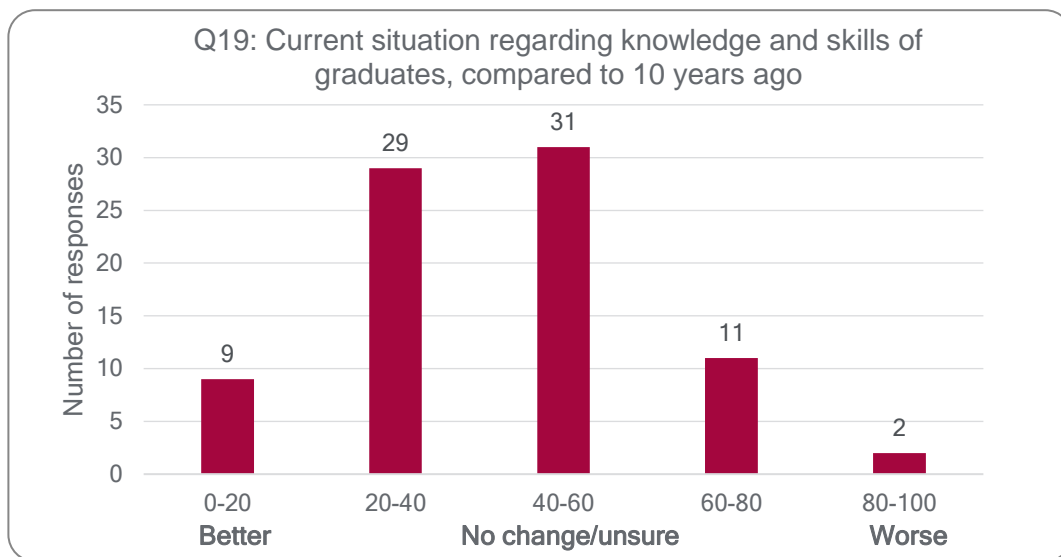


Figure 6.19: Perceptions of graduate skills and knowledge (Q19)

Score: 43 on average, i.e. more or less the same or some improvement (Median = 45.5).

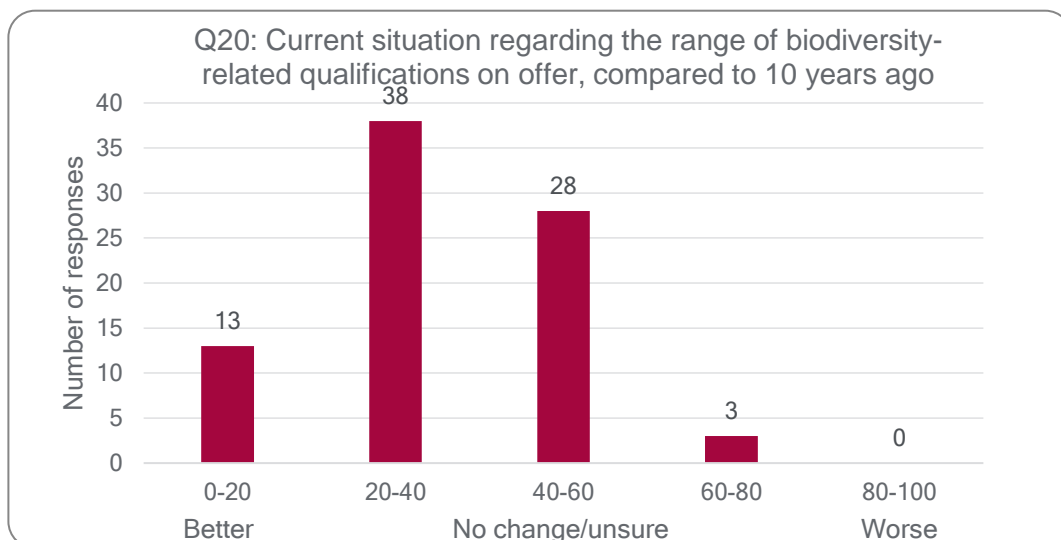


Figure 6.20: Perceptions of the range of biodiversity-related university courses on offer (Q20)

Score: 35 on average (Median = 35.5), i.e. improvement

6.3.3 Conclusions

According to the perceptions of survey respondents, both graduate skills and the range of biodiversity-related courses on offer have improved in the past ten years, and this may have contributed to a slightly lower number of unfilled vacancies. Survey respondents also felt that the situation with respect to scarce skills has improved over the period and that implementation of the BHCDS has been successful in this regard. However, this does not translate into complete satisfaction with available skills, as other survey findings will show.

6.4 SG3: Improve retention and effective deployment of suitable individuals

6.4.1 Relevant objectives and initiatives for this strategic goal

Strategic Objective 2 (Up-skilling)

Extend existing capacity: 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.

Strategic Objective 3 (Retention)

Improve retention and effective deployment of suitably skilled people in the sector through organisational design, skills planning, development and human resource development processes.

6.4.2 Findings

The Groen Sebenza and WWF internships and GreenMatter Fellowship all had significant elements focusing on equity or racial transformation, belonging and pride in addition to skills and retention in the sector; the HRD Network directly addressed the ability of organisations to better attract, upskill and retain suitably qualified and skilled individuals in the sector. The outcomes and impacts of these BHCDS implementation initiatives are therefore again noted in this section along with survey findings addressing aspects such as the transformation of workplace cultures. The role of the NESPF in creating related enabling conditions is also reviewed here.

Increased intern competence, confidence and integration

The case studies indicated that the way in which Groen Sebenza, internships and the Fellowship have been run has helped to grow competence and confidence in the participants, cultivated a sense of belonging to the sector and a sense of pride in their work. Below are quotes that illustrate reported outcomes achieved:

“Interpersonal skills that I learned during my internship are invaluable as much of my week is spent negotiating for data by nurturing genuine relationships. And of course, I would be nowhere without the confidence I gained as an intern ... In terms of content, ... one of the most useful skills I learned was the importance of open communication with your mentor/boss. The older adults in my community came from a different generation and had always cautioned that bosses were not people with whom to share your goals and aspirations.”

“WWF had four sessions of two nights away where all of the interns would come together to discuss their experience and receive career guidance. This provided a

safe space to support growth rather than being left to your own devices at the company where you were placed. It was great to interact with the other interns and have a sense of community ... This internship has a sense of community even when you leave the programme.”

“SANBI is just the platform I needed in my career as I am learning new things every day. It keeps me on my toes. I am not treated as intern but a professional where my recommendations in what we are working on are considered valuable. I have been given opportunity to deliver a presentation on the proposed Amathole Biosphere Reserve, and have worked on developing policy and legislative framework to be aligned with the Land Reform and Biodiversity Stewardship strategy.”

“At the beginning [the interns were] very shy, not very confident, lack of communication skills at the end confident and improved communication skills.”

Improved employee, directorate or unit and organisational performance

The internship programmes have opened up a new way of working with interns creatively and productively in organisations. In WESSA, for example, this has resulted in a situation where they are no longer viewed as a cost but contribute towards the realisation of the host organisation’s goal while they are also benefitting from workplace-based learning. Available data suggests that, in addition to influencing the number and quality of internships programmes in the country, internship programmes have become longer and more comprehensive, from as short as 3 months to as long as 30 months.

Organisations were inspired by the demonstrated added value of interns, who have also been described as creative and innovative. For example, one graduate working in the National Botanical Gardens identified the need for developing management plans for all nine Gardens. And this is being addressed. Commenting on the transformation and impact of internship graduates in the biodiversity sector, the CEO of WWF wrote: “The once academic, thesis-led ideas of these eager individuals are now being put into practice where it matters, applied to complex real-life challenges ... these former interns are part of diverse networks of environmentally friendly active organisations and creative individuals.”

A replicable model for future skills development and job creation

The internships programmes have inspired organisations to improve their human capacity development practice. This is reflected in three main kinds of improvements: (i) new and more comprehensive internship programmes in partner organisations, (ii) wider application of the capacity development approach drawn from the internship programmes, and (iii) closer learning-training oriented partnerships between organisations in the sector. For example, DEFF, WESSA, SANBI, Gondwana Alive! and Midvaal Local Municipality have adopted the Groen Sebenza internship model in their respective organisations. WWF has supported the development of a partner-led internship programme through the South Africa Deep Sea Industry Association (SADSTIA), which focuses on developing marine science skills through placing interns with its members.

Impact on enhancing social equity in and transformation of the biodiversity sector

A combination of the five outcomes described above, are contributing to social equity in and transformation of the sector through supplying job-ready graduates, predominantly black South Africans. For example, in *Groen Sebenza* 69% and over 50% of the 955 interns were blacks and women respectively. The majority of the 128 WWF interns (66%) reviewed

(2011-2017) were women; and 75% were black South Africans. Similarly for the *GreenMatter Fellowship*, in which 132 of 175 beneficiaries were black.

The social equity improvements are contributing to transformation of the sector's attitude towards black professionals who are in some ways relatively new to the sector, but also previously marginalized or new universities. Historically, for example, there was a common scepticism in the biodiversity sector about employing graduates from former black universities (also reported in the evaluations reviewed for the case studies). Some potential employers would not even consider shortlisting applicants from these universities. Evaluation participants mentioned that interns who have graduated from these universities and were trained under internships programmes have performed well, challenging and changing the bias against the Historically Black Universities.

Survey data relevant to equity, a sense of belonging and retention of black professionals

In response to the survey question "*What has been achieved (contribution/impact) in achieving transformation of organisational leadership?*" (Figure 6.22) most respondents felt that this has only been *partly* achieved (15 respondents = 52%). Only 21% (6 respondents) felt it was *achieved*, while 6 respondents felt it was *not* achieved (=21%) or were unsure (2 respondents = 6%). Participants perceived an improvement in the racial profile of both executives and professional scientists (Figures 6.23 and 6.24).

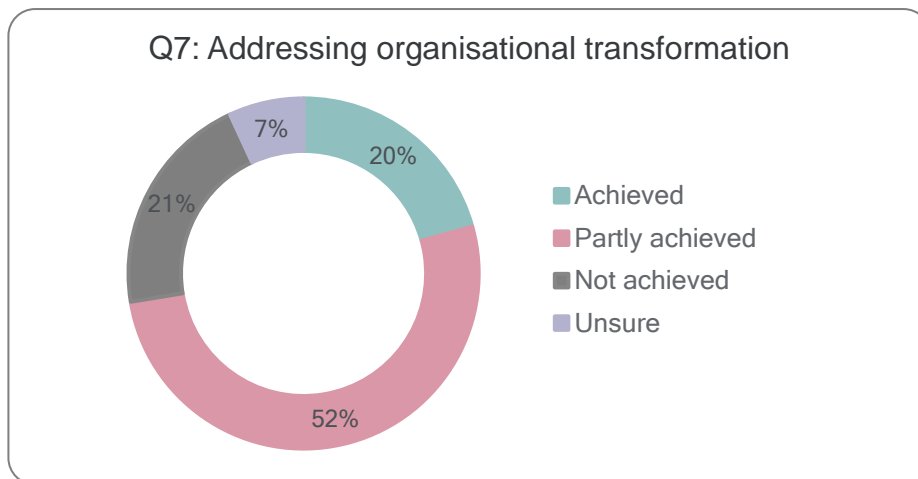


Figure 6.22 Summary of responses to a question about participants' perceptions of transformation in organisational leadership

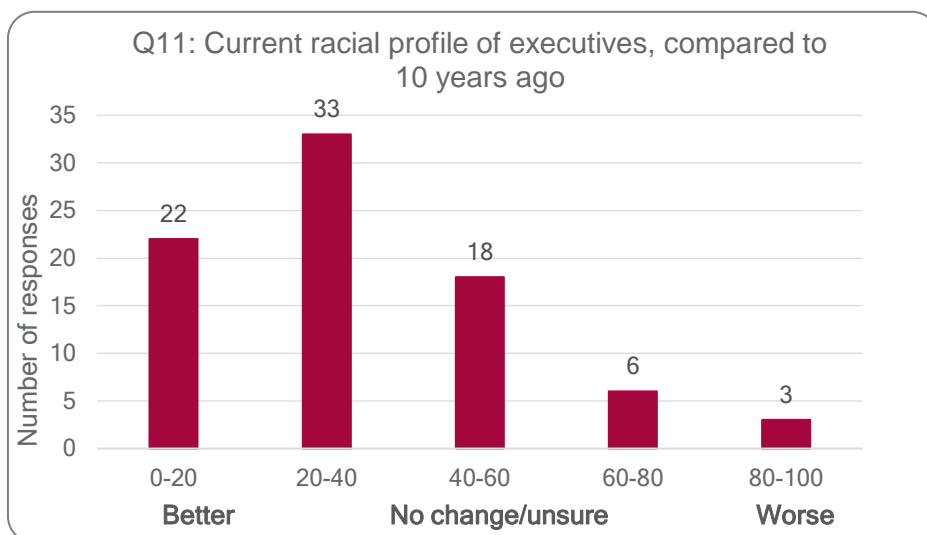


Figure 6.23: Perceived racial profile of executives (Q11)

Score: 35 on average, i.e. improvement (Median = 34)

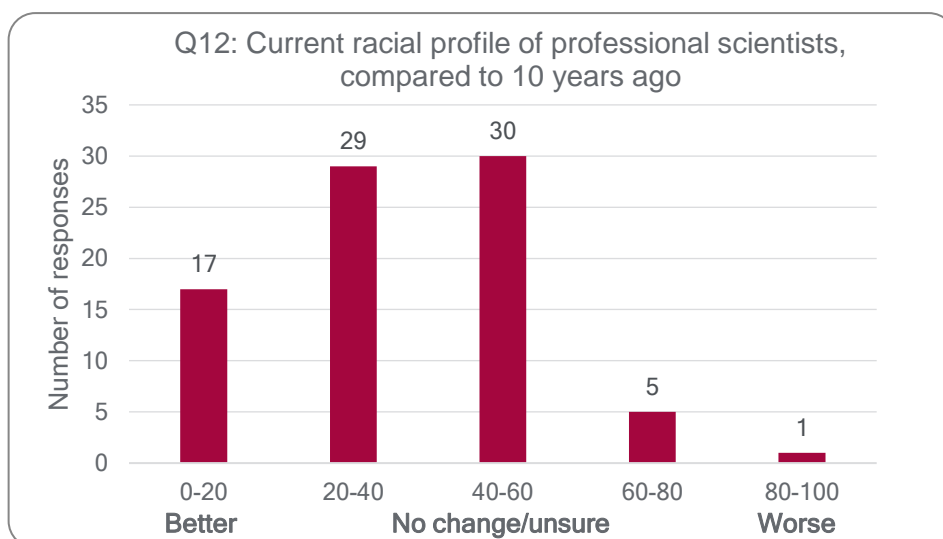


Figure 6.24: Perceived racial profile of professional scientists (Q12)

Score: 38 on average, i.e. slight improvement (Median = 40)

Some detail from the survey is that UCT still struggles to find South African black PhD candidates. Some survey respondents indicated that fewer graduates with more support would be better for the sector than more graduates with superficial training. This is a perspective to consider alongside the increasing numbers of university enrolments described in Section 6.2.

The aspect of transformation that survey respondents felt had improved the most was the **gender profile of executives**. Some 28 respondents (34% of those who answered this question) scored this aspect between 0 and 20 on the sliding scale, indicating *substantial improvement*.

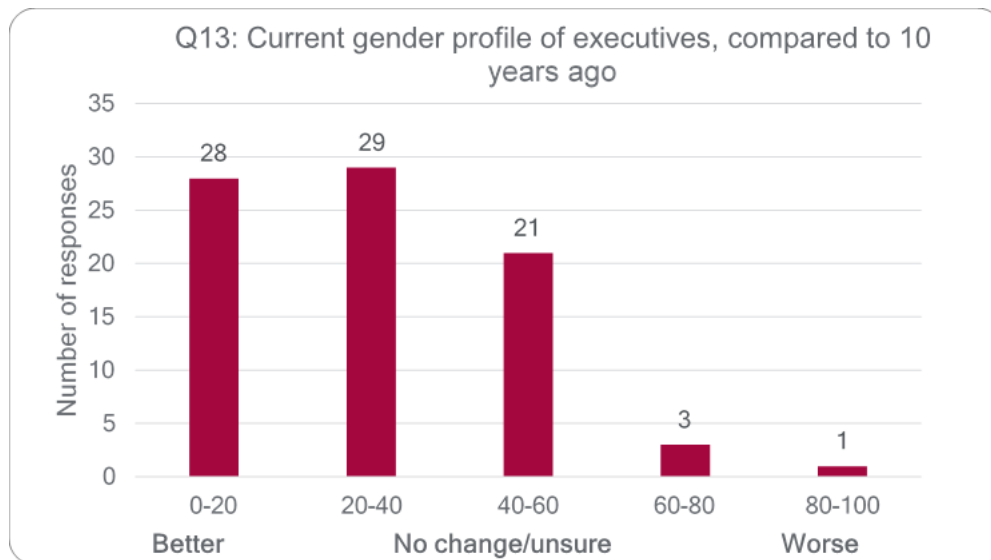


Figure 6.25: Perceived gender transformation at executive level (Q13)

Score: 31 on average (Median = 29.5) i.e. Substantial improvement

Regarding turnover of staff in human resources leadership positions, most respondents felt that the situation has not changed much over the last ten years (Figure 6.26). Alternatively, this could also indicate that many respondents were unsure about their answers.

However, most survey respondents felt that **budget constraints were worse or substantially worse** than they were ten years ago (Figure 6.27). Budget constraints will affect retention and deployment of staff within organisations, as well as the overall effectiveness of organisations - the ultimate goal reflected in the NBSAP and NBF.



Figure 6.26: HR Leadership Turnover (Q14)

Score: 46 on average (Median = 50), i.e. more or less the same.

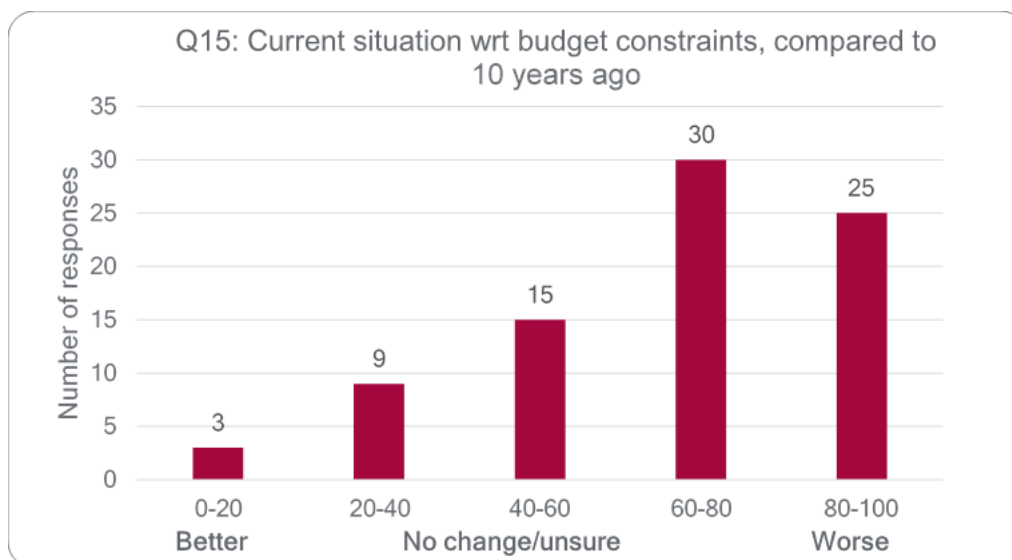


Figure 6.27: Budget Constraints (Q15)

Score: 66 on average, i.e. substantially worse (some up to 100) (Median = 71)

On a more positive note, *two thirds (66%) of all respondents felt that there had been improvement or substantial improvement in mentoring support over the past ten years* (Figure 6.28).

In addition to this, most survey respondents felt that workplaces were slightly more attractive or desirable places to work in than they were ten years ago (Figure 6.29).

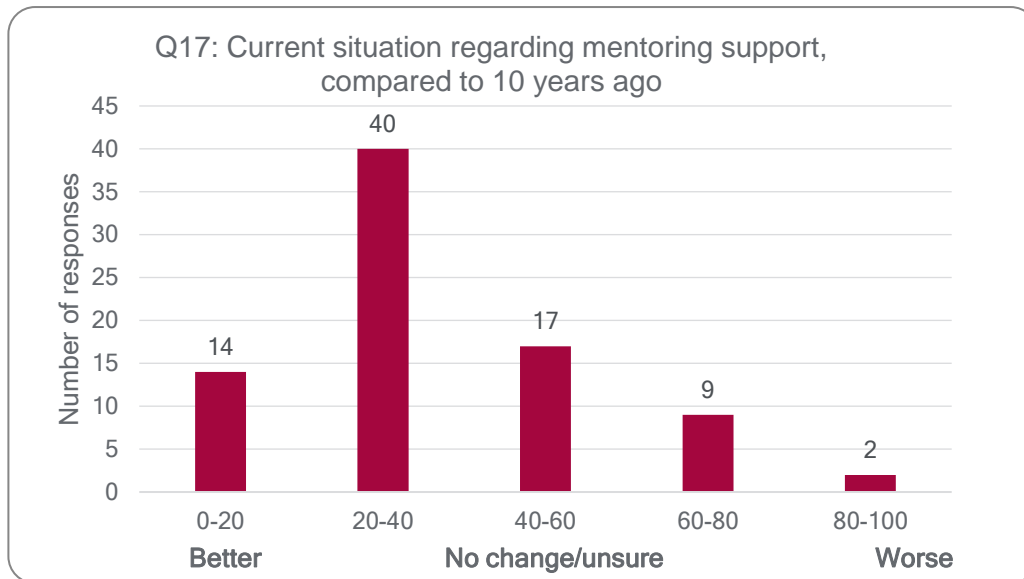


Figure 6.28: Mentoring (Q17)

Score: 37 on average (Median = 35)

Among GreenMatter Fellows surveyed however, the findings regarding workplaces were mixed. While some felt that the sector was welcoming them as young black professionals, others felt that racial transformation still had a long way to go. They quoted situations where they were often the only black person in the workplace. A young conservation professional lamented: “It is hard to be a black scientist”, in response to a paper published in the *South African Journal of Science* (Nattrass, 2020) which suggested that black South Africans are too materialistic to be interested in nature careers.

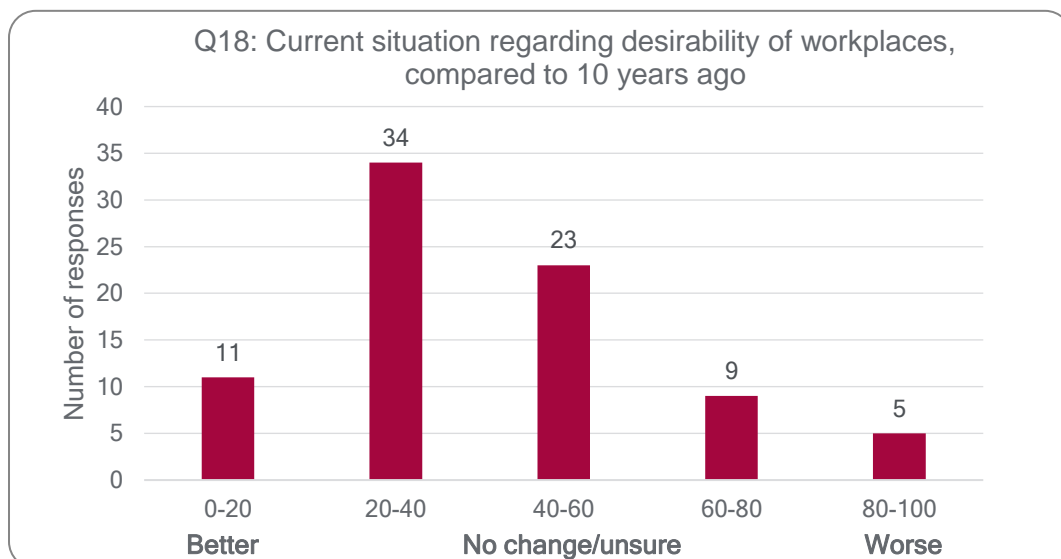


Figure 6.29: Perception of workplaces as a nurturing environment for transformation (Q18)

Score: 42 on average (Median = 40)

6.4.3 Conclusions

Regarding transformation and the suitability of workplaces as environments within which black staff can grow and succeed, the survey respondents generally felt that workplaces are more welcoming now than they were ten years ago - in terms of the racial profile of executives and scientists, the gender profile of executives, and the availability of mentoring support. These factors will act to improve retention of staff. However, among GreenMatter Fellows the perceptions were mixed, with several examples given of transformation still being an incomplete project, and themselves playing a pioneering and sometimes isolated role. Furthermore, persistent budget constraints are a negative factor which may affect retention of staff in the sector.

6.5 SG4: Create enabling macro-conditions for skills planning, development and evaluation

6.5.1 Strategic objectives and initiatives relevant to this goal

Strategic Objective 1 (Promotion: Attraction and Meta-conditions)

Promote the biodiversity sector among key decision-makers and all South Africans, especially black South African school leavers, students and graduates, and leaders in the national skills development system, as a sector with a strong vision of transformation and opportunities for fulfilling work that contribute to the national development agenda.

Strategic Objective 6 (Meta-conditions)

Increase the impact of the collective effort of HCD initiatives relevant to the sector, through articulation (connecting initiatives) and promotion.

Systemic outcomes of the Fundisa for Change programme, careers project and mentoring project have been mentioned above. In this section we focus on what stands out as a major system-building initiative in the BHCDS implementation, the National Environmental Skills Planning Forum, and refer again to the achievements of the HRD Network as well as the broader Organisational Strengthening stream of BHCDS implementation of which it formed part. Fundisa for Change was discussed earlier. None of the other advocacy and system building initiatives seem to have been big or sustained enough to have yielded similar levels of systemic outcomes.

6.5.2 Findings - Outcomes and Impacts

The case study of the National Environmental Skills Planning Forum identified five main outcomes.

Inclusion of green skills into national curriculum and national skills development strategy

The NESPF has used multi-stakeholder collaboration to make national contributions and develop the sector's policy and strategy influencing capacity. This comes from its commitment and contribution to the elevation of green or environmental skills into the national agenda, including paying attention to its social transformation and sustainability

interest. It has contributed to this through promoting the utilisation of the Environmental Sector Skills Plan and subsequently through producing intelligence information to update skills needs in the sector. Consequently, the Forum has:

- Contributed to the drafting of the *National Environmental Education and Training Strategy and Action Plan* (2019-2020), which seeks to improve policy coherence and synergy and enhance the value of efforts made by all actors involved in environmental education and training.
- Enabled the integration of Education for Sustainable Development (ESD) into the Department of Basic Education's Curriculum and Assessment Policy Statements (CAPS) and the *White Paper on Post School Education and Training* produced by the Department of Higher Education and Training (DHET).
- Influenced the integration of green skills into the National Skills Development Strategy (NSDS III), which is central to the wider national transformation agenda to achieve a socially just, resilient, sustainable development pathway.
- Provided the basis for DHET to require all SETAs' and industries' Sector Skills Plans (SSPs) to be screened by DEA to ensure that they address green skills as priority skills.

Strengthened link between ESD and green skills development

The Forum has contributed to building the bridge between ESD in schools, and post-school green skills development. This has meant connecting actors and processes on the environmental skills supply side (in education and higher education) to those on the skills demand side (the workplace). The series of occupationally-directed studies conducted in the Green Fund-supported Green Skills programme, established under the auspices of the NESPF, are contributing to the emergence of green skills research as a new knowledge field in South Africa. Outcomes include the development of new green skills research methods and enhanced green skills analysis and capacity development, in partnership with the NRF, Rhodes University, Wits, UCT, WWF, DEA, the DBSA, and several SETAs.

A legitimate and credible mechanism for the biodiversity sector's contributions to skills development

The NESPF mobilised, coordinated, deliberated on, synthesized and communicated the ideas, needs and ambitions of the different actors in the environment (including biodiversity) sector. The identity of the forum as a national representative body led by a department with the mandate to ensure the development of environmental skills, has given it some legitimacy. This is important given that the sector does not have a specific SETA or professional body to represent its interests and to access power that can help implement the ESSP and the BHCDS. The rigorous processes of engagement and the quality of products, coupled with the utilisation of experts in the environment sector, have further given the forum's contributions credibility. In addition, the NESPF's role and demonstrated capacity to keep stakeholders informed has given it both legitimacy and credibility in the eyes of internal and external stakeholders. This has particularly been the case during the first six years of the forum when it could hold Skills Summits regularly and make decisions and recommendations that would be implemented between Summits. Since Summits are no longer held, or at the same scale, the visibility and convening reach of the Forum has decreased.

Strengthened integration of green skills into the SETAs' SSPs and National OFO

The NESPF has made direct contributions to national skill and occupation structures and systems. In particular it facilitated the development of the aforementioned Green Skills programme, which has been strengthening system capacity for green skills planning, analysis and employment in the country. It has been doing this through clarifying green occupations for OFO development and supporting DHET, employers and SETAs. The Green Skills Project has had a catalytic effect in the environment and biodiversity sector through building SETA capacities to incorporate green skills, with 17 of the 21 SETAs (81%) integrating green skills development in their annual skills plans. A review by Wits University unfortunately found that while several green skills studies were funded by the SETAs, the SETAs did not follow this up with investing in developing the green skills priorities identified. Thus, while this has been a valuable *outcome*, more needs to be done to achieve *impact* here.

Significant contribution to the integration of green skills occupations in the national skills system

The Forum's review of the Organising Framework for Occupations (OFOs) in partnership with the HRD Network partners and engagement with the Quality Council for Trades and Occupations (QCTO) resulted in the registration of green skills occupations with DHET. By 2016, 90 occupations were defined as green, 14 of which were newly developed occupations. The registration of green skills is a significant *outcome* because registered skills qualify for government financial support (potential *impact*).

Strengthened HCD in the biodiversity and broader environmental sector

The NESPF played a coordinating and shaping role in the establishment and development of programmes and structures and some of the documents that supported HCD in the sector, and opened the path for DEA to fund some of these.

Some of the most important guidance documents targeted at the environment sector, with direct relevance to the BHCDS at organisation level are:

- An Enabling Document for all SETAs as supporting material for SETA Skills Development Facilitators (SDFs). The Enabling Document guides all SETAs to be more proactive in green environmental/green skills development.
- A source book to support skills planning for green economies, for employers in the sector to identify and anticipate green skills needs and build them into skills plans and occupational descriptors.
- An induction workbook for interns in the environment and biodiversity sector, and a guidebook for mentors who support interns.
- The aforementioned national green career development framework for attracting and guiding students (and employees) in choosing learning programmes and green careers.

Our analysis suggests that the HRD Network and the broader Organisational Strengthening stream of work in the BHCDS programme achieved some of its planned results and contributed to three of the six areas of influencing the HR and Occupational Learning Systems of organisations, as outlined below.

Improved mentorship capacity

Mentorship capacity in the sector was strengthened (as confirmed by survey results) through a guideline document for inducting interns, a mentoring toolkit and focussed mentor training

(GreenMatter Mentors for the Environment Train the Trainers Course, Pilot 2014). These initiatives were used to enhance the quality of mentoring and therefore learning in Groen Sebenza, the WWF-SA internship and other internship programmes, which in turn further added to mentoring capacity.

Job titles and qualification requirements developed

The HRD Network contributed to the development of job titles and qualification requirements, and the standardisation of occupational descriptions in the biodiversity sector through its work on OFOs. The network's participation in the OFO process resulted in a common understanding in the sector on: (i) HR issues faced by the sector, (ii) the SETA landscape, (iii) skills needed in the sector, and (iv) the mapping of jobs and occupations in the conservation/biodiversity sector.

Occupational descriptions in the biodiversity sector standardized

The HRD Network mapped 260 conservation job titles to 49 OFO occupations, recommended the amendment of six occupations and the addition of 2 new job titles in the OFO. The work of the network also culminated in the emergence of an OFO Working Group for the sector to carry on with the work on Occupational Learning Systems.

Inter-institutional collaboration promoted

The HRD Network's collaborative process of addressing HR and occupational challenges in the sector also contributed to the practice of inter-institutional collaboration in the sector. Some of the outputs of the collaborative work include co-development of: (i) an HRD Concept Document, (ii) the Human Resource Toolkit, which was organised around the sector priorities, (iii) a methodology for Workplace Skills Planning, and (iv) principles to foster diversity in the sector (addressing the transformation drive). In this regard, the HRD Network contributed to the BHCDs' interest to provide "means for organisations across the sector to contribute in a concerted manner to skills matters which affect them individually and collectively ... greater coordination and synergy."

In addition to contributing to the above planned results, the HRD Network strengthened environmental managers' capacity to do skills planning through interacting with HR practitioners whose perspectives had seldom been sought before. Similarly, the HRD Network helped HRD practitioners to appreciate the perspective of environmental managers and their skills needs. These are important *outcomes*, but there was general agreement that the HRD Network has not continued for long enough to see its outcomes translate into *impacts*. The potential for achieving impact was also further reduced by reduced participation in the networks once funding ceased, including funding for a large National Skills Summit to bring all the various initiatives and role-players together, and expand them.

6.5.3 Financial Analysis

The demise of a number of these programmes is reported in this review as being due to funding but it does not dig deeper into why this is the case considering that the Lewis Foundation's budgeted actually increased to GM in the 2,5 years after the second Director was employed In July 2013.

6.5.4 Conclusions

Significant outcomes were achieved for a challenging objective, namely to strengthen the capacity of environmental organisations and the wider system to plan for and produce green skills. Methods for green skills studies were developed, studies were undertaken to identify skills priorities, SETAs and HR divisions were provided with guidelines and tools, and green occupations were listed in the national system. However, with few exceptions these outcomes did not translate into impacts. The protracted nature of organisational and systemic challenges mean that these initiatives probably have to be sustained over longer periods. Strong institutional leadership and strong incentives for participation are needed among the various government entities responsible for environmental skills development systems and outcomes, in partnership with industry employers, employer bodies and other key stakeholders. Chapter 7 suggests that a serious disconnect remains between the country's commitment to sustainable development and just transitions to an inclusive green economy, and the DHET and associated entities responsible for skills planning and funding.

7. IMPLEMENTATION GAPS

7.1 Introduction to Chapter 7

This chapter speaks to Objective 3 of the review (Table 1.1), namely to identify the critical gaps in the implementation of the BHCDS to date.

The sources of information for the gap analysis in this chapter are as follows:

- ... survey findings
- ... case studies
- ... key stakeholder interviews, and
- ... the GreenMatter Independent Evaluation Report.

Contextual changes are reviewed, with a view to making recommendations on how to address these gaps. It should be noted that some policies and contextual changes (notably the update of the NBSAP 2015-2025) have been considered in Chapter 3, in order to establish the relevance of the BHCDS in relation to a changing policy context and will not be repeated here.

The sources of information for the contextual analysis are as follows:

- survey findings
- ... document analysis (see Appendix E for a list of documents and their references).

Recommendations made take into account (i) gaps identified, (ii) the observed strengths and weaknesses of the implementation programme, (iii) the principles of the BCDS and (iv) the presence of other HCD, skills and capacity development programmes (see Figure 7.1).

7.2 Remaining Challenges based on Survey

7.2.1 Vacancies in the sector

Just more than half of the survey respondents (52%) indicated that there were no positions their organisations were unable to fill. For the rest (see Figure 7.1) the most commonly reported gap was “experienced technical staff and managers” (17%), as well as “early career technical staff” (10%) and “senior leadership” (10%).

These figures do of course reflect the composition of the sample of respondents - so for example, the lower proportion of researcher vacancies may simply reflect the fact that there were fewer research organisations represented in the sample (see Chapter 3 for an overview of survey respondents). In the list of scarce skills (7.2.2) several research skills are identified. The finding on vacancies can also indicate that organisations do not necessarily want or need to appoint scientists, but they need to draw on scientific skills and find it difficult to obtain those when needed.

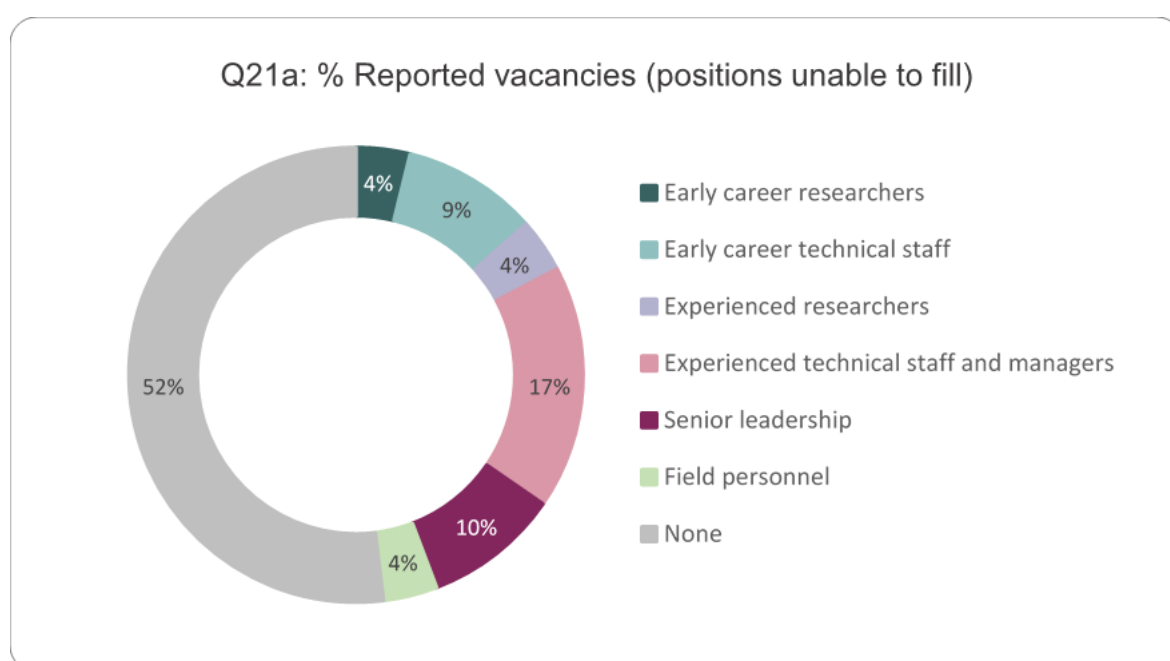


Figure 7.1: Vacancies (positions their organization was unable to fill) reported by survey respondents

Note: While it would be useful to know exactly where the vacancies or skills gaps are, e.g. in national, provincial or local government, NGOs or the private sector, the survey did not provide enough information in this regard. Determining sector wide skills needs is a specialist task that should be based on a dedicated skills intelligence platform and process, such as Statistics South Africa and the DHET’s Labour Market Intelligence facility at the Development and Poverty Research Unit at UCT. The Green Skills programme has developed suitable methodologies for tracking environmental skills needs, including those that are not yet anticipated by employers. In this regard it was taking forward work started as part of the HRD Network. In National Environmental Skills Planning Forums, StatsSA has raised the possibility of conducting dedicated case studies to better identify and quantify environment-related needs, and then to take this up in the quarterly and annual Labour

Force Surveys and censuses. These and other options must be pursued on a coordinated scale, potentially in a revised HRD Network.

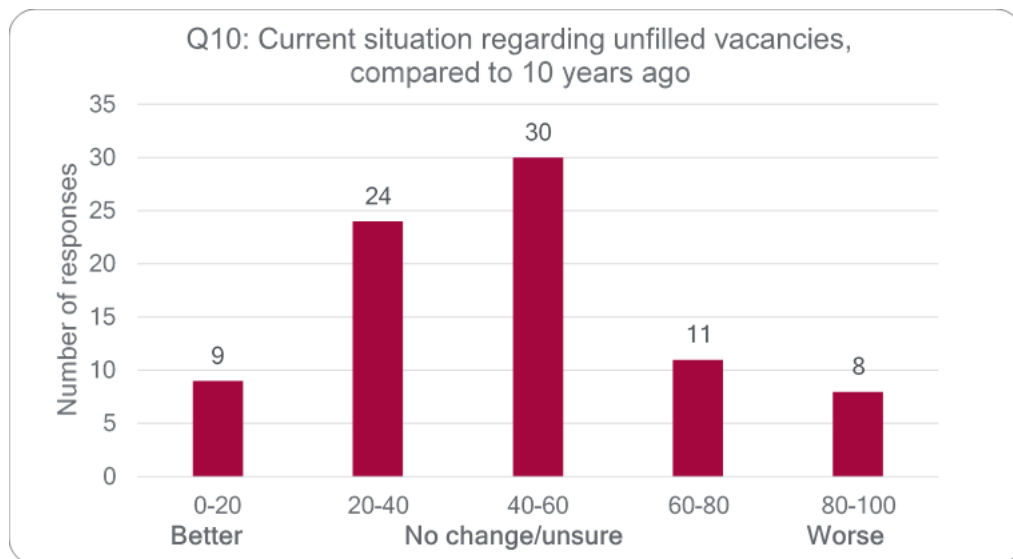


Figure 6.21: Perceptions of the situation regarding unfilled vacancies (Q10)

Score: 46 on average (Median = 49), i.e. no change or slight improvement

7.2.2 Skills gaps

In response to a different question, the biggest reported skills gaps within organisations (Figure 7.2) were for technical skills (reported by 37% of respondents), leadership skills (14%), support skills (10%) and other (10%). Only 21% of respondents reported no skills gaps. The fact that this is lower than the 52% who reported no vacancies suggests that *skills gaps are still present in organisations even when all posts are filled*. This reflects a need to address both (i) organisations' ability to create posts for all the skills they need for their mandates and (ii) education providers' ability to more closely match skills requirements; however, as we see below, some of the scarce leadership related skills are experience linked and unlikely to be 'ready-made' by universities or short course providers.

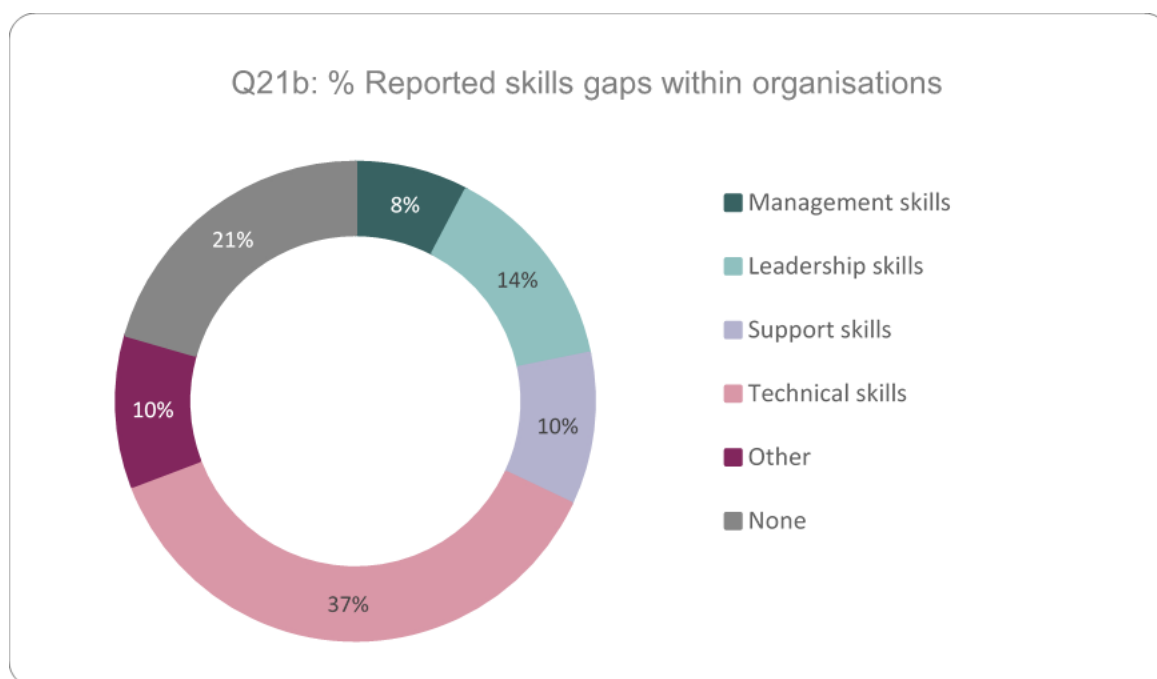


Figure 7.2: Skills gaps within organisations as reported by survey participants

Specific skills gaps reported under each of the categories are as follows:

Management skills gaps: Coordination skills; project management (especially for complex multi-partner projects); business and financial skills; knowledge of strategy and engagement processes.

Leadership skills gaps: Business development, business management and planning; intra- and inter-personal skills; teamwork, collaboration; diversity management; cross-cutting and cross-sectoral knowledge; general knowledge of the conservation landscape in SA; the science-policy interface; horizon scanning; project development. *Note: Several of these are a function of experience.*

Support skills gaps: Fundraising; marketing; financial skills; administrative skill; legal support; human resources skills; private sector engagement.

Technical skills gaps (Highlighted skills were mentioned by several respondents): GIS (high level); information and computer technology such as STEAM, artificial intelligence (AI), machine learning, coding and Internet of Things programming; data science, bioinformatics; quantitative (numerical) and statistical skills; specialist biodiversity skills (e.g. for commenting on EIAs), detailed field identification skills, plant identification, practical conservation skills, ecological technicians, Field Rangers, Conservation General Workers; Biodiversity Economy, Wildlife Economy, Resource Economy, Resource Ecology, Applied Ecology, Botany, Taxonomy, Landscape Ecologist, Conservation Planning and Spatial Planning, Land Use Scientist, Wood Scientists, wildfire specialists, air quality specialists (chemical engineers), Environmental Sociology, Social Ecology and community development, socio-economic transformations [a new protected area function], Environmental Education, Tourism, Sustainable Development, heritage resource management, Climatology, Climate Change, Conservation Ecology, Ecosystems Accounting, Zoology, estuarine work, underwater reef research, basic SCUBA diving, basic

marine guiding, marine specialists, animal behaviourists, aquarists, animal health specialists, wildlife crime/trade specialists - enforcement and prosecution, Environmental Law, urban biodiversity professional officers. Added by Steering Committee: Scientific writing skills needs identified by consulting firms (a significant employer of biodiversity skills).

Other: High quality writing skills, critical thinking, problem solving, people skills, knowledge synthesis (people with skills required to interpret information and make it accessible to multiple audiences), data and information management.

7.2.3 Leadership

Only 18% of respondents (13 out of 77 people) indicated that they experienced no leadership challenges in their organisations. Leadership challenges identified entailed the following:

Vision and Leadership skills

Points mentioned here included the importance of vision, commitment and passion for good leadership, as well as the ability to facilitate learning, lead change and advocate for the sector and the work of the organisation. In the academic environment, one respondent noted: "Promoting people into leadership positions that are better suited as academics. Appointing the most knowledgeable or person with most published papers does not always guarantee a good leader."

Transformation of leadership

While many participants simply noted the need for transformation (or greater transformation) in their organisations, some specific details included mention of the importance of multicultural and intergenerational leadership, willingness to transform, and a lack of policies and organisational support for transformation.

Leadership and organisational structure

Issues here included leaders without relevant scientific background, too many staff reporting directly to leaders, problems with succession planning, and (remaining) shortages of mentors and supervisors. It is still difficult to find people with both scientific and managerial skills. Some organisations have a high turnover at executive level, while others report that the current leadership remain entrenched in their positions, creating few opportunities for change within their organisations.

Organisational culture and leadership

Issues here included staff motivation, lack of conflict resolution skills, lack of institutional support, "constant crisis management leading to an inability to think and plan strategically", too much time in meetings, heavy workloads and a "compliance driven work culture", a point which was raised more than once. Another stakeholder responded that: "Competent leaders with the necessary experience and skills to be effective are not coming through the ranks internally and externally recruited people willing to work for the low pay are often not of the right calibre. Nor do they then have the institutional knowledge needed to lead effectively".

Governance

Governance issues mentioned were:

- "political interference leading to instability and insecurity"

- the complexities of a rapidly changing and underfunded sector
- industry coordination and
- budget constraints (exacerbated by the Covid-19 crisis).

7.2.4 Transformation (Q21)

On whether transformation is being achieved or not, there were mixed views, just as there had been among interns, as reported in Chapter 6. Some 19% of survey respondents (14 out of 73 respondents) experienced *no transformation challenges* in their organisations, while 21% (15 respondents) indicated that *further transformation is needed*.

Some challenges mentioned are illustrated with anonymized survey extracts below:

“Due to salary constraints skilled and competent people with the right demographics are hard to attract. The work load and resource challenges make it even harder to retain them.”

“People don't work as well together as they could - there is still much fragmentation and mistrust. This leads to under-performance and under-delivery.”

“Huge challenges with conservative predominantly white [...] reasserting influence and undermining transformation at Board and executive management. [This] places [...] partnerships with government at risk.”

“Are we transformed on paper only? What support is provided for new staff joining?”

“We transformed and no work was done.”

Several respondents (13) mentioned that the needed skills are not uniformly spread across all racial groups and that it is difficult to find black African candidates with the right skills and experience.

“Racism” was explicitly mentioned by one person employed in a prominent stakeholder organisation.

7.2.5 Reasons for Remaining Challenges (Q21)

The two main reasons put forward for these remaining challenges were

- budget constraints and
- staff retention.

These are connected, because low salaries contribute to an inability to retain talented staff, especially experienced staff. Interestingly, there is a perception on the part of government entities that they lose candidates to the private/NGO sector, and vice versa. Likewise, a respondent from the tertiary education sector felt that “strong black graduates enter the work place rather than seek postgraduate degrees due to low bursary amounts” and “industry swoops on talent early in their careers”. *These sentiments coming from all sectors suggest a general competition for talented candidates - suggesting that such candidates are still in short supply (while at the same time, it is not difficult to fill available positions). The issue therefore seems to be the ‘calibre’ of the available candidates.*

Regarding staff turnover, the following was noted: “Biodiversity sector is not desirable for upwardly mobile black professionals. Poor remuneration has a lot to do with it” and “Hunter-

gatherer style of career development - people move on to better paid, status positions very quickly”.

Difficulties around transformation (see the previous question) also featured as reasons for the remaining challenges. Someone in higher education stated: “I am not sure the universities are capable of achieving the right kind of transformation”. Another respondent stated that “biodiversity is still considered as a class issue hence we do not embrace transformation individuals”.

One (government) respondent identified “Overly onerous, complex and risk averse administrative procedures under PFMA [Public Finance Management Act]”, while another noted “we’re constrained by the general state of affairs in the public sector and the auditor-general’s approach to addressing corruption”.

Another respondent identified “piecemeal non-systemic interventions” as a reason for the remaining challenges.

Education-related reasons mentioned included:

- “Poor tertiary education, unfocused”
- “Poor quality of tertiary education in environmental fields”
- “Lowered school education standards”
- “Poor science education at school”, and
- “Overloading of training institutions”.

One respondent attributed the lack of available skills to the rapid growth of certain fields, such as artificial intelligence, sensor technology, drones, aerospace applications, smart GIS and technology and innovation solutions for conservation (i.e. the presence of a lag effect).

7.2.6 Conclusions on Remaining Challenges from Survey Findings

The survey, while reporting positive changes towards transformation and in particular, better mentoring in organisations and gender and race transformation at senior levels, also raised a number of remaining challenges. At least half of respondents feel that transformation is still an incomplete project, with a range of causes varying from insufficient budgets to organisational cultures. The list of remaining or new scarce skills is long. It includes many that were also on the list that informed the BHCDS in 2010. On the basis of these findings, it can only be concluded that the BHCDS has not yet achieved its goals. This was also the view of the majority of respondents, who indicated that the strategy was a relevant intervention that had worthwhile outcomes, but not enough.

A reference to “piecemeal and non-systemic interventions” is of concern, as the BHCDS was intended to be exactly the opposite - systemic and not piecemeal. This could be attributed to the gap in coordination that could have aligned and connected the various interventions in the BHCDS programme of implementation, in a more cohesive and concerted effort.

However, the budget constraints in the sector also seem to be a significant factor mitigating against success. The bind - more capacity is needed to unlock more budgets, and better budgets are needed to unlock more capacity - has not been overcome in the 10 years.

A new constraint not mentioned 10 years ago, is the stifling impact of more elaborate procurement and public funding management procedures.

7.3 Gaps based on Case Studies

The case studies identified several project specific gaps. They are outlined in detail in the case study reports. Here a summary is provided, particularly as they reflect gaps influencing the success of the BHCDS implementation more broadly. Extensive recommendations on how to address these, were produced as part of the case studies.

7.3.1 Gap analysis of Fundisa for Change

Gaps in the partnership model: A key challenge was the low levels of involvement of the government departments responsible for teacher education and the schooling system: DHET and DBE. Other role-players whose participation has been either absent or marginal are the deans of teacher education institutions. It is worth noting that the programme had started off well with the national Dean's Forum but lacked follow-up. A consequence of this set of challenges is that there has been little uptake of the programme in DBE structures for the Continuous Professional Development (CPD) of existing teachers.

Gaps in the intervention strategies: A total of 2,080 educators comprising 1,080 teachers and teacher educators (from 10 universities), and 1,000 pre-service teachers received training – but the DBE employs 400,000 teachers. In addition, the extent to which the resource materials could be used to influence content was relatively low as they are not textbooks. Gaps in the implementation of the national engagement strategies were attributed to a lack of dedicated human and financial resources for high level system engagement and policy influence, the low strategic level participation of DBE and DHET, as well as a lack of a critical mass of universities to ensure systemic change across the teacher education system in the country.

Coordination gaps: The study found: (i) inadequate foundational coordinating and systemic support for the core functions of the programme, (ii) over-dependence on the goodwill of partners to provide some essential services, (iii) not always having a full-time programme coordinator, (iv) the conversion of GreenMatter from a coordinator to an independent NPO with further loss of coordination capacity, and (v) the coordination focus being mostly at the operational level with inadequate focus at the strategic level, which is partly explained by the salary level for the position (lecturer in a university setting) and the limited support for the advocacy work from among the participating and coordinating partners (i.e. there is reliance on one person to do advocacy, who is not in a coordination role).

Low levels of human and financial resources: The *Fundisa for Change* Programme as a whole has faced several general challenges which have led to a lack of capacity, follow up and follow through. The lack of capacity arose from insufficient dedicated time and financial resources to carry out the work of the programme. The low levels of human resources resulted in time constraints to carry out necessary work at the required level and in time. In addition, engagement with the DBE could not be adequately pursued due to high turnover of DBE staff involved in the *Fundisa for Change* Programme.

At the same, the lack of a steady flow of funds to support the programme has undermined: (i) the hiring of personnel for the strategic work, (ii) the production of learning materials from research conducted and their use to influence the national curriculum; and (iii) the performance of the coordination function.

Learning and adaptation gaps: The *Fundisa for Change* programme did not put in place a high-level process to continuously scan the environment, review and learn from experience and develop new solutions to ensure ongoing solution implementation, review and refinement. These processes could have been jointly implemented by the National Steering Committee and National Advisory Committee and replicated at provincial level, but the limited availability of a strong coordinator made this difficult.

7.3.2 Gap analysis of the HRD Network

We identified three main gaps in the implementation process based on analysis of both primary and secondary data generated during the evaluation.

Perspective related gaps: Partner organisations found it difficult to work with the ‘collaborative advantage’ approach. A second and related challenge was that HR managers as process specialists, and line managers as content specialists in the participating organisations did not have a history and culture of working closely with each other.

Execution challenges: With only about 20 organisations being active in the network the number of participants in the network was too small for the sector to be able to generate the needed scale of change. There was also relatively low participation from the private sector. Participation of one SETA (CATHSSETA) was limited and there was no participation from others SETAs under which some organisations in the sector are registered (e.g. AGRISSETA and ETDPSETA under which SANBI and WESSA are registered). The HRD Network lacked funding to continue beyond the first three years. At organisational level, in cases where more personnel were needed, there was lack of funding to fill positions that arose. This lack of funding was partly linked to lack of resource mobilization capacities among senior management in the organisations.

Adaptation gaps - Limited commitment, resources and time: The implementation of the responses or solutions that were jointly developed through collaborative processes was undermined by constraints linked to low buy-in by those with decision-making powers in the participating organisations. It was also undermined by lack of resources, not only to pay for staff time while they attended the HRD Network events but also for the implementation of some of the recommendations. Consequently, the HRD Network did not get to the point of ensuring the implementation of its co-developed responses and solutions such as improving workplace skills planning, using the OFO to do skills planning and development, and engaging diversity in the South African workplace. This is likely to have been worsened by the fact that the HRD Network operated for three years only. A proposal for GreenMatter to take over the coordination of the HRD Network did not materialise.

7.3.3 Gap analysis of the NESPF

Execution gaps: These include the lack of active participation of key government departments and skills agencies in the forum. The strategic actors whose participation has been too limited to be effective include DHET; the DWS; the NRM, Climate Change, Biodiversity; Green Economy and other divisions within DEA/DEFF; and SETAs. More extended and more active participation would have facilitated the collective tackling of challenges and a more strategic utilisation of resources in the implementation of the BHCDs.

Another execution gap has been inadequate human resources. Though competent and effective, the number of people involved in policy influencing work has been small. In addition, there are not enough ‘foot-soldiers’ or people at operational level within participating organisations to provide information on the extent to which the strategy is being implemented. This has been worsened by lack of clarity on strategy implementers’ line functions and reporting arrangements.

Finally, there have been insufficient financial resources in two main areas: (i) operational, and (ii) project funds. DEFF, which manages the Forum, does not have an operational budget for it and there is no dedicated function for resource mobilization in the Forum. This has put the burden of fundraising on a few partner institutions. Some of the planned projects could not be implemented due to lack of financial resources.

Learning and adaptation gaps: The NESPF has low capacity to respond to changes in the biodiversity sector in real time, particularly those that require up-to-date skills intelligence, which is not being gathered. Efforts to engage the central skills intelligence gathering functions of DHET have not born fruit. The Forum’s responsiveness to new and emerging developments over the last four years has been partly constrained by an inability to hold the National Environmental Skills Summits more regularly and on significant scale.

7.3.4 Gap analysis of the internship programmes reviewed

The review identified many enabling factors, but also two main gaps in the internship programmes included in the case study. The gaps, which are discussed below, are likely to apply to other internship programmes that are being and have been implemented.

The lead and host organisations faced the challenge of creating jobs while running the Groen Sebenza internship (perhaps more accurately called an employment incubator) programme. Creating *new jobs* was challenging, particularly when government put a moratorium on increasing expenditure around the time that interns were about to complete their training, resulting in government departments not being able to create posts for the interns to fill. Various models were tried out and these need to be shared and analysed, and perhaps compared to lessons learnt in other initiatives, as job creation remains a very high priority for the country and the sector.

Another gap was training of interns on entrepreneurship, which may be necessary if they are also to participate in employment creation. This highlights the potential of initiatives like the *Imvelisi Enviropreneurs* programme, provided it is able to provide the joined-up support and articulated institutional ecosystems that emerging entrepreneurs need.

Inadequate mechanisms for timely responsiveness of dynamic developments in the systems of influence and internally

This is a key adaptation and execution gap. The skill needs in the biodiversity and environment sector have been changing since 2010 when the Environment Sector Skills Plan and BHCDs were produced. There has been no subsequent and regular monitoring and updating of skill needs at sector level. Anecdotal evidence generated during the evaluation suggests that some of the new skills that are needed now include: (i) resource economists, (ii) wildlife trade specialists, (iii) specialists in the management of zoonotic

diseases (an area that is receiving increasing international attention due to the surge in illegal wildlife trade before Covid-19), (iii) bio-security and biotechnology specialists, (iv) people with combinations of skills.

The second systems gap concerns the absence of a BHCDS-wide monitoring, evaluation and learning mechanism to aid collective learning and adaptation and improve the execution of all internship programmes. Consequently, opportunities for cross-learning, marketing and communications, and more, are being missed. This has been worsened by the absence of systematic reviews or meta-evaluation of all the internship programmes that have been and are being implemented as part of realising the BHCDS.

7.4 Summary High Level Gaps in Implementation

7.4.1 Gaps in the Strategy

The review of the strategy context, principles, problem analysis, goals and objectives in chapters 2-3, suggests that all these aspects were appropriate at the time. This review has found few indications that the context has changed such that changes in the high-level strategy are needed.

Our analysis raised the concern that perhaps the BHCDS was conceived too narrowly and that the participation of more organisations should have been more actively sought from the start. A review of implementation documents suggests that efforts were made to engage a broad range of stakeholders including industry, labour, SETAs and diverse government departments. However, these efforts were limited, not necessarily by lack of intent but by lack of more widespread advocacy capacity among the role-players that coordinated and carried implementation. The possibly narrow demarcation of target groups was also extended during implementation; e.g. in Groen Sebenza, non-graduate interns were included when it seemed appropriate to do so; and the Imvelisi entrepreneurship project extended not only the range of partners involved in BHCDS implementation (e.g. WRC, YWP-ZA, DST/DSI, Innovation Hub), but also the focus of engagements, i.e. beyond training for job readiness, to business ideation. Several programmes of implementation (Fundisa for Change, the HRD Network) extended from a biodiversity focus to a broader environmental focus in engaging partners and development resources. However, a view remains that a too narrow focus was a key design limitation for the strategy.

This gap is most likely to be addressed by an extension of advocacy and high-level engagement capacity rather than by re-formulating the BHCDS, which does not seem to preclude broader partnerships.

7.4.2 Scarce skills gaps

Section 7.2.2 shows that a large number of skills needs are perceived as unmet. The includes new needs (associated e.g. with new technology and new risks), as well as many 'basic' biodiversity research, management and conservation related skills; IT and cross-over skills also identified in 2010. Skills that combine economics and biodiversity were flagged in 2010 as potentially scarce, and are now a much more prominent need, raised repeatedly (Section 7.5.2 indicates that this matches a global trend). It would seem that targeted

initiatives such as the Fellowship (bursary and skills funding) as well as career guidance and mentoring need to be upscaled. At the same time, they should be informed by accurate skills intelligence; the survey used for this review needs to be verified with on-the-ground sense checking and an updated analysis of the causes of persistent shortages in some areas, as well as analyses that will indicate exactly how new skills needs should be tackled. The SETAs have proven to be a sometimes willing but with little exception a less-than-effectively in the past 10 years, as their ability to implement their research-informed strategies is being undermined by broader agendas (introduced e.g. by DHET or SETA Boards).

7.4.3 Overall strategic implementation gaps

The review identified four overall strategic implementation gaps:

- sustained demand side interventions;
- sustained and significant advocacy to grow the support base for biodiversity capacity development;
- sustained coordination on programmatic and overarching levels to optimise the impact of initiatives by joining them up and creating synergistic and systemic benefits; and
- sustained interventions to improve organisational skills bases, transformation cultures, strategies and functioning ('organisational strengthening').

The overview of implementation initiatives (Chapter 5) shows that initiatives focusing on the supply side were more successful; more consistently implemented and better supported as reflected in budgets and partner participation, compared to system-building and demand side initiatives.

While the existence of skills gaps is *partly* a supply side issue, and hence supply-side interventions remain needed (also to address the enrolment-graduation gaps noted in Section 6.2), it is clear from the survey that most of the reasons for persisting HCD or capacity issues are systemic and organisational in nature. It is therefore a concern that vital advocacy and coordination capacities and opportunities were lost or under resourced (for example, BHCDs coordination, Fundisa for Change coordination, and the National Environmental Skills Summit), and that key Organisational Strengthening initiatives were discontinued. Should they be picked up again in the next 10 years, reasons for their inability to sustain themselves should be taken into account in their re-design.

The overview of gaps in the case studies undertaken for this review (and in the GreenMatter Independent Evaluation) shows a pattern of:

- levels of involvement remained low and failed to scale up and out in many cases, with *Groen Sebenza* and *Fundisa for Change* being exceptions
- lack of follow-up
- lack of coordination capacity
- inadequate financial resources
- lack of continuous high level scanning
- no joined up support and articulation.

7.4.4 Monitoring and Reporting Limitations

The lack of comprehensive and shared monitoring and reporting on the BHCDS is a critical gap. While SANBI and DEA/DEFF reported on some aspects of the programme of implementation, these reports are not shared and deliberated with the sector, and thus of limited value in informing the way forward. Very positively, evaluations have been undertaken, but are not available in one place, or again, shared with implementation partners across the programme, to celebrate successes and inform shared decision-making about the way forward. Fundisa for Change has been evaluated repeatedly, seemingly covering the same ground but for different purposes/funders. A key monitoring gap is the absence of tracer methodologies and record keeping in the GreenMatter Fellowship and the Work-Integrated Learning project. This limits the sector's ability to identify successes or areas that need more work, and also its ability to follow up with programme beneficiaries to enquire if they need more support, or whether they are in a position to act as ambassadors, mentors others, etc.

Research to keep up with changing skills needs is a form of strategic monitoring and reporting that is also absent. It is not clear whether particular scarce skills needs (like bioinformatics) have been met and if not, why not, and what more needs to be done. Research will be needed to determine how best to address new skills needs. The Green Skills programme has produced methodologies for undertaking such work; however connections between the relevant role-players in the skills ecosystem are still inadequate to optimally use such research.

Monitoring, evaluation and reporting is one of the main mechanisms in which South African government partners and funded programmes are held accountable; it ensures that work is done as intended and funds are well spent, and it keeps up the momentum when other priorities threaten to push the commitment to the side. Many of us renew our focus on a particular activity when its reporting date becomes due. The M&E function also has many more benefits besides keeping implementers focussed and accountable. It provides credible information and products for marketing, communications and further fundraising purposes; documented successes and progress can motivate current partners and inspires the participation of new partners; it lends credibility and allows for a sector to be "taken seriously", and it informs strategic decision-making. Given all these clear benefits from a clear M&E and reporting system, it is surprising that not more effort has been given, for example, to implementing the BHCDS' M&E framework. Although the GreenMatter Independent Evaluation Report indicates that there has been an absence of monitoring and indicators for measuring success, such indicators have been developed through stakeholder consultation and criteria for M&E are included in the BHCDS (2010, pp.74-81).

7.4.5 Funding

There has been a gap in sustained funding. The Lewis Foundation's initial guarantee of core and catalytic funding was vital in getting the BHCDS implementation programme off the ground. The review found numerous examples of how this funding (e.g. for the Careers initiative, Fundisa for Change, and Fellowship) was catalytic not only in enabling others to raise further funding, but also to have tangible implementation outcomes that led to further outcomes and impacts. This funding was not enough by itself, and partners who contributed

included DEA/DEFF, SANBI, universities, other foundations, SETAs, NGOs and Treasury. However the core base of sustained funding was set to reduce over time. GreenMatter was established with the purpose *inter alia* of growing this core base from which to launch initiatives, with additional funding, both by raising funds and by supporting partners in fundraising. This meant that GreenMatter staff had to be funded, at a level commensurate with the high-level advocacy, coordination and business development roles it was set to play. Its key fundraising strategy was to start initiatives (like the Fellowship) that would give it profile and a base from which to engage potential donors. As the pressure mounted on the GreenMatter core team to fundraise for flagship programmes, as well as their own positions and body staff, the ability to support partners and undertake non-income generating advocacy and coordination work, seems to have diminished accordingly. Two fundraisers left and the director was found wanting in bringing in the necessary resources. Stakeholders criticised the funding strategy for being in competition with, rather than in support of partner organisations. In the interim, initiatives whose leads were unable to singularly fundraise for their continuation, such as the Work-integrated Learning, Careers, Mentoring and HRD Network, fell by the wayside. While some of their benefits continued (notably Mentoring capacity and Careers resources) this was not always the case, and not optimally.

The main re-think for the next 10 years therefore has to be the funding and the institutional home(s) of the initiative. The BHCDS is a policy directive, ambitious in its goals in keeping with the systemic issues it aims to address. To transform a sector that is still being experienced as racist in some respects, it *has* to be more than a bursary programme. To match this ambition and intent, it needs to be adequately funded. The early years of implementation has shown that with adequate resources, stakeholders rise to the occasion, collaborate, innovate and push the sector forward.

7.5 Contextual Changes and Analysis

What are the (policy, funding, social, environmental, political, economic) trends internationally and nationally, that have been or will be affecting the sector, its skills needs, and potential opportunities for addressing them?

7.5.1 Survey Responses

Table 7.1 is a list of regional and international trends noted by survey respondents. There are a number of negatives in the picture they paint: Both societies and biodiversity are faring poorly and efforts to address biodiversity issues could potentially be hampered by reduced international funding, corrupted or non-transparent governance, and persistent drivers for resource extraction by global powers out of Africa, among other negative drivers.

Respondents however also noted a number of positive drivers. These were the Convention on Biodiversity (CBD) Framework, the UN Decade for Restoration, Agenda 2063, and increased climate change funding. They noted a growing understanding of the importance of biodiversity (presumably in society broadly or among decision-makers), the possibility of integrating biodiversity indicators in business metrics, and the availability of more biodiversity and earth science related data and tools. This latter is born out in our document-based analysis (Section 7.5.2).

The rise in wildlife crimes (point 4 in Table 7.1) is a particular concern; in 10 years this has worsened, despite it being identified as a serious issue in 2009. The BHCDS has not given this any concerted attention. One survey respondent phoned to advise us that a “wildlife crime academy” is being established in South Africa; this is worth further investigation.

Table 7.1 Survey Responses Regarding Current Regional and International Context

Regional & International context relevant to biodiversity skills development as identified by survey respondents
<ol style="list-style-type: none"> 1. The reality of a finite world and the impacts of living beyond the limits, massive inequities in access to and consumption of resources which are likely to exacerbate conflicts; examples being ... <ul style="list-style-type: none"> ○ [Threats to] food security ○ Climate change ○ Water risk ○ Over-fishing 2. Challenges faced by organisations in the Global South in submitting big funding applications 3. Lack of capacity on the continent; limited interaction with SA, lack of transparency and good governance - a hindrance to attracting international funds 4. The expansion of transnational organised crime and the impact of human trafficking, displaced peoples, greater demands for wildlife products. 5. Increased resource extraction out of Africa; impacts of Chinese “Belt and Road” 6. Due to social media opinions and 'solutions' gain prevalence that are no longer grounded in facts and good science but rather in sensationalism. 7. “The growth of environmental nationalism” 8. COVID-19 impacts on economies around the world - reduced international funding 9. COVID-related growth of online education and remote working 10. Increased understanding of the importance of natural capital, Ecosystem-based adaptation, nature-based solutions - and the biophysical limits to these 11. Increasing availability of funding for climate change mitigation and adaptation 12. Agenda 2063 13. UN Decade of Restoration 2020-2030 14. Big data and modelling in biodiversity research to address the response of ecological networks and ecosystems to global changes 15. Biodiversity and climate indicator integration into business impact metric prioritisation. 16. World Meteorological Organization standards available and relevant for accessing funding 17. Regional cooperation and policy alignments 18. Outcomes of the IPBES Assessment 19. Convention on Biodiversity: Capacity and resource implications of implementing the post-2020 Global Biodiversity Framework being developed by the CBD; funding that may become available particularly to build capacity in countries 20. Availability of developing country finance programmes 21. Increased funding and partnership opportunities out of the East

Table 7.2 Survey Responses Regarding Current National Context

Current national context relevant to biodiversity skills development as identified by survey respondents
<ol style="list-style-type: none"> 1. Climate change 2. Declining state of freshwater resources 3. Worsening biodiversity status; e.g. Albany thicket needs urgent biodiversity attention 4. Increasing urbanisation and population density 5. Poverty and inequality 6. National commitments to international policy 7. Natural capital as a concept and the way in which it can be used to create awareness and integration into corporate strategies and supply chains 8. Growing emphasis on transitioning to a green economy (as part of post-COVID recovery), renewable energy, landscape restoration job options, water resource conservation, ecological infrastructure and green urban planning 9. Need to build semi-skilled labour opportunities and diversify jobs in the green economy 10. Unemployment and under-employment, especially of youth 11. High unemployment of graduates, “too many graduates” 12. “Huge numbers of poorly skilled school leavers in an environment that requires skills, exacerbated by COVID-19” 13. “Not enough depth to higher education (superficial degrees/thesis), too much emphasis on producing more PhDs and not enough on high quality education” 14. “Many current graduates have book knowledge but very little understanding of how this knowledge applies to real life. The rise of online courses ... means this lack of real-world knowledge is likely to become even more prominent” 15. The current PSET system is unable to cope. The over-reliance on academic Higher Education and Training may be skewing the labour market 16. Centres of Excellence as a model that has worked; now being threatened with closure 17. Currently many young professionals are trained in the policy environment but not streamed or trained into the realities of implementation on the ground 18. “Brain drain” - loss of skills to other countries 19. The shift to flipped classrooms, blended-learning and the growth of internet connectivity in rural areas 20. The emergence of 4IR technology, big data and data science 21. Dominance of SANBI and national departments in accessing international funding 22. Pressure by “animal rights extremist organisations” on wildlife economy initiatives

Survey respondents have picked up on some of the higher education trends, e.g. an increase in graduate numbers with not enough attention to the quality of their education and skills. The importance of developing work-related skills in the workplace itself (rather than or not just at university) was also noted, with a fear that the rise of online learning would give graduates even less time in the field. Internship programmes will need to adjust to address this need.

Respondents were also optimistic about the possibility of country level funding from big international developments like the CBD Post-2020 framework; the BHCDs should apply resources so as to engage with these and other developments in order to channel available funds to systemic rather than “isolated and piecemeal” or duplicated initiatives.

Other HCD Initiatives

The review was mindful that it could not attribute all observed achievements to the BHCDS, as there are a number of other programmes, policies and initiatives with a capacity development focus, and many of them also cover the biodiversity related skills needs. Figure 7.3 depicts survey respondents' perceptions of which other initiatives have also contributed to the implementation of the BHCDS over the past 10 years.

Challenges around evaluating organisations' contributions to the implementation of the BHCDS were noted: "Longitudinal datasets from individuals who have specifically benefited from programmes is needed to track the specific outcomes of these processes."

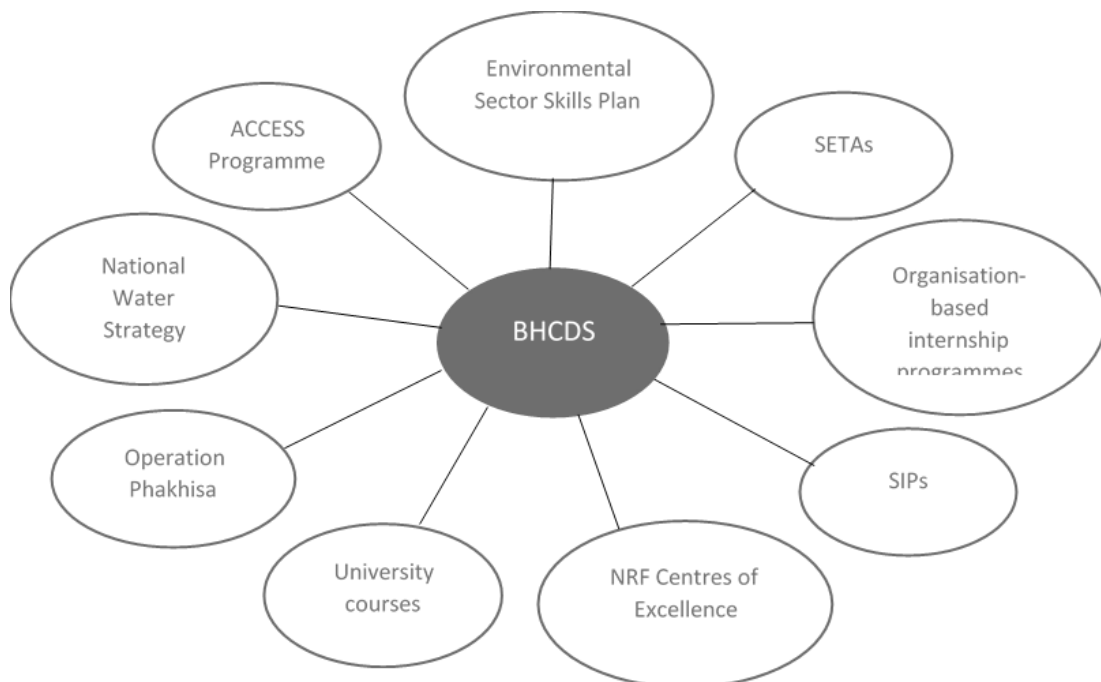


Figure 7.3 Other HCD initiatives with a Biodiversity and Environmental Focus

7.5.2 Analysis of National and International Trends

The point of departure for the following analysis is the review finding that organisations with biodiversity remits are still underfunded. This means not only that BHCDS is likely to remain underfunded, as the case studies suggest 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.

This analysis is therefore geared towards potential funding sources, as well as to possible contextual changes in the skills required by the sector. The review also suggests that these two points may be linked, i.e. one of the main capacity gaps is the capacity to mobilise resources for the sector.

The sector competes for funding with other national priorities including Energy and Water, job creation, social development, health, and measures to reduce poverty which is deepening as climate change and a weak market economy conspire to affect the poorest of

the poor most severely. The National Employment Vulnerability Assessment (2017) predicted that workers in Mining, Coal Mining, Agriculture and Tourism, are going to be most severely affected by climate change, and the associated Sector Jobs Resilience Plans make recommendations for just transitions, *inter alia* for farm workers as a particularly vulnerable group. Subsequent to these reports, the Covid-19 pandemic has affected all those on the margins of the market economic, severely.

The biodiversity sector knows that it can create work and income opportunities for low- to intermediate skilled workers; it has for example proven this in the successfully sustained Working for Water and other NRM related Expanded Works Programmes. In the past 10 years a growing body of studies on a wider range of green jobs has been “making the case” for biodiversity. The *Green Jobs Report* of 2011 (DBSA, TIPS) calculated that most of the green employment opportunities to be unlocked in South Africa would be in natural resources management (NRM). Driver, Mukhadi and Botts (2019) determined that the number of current biodiversity jobs (418,000) is already significant compared to employment in mining, and potentially growing (whereas mining, on 430,000 jobs, is contracting). But where would the funds come from? Resource economists like Blignaut provided accounting measures that turn land restoration investments into assets rather than expenses. The *Presidential Jobs Fund Framework Agreement* of 2018 suggested that funding mechanisms already exists, when it 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 millions⁴⁹ of jobs in mine rehabilitation⁵⁰.

In the past 10 years Government has from time to time expressed a commitment to just transitions towards an inclusive green (low carbon) economy. Examples are the Green Economy Accord (2011); and in 2020 President Ramaphosa at the launch of the Climate Change Adaptation Strategy⁵¹ declared that while the Covid-19 affected economy required urgent recovery measures,

“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*”.

Recently the *Africa Report* shared that the restoration⁵² of 350 million hectares of degraded ecosystems between now and 2030 could return \$9 trillion in ecosystem services and remove up to 26 gigatonnes of greenhouse gases from the atmosphere. This is almost half of what the world emitted in 2019⁵³, and just one example of new studies that demonstrate the link between biodiversity, climate change resilience, and benefits for human and

⁴⁹ The Centre for Environmental Rights reports that South Africa has 6000 derelict and abandoned coal mines.

⁵⁰ SANBI's 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.

⁵¹ <https://www.sanews.gov.za/south-africa/sa-works-create-new-inclusive-economy>

⁵² This does not imply tree planting in former savanna ecosystems.

⁵³ <https://www.theafricareport.com/54920/africa-restoring-1-billion-hectares-would-mitigate-climate-change/>

economic well-being. The biodiversity sector now has more research at its disposal to show that investing in biodiversity work, jobs and businesses, would help buffer society from floods and drought, unlock opportunities for eco- and adventure tourism, secure and restore water sources, and protect food security through healthy soils and pollinators. Calls for more resource economists (as a scarce skill) indicate that the links between biodiversity and social and economic benefits foreshadowed in the BHCDS in 2010 are now widely recognised and that skills are needed to further explore and develop them.

Nowhere is this more evident than in a report on the biodiversity economy by a Cambridge University economist, and tellingly commissioned by the UK government (HM Treasury). Released in February 2021, the Dasgupta⁵⁴ report provides 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 argues that fundamental changes can be achieved by transforming *just two institutions*: the financial sector (chiefly banking), and education, particularly in relation to economics education. These two institutions are the key leverage points for transforming society to act on a radically new understanding that: the market cannot protect nature, nature is not external to the economy, people and economies are embedded in nature, new measures are needed to measure economic success (inclusive wealth) and controls are necessary, but difficult to regulate, hence both financial incentives and internal controls and therefore education, are vital.

This approach echoes 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) which argued for a transformed and expanded view of the economy, as consisting not only of markets, but also of households, governance, and the Commons, and hence decisions about what is economically sound, would take all these dimensions into account. The key findings from this study were discussed at the National Environmental Skills Summit in 2018 and the following agreed:

- Stronger coordination of data collection and analysis is important.
- Many policies should be reviewed, based on the findings of research and the experience of those implementing the policies.
- Adaptive M&E strategies are important, accompanied by adaptive management strategies, to ensure nimbler responses to policy implementation challenges.
- Capacity-building is needed - may include individual skills development embedded within organisational capacity-building efforts, focused on service delivery priorities
- The analysis achieved through the initial case studies should probably be extended also to other parts of the green economy (mine rehabilitation and waste suggested).

The above points suggest that data collection and analysis skills, policy review skills, adaptive M&E skills and organisational capacity-building skills will be needed in the sector in order to effectively implement green economy initiatives.

⁵⁴ Dasgupta, P. 2021. The Economics of Biodiversity: The Dasgupta Review. Abridged Version. London, HM Treasury. www.gov.uk/official-downloads

BHCDS implementers can further draw on a range of new policies and national and international frameworks that help make the case for investing in biodiversity and also guide the way to the kinds of skills that will be needed. These guidelines include the Global Sustainable Development Goals, that refer to Climate change, Life on land, Life in water, Poverty and Education in an integrated manner. The United Nations' Decade on Restoration (2020–2030), launched in 2019, is closely associated with the SDGs. So is UNESCO's ESD2030, which follows on the Global GAP and before it, the Decade of Education for Sustainable Development. Both of these are particularly relevant for biodiversity and skills development in Southern Africa, and underpin the SADC wide "Sustainability Starts with Teachers" initiative, which drew on Fundisa for Change experience, networks and resources.

Other relevant responses are the "Build Back Better" initiative of the UNDP (2019) and the IPBES, the International Science-Policy Panel on Biodiversity and Ecosystem Services, launched in 2012. The *IPBES Global Assessment* released in 2019 was the first since the Millennium Ecosystem Assessment in 2005. It integrates natural and social science perspectives, different knowledge systems and diverse dimensions of value. It will underpin the post-2020 Convention on Biological Diversity Framework (which survey respondents felt would have a focus on capacity development and therefore potentially provide funding resources) and is also closely linked to the 2030 Agenda for Sustainable Development, the Sustainable Development Goals (SDGs) and the Paris Agreement on Climate Change.

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. The IPBES held a Pandemics Workshop in 2020 which identified knowledge gaps highlighted by COVID-19 and recommended a "One Health" integrated approach to averting interconnected biodiversity, climate and health crises.

Skills needs identified relate to, among others:

- Relationship between restoration, degradation and disease emergence
- Economic analyses of return on investment in restoration
- The relative importance of the legal and illegal trade in wildlife

The One Health concept is also promoted in the Strategy of the UN Decade on Restoration. A trend towards greater integration across previously separate 'fields' is evident in many of these international guidelines. Common threads include the links between human well-being and well ecosystems and biodiversity as exemplified above; and an emphasis on economics and financial measures; as well as "transformative change". Monitoring and evaluation is frequently mentioned as an important area to unlock access to private funding, track progress and evaluate impacts. Many of these guidelines also highlight the importance of skills, education and capacity development. Multi-actor governance interventions are seen as powerful "levers" for transformative, systemic change in global sustainability pathways

(IPBES, 2019). The IPBES positions “capacity building” as a top lever towards “transformative change”.

Skills for effecting transformative change skills suggest *inter alia* advocacy and negotiation skills, and integrated planning informed by systems understanding. In 2015 South Africa’s *Green Economy Learning Assessment*⁵⁵ identified the importance of combinations of technical, relational and transformational competencies for those driving transformative change. The IPBES has a Capacity Development Rolling Plan (2017), unfortunately mostly focussed on its own workplan. It includes a fellowship programme, training, secondments and internships, exchange visits among institutions, and strengthening national and regional capacities by promoting national capacity self-assessment and “matchmaking” of support by partner institutions. The IPBES also notes that knowledge gaps exist in:

- Fresh water and diverse marine ecosystems
- Taxonomy (expanded into new ecosystems such as soils)
- Ecosystem services
- Nature-people relationships
- Engaging communities and indigenous knowledge
- Scenario development to aid decision-making, and
- Data for policy development and policy evaluation.

UNEP’s “Build Back Better” plan mentions skills and jobs in blue and green economies.

With regards to skills, the ESD2030 initiative is a significant drive to build on the central role of ESD as a key enabler of all the SDGs as noted by the UN General Assembly, as well as a goal in its own right. ESD2030 aims to increase the contribution of education at all levels to building a more just and sustainable world. The ESD 2030 Roadmap will focus 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 DHET’s inclusion of ESD in the Minimum Requirements for Teacher Education Qualifications.

A review of policies and guidelines produced in South Africa’s skills sector over the past decade, is on the other hand disappointing. In their updated (2017) South African Country Report on *Skills for Green Jobs*, for the International Labour Organisation (ILO), consulting firm OneWorld is particularly scathing about the absence of references to the green economy and green or environmental skills in DHET frameworks such as the *National Skills Fund 2016/17-2020/21 Strategic Plan* and the *White Paper on Post-School Education and Training* (2014) among others. They point 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” (p.25). “This is despite the fact that the green economy has been identified as a key sector for job creation in various government plans, including the 2011 Framework for a New Growth Path (ibid)” There has been little progress since the ESSP made the same observation. The ILO Country Report notes that the policy environment in general has however “evolved significantly” since 2010. In 2017, for example, a “sophisticated set of well-aligned policies” are in place (addressing climate change, green economy transitions and links to the National

⁵⁵ https://www.un-page.org/files/public/green_economy_learning_assessment_south_africa.pdf

Development Plan), but slow economic growth and political uncertainty have impacted their implementation. Policies have not translated into proactive skills development frameworks (although some progress was noted).

The 2017 ILO *Country Report on Skills for Green Jobs* (p.7) argues that “The country needs a closely aligned skills system in order to achieve transformation. This is challenging because the skills system is relatively new ... also constantly changing. The challenge is exacerbated by the cross-sectoral nature of the emerging green economy. Meeting these challenges necessitates a coherent approach that considers all the ongoing discourses related to the green economy that [still] take place on an *ad hoc* basis.”

Also relevant is the *White Paper on Science, Technology and Innovation* released in 2019. It outlines the medium to long-term policy approach for the science, technology and innovation (STI) sector. It is intended to position the National System of Innovation (NSI) to address socio-economic challenges and respond to drivers of global change. It is therefore highly relevant for the BHCDS.

Some of the global changes highlighted in the White Paper on STI include demographic shifts, urbanisation, widening inequality and youth unemployment, ICTs and the Fourth Industrial Revolution, as well as climate change, drought and loss of biodiversity – identified as some of the big risks that will shape policy in the near future. The concept of a circular economy is likely to become prominent in future growth discourse. New environmental policies will require new technologies, processes, services and business models. It is argued that South Africa urgently needs to expand its STI capabilities to support achievement of its national development priorities as outlined in the NDP:

“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 overemphasised.” (p15).

The *White Paper* recognises inter- and transdisciplinary knowledge as increasingly important and envisages a greater contribution by the social sciences in addressing complex problems. An open science approach will allow greater access to information and help to realise the benefits of collaborative approaches to knowledge development. The research system’s output of human resources will be improved (e.g. through developing the skills pipeline, providing increased support for students, increasing supervisory capacity, and transforming the demographics of the professoriate). In addition to a focus on academic outputs and PhDs, the *White Paper* supports a diversity of post-secondary education opportunities and technical skills for the economy, including education and training for a future of digital jobs (which would be in support of some of the skills needs identified in the biodiversity sector).

The *White Paper on Science, Technology and Innovation* notes that: “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, in particular innovation and technology-driven change that affects organisations and individuals alike. 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.”

In conclusion, this review of contextual changes suggest that a strategy to build transformed and transformative capacity for biodiversity organisations is more relevant than ever, many of the identified skills priorities are still vitally important, and potential funding resources and partners exist.

Detailed recommendations for improving implementation initiatives, as well as high-level recommendations pertaining to the implementation of the strategy as a whole, are presented in Chapter 9. But first, the outcomes of the deliberations of the various syndicates at the Mini Environmental Skills Summit are presented to further inform future strategic planning.

8. OUTCOMES OF THE MINI SKILLS SUMMIT MARCH 2021

As part of the review a so-called Mini Environmental Skills Summit was held online on 24 and 25 March 2021. The invitation was distributed through the networks of the key partners and included all those who had expressed an interest in attending during the survey.



SANBI
Biodiversity for Life
South African National Biodiversity Institute

YOU ARE INVITED

The 20 year Biodiversity Human Capital Development Strategy (BHCDs) was developed and launched in 2010. SANBI in partnership with Lewis Foundation embarked on the review of the BHCDs in 2020.

SANBI invites you to an online mini skills summit where the report on the review of the BHCDs implementation will be presented and resolutions taken to inform priorities and actions for the remaining ten years of implementation.

📅 : 24 and 25 March 2021 (mornings only)

🕒 : 08:30 – 13:00

💻 : Online with Microsoft Teams

✉ : RSVP to z.nzeru@sanbi.org.za

(Please indicate the syndicate you would like to take part in. **Please find the draft programme attached for further details.**)

🔗 *Participants who RSVP will receive a Microsoft Teams link closer to the event.*


THE LEWIS
FOUNDATION

#BHCDs2021
#LewisFoundation
#SANBI

🐦 @SANBI_ZA

The agenda for the Summit is shown below.

Mini Environmental Skills Summit

Focused on the Biodiversity HCD Strategy (2010-2030) Mid-Term Review

DAY 1 | 24 MARCH 2021 | ONLINE Zoom ID 620 817 0006

8:15	Start connecting Zoom ID 620 817 0006	
8:30-9:45	<ul style="list-style-type: none">• Welcome and Opening Remarks - Carmel Mbizvo, SANBI• Overview of the outcomes of the review - Eureta Rosenberg, Review Team• Response to the review and the contours of what needs to be deliberated - Shonisani Munzhedzi, DFFE• Opportunity for questions and comments - Vivian Malema, SANBI• Syndicates and their purpose beyond the Summit - structuring of break-aways and report-back - Eureta Rosenberg	
9:45-10:05 Tea break with music while we get a drink and stretch		
10:05-10:15	Return to plenary and choose a break-away room: Syndicate 1: Attraction, access and supply facilitated by Michelle Hiestermann Syndicate 2: Organisational strengthening, demand and enabling conditions facilitated by Bangani Ngeleza	
10:15-11:45	SYNDICATE 1 - ACCESS & SUPPLY Facilitator: Michelle Hiestermann (WRC) Supply side successes (attraction, access, mentoring, intern & fellowships, career guidance, transformation) - how to sustain successful initiatives and encourage more role-players to get involved and benefit? Presentation: Eureta Rosenberg	SYNDICATE 2 - ORGANISATIONAL STRENGTHENING & DEMAND Facilitator: Bangani Ngeleza (Review Team) Partners have been unable to maintain initiatives to strengthen organisations with biodiversity remits; budgets are worse than ever and organisational cultures remain untransformed for some. How to do better? Presentation: Bangani Ngeleza
11:45 Take a short break as we leave the break-away rooms and come back to plenary		
12h00-13h00	PLENARY - Report back from the 2 syndicates: (10 minutes each) <ul style="list-style-type: none">• What goals did they set? [Don't repeat the issues]• Which organisations and individuals will be in the group? Who will lead it? Who else should be involved?• How long is needed to do this work? Invitation to join Day 2	

Note: “A syndicate is a self-organizing group of individuals, companies, corporations or entities formed to transact some specific business, to pursue or promote a shared interest. [Wikipedia](https://en.wikipedia.org/wiki/Syndicate)”

DAY 2 | 25 MARCH 2021 | ONLINE Zoom ID 620 817 0006

8:30 - 8:45	Plenary Session Chaired by Vivian Malema, SANBI Re-cap of Day 1 and Structure of Day 2 Choose a break-away room from Syndicates 3 and 4	
8:45-10:45	SYNDICATE 3 - SCARCE SKILLS Facilitator: Henry Roman (DSI) Do we need more focussed, smaller strategies to address scarce skills gaps? How to keep track of needs & progress? What are the requirements for a live skills intelligence system and how to achieve them? Presentation: Karen Kotschy	SYNDICATE 4 - TRANSFORMATION IMPERATIVES Facilitator: Donovan Fullard (SAEP) Race & gender statistics have improved but there are still also concerns as illustrated by the SAJS article on why “black students don’t study wildlife”. What has worked? What more must be done, how and by whom? Presentation: Eureta Rosenberg
10:45-11:00 Tea break 15 minutes - Music while we get a drink and stretch, prepare to choose your final syndicate		
11:00-11:05	Return to plenary and choose a break-away room: Syndicate 5: Coordination, advocacy & evaluation facilitated by Mutizwa Mukute Syndicate 6: Jobs & Livelihoods facilitated by Mandy Barnett	
11:05 - 12:30	SYNDICATE 5 - COORDINATION Facilitator: Mutizwa Mukute (Review Team) Looking back at the discussions, consider the best models to ensure coordination power, advocacy and unlocking resources, monitoring and reporting. Links to other HCD Strategies Presentation: Mutizwa Mukute	SYNDICATE 6 - JOBS & LIVELIHOODS Facilitator: Mandy Barnett (SANBI) How to unlock more biodiversity jobs & sustainable livelihoods? Who to engage with and how, around organisational budgets as well as business, social enterprises and livelihood opportunities Presentation: Eureta Rosenberg
12:30 Leave break-away rooms for the final plenary		
12:30 - 13:15	Chair: Eureta Rosenberg Plenary - Report back from the 4 syndicates: (7 minutes each) What goals did they set? [Don’t repeat the issues]	

	<p>Which organisations and individuals will be in the group? Who will lead it? Who else should be involved? How long do they need to do this work?</p> <p>SAVE THE DATE FOR THE NEXT SUMMIT WHERE SYNDICATES WILL RECONVENE</p>
--	---

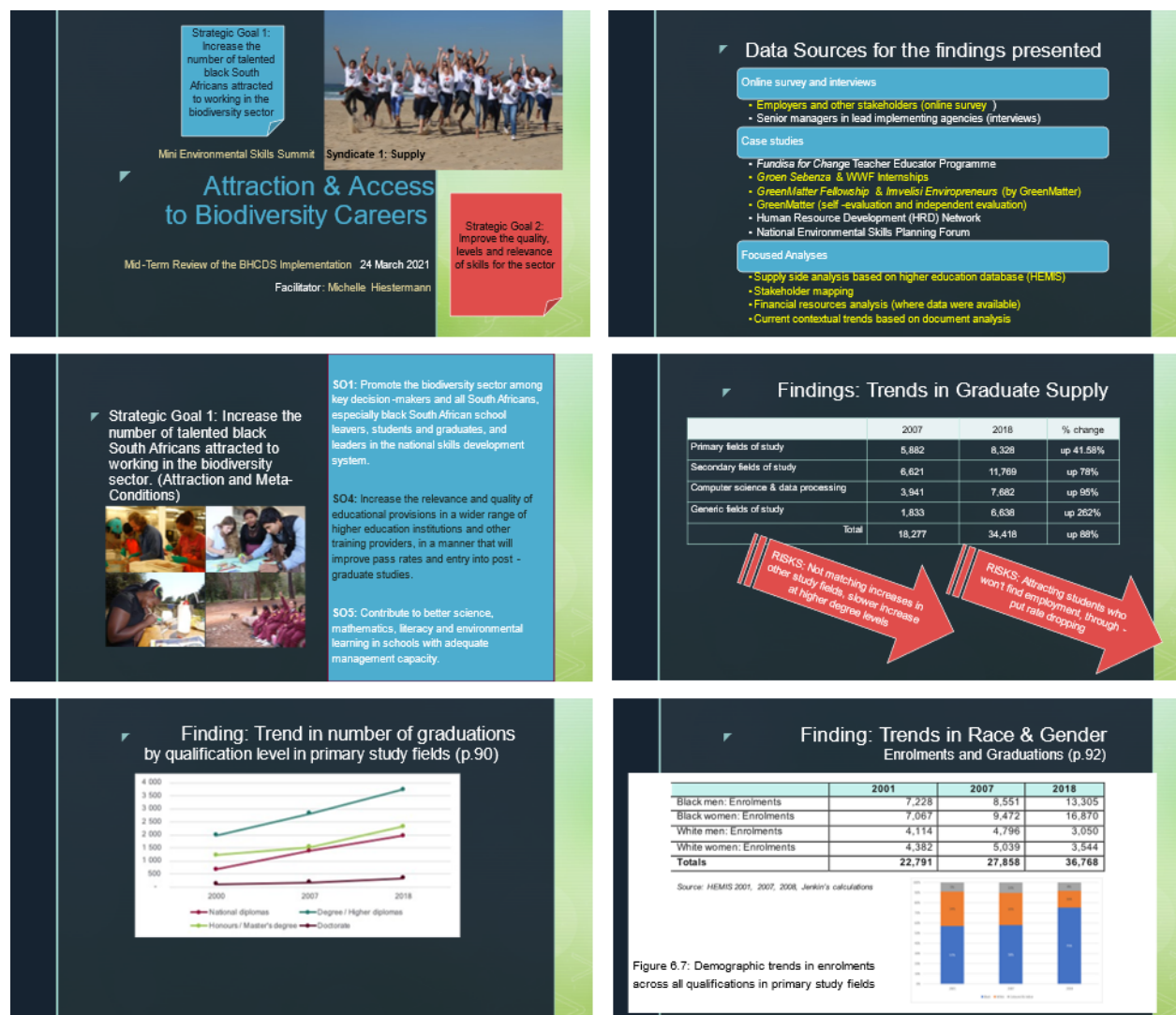
Mr Shonisani Munzhedzi (DFFE DDG) responded to Prof. Rosenberg's presentation of the purpose and findings of the review. He stated that the four core goals of the Strategy are still relevant. Over the last ten years, the same issues and challenges have been experienced worldwide (ongoing loss of biodiversity, similar drivers). Internationally, there are many new strategies that pertain to the post-2020 period, such as the new CBD strategy. He noted that in high-level cabinet engagements, he has observed a changing view of biodiversity in SA. It has assumed a more central role. For example, DFFE is working with StatsSA and others in government on natural capital accounting, the biodiversity economy, green skills and health. Biodiversity is even central to political economy these days, through climate change and other international commitments.

The need to address skills and transformation in the sector still remains. Mr Munzhedzi mentioned a review of skills for scientific work recently initiated within DFFE, which concluded that there has been an erosion of scientific skills within government and that black scientists are not being attracted and retained. There are transformation issues beyond just numbers. For example, "emerging professionals" never "emerge" even after 15 years, and the average time people stay in a job is only around two years.

The DDG expressed his feeling that it would have been nice to have this review two years earlier, and alluded to the need for more regular assessment and tracking of implementation. He welcomed the review findings and highlighted their importance for updating the Strategy, strengthening the implementation architecture and improving transformation in the biodiversity "sector".

Syndicate 1: Access and Supply


The introductory slides for this session are shown in Figure 8.1 below.



Overall: How to sustain successful initiatives under current conditions and encourage more role-players to get involved and benefit

Proposed Focus for this syndicate

Syndicate 1 (Supply) can consider one or all of these questions as their focus, and may reframe them.



1. How do we keep funding strong, motivated youth in biodiversity studies *with a likelihood of finding work or livelihood opportunities?*
2. How do we attain good throughput i.e. those who start, complete the qualification?
3. How do we ensure the right kinds of skills among graduates? *Encourage curriculum innovation at universities under stress?*
4. How do we maintain and extend strong internships and mentoring in the sector?
5. *Is there value in tracking graduates, and if so, how should it be done and by whom?*

Figure 8.1 Introductory slide presentation for Syndicate 1

The discussion in Syndicate 1 was wide-ranging and covered all five of the guiding questions shown in Figure 8.1. The main points are reflected below.

1. How do we keep funding strong, motivated youth in biodiversity studies with a likelihood of finding work or livelihood opportunities?

- GreenMatter has insight into what is happening on the ground for students – their motivation, how they see their career unfolding. They don't see / can't see anything. This is discouraging for them; it is 'studying into a void'. They have the passion, but no direction. This may be due to a lack of formal career track systems such as those for lawyers and accountants. Students need close relationships with people who've been in professions for a long time. They need to connect with the world of work e.g. professionals speaking to students – there is not enough of this happening at the university department level.
- Marketing is needed to attract and bring people into the fold. Many of the GreenMatter Enviropreneur students entered because they had been following on social media 2-3 years beforehand. This sparked an interest and when they felt ready, they attended the course/programme. Information needs to be put out regularly. The audience is youth – they are digital. They are interested in learning through their cell phones. Students are frustrated that they are not getting information from companies/organisations, and it would help if there was one place they could go to get information.
- Students are also left to their own devices finding opportunities for practical learning, often a credit-bearing component, and struggle to find suitable opportunities. The experience of students in other countries (Canada) is very different. These students have many incredible opportunities to learn beyond the lecture room - from study

abroad, to field-based learning, community-based programs and more. This is where the leadership develops in my opinion. It is a crucial part of professional development that is largely absent in SA due to lack of funding (?)

- A young, new work entrant shared his experience: Most students at university level take qualifications that they think will help them to get a job easily. Most millennials in under-resourced schools are not well introduced to the biodiversity sector. There is also a perception that it is difficult for black professionals to get a job in the sector.
- A local government official noted that in his experience, black professionals don't tend to stay long in one position and this affects their ability to gain the experience they need to progress into senior management. They tend to take roles that offer better salaries, and may move out of the field. Once they obtain senior management roles, few seem interested in studying further or building their skills for future roles. This problem is particularly affecting black professionals.
- It was suggested that organisations should have clear career development plans so that new entrants/youth can see possible career pathways and opportunities for them. This would make them less inclined to leave if they find something better.

2. How to obtain good throughput, i.e. those who start, complete the qualification?

- There was some discussion of the problem, but no solutions were proposed during the session.
- One participant expressed concern about the low numbers of diplomas/certificates compared to university degrees and wondered what is driving this pattern. He felt that more technical/vocational training and resources are needed, and programmes supported by CATHSETA should focus here. The high numbers of students who never complete their qualifications is also of great concern because everyone loses when this happens.
- Students may in some cases embark on postgraduate studies simply because they are unable to find work and not because they are really interested in further study. Many PhDs struggle to find work, or don't find work in their area of interest.

3. How to ensure the right kinds of skills among graduates? Encourage curriculum innovation at universities under stress?

- The review team clarified the fields included under "biodiversity fields" (see below).

HSRC baseline	Mid-term review
BIODIVERSITY RELATED FIELDS OF STUDY	
0102, Agricultural Extension	Not found <i>Alternatives / additions:</i> 0103, Agricultural production operations
0104, Animal Sciences	0106, Animal sciences 1306, Zoology / Animal biology
0105, Horticulture	0104, Applied horticulture and horticultural business services
0106, Plant Sciences	0108, Plant sciences 1303, Botany / Plant sciences
0107, Soil Sciences	0109, Soil sciences
0108, Fisheries	No longer & Ichthyology not found
0109, Forestry	0110, Forestry and wood sciences
0110, Outdoor Recreation	Not found <i>Alternatives / additions:</i> 0417, Parks, recreation and leisure facilities management
0111, Wildlife	Not found
0113, Renewable Natural Resources	Not found
0199, Other Ag and Renewable Resources	0199, Agriculture, agricultural operations and related sciences, other
0908, Veterinary Health Sciences	0915, Veterinary medicine 0916, Veterinary biomedical and clinical sciences
1503, Biological Sciences	1301, Biology, general
1506, Oceanology	Not found
1599, Other Life Sciences and Physical Sc	1399, Life sciences other
2203, Geography	1405, Geography and cartography

- Regarding curriculum innovation, some participants felt that the education system is not changing fast enough with environmental change; and that the way students are taught doesn't prepare them for working in the sector. A two-pronged approach was suggested: (1) talk to Higher Education Institutions (HEIs), and (2) develop learner interest and passion outside the classroom. Programmes that supplement the university learning would really help with attraction and retaining. It is interesting to see how HEI's have cut funding for experiential learning / field-based learning.
- Participants felt that the curriculum needs to start integrating biodiversity studies into other fields (Stats/Mathematics, Engineering, Social Sciences etc.), given the national developmental agenda
- Do we understand the biodiversity landscape and what mechanisms are in place for connecting supply and demand? We need to understand the demand for the skills better. Suggestion made by participants included: doing a mapping exercise and engaging with the different actors for focused integration; addressing lack of transparency within the sector or institution; and encouraging Institutions of Higher Learning to partner with various organisations on specific skills, for example creating advisory committees that invite marketplace practitioners to sit on their boards to understand the current trends and skills required; and evaluating institutions on whether they train students to understand current and relevant issues and to address these issues. Participants felt that a Skills Forum for the Biodiversity and Conservation Sector needs to be formalised, for annual engagement with key strategic issues on an ongoing basis. ("We're waking up now 10 years later, only to lament missed opportunities to coordinate our efforts better!")
- We need to look at this with both "current" and "future" lenses. Careers will change with time. Are we using the same eyes for the current and the future, or do we need 'new eyes'? What are these lenses that we should be using to project into the future? We've understood the supply to an extent, but not adequately the demand - both scientific and not scientific. It is important to include other skills required beyond technical. In the last 10 years a lot of change has happened, and in last year change has almost been like a revolution in itself. What are the drivers that will inform us for the future?

- The Nsasani Trust/OTS Women in Science course in the Kruger National Park uses the science training as a platform for both scaffolding skills of the undergraduate students and developing the “softer skills” - the personal & interpersonal skills needed to perform and thrive in an uncertain workspace. They have found that they need to spend a great deal of time on both the skills and the values. Having run the courses for 9 years now, they are finding that they need to focus on the latter more and more.
- Groen Sebenza has a big internship programme and realised that “soft skills” is a significant need. Five areas of development – career guidance, leadership, computer training etc. There have been great programmes in the past, but there are still a lot of gaps, and new areas arising. As a syndicate we need to work with the review report and strengthening how to move forward post-2020; and therefore also the lens we use for the future.

4. How do we maintain and extend strong internships and mentoring in the sector?

- Mentoring is critical as it gives real world experience. Participants were asked if they have examples of how organisations have integrated mentorships – for example into professional plans – to see how we can support institutional strengthening in this area.
- The City of Cape Town implemented a coaching and mentoring platform. To date they have spent about R3m training internal and independent coaches and supervisors. Coaching and mentorship is a recognised competency for the individual, so time can be allocated to these activities.
- Various organisations in the Breede-Gouritz catchment instituted a 3-year long internship programme. Many interns don’t complete the internship – internship is therefore ‘cocooned’. CTEET has found that multiple year learnerships/internships are definitely advisable, as interns are better capacitated in terms of skills and job-readiness and find fixed employment in the sector before the end of their contracts.
- Institutions need to be deliberate about internship and mentoring; should be embedded in career development plans by employers. Senior researchers/staff need to ask themselves the question – who will be taking over from me when I leave?, and to be strategic about it.
- Mentoring should be integrated into the organisation’s culture. One participant did a case study on an organisation (business) where mentoring wasn’t taken seriously. People are more likely to provide mentoring if they have benefitted from it themselves when they were younger. Mentor sharing was seen as useful. Support from senior leadership is important so it is seen as part of a mentor’s KPIs and job. Continuous Professional Development is critical in the workplace, for example through compulsory quality short courses which seem to be a good platform for this.
- The importance of softer skills was raised again, especially the need to consider mental health as part of growing an individual (highlighted through Covid and the need for self-care). Mentors need to focus on the softer side of the person, to help

them stay the course with their studies. People need an emotional sense of security to grow, develop and learn.

- A concern was raised around the time taken for young professionals to land a “proper” job. How many internships do you need to enter into before you get employment?
- One participant also highlighted the cost of mentoring. The amount of time and capacity involved in mentoring can be really challenging.

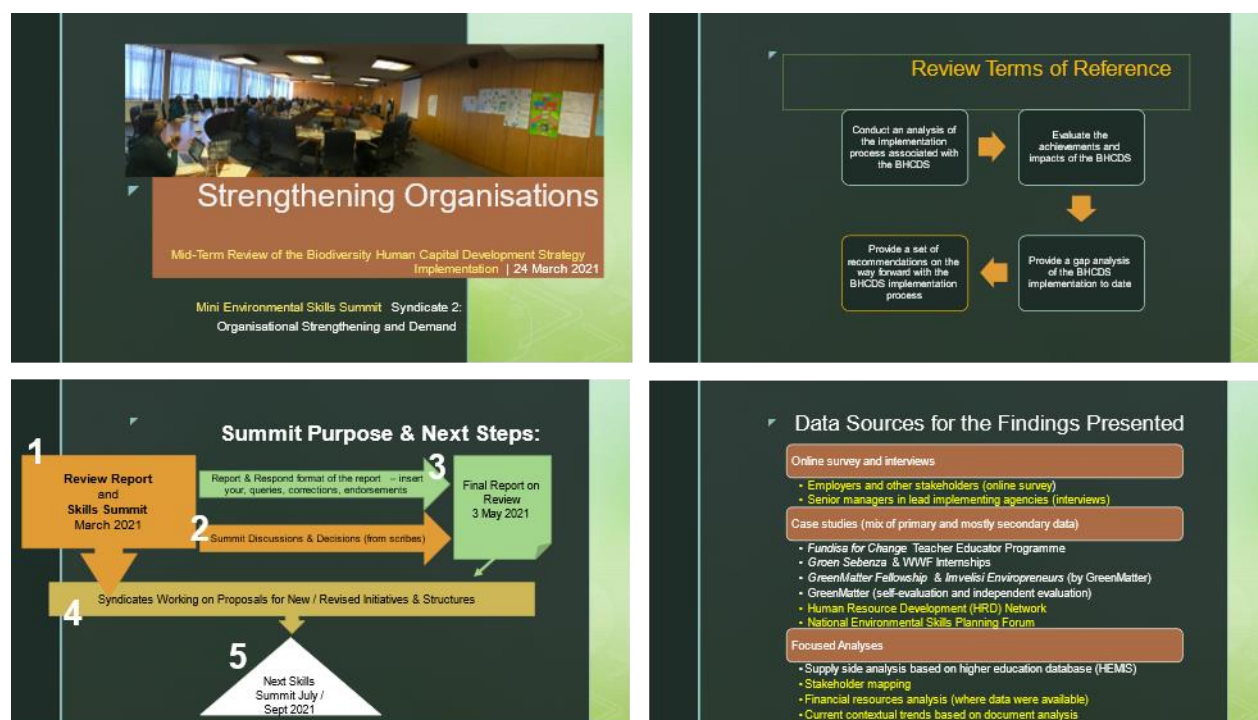
5. Is there value in tracking graduates, and if so, how should it be done and by whom?

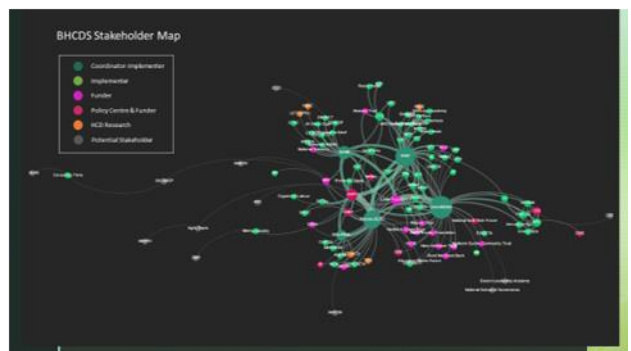
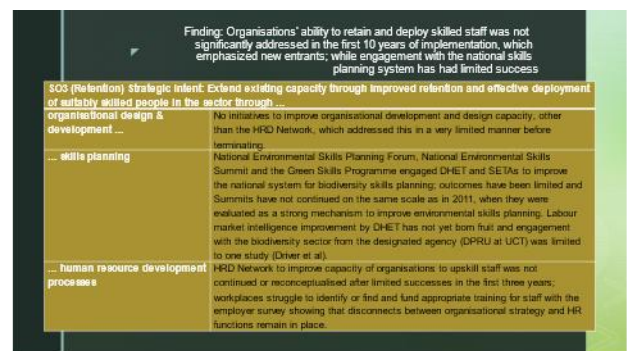
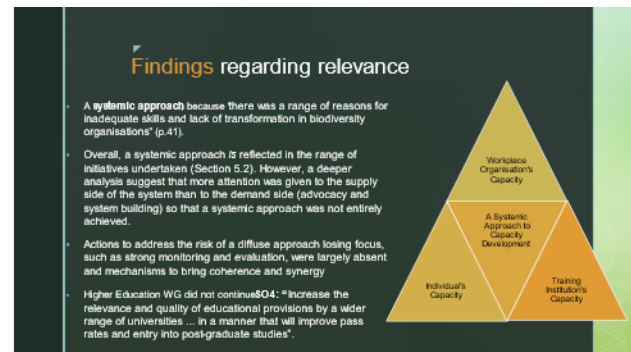
- Participants felt that it would be good to track graduates – how did they get to where they are – because it would give us useful data. Suggestions for who should do this included: employers (need to record the training, and can then track jobs taken etc.); or graduates could also update their LinkedIn profiles as a way of tracking.
- In the US the Spencer Foundation annually provides a grant for research on education models. The Nsasani Trust is looking to apply and could team up with people – this would be a 5-year project on interventions, tracking pathways of people etc. Needs a partnership approach. People were invited to contact Karen Vickers.

The following people committed to being part of this syndicate going forward:

Karen Vickers (Nsasani Trust - happy to lead but it would be great to partner with at least one other person on this), Vivian Malema (SANBI), Ashwell Glasson (SAWC) and Abel Ramoelo (SANParks).

Syndicate 2: Organisational Strengthening





Proposed Focus for this syndicate

Syndicate 2 (Organisational Strengthening & Demand) may consider these questions as their focus, and may reframe them.

1. How do we strengthen leadership skills in the context of the challenges identified?
2. How do we monitor & evaluate our progress in this regard?
3. How can biodiversity organisations strengthen their ability to raise more resources?
4. How do we more effectively engage national systems like StatsSA, National School of Governance, Treasury, GTAC, DPME? Who is well placed to lead this?
5. Which other entities should the biodiversity sector engage to strengthen its organisations, and how? Who is well placed to lead this?

Figure 8.2 Introductory slide presentation for Syndicate 2

Syndicate 2 was provided with five questions to discuss (Figure 8.2). One of the group members commented at the start that these questions seemed disjointed and not in keeping with a systemic approach. The group went back and looked at the Theory of Change (Slide 7) and the following connections between questions were suggested: Q1 addresses strong leaders, Q5 addresses strong organisations (who can help with strengthening), Q3 addresses the intended outcome (more resources, more jobs). Q2 (M&E) and Q4 (interfacing with national systems/orgs) are overarching issues.

The discussion covered the following main points:

- It is important to remember that organisational strengthening is context-specific. We therefore also need to think about how to strengthen the supporting environment, and how to get support from other sectors.
- There is a need to broaden the focus beyond the “traditional” players (for example, BUSA has a working group on Just Transitions and business is galvanising around this). Also the YES youth employment programme, law enforcement, compliance monitoring & enforcement, environmental journalism, municipalities, etc. The BHCDS initially referred to the “biodiversity sector” but was then broadened over the years to include all sorts of things that impact biodiversity (recognising that there isn’t really such a thing as the biodiversity sector). It expanded to include Honours students, Enviropreneurs, bursaries for resource economics etc. One participant felt that this widening of scope has apparently not been well communicated, judging by the discussions around the need to expand the scope, and it also didn’t come across in the review.
- There is opportunity for tracer studies to help us understand why people leave. But we also need to look at the broader context. Over the past 5 years we have seen

integration of “biodiversity skills” into other sectors. So do people leave the sector or do they just take their skills elsewhere, still to the benefit of biodiversity?

- We need to strengthen organisations to work across sectors (e.g. agriculture and biodiversity, agriculture and wetlands, tourism and biodiversity etc.)
- Look at examples of organisations that are doing well, to tell the aspirational story and also recognise these successes. Lessons can also be identified from past successful initiatives, like Operation Phakisa, to help with advocacy. One participant felt that “we have made our narrative too complicated, so it is difficult to advocate for biodiversity capacity in other sectors”.
- The same issues were all present 10 years ago. The solutions were all proposed then too (e.g. looking for nexus opportunities, linking to supply side, reducing constraints on leadership). Initiatives were set up, but faded away due to lack of funding beyond the initial seed funding. How to address this now? A high level of coordination and effort is needed. These are not “sexy” issues. Who will do this work? One participant expressed a sense of *deja vu*. Perhaps we should think about leadership more broadly and how to spread the leadership responsibility? When raising resources for climate change adaptation, SANBI has made capacity development an integral part of all proposals so that it is less easy for it to be “chopped” when budgets are cut.
- A participant who was close to the operation of the HRD Network from 2009 to 2013 felt that we have a good idea of the nature of the challenges, but funding was not available to carry on the work. We do need to understand better how leadership translates into organisational functioning. We should revisit our previous insights, otherwise we might be having this same conversation in 10 years’ time!
- Many of the problems are with organisations at regional and local levels such as municipalities, provincial environmental bodies (inspectors, CME) etc. Maybe we should be strengthening different or additional organisations? Fixing these “broken” or weak organisations would go a long way to improving the demand for biodiversity skills. The route to strengthening these organisations may be partly through leadership, but is also through *strengthening accountability*. Therefore, supporting “watchdog” organisations and civil society bodies which help to make weak organisations more accountable and transparent may also be a relevant part of the strategy? This is a long-term project though.
- Evaluation could be used to strengthen the theory of change for this part of the strategy, for example to test the assumption that the main route to organisational strengthening is leadership ability/capacity. It may be that the reasons for lack of success in creating more jobs and increasing budgets lie elsewhere, such as in the context, rather than within organisations. What are the criteria for evaluating “effective organisations” and “organisational strengthening”?


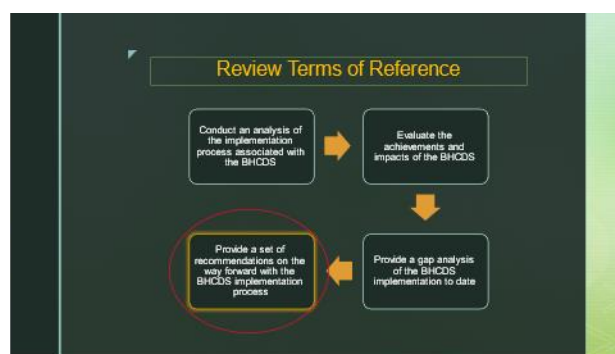
Nobody suggested reviving the HRD network, but it was mentioned that the reasons for its demise were funding-related and not due to a lack of interest.

Syndicate 3: Scarce Skills

Mini Environmental Skills Summit Syndicate 3: Scarce Skills

Addressing Scarce Skills Gaps

Mid-Term Review of the Biodiversity Human Capital Development Strategy 128 March 2021
Facilitator: Henry Roman

Data Sources for the Findings Reported Here

- Online survey and interviews**
 - Employers and other stakeholders (online survey)
 - Senior managers in lead implementing agencies (interviews)
- Case studies**
 - Fundisa for Change Teacher Educator Programme
 - Green Sebenza & WWF Internships
 - GreenMatter Fellowship & Imveliso Entrepreneurs (by GreenMatter)
 - GreenMatter (self-evaluation and independent evaluation)
 - Human Resource Development (HRD) Network
 - National Environmental Skills Planning Forum
- Focused Analyses**
 - Supply side analysis based on higher education database (HEMIS)
 - Stakeholder mapping
 - Financial resources analysis (where data were available)
 - Current contextual trends based on document analysis



Strategic Goals

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

SD1: Promote the biodiversity sector among key decisionmakers and all South Africans especially black South African school leavers, students and graduates, and leaders in the national skills development system ...

SD2: Improve the skills of those already in the workplace and underemployed or underutilised in a manner that contributes to social equity, a sense of belonging and pride in the sector.

SD3: Improve retention and effective deployment of suitably skilled people in the sector through organisational design, skills planning, development and human resource development processes.

SD4: Increase the relevance and quality of educational provisions by a wider range of higher education institutions and other providers, in a manner that will improve pass rates and entry into postgraduate studies.

SD7: Increase the supply of scarce skills through targeted higher education in initiatives in priority areas identified through ongoing needs analyses.




Findings: Detail of Skills Needs

Leadership Skills Gaps

- Business development, business management and planning
- Intra- and inter-personal skills; teamwork, collaboration
- Diversity management
- Cross-cutting and cross-sectoral knowledge; general knowledge of the conservation landscape in SA; the science-policy interface
- Horizon scanning
- Project development

Support Skills Gaps

- Fundraising
- Marketing
- Financial skills
- Administrative skills
- Legal support
- Human resources skills
- Private sector engagement

Note: Some of these are a function of experience.

Findings: Detail of Skills Needs

Technical Skills Gaps

GIS (high level): information and computer technology; artificial intelligence (AI), machine learning, coding and Internet of Things programming; data science, bioinformatics; quantitative (numerical) and statistical skills; specialist biodiversity skills (e.g. for commenting on EIAs), detailed field identification skills, plant identification, practical conservation skills, ecological technicians, Field Rangers, Conservation General Workers; Biodiversity Economy, Wildlife Economy, Resource Economy, Resource Ecology, Applied Ecology, Botany, Taxonomy, Landscape Ecologist, Conservation Planning and Spatial Planning, Land Use Scientist

Wood Scientists, wildlife specialists, air quality specialists (chemical engineers), Environmental Sociology, Social Ecology and community development, socio-economic transformations (a new protected area function), Environmental Education, Tourism, Sustainable Development, heritage resource management, Climatology, Climate Change, Conservation Ecology, Ecosystems Accounting, Zoology, estuarine work, underwater reef research, basic SCUBA diving, basic marine guiding, marine specialists, animal behaviourists, aquarists, animal health specialists, wildlife crime/trade specialists - enforcement and prosecution, Environmental Law, urban biodiversity professional officers, scientific writing skills needs identified by consulting firms

Note: Determining skills needs is a specialist task not undertaken by this review

What was done? Sample of Scarce Skills Initiatives

- GreenMatter Fellowship
- NRF, CATHSETA bursaries
- SANBI - SABIF, SABI, BioBankSA, ...
- Groen Sebenza
- WWF Environmental Leaders & internships
- Imveliso Entrepreneurs
- No collaboration with Global Change Grand Challenge Marine Science and Bioeconomy initiatives?
- NESPF and HRD Network
- Green Skills Programme – research to identify skills needs

Articulation with the national research (and development) agenda is evident in the bursaries provided through GreenMatter Fellowship, formulated to address priority areas. Attempts to articulate with other funding agencies, the DSE, DHEET, and SETAs' Sector Skills Plans

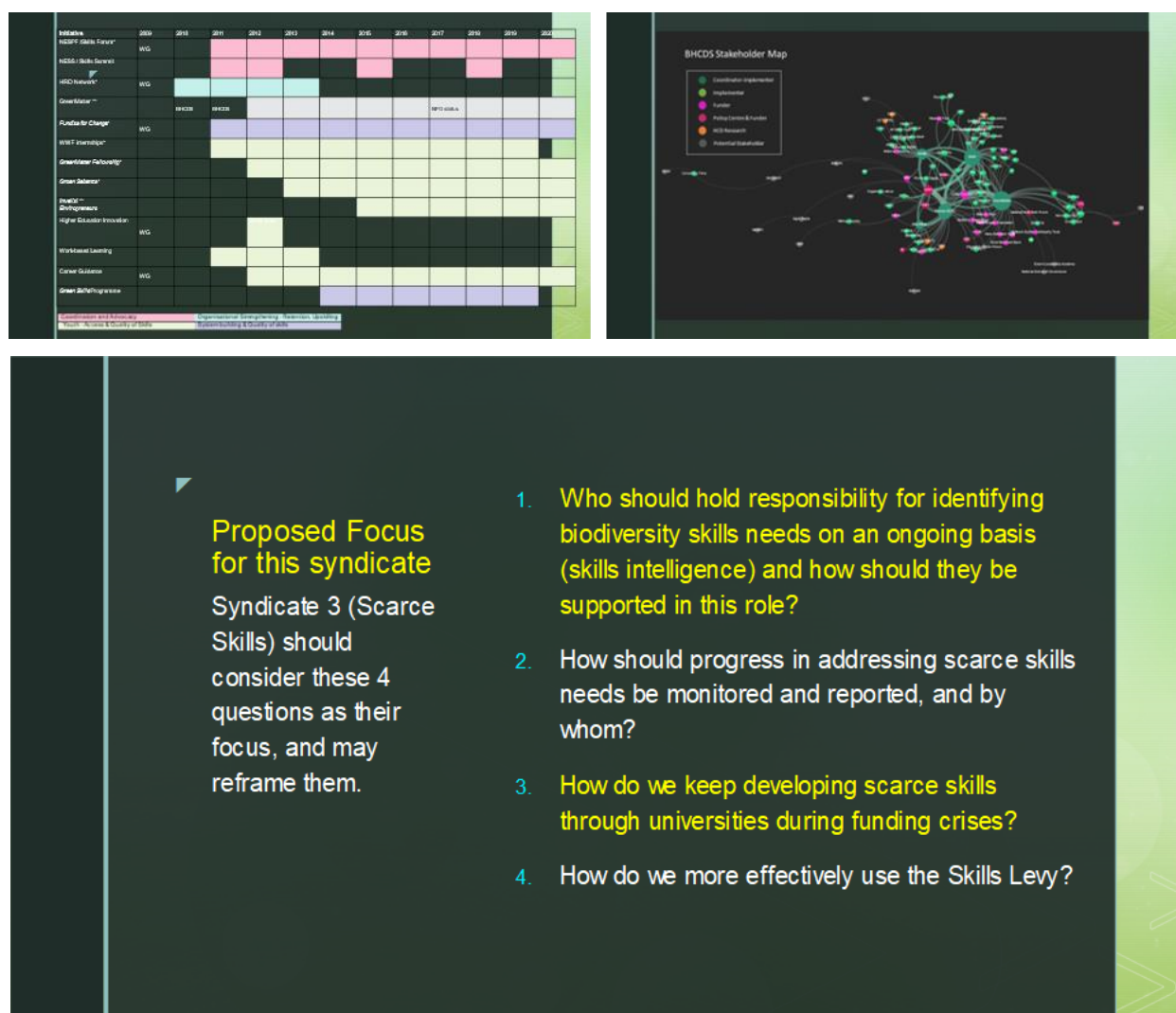


Figure 8.3 Introductory slide presentation for Syndicate 3

The Syndicate 3 discussion started with some **clarification about the “high skills” focus of the BHCDS**.

Some participants expressed a need to review the thinking that an investment in “high skills” would be the best way to create employment opportunities, and that the TVET and occupational categories, as well as private training providers, should be included going forward. The DSI is also now looking at skills that can be developed through SETAs and TVET colleges, to take cognisance of how things have changed over the last 10 years. One area mentioned in particular was the “law enforcement value-chain” in relation to the illegal wildlife trade, which requires various forensic and investigative skills as well as frontline field rangers.

There was a query about whether data from the SETA skills plans was included in the review. A group member explained that when the Strategy was initially developed the focus was largely on post-graduate skills and capacity, but that this expanded over the past 10 years to include other skill levels, sectors and models (such as “enviropreneurs”). Another member explained that the BHCDS Review was about reviewing the existing strategy, which had a “high skills” lens. Looking at the rest of the PSET system was not part of its scope.

The focus of the discussion then turned to **the need to set up a skills intelligence system to track skills needs and progress, and how this might be achieved**. The main points are captured below:

- Participants felt it will be important to understand skills from a *demand perspective* (i.e. which qualifications, skills, knowledge, attitudes, values and behaviours are valued by employers and therefore enhance employability?). We cannot afford to perpetuate a high graduate unemployment rate yet have a shortage of skills. The group did not think that we have a good enough understanding of where demand for biodiversity skills exists from the employer side, across various economic sectors, both public and private.
- The BHCDS review was not able to assess in a sufficiently robust and nuanced way which priority skills we have managed to develop in the last 10 years, and which were not attended to completely. It was only able to provide an indicative sense from the employer survey, based on employers' perceptions. This produced a long "shopping list" of skills, but these would need to be grouped or prioritised in some way to be of practical use.
- Participants also noted the importance of looking at the quality of jobs/occupations for the future from a systemic perspective. Training cannot necessarily be done the way it was done 40 years ago. There is a need for horizon scanning to identify emerging skills, especially in light of the 4th Industrial Revolution.
- On the issue of who should be involved in setting up an effective skills intelligence system, participants felt that a group of partners is needed. This should include research institutions with experience in the field of skills development, DHET (supported by other government departments e.g. DWS, DSI and entities e.g. SANBI, CSIR), StatsSA, SETA's, etc. A live tracking system could be achieved by partnering with the Department of Home Affairs or SARS to track what people have been doing. A live system would have advantages, because a manual system would require a lot of work to bring together data from different organisations and clean it up, however partnering with DHA or SARS would require high-level engagement with sector leaders, and MoUs.
- It is important to look at the systems that already exist for measuring and tracking skills, rather than setting up a separate system. Presha Ramsarup from Wits REAL mentioned a system via the DHET Labour Market Intelligence Partnership (LMIP). This is funded through the National Treasury and South Africa's National Skills Fund. It includes a list of occupations in higher demand which is linked to Home Affairs. Its purpose is to "facilitate alignment and coordination between the DHET, other government departments, SETAs, professional councils, South African Qualifications Authority (SAQA), universities, the research community and the private sector". So there is already a national structure. The Directorate is trying to improve the data, and we need to connect into this to provide better data for our sector. It is in our interest that the national data is accurate. The primary point is to support the current ecosystem.

- There was general agreement that DHET should be the primary body responsible for identifying skills needs – but how can we better support them?
 - From research done to date – the system relies on data that goes from employer to SETA to DHET. This process needs to be strengthened. We should work with the DHET and the StatSA questionnaire to develop WSP – what questions do we need to ask employers so that they give SETAs the data we are interested in? We probably need meta-data inputs into these systems using data science tools. These are emerging areas of expertise, there is a lot we can tap into.
 - Recognise that CATHSSETA does not capture all skills for biodiversity (e.g., law enforcement falls under SASSETA). So one cannot necessarily get a true sector reflection from one SETA – how can we pull all the SETA information together into a cluster?
 - We need to organise ourselves better as a sector so we can co-ordinate / organise ourselves to provide support to DHET. One suggestion was to have a responsible party which informs DHET (having a task team was not seen as ideal, because given the complexity of the sector DHET may not have the nuanced knowledge of the sector that is required).
 - The following organisations agreed to lead on setting up a process to engage with DHET: DSI (Henry Roman to speak to the Biodiversity Sector desk within DSI) and SANBI (Vivian Malema).

The syndicate concluded the discussion by coming up with **three goals and a 3-year plan**:

1. Engage with the current data ecosystem and support it to produce better data for planning

- a. SANBI / Wits/ DEFF / DSI to engage with DHET to enhance and support data collection (build on/use current system(s), to improve the information to better inform skills planning and mobilisation.
- b. Identify what data sets are out there.

2. Demand-side skills mapping and planning with a futures perspective

- a. Define what the biodiversity sector is and what it encompasses (with a provider / employer lens)
- b. Define scarcity (e.g. relative and absolute) and build an understanding of the factors that are causing scarcity (capture the nuances of the situation)
- c. Identify actors and roles e.g. upskilling (through mapping exercise – see e.g. DSI water mapping)
- d. How can this inform resource mobilisation especially in a time of uncertainty such as the pandemic? Funding is an important consideration where the focus is not just a supply solution (which can result in oversupply).

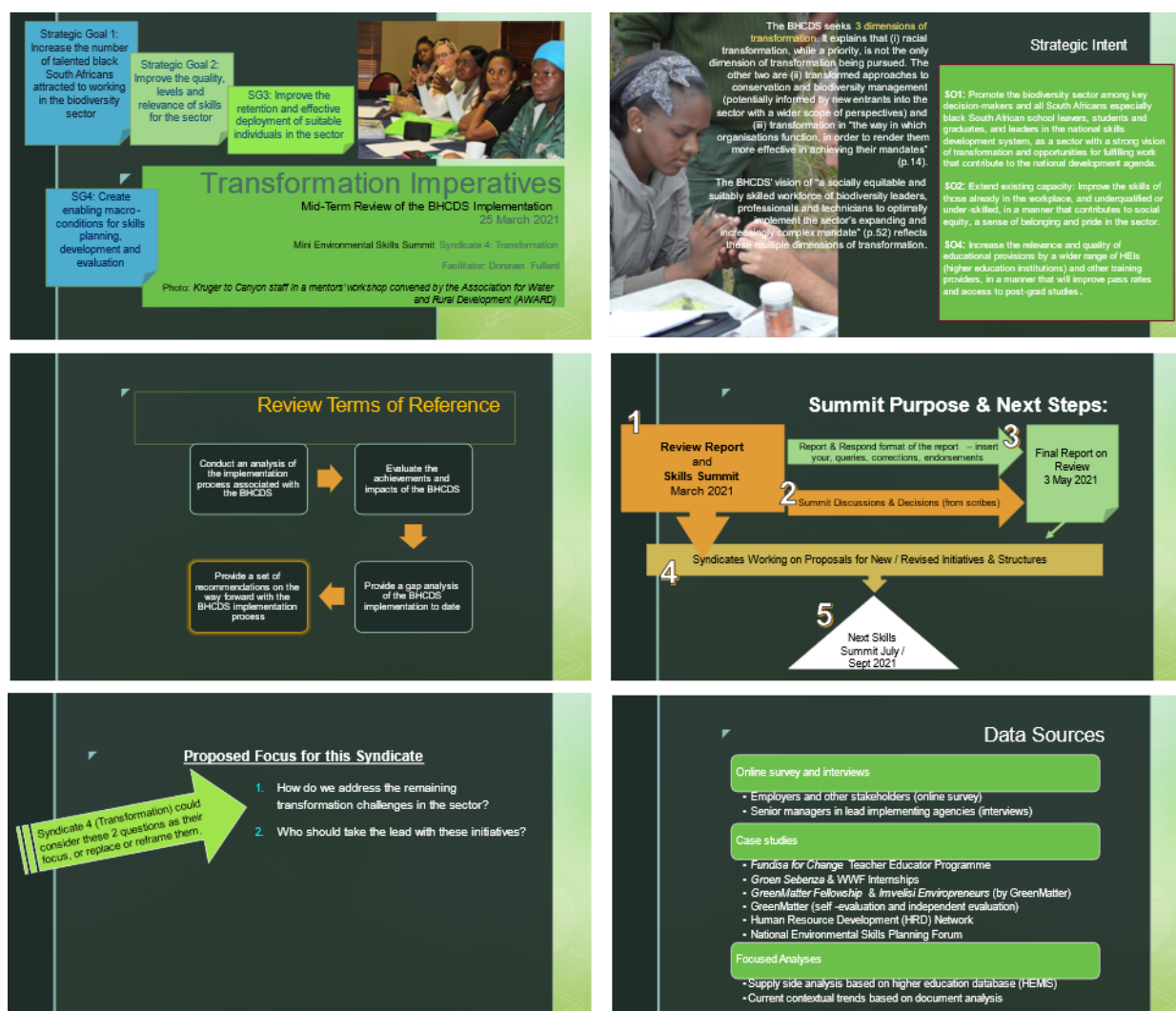
3. Develop an intelligent skills mapping ‘tool’ or mechanism

- a. Need to look at high-end skills provided beyond universities to include private and TVET provision (or is it going beyond high-end skills and including middle/lower?)
- b. This would be informed by / aligned to Goal 1.

This Syndicate agreed to become a working group to flesh out the different points being raised to come up with a proper plan before the next summit. The following people committed themselves to working in Syndicate 3:

Henry Roman (DSI), Vivian Malema (SANBI), Siphokazi Bokwe (SANParks) and Nicola Jenkin (Pinpoint Sustainability).

Syndicate 4: Transformation



The discussion for this syndicate started by focusing on the nature of the remaining transformation challenges in the sector and how these can be addressed (Figure 8.4). The following points were raised:

- While the HEMIS data indicate a huge improvement in racial profiles in biodiversity and natural sciences generally, the biggest challenge is around the institutional environment or **organisational culture** that perhaps is not welcoming and conducive for black scientists to develop fully. We must focus on supporting institutions to create the enabling macro-environment which is supportive of nurturing and developing the young recruit. It is the dominant prevailing culture in institutions that creates a revolving door for young black scientists – it is relatively easier to generate the numbers but quite a huge effort to transform the leadership/executive structure, and people may be reluctant to change.
- Why do black people find some organisational cultures alienating? Because of the long tradition of “the way we do science” and a lack of confidence that new ways of doing science have the same veracity, e.g. citizen science and indigenous knowledge. Are black professionals given an opportunity to participate in real science e.g. as lead authors of publications on which NRF ratings are based? Where are the black university lecturers (especially in middle management)? Navigating the sector as a person of colour can be very daunting because of the old guard mindset and the enabling environment is quite volatile.
- While it is good to grow young graduates as future leaders, we also need to transform the way in which we see our older staff – an organisation is not transformed unless existing staff are empowered. Unfortunately class does play a role in transformation as well.
- A simple commitment to learn each other’s languages could be a way of fostering transformation.
- It would be nice to take stock of internal transformation documents (e.g. policies, strategies, charters) at key institutions like SANBI, SANParks, provincial entities, University departments etc. to see if there has been progress at decision-making level to foster transformation.
- A safe space is needed for young people who may feel threatened to speak out in their own organisational contexts. In general, employees often have to put disclaimers before they can talk openly about transformation just to be sure they don’t get into trouble. This is typical if organisations don’t have transformation pledges/charters/common view/policy.
- Even in the NGO space, transformation remains a challenge. Funding is really an issue, but internships and learnerships should be dedicated towards achieving transformation. Even if the NGO is not able to offer employment after the completion of the internship period, the exposure should enable candidates to develop a well-rounded skills set, making them an attractive asset. Birdlife Africa has had significant success in achieving this.

There was then some discussion on attracting young people:

- Participants expressed the need to grow the interest in biodiversity from the Foundation Phase – Fundisa for Change and Eco-Schools are relevant examples. Interest and passion needs to be fostered from ECD throughout the school career. There is a need for continued contact for those interested in the environment. Once-off engagements are great for 'planting the seed' but multiple engagements are needed throughout schooling, from ECD to the end of high school. Organisations need to collaborate or partner to achieve this. Providing school children with hands-on experiences in the environment is very under-funded, so one possibility is to promote the importance of experiential learning and exposure among funder groups.
- Experiential learning also needs to be addressed at tertiary level. Craig Foster, the “My Octopus Teacher” filmmaker, mentors young marine biologists doing their Honours and Masters degrees, and for the majority of them, this is the first time they get into the ocean with a pair of goggles. If we provided experiential learning in undergraduate courses it could contribute to more of these students taking up conservation careers and going on to postgraduate studies.
- What is being done beyond internships to create proper job opportunities or entrepreneurial opportunities? Are there any plans for youth after they've completed their training? Follow-ups? An exit plan or strategy? Look at the demand from the employers' side, the type of skills they need. What about young people who are already working e.g. in the NGO space, but need upskilling and more opportunities? Interns should be exposed to meetings and international events, to help them to apply the content they studied at university.
- The connections between this session and the previous day's session on attracting youth were acknowledged (see Syndicate 1).

Regarding leadership:

- Regular leadership development sessions are needed in organisations, targeting also the middle management who are the future leaders. The development of leadership was also a point of discussion in the organisational strengthening group (the theory of change of the BHCDS was that better leaders create more welcoming workplaces and attract more funding to enable more employment).
- The tracer studies proposed for the various HCD programmes e.g. The GreenMatter Fellowship and Groen Sebenza could include questions on organisational strengthening and transformation, as there is a significant body of young people that have entered and/or left the sector, who could provide a clearer picture as to where the issues lie, in which organisations, and how they could be addressed.
- In Syndicate 2 on organisational strengthening, there was little to no interest in leading or being involved in a working group to address these issues. The key question is who is going to lead and push these systemic agendas that are not the core business of most of the organisations in the room? This will likely be a major focus of the Syndicate 5 discussion on coordination of the BHCDS over the next 5-10 years. The working groups set up in 2009 were highly effective initially due to

motivated and effective coordination. When this faded away, these hard-to-address systemic issues were replaced with a focus on the lower-hanging fruit. This is reflected in the table showing the initiatives that were started and then faded away.

Regarding succession planning:

- Knee-jerk reactions to outside pressures to transform without a clear plan, can actually hurt rather than help young people. Sometimes young people are used as a “front page”, and their contributions are noted but not acted on. New leaders should not have to feel grateful for being given the opportunity. Watch out for ‘greenwashing’ with black people’s faces when it is not sincere and real. The power dynamics driving the transformation efforts should be interrogated because they can scupper them.
- The Wild Trust’s Tomorrow’s Leaders Today was a continuation of GreenMatter’s leadership initiative (2-3 years ago).

Participants then focused on some more concrete proposals on what to do.

- One suggestion was to draw a systems map, put all the issues on to the systems map so it is not so overwhelming, then looking at low hanging fruits, see how they can be connected so as to address multiple issues at the same time?
- Some participants felt that this is a difficult area and that it would be helpful to produce a simple guide on what to do to catalyse organisational culture change – one or two pages with some visuals.
- Another proposal was to change the language – to portray black people as victors rather than victims (so don’t present them as being on the back foot and being invited to an existing party).
- How do we build on the cadre we already have – where are the participants in the BHCDs initiatives now, 10 years later? We need to solidly understand that and understand the catalytic triggers at organisational levels – this also links to a suggestion made in the Organisational Strengthening Syndicate (Syndicate 2).
- It was proposed that the Employment Equity measure and reporting be used, rather than creating a new measure.
- One participant expressed satisfaction at the open participation on this topic and stated that we should be intentional and deliberate about transformation across the biodiversity sector. He offered the following suggestions to achieve this:
 - Attract and increase the numbers of black employees at all levels
 - Develop clear career development plans – from junior to higher positions within the organizations
 - Develop dedicated programs and pipelines to support career growth (studentships - higher degrees, internships, postdocs, leadership programs)
 - Allow young people to be involved in research or be hands-on with various tasks within the organization. Let them be part of the change we want to see within organizations
 - Mentoring is a must.

The following committed to the ongoing work of this syndicate: Abel Ramoelo (SANParks), Ashwell Glasson (SAWC), RJ Sebola (SANBI), Cindy-Lee Cloete (WESSA), Vivian Malema (SANBI), Henry Roman (DSI) and Janavi da Silva (GreenMatter).

Syndicate 5: Coordination, Advocacy and M&E

Coordination, Advocacy and M&E

Mid-Term Review of the Biodiversity Human Capital Development Strategy Implementation 26 March 2021

Mini Environmental Skills Summit Syndicate 5: Coordination

Facilitator: Mutizwa Mukute

Your Purpose

Looking back, consider the best approach(es) to achieve coordination effectiveness, advocacy and unlocking resources, monitoring and reporting in future

Presentation outline

1. BHCD Strategic objectives related to Coordination
2. Key findings on relevance
3. Key findings on BHCD positioning/niche
4. Key findings on:
 - a. Overall coordination
 - b. Coordination of implementation
 - c. Advocacy
5. New key insights about the context
6. Task for the Coordination Syndicate

Advocacy for what?

Why coordinate?

SO1 (Attraction and meta-conditions): Promote the biodiversity sector among key decision-makers, and all South Africans especially black South African school leavers, students and graduates, and leaders in the national skills development system, as a sector with a strong vision of transformation and opportunities for fulfilling work that contribute to the national development agenda.

SO6 (Meta-conditions): Increase the impact of the collective effort of HCD initiatives relevant to the sector, through articulation (connecting initiatives) and promotion.

Findings: Positioning

- The BHCD was positioned in overlapping institutional priorities
- BHCD implementation aligned well with the ESSP but not with other strategies like Global Change Grand Challenge

"There was a risk of pursuing sector cohesion in a manner that leads to inwardly focused relationships and the development (or perpetuation) of an insular network. A more expansive view of stakeholders that goes beyond the sector, but that rather focuses on the ecosystem for biodiversity human capital development may have resulted in a wider reach and more impact" p. 52

Findings: BHCD Relevance

"Investing in biodiversity skills is relevant from a social and economic development perspective, both in terms of direct employment creation opportunities, and in terms of biodiversity being part of the biosphere 'base' on which social development and economic development rests; that is, if this base erodes, many other existing and potential development opportunities and livelihoods may be lost, particularly in light of climate-related threats to water and food security in South Africa and the region" (p. 35)

Findings: BHCD Relevance (continued)

National Biodiversity Strategy and Action Plan (NBSAP 2015-2025):

"SO5. Conservation and management of biodiversity is improved through the development of an equitable and suitably skilled workforce"

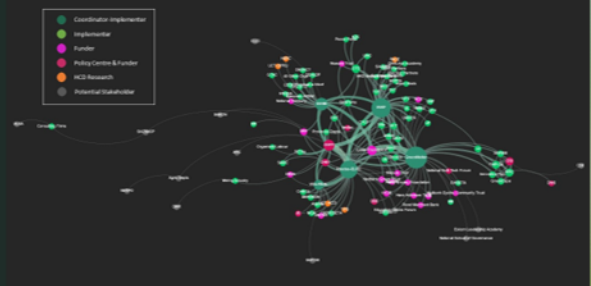
BHCD Stakeholder Map

Findings: BHCDS Relevance (continued)

National Biodiversity Strategy and Action Plan (NBSAP 2015-2025):

"SO5. Conservation and management of biodiversity is improved through the development of an equitable and suitably skilled workforce"

BHCDS Stakeholder Map



Findings: Coordination initiatives overview and achievements

- Early Working Groups
 - NESPF (Forum)
 - NESS (Summit)
 - GreenMatter
 - Green Skills
 - Green Sebenza
 - Fundisa 4 Change
- The 2010-2013 period saw high levels of goodwill, enthusiasm and 'can-do' associated with the widespread sector support and the opportunity to make a significant difference
 - Various parties played coordinating roles e.g. SANBI, WWF, Rhodes, DEAF/DEFFE and GreenMatter
 - Some sense of shared ownership in some initiatives
 - "The development and implementation of the BHCDS produced a unity of purpose and practice amongst biodiversity sector role-players and a renewed commitment to human capital development" (p.60)
 - NESS reports all concluded that: coming together like this is important; it needs to be done again/ more often; and, participation should be extended to more organisations who also should be role-players in this space. But, the event was not held every second year as envisaged. Summits served to launch and distribute resources, with presentations or workshops to mediate them into use.

Findings: Coordination Implementation structure

Strengths: The development and implementation of the BHCDS produced a unity of purpose and practice amongst biodiversity sector role-players and a renewed commitment to human capital development



Figure 4.6 Implementation structure, reflecting the implementation methodology

Findings: Coordinating implementation



Findings: Coordinating implementation

- While SANBI is positioned in the NBF (2009) as the agency to lead the development of the BHCDS and coordinate its implementation, several others were named in the NBF, and the strategy should "belong to agencies across the sector". This could be achieved through:
 - Sector-based development of an ongoing nature
 - Strategy promotion via pro-active communications
 - Shared means of implementation (p.48)
- An unfunded policy directive, not legislated, and not directly funded by government
- Requiring high levels of advocacy, fundraising capacity, and
- perhaps resulting in uncoordinated M&E, reporting.
- Revised NBSAP positions DEFFE as the lead agent for the BHCDS

Advocacy Initiatives and achievements

- NESPF (SETAs, DHET, DBE, DEFF)
 - NESS (as above)
 - Green Matter (DST, NSTF, Foundations, ACCESS, SAECN ...)
 - Green Skills (SETAs, DHET)
 - Fundisa 4 Change (DBE, DHET)
 - Work-integrated Learning (DHET)
 - Career Guidance (DHET)
- SO6 (Meta-conditions) Increase the impact of the collective effort of HCD initiatives relevant to the sector, through articulation (connecting initiatives) and promotion.
- Partnerships and organisational commitments were leveraged.
 - Innovation and synergies achieved by bringing stakeholder together.
- BUT
- Advocacy achievements are not adequate and the absence of a Steering Committee and Advisory group could have contributed to the constraints.

Findings: Example of Advocacy at thematic level

Fundisa for Change as Advocacy Initiative

- Starting in the Fundisa for Change programme is one of the longest running initiatives in the BHCDS implementation (with ESSP)
- From 2011-2013 partners raised in the region of R10 million, some R2.2 million from the Lewis Foundation.
- Rhodes University has been the lead implementing agency and the number of partners involved is a notable feature, along with its longevity, its relevance to the Foundational Building Strategic Goal of the BHCDS (and the broader ESSP).
- Fundisa for Change advocacy role saw the uptake of environment and sustainability education into minimum standards for teacher education by DHET and the accreditation of ESD training for teachers, through the South African Council of Educators (SACE)

New contextual insights

Launch of the Climate Change Adaptation Strategy (Ramaphosa, 2020):

"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."

Relevant contextual insights

The Dasgupta report (2021) provides a comprehensive synthesis of the links between biodiversity and economic development and a coherent set of recommendations for how to save biodiversity and ourselves. It argues that fundamental changes can be achieved by transforming institutions (the financial sector (chiefly banking), and education, particularly economics education). These two institutions are the key leverage points for transforming society to act on a radically new understanding that the market cannot protect nature, nature is not external to the economy (people and economies are embedded in nature) new measures are needed for economic success (inclusive wealth) and controls are necessary but difficult to regulate, hence both financial incentives and internal controls and therefore education, are vital.

Dasgupta, P. 2021. The Economics of Biodiversity: The Dasgupta Review. Abridged Version. London, HM Treasury. www.gov.uk/government/uploads



<p>Proposed Focus for this syndicate</p> <p>The Coordination function involves several activities: (i) positioning, (ii) coordination and connecting, (iii) advocacy, and (iv) monitoring and evaluation</p> <p>The Coordination function institutional arrangements at different levels: strategic, programmatic/administrative, and thematic</p>	<p>TASK FOR THE COORDINATION SYNDICATE</p> <ol style="list-style-type: none"> 1. Please discuss and propose a model that would be suitable for implementing the Strategy, in particular, coordination, advocacy and M & E roles. Bear in mind the different levels of coordination. 2. Suggest names of entities to play the different roles at the different levels.
---	--

Figure 8.5 Introductory slide presentation for Syndicate 5

Syndicate 5 was asked to consider the best approach(es) to achieve coordination effectiveness, advocacy and unlocking of resources, as well as monitoring and reporting in future. The discussions were well focused around the two proposed tasks (Figure 8.5). The following aspects of a suitable model for coordinating implementation of the Strategy were discussed:

- **The DFFE as a natural coordinator of this work:** there was general agreement amongst the group that it would make sense for DFFE to play a key coordinating role. 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 a new one. 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. Thomas Mathiba from DFFE supported the suggestion, but noted the need for endorsement from the DDG and clarity on the level of participation (branch and forum level?). A group member noted that the DDG's attendance at this Summit was a positive signal.
- **Learning from past experience:** group members felt it was important to learn from past experiences with coordination of the BHCDs. One person felt that 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. Another noted the requirements of the Coordinator position: 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. It was envisaged originally that SANBI would take over the coordination role but this has been difficult due to financial constraints. How would this be different for DFFE? 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.

- Another learning was that NGOs (such as GreenMatter) can play an important role because they are more “agile” than government departments, and are able to access funding sources that are not available to government. GreenMatter noted their willingness to coordinate and reclaim the “By the sector, for the sector” idea.
- The experience of the Fundisa for Change Programme was also 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.
- **The proposed model:** participants felt that a public-private partnership (PPP) model could work. The PPP could be managed through MoAs, with DFFE as lead and NGOs like GreenMatter brought in. This would combine the benefits of government (stability, accountability, influence and advocacy) with those of NGOs (agility, access to additional funding sources, advocacy in different spheres). There are precedents for co-leadership between DFFE and NGOs under GEF6 and 7. It was suggested that if DFFE is to take this on, the coordination function should sit within the NESPF and not within the biodiversity section. This could be a wonderful mechanism to strengthen the Forum, which was described as “the best mechanism we have, although it does have its challenges”. The NESPF could take a role working with the Labour Market Intelligence Forum of DHET.
- The following responsibilities/functions were suggested for the coordinating body:
 - Ensuring renewed commitment/momentum from stakeholders is maintained
 - Scanning for and bringing in best practice from other sectors
 - Connecting to other relevant initiatives
 - Ongoing HCD horizon scanning across sectors relating to biodiversity
 - Identifying gaps, key research needs and shifts in the landscape
 - Driving the review of 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

Participants noted that further discussion would be needed in order to flesh out the details of the model. A possible first step could be for Vivian Malema to provide the group with some background on the difficulties SANBI has around taking on the coordination role, since these might also apply to DFFE and would need to be carefully considered.

The following expressed interest in being involved in the ongoing work of the syndicate:

Janavi da Silva (GreenMatter), Vivian Malema (SANBI), Lindy Rodwell (The Lewis Foundation), Ashwell Glasson (SA Wildlife College), Shanu Misser (SANBI), Abel Ramoelo (SANParks), Louise Matschke (CTEET) and Thomas Mathiba (DFFE, chair of the NESPF).

It was suggested that the DDG, Shonisani Munzhedzi, also be approached to participate, and that invitations could be extended to other DDGs e.g. Ishaam Abader (Regulatory Compliance and Sector Monitoring), and someone from the marine sector.

Syndicate 6: Jobs and Livelihoods



Jobs and Livelihoods

Mid-Term Review of the BHODS Implementation | 25 March 2021

Mini Environmental Skills Summit Syndicate 6: Jobs and Livelihoods

Facilitator: Mandy Barnett

How to unlock more green jobs:

Research commissioned by WWF-SA and the NESPF and conducted through TIPS and Wits, *Unlocking Green Jobs in South Africa: A catalytic intervention* (McLean, 2018). The study findings were discussed at the 2018 National Environmental Skills Summit and the following agreed:

- Stronger coordination of data collection and analysis is important.
- Many policies should be reviewed, based on the findings of research and the experience of those implementing the policies.
- Adaptive M&E strategies are important, accompanied by adaptive management strategies, for nimble responses to policy implementation challenges.
- Capacity-building is needed - may include individual skills development embedded in organisational capacity - building efforts, focused on service delivery priorities
- The analysis of case studies should be extended to other parts of the green economy e.g. (Mine rehabilitation and Wastes).

These points suggest that data collection and analysis skills, policy review skills, adaptive M&E skills and organisational capacity-building skills are needed to effectively implement green economy initiatives

Strategic Intent

SO1 (Promotion; Attraction and meta-conditions): Promote the biodiversity sector among key decision-makers and all South Africans especially black South African school leavers, students and graduates, and leaders in the national skills development system, as a sector with a strong vision of transformation and opportunities for fulfilling work that contribute to the national development agenda.

SO2 (Up-skilling): Extend existing capacity: Improve the skills of those already in the workplace, and underqualified or under-skilled, in a manner that contributes to social equity, a sense of belonging and pride in the sector.

SO3 (Retention): Improve retention and effective deployment of suitably skilled people in the sector through organisational design, skills planning, development and human resource development processes.

SO4 (Skills provision): Increase the relevance and quality of educational provisions by a wider range of HEIs (higher education institutions) and other training providers.

SO7 (Skills provision): Increase the supply of scarce skills through targeted higher education in initiatives in priority areas identified through ongoing needs analyses.

SO6 (Meta-conditions): Increase the impact of the collective effort of HOD initiatives relevant to the sector, through articulation (connecting initiatives) and promotion.

Sample of Jobs-related Initiatives

- The intended articulation with the country's overall development agenda is evident in particular in relation to the BHODS youth-directed initiatives, which contributed to youth development and supported youth into employment.
 - Imvelo/Entrepreneurs with DSI, WRC, WSI, GreenMatter
 - WWF Environmental Leaders & Internships
 - The Green Sebenza and WWF internships programmes
 - GreenMatter Fellowship
 - Bridging into Work with a Work-integrated Learning component.
- Green Jobs study undertaken by WWF with Trade and Industries Strategy and Policy (TIPS) and Green Trust (Nedbank).
- The Green Skills programme (Rhodes and Wits with Forum) with funding from SANParks explored strategies for creating more employment through environmental initiatives.
- Participation in the 2018 Presidential Job Summit preparations convened by Nedlac.

Presidential Jobs Summit Framework Agreement (2018): "Challenges with the financial provisions for mining rehabilitation (must) be resolved in an engagement between the Department of Mineral Resources, Department of Environmental Affairs and Department of Water and Sanitation".

Example: Groen Sebenza

- SANBI formed 47 organisation -strong partnerships;
- Drew on GreenMatter fundraiser and GTAC;
- Mobilised funding from National Jobs Fund (Treasury) – R300,000,000
- 955 "pioneers" (matriculants and graduates) trained, and by 2018 69% were permanently employed; 3% self-employed; 7% in further study.
- Partners provided mentorship, training, individually and shared; lessons learnt from various sector experiences available for the initiative; and new lessons gained.
- Steering Committee and M&E framework in place
- Compliance & Innovation – new models for job creation to be shared.

How to unlock more green jobs - the BHODS Theory of Change

The ToC is that higher-level skills in biodiversity agencies can unlock many more employment opportunities which would then also benefit lower-level skills with more employment opportunities.





Figure 8.6 Introductory slide presentation for Syndicate 6

This syndicate's discussions focused on the following questions (Figure 8.6):

1. Where are people succeeding in creating biodiversity jobs and making them visible?
2. How can we do more of this?
3. Who is well placed or willing to lead this?

Where are people succeeding in creating biodiversity jobs and making them visible?

- **The EPWP programmes** – these focus on lower-skilled or semi-skilled jobs and are aimed at reducing poverty. These programmes show us what is possible in this

country. One participant felt that we need to find ways of expanding these opportunities, because we've had a decade of desperation and know how much work is required. There was some discussion about how to identify relevant work opportunities and how to respond to these; also about the question of where people go beyond the EPWP. Another participant noted that the EPWP programmes provide a good example of how difficult it is to convert temporary jobs into permanent jobs. It may be necessary to work closely with Economic Development departments and train people to respond to tenders, set themselves up to compete in the job market, start businesses etc. (which requires administration and business skills).

- **Operation Phakisa** in the marine sector, which had the key objective of fair access and sharing of natural resources. Participants felt that it may be time to review the lessons learnt – why some initiatives failed or were slow to build, what were the challenges/blockages? One participant felt that Operation Phakisa's approach to biodiversity-based business opportunities (e.g. aquaculture) was helpful and that legislation around bioprospecting needs to be overhauled because over-regulation is inhibiting job creation.

How can we do more of this?

Participants mentioned the following areas of opportunity:

- **Climate change adaptation:** The biodiversity "voice" could be a lot stronger in the climate change space, with a focus on enabling diversification of livelihoods to build resilience to impacts of climate change. One participant felt that capacity building and incentive structures have been successfully created at local / private sector level and that there are lessons we could take on board. It is necessary to look carefully at the incentive system for local government that will prompt job creation, because action will not happen without incentives. Another participant mentioned that there is quite a lot happening in the mitigation space.
- **Land Reform:** The land reform programme is looking at opportunities to bring in new ownership models and to involve the youth. Some participants felt that this is a big opportunity to explore to bring biodiversity into land reform, and it is a holistic approach that links jobs and livelihoods. Communal Property Associations (CPAs) are key structures, but there is a lot of complexity in community structure and social cohesion is often lacking; youth are often not given opportunity to be part of CPAs and contribute to decision-making. Business plans need to be developed and this can be frustrating especially when people are opportunistic. Participants shared some experiences with the energy of youth in these contexts and argued that this energy should be harnessed to unblock some of the challenges and see land reform as an opportunity for job creation.
- **Mine rehabilitation:** Rehabilitation of old mining areas can unlock jobs and promote a shift from an extractive to a regenerative economy. The mining companies have set aside money for rehabilitation, but do not in practice use the money for this. One participant described the difficulties of working in this space, and that good policies and vision often do not translate into practice. He suggested the use of mechanisms such as Social Return on Investment (SROI) to help companies to directly reflect

their impact. Another participant felt that there is quite a bit of window-dressing going on regarding numbers of jobs created and that this should be watched carefully. There is a need to create long-term viable jobs e.g., mining in Botswana is being opposed by the community but drawn by jobs. How do we raise alternative opportunities that are not extraction – and create demand for these? Participants mentioned some rangeland management examples, and it was felt that these would be worth collecting so that they become more commonly known.

- **Urban youth:** Participants felt that there are huge opportunities for urban youth, for example around urban green spaces, waste and rehabilitation. One participant wondered why the EPWP programmes do not engage more with the private sector and its needs, for example to let companies know about well-trained individuals where resources have been invested and who are ready to work. This person felt that we worry too much about the public sector and its shortage of money and complicated supply chains. Supply chain management needs to support and not hinder job creation. Another participant expressed the need for organisations to be more accommodating towards young people with no experience or no matric qualification. Young people are blocked out by the fact that they don't have qualifications, but they have dreams and passion.
- **Ecological infrastructure for water security:** There is potential for cross learning with the GEF6 EI4WS project which is essentially exploring financial mechanisms to unlock investment in ecological infrastructure and integration of “green” with “grey” solutions. It is working with the private sector and other sectors as well as government, aiming to create jobs through finance and partnership solutions.
- **Create a green jobs employment agency?**

Several participants felt that the EPWP would be the best place for government to start and would be more sustainable than some of the other interventions, because the foundation is already there and relatively small further investment is needed to continue to grow in this space. For example, a 10% increase in EPWP. Working on Fire's High Altitude Teams was mentioned as a success story – the last socio-economic assessment showed that these contractors were having a great impact in impoverished communities, particularly during COVID. Contractors were proud of being able to retain workers. A participant expressed “There is something here to work with. This is a place we can go to right now”.

An important point was raised about the need to consider COVID-19 in this discussion. The COVID-19 pandemic has exacerbated the huge differences between classes, and going forward, a clear way of improving livelihoods would be a more universal access to the internet and cheaper data. COVID has had a huge impact on jobs/livelihoods in biodiversity fields, especially in the private sector – such as the young people trained as rangers, chefs, guides etc. in the tourism cluster in the Lowveld. People are no longer sure about the potential of the wildlife economy and are looking for jobs elsewhere. Livelihood diversification is important – and this does not feature much in entrepreneurship and business training. People will need to collaborate, cooperate and diversify if their businesses are going to be sustainable.

Transformation was identified as another important factor in addressing the question of how to expand job creation. This was seen as still being a challenge. One participant felt that the biodiversity sector has up to now been lucrative only for a few. Transformation therefore needs to remain a central focus and priority for next 10 years of the Strategy (along with livelihoods, diversification and skills).

Who is well placed or willing to lead this?

Given that public sector funds are restricted at present, it was felt that public-private partnerships are important. Where is the private sector? How can we unlock this?

The facilitator stated that people in this group have deep understanding of the issues, where to take things from here, and where the Strategy could focus for the next 5 years. She encouraged people to make a firm commitment to take this forward.

The following agreed to be involved in the ongoing work of this syndicate:

Theressa Frantz (accepted), Gary Newman (to confirm), Maletje Mponwana (accepted), Tanya Abrahamse (happy to be consulted on ideas), Mandy Barnett (climate change interface critical here, so volunteered) and Nicola Jenkin.

Suggestions for a way forward were to pull together available research to identify where the blockages are, as well as understandings of what can be done. Then look at the skills that are needed, how to give people access to these jobs, and enable this. This is arguably the most important developmental agenda at this time, so should we not try to raise resources to do this? Advocate and bring what is happening into a shared space to build on what is happening e.g., best practice. Have a range of examples in urban and rural areas of what is being done, and what more could be done if specific dimensions are addressed - as put forward by the Presidential Jobs Fund Framework Agreement around rehabilitation. This is an important focus for the BHCDS in the next 10 years, and of course feeds back to training and supply. But the Strategy's starting point should be jobs and livelihoods. The shift from supply to demand shows responsiveness to the changing needs of society, and possibly also to the DDG's comments about aligning the strategy to the medium-term framework.

It was suggested that putting together a book on the above could be a valuable undertaking, for advocacy and identifying who needs to be involved. This idea was supported by several group members, and involving the private sector and the youth were seen as important.

9. RECOMMENDATIONS

9.1 Recommendations - Programme Specific

9.1.1 Fundisa for Change recommendations

The case study of this programme identified several recommendations around implementation gaps in the partnership model, coordination function and human and financial resources, gaps in intervention strategies, and gaps in the learning and adaptation system.

Fundisa for Change should strengthen its partnership model by expanding the structure and role of the Advisory Committee

Expanding the Committee's structure will entail ensuring the active participation of DBE and DHET and the Deans Forum and ensuring representation from government, parastatals, NGOs and universities to reflect the multi-stakeholder nature of the initiative. Role expansion entails that the Advisory Committee also takes on the role of the non-existent Steering Committee. The main role that DHET should play in the programme is implementing the MRTEQ policy, improving pre-service training, integrating ESD in teacher education and developing standards for ESD and teacher education. DBE on the other hand should focus on in-service training and 'training of trainers' at operational level and also produce teaching and learning materials and support Professional Learning Communities.

Fundisa for Change should strengthen national and sub-national programme coordination towards fostering systemic impact

We recommend that *Fundisa for Change* employs two national coordinators. One of the coordinators should be assigned the responsibility for implementing the programme at operational level while the other plays the strategic role of creating an enabling environment for programme implementation. This means that the latter will be responsible for high-level engaging with the national education system, mobilising resources, and scaling transformative learning. *Fundisa for Change* should also consider the creation of a senior advocacy position at national level to increase its effectiveness in policy influencing work. In addition, the programme should consider the establishment of provincial hubs comprising all the key stakeholder groups to coordinate and catalyse sub-national level implementation.

Fundisa for Change should increase financial resources and sustainability

The two main recommendations on improving the funding and financial sustainability of *Fundisa for Change* are: (i) develop a long-term funding strategy that enables flexibility and is aligned to the Continuous Professional Development mandate of the government institutions, and (ii) mobilise financial resource locally, especially from DHET and DBE's Teacher Professional Development Unit and ETDPSSETA Funding, DBE provincial training budgets and DEFF for 'training of trainers' programmes, and the private sector.

Fundisa for Change should consider investing more in the use of a catalytic approach to programme implementation

A catalytic approach ensures the creation of an enabling environment and a multiplier effect. In order to achieve this, it should: (i) let DBE and DHET play more strategic roles in the programme and participate more actively and consistently in the Fundisa for Change

programme, (ii) replicate the partnership model at provincial levels to enhance the distribution and spread of Fundisa for Change programme activities, (iii) engage more strategically and consistently in policy influencing work through the coordinator and the Advisory Committee, and (iv) mobilise adequate resources to support system level changes.

Fundisa for Change should create a ripple effect among teacher educators, subject advisors, teachers and student teachers in the country

The desired ripple effective can be achieved through: embedding the “train the trainer” approach, and involving and working through all TEIs and universities with a teacher education mandate. Against this background, Fundisa for Change should increase availability of SACE-endorsed learning and teaching materials, contribute to the production of school textbooks and increase educator access to them. This can be achieved through Fundisa for Change: (i) working with actors involved in the development, approval, publishing and utilisation of teaching and learning materials, especially textbooks, (ii) observing LTSM policy guidelines and addressing knowledge co-creation, intellectual property rights challenges, and (iii) increase the range and quantities of the materials more accessible to intended users. Finally, Fundisa for Change should use research not only to deepen understanding and implementation of quality and relevant ESD but also to demonstrate, to DBE and other interested actors, how the programme is instrumental to better learning and better examination results.

Fundisa for Change should adopt a deliberate expansive learning approach

An expansive learning approach will ensure that the CoP and associated structures continuously review their practice, co-learning, and develop and refine appropriate solutions. This can be achieved in several ways, which include: (i) obtaining and processing ongoing feedback on how the trained educators are performing, and the new challenges and opportunities that may be emerging, (ii) identifying and responding to new contextual and policy developments with a bearing on ESD in the schooling system, and (iii) identifying and sharing the essence of what makes the programme work effectively in integrating ESD in teacher education, and (iv) putting in place more robust monitoring, evaluation and learning (MEL) and associated information and knowledge management systems at different levels of the partnership to trace impact and foster learning and accountability.

9.1.2 Internships Programme Recommendations

Collectively re-assess priority skills needs in the biodiversity sector to guide the focus of internship programmes

All organisations that have run and/or hosted internship programmes in the biodiversity sector should assess and establish the new and emerging skills needs in the biodiversity sector and redesign the internship programmes accordingly. This is because there have been many new national and international developments and insights after the study, which include South Africa’s Green Economy strategy, circular economy thinking, climate change adaptation and mitigation developments, and Sustainable Development Goals. The impact of COVID-19 pandemic on skills needs in the sector will also need to be taken into account.

Capture lessons learnt regarding job creation and use them to promote the sector with key decision-makers

This project has captured the national imagination and presents a good opportunity to promote the sector among key decision-makers, particularly in the context of job creation and the Post-COVID recovery of the country. It is already being taken up by other agencies, and there are already lessons learnt regarding job creation models. These should be collated, and together with other job creation initiatives and studies related to the sector, discussed, published, and used for further innovation in this regard.

Establish and operationalise a sector-wide mechanism for collective action learning on internship programmes

Organisations that implement internship programmes in the biodiversity and related sectors should consider establishing a national collective action learning mechanism that continuously reviews, reflects on and improves internship practice. The responsibility would entail scanning of the operating environment to understand dynamic systems of influence; sharing, appreciating and critiquing internal practices; learning from good and emerging practice; and drawing on these to make continuous strategic improvements to internship programmes. Another responsibility would be to commission evaluation and systematic reviews of internship programmes. The mechanism would share some of its products through national platforms such as the National Skills Planning Forum.

9.1.3 HRD Recommendations

The HRD Network case study identified three interrelated recommendations

Revive the HRD Network in consultation with relevant actors (DEFF & SANBI to lead)

The role of the HRD network is still needed to ensure the effective implementation of the BHCDS. The human resource systems of organisations in the sector still needed to be strengthened. The occupational learning systems and competence development in the sector are dynamic and still require a collaborative approach by actors in the sector and beyond. Against this background, we recommend the revival of the network. DEFF and SANBI's mandates put them in a good position to lead this process.

Ensure a broader composition of the HRD Network (DEFF & SANBI to lead)

We recommend that the network is governed and led by a multi-stakeholder committee formed, convened and run along lines of the *Groen Sebenza* Advisory Committee. This will be based on a wider membership in the network. Broadening network representation and members' meaningful participation can be achieved by: (i) active recruitment of members, (ii) obtaining the participation and buy-in of the heads of participating organisations, (iii) ensuring the participation of line managers in HRD processes, (vi) developing a model of implementation that fosters organisational level learning and change and the provision of necessary programme support to do so, and (v) the active participation of relevant SETAs to support relevant organisations. Working in this space will require human resource practitioners in this sector to work with their high-level counterparts in other sectors.

The HRD Network should build the capacity of top management to create jobs in the sector

One of the constraints to employment creation in the sector is lack of leadership capacity to identify opportunities and mobilise necessary resources (see internship case study). Against this background, we recommend the HRD Network build the capacity to support top

management to develop income and job-creation programmes and projects that advance the national green economy. This also involves developing their fundraising capacity. In the environment sector, this implies helping top management to think about rehabilitation, restoration and regeneration of the land/ecosystems and developing circular value chains towards sustainable or shared value creation.

9.1.4 NESPF Recommendations

Expand the membership and leadership of core partners of the Forum

The NESPF should deliberately seek and obtain a higher degree of participation of key government stakeholders as core strategic partners. Such forum partners would form an essential part of the leadership of the Forum. The organisations that we recommend for including as core partners include but are not limited to DHET, DST, Department of Water and Sanitation, the Climate Change and other relevant divisions in the DEFF, and SETAs. Their active participation would enhance the breadth of engagement, knowledge and experience, and financial resources available to research into, formulation and implementation of the national environmental skills development planning agenda, direction and strategy, and reviewing and learning of environmental skills development and utilisation.

Enhance its coordination role through developing clear structures and systems

The NESPF should structure itself for more strategic and impactful coordination. This should be done through the establishment of several structures and associated terms of reference.

The key structures that it should consider are:

- Establishing a Steering Committee that provides leadership to the forum and engages in strategic and policy shaping and influencing work,
- Establishing working groups that work on different issues and opportunities,
- Establishing provincial structures to carry out forum initiatives at sub-national level,
- Strengthening the coordination unit in DEFF by providing it with more adequate human and financial resources, and
- Ensuring youth involvement in leadership structures.

Making these changes will require the mobilization of additional resources. DEFF, which is responsible for coordinating the forum, and SANBI, which is responsible for the implementation of the BHCDS, should form part of the core group of organisations responsible for mobilising resources for implementing forum recommendations.

9.2 Overall Recommendations

9.2.1 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.

9.2.2 How to achieve the above

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.

1. Fund coordination hubs with clear, realistic and agreed upon deliverables to overcome the principal-agency dilemma (see Chapter 2).
2. This should include a coordinating hub with responsibility for the National Environmental Skills Summit which should be held annually to start with, following on the March 2021 Mini Skills Summit, where syndicates (working groups) were established to take the BHCD remit further.
3. 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 DEFF Biodiversity Research and Evidence Indaba, UJ Africa Evidence Centre, Wits CLEAR.
4. 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.
5. 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 Dasguptha 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.

6. Appoint a steering committee for the BHCDS implementation.
7. Appoint an advisory board for the BHCDS implementation.

9.2.3 Other specific areas to address

1. Track impact of DHET MRTEQ and support where necessary (significant new opportunity)
2. Track the number of conservation WiL students funded to completion, in relation to sectoral needs
3. Track % of SET undergraduate pool going into university
4. Drive career guidance for students across faculties
5. Continue postgraduate bursary programme (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 DEFF and Provincial Agencies, SANParks to invite proposal 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
12. Do the same for industry and the Departments of Water, Science and Innovation, and WRC.

9.2.4 Recommendations from the Mini Environmental Skills Summit

Many specific proposals emerged from each of the syndicates' discussions. In general, there is overlap between these, so it is recommended that the syndicates plan their activities collaboratively going forward, so as not to duplicate effort. Key areas of overlap include:

1. Work on a skills intelligence system – the most detailed proposals for this came from Syndicate 3, but it was also mentioned by Syndicate 1 and Syndicate 6.
2. Tracer studies to track graduates and past interns – Syndicates 1 and 4.
3. Attracting young people to the sector and promoting field-based experiential learning – Syndicates 1 and 4.
4. Compilation of case studies for advocacy and communication purposes – specific proposals for a book were made by Syndicate 6, but they should work with

Syndicate 5 since creating a coordinating hub or hubs will include the advocacy and communication functions.

Syndicate 2 (Organisational Strengthening) should perhaps merge with others. Although reviving the HRD network was a recommendation of this review, there was little interest in this at the Summit. Several of the work areas for Syndicate 2 are covered by other Syndicates, particularly Syndicate 4 (organisational cultures) and Syndicate 1 (mentorship and career development plans). An alternative for Syndicate 2 could be to carry out an evaluation study of the Theory of Change for organisational strengthening in the BHCDS. It is possible that the reasons for the lack of success in creating more jobs and increasing organisational budgets may not be related to leadership, but may lie within the context. For example, another possible route to strengthening organisations (particularly very weak or non-functional ones) may be to increase accountability and strengthen civil society to perform a “watchdog” function. Such an evaluation could produce a revised theory of change, and criteria for evaluating “effective organisations” and “organisational strengthening” in the next 10 years of the BHCDS. This would produce a stronger basis on which to focus the work of organisational strengthening.

There was general consensus that when the BHCDS is updated, its scope should be broadened beyond the current focus on universities and so-called “high skills”, to reflect the trend that has already started during the past 10 years of implementation of BHCDS programmes. Another key consideration raised during the opening address by S Munchedzi was that the biodiversity sector should not just run in parallel to other sectors, but as an underpinning to and across all other sectors, with external and internal skills demands intersecting (summary by N King). An example given of sectors to connect was engineering (M Hiestermann). T Abrahamse argued that “we need to make the case for human capital in our sector anew, and more compellingly”, taking some of the comments from the United Nations Presidential Summit into account, and to show how the benefits would not only be for a narrowly defined sector. The case must be made simply, more visually, and must link to the economy, broader social challenges and people’s lived reality.

APPENDIX 1 Documents Reviewed for the Contextual Analysis

CBD (2020). *Recommendation adopted by the open-ended working group on the post-2020 Global Biodiversity Framework*. Convention on Biological Diversity, UNEP. Rome 24–29 February 2020.

Dasgupta, P. (2021). *The Economics of Biodiversity: The Dasgupta Review. Abridged Version*. London, HM Treasury.

Department of Higher Education and Training (2014). *White Paper for Post-School Education and Training: Building an Expanded, Effective and Integrated Post-School Education System*. Government Gazette No. 37229, 15 January 2014. Available at https://www.gov.za/sites/default/files/gcis_document/201409/37229gon11.pdf

Department of Science and Technology (2019). *White Paper on Science, Technology and Innovation*. https://www.dst.gov.za/images/2019/WHITE_PAPER_ON_SCIENCE_AND_TECHNOLOGY_web.pdf

IPBES (2017). *IPBES Capacity-building Rolling Plan (Executive Summary)*. Available at https://www.ipbes.net/sites/default/files/ipbes_capacity-building_rolling_plan_and_executive_summary_0.pdf

IPBES (2018). *Summary for policymakers of the regional assessment report on biodiversity and ecosystem services for Africa of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services*. E. Archer, L. E. Dziba, K. J. Mulongoy, M. A. Maoela, M. Walters, R. Biggs, M.-C. Cormier-Salem, F. DeClerck, M. C. Diaw, A. E. Dunham, P. Failler, C. Gordon, K. A. Harhash, R. Kasisi, F. Kizito, W. D. Nyingi, N. Oguge, B. Osman-Elasha, L. C. Stringer, L. Tito de Moraes, A. Assogbadjo, B. N. Egoh, M. W. Halmy, K. Heubach, A. Mensah, L. Pereira and N. Sitas (eds.). IPBES secretariat, Bonn, Germany. 49 pages.

IPBES (2019). *Summary for policymakers of the global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services*. S. Díaz, J. Settele, E. S. Brondízio E.S., H. T. Ngo, M. Guèze, J. Agard, A. Arneth, P. Balvanera, K. A. Brauman, S. H. M. Butchart, K. M. A. Chan, L. A. Garibaldi, K. Ichii, J. Liu, S. M. Subramanian, G. F. Midgley, P. Miloslavich, Z. Molnár, D. Obura, A. Pfaff, S. Polasky, A. Purvis, J. Razzaque, B. Reyers, R. Roy Chowdhury, Y. J. Shin, I. J. Visseren-Hamakers, K. J. Willis, and C. N. Zayas (eds.). IPBES secretariat, Bonn, Germany. 56 pages.

IPBES (2020). *Workshop Report on Biodiversity and Pandemics of the Intergovernmental Platform on Biodiversity and Ecosystem Services*. Daszak, P., Amuasi, J., das Neves, C. G., Hayman, D., Kuiken, T., Roche, B., Zambrana-Torrel, C., Buss, P., Dundarova, H., Feferholtz, Y., Földvári, G., Igbinosa, E., Junglen, S., Liu, Q., Suzan, G., Uhart, M., Wannous, C., Woolaston, K., Mosig Reidl, P., O'Brien, K., Pascual, U., Stoett, P., Li, H., Ngo, H. T., IPBES secretariat, Bonn, Germany, DOI:10.5281/zenodo.4147317.

MacLean, D. (2019). *Unlocking Green Jobs in South Africa: A Catalytic Intervention (Synthesis Report)*. Trade & Industrial Policy Strategies (TIPS) and World Wide Fund for Nature, South Africa (WWF-SA). Available at https://www.tips.org.za/images/Unlocking_green_jobs_in_South_Africa_A_catalytic_intervention_Synthesis_report_.pdf

Makgetla, N., Maseko, N., Montmasson-Clair, G. and Patel, M. (2019). *National Employment Vulnerability Assessment: Analysis of potential climate change related impacts and vulnerable groups*. Trade & Industrial Policy Strategies (TIPS), Pretoria. Available at https://www.tips.org.za/images/National_Employment_Vulnerability_Assessment_Analysis_of_potential_climate-change_related_impacts_and_vulnerable_groups.pdf

Makgetla, N., Maseko, N., Montmasson-Clair, G. and Patel, M. (2020). *The SJRP Toolbox: Summary for Policymakers*. Trade & Industrial Policy Strategies (TIPS) for the Departments of Environment, Forestry and Fisheries and Trade and Industry. Available at

[https://www.tips.org.za/images/TIPS_for_DEFF-dtic - SJRP - Summary for Policy Makers May 2020.pdf](https://www.tips.org.za/images/TIPS_for_DEFF-dtic_-_SJRP_-_Summary_for_Policy_Makers_May_2020.pdf)

National Planning Commission (2012) *National Development Plan 2030: Our future - make it work* (Executive Summary). Available at <https://www.gov.za/sites/default/files/Executive%20Summary-NDP%202030%20-%20Our%20future%20-%20make%20it%20work.pdf>

OneWorld (2017). *Skills for Green Jobs: South Africa, An Updated Country Report*. OneWorld Sustainable Investments for the ILO joint EMP/Skills-Green Jobs Programme and Research Project 'Skills for Green Jobs II'. Available at <https://oneworldgroup.co.za/wp-content/uploads/2018/10/20170915-ILO-Skills-for-Green-Jobs.pdf>

PAGE (2016), Green Economy Learning Assessment South Africa: Critical Competencies for Driving a Green Transition. DEA, DHET, DST, UNITAR, UNDP, Rhodes University.

UNEP (2019). New UN Decade on Ecosystem Restoration to inspire bold UN Environment Assembly decisions. Available at <https://www.unenvironment.org/news-and-stories/story/new-un-decade-ecosystem-restoration-inspire-bold-un-environment-assembly>

UNESCO (2019). *UNESCO 40th General Conference adopts a new global framework for Education for Sustainable Development for 2020-2030*. Available at <https://en.unesco.org/news/unesco-40th-general-conference-adopts-new-global-framework-education-sustainable-development>

APPENDIX A: Supply Analysis - Fields of Study

Appendix A1: CESM category differences between the baseline and the mid-term review

Second order CESM (Classification of Educational Subject Matter) categories used on HEMIS to refer to university courses, were changed by DHET in 2010 to those used in the mid-term review, which therefore differ in some instances from the HSRC baseline (conducted in 2007)) as illustrated in the next table.

Appendix A2 (following the table) provides a breakdown of the courses listed for agriculture and computer studies / sciences for the baseline and mid-term review respectively. This shows there were some significant adjustments and new course classifications.

HSRC baseline (2007)	Mid-term review (2018)
PRIMARY BIODIVERSITY RELATED FIELDS OF STUDY	
0102, Agricultural Extension	Not found
	<i>Alternatives / additions:</i>
	0103, Agricultural production operations
0104, Animal Sciences	0106, Animal sciences
	1306, Zoology / Animal biology
0105, Horticulture	0104, Applied horticulture and horticultural business services
0106, Plant Sciences	0108, Plant sciences
	1303, Botany / Plant sciences
0107, Soil Sciences	0109, Soil sciences
0108, Fisheries	No longer & Ichthyology not found
0109, Forestry	0110, Forestry and wood sciences
0110, Outdoor Recreation	Not found
	<i>Alternatives / additions:</i>
	0417, Parks, recreation and leisure facilities management
0111, Wildlife	Not found
0113, Renewable Natural Resources	Not found
0199, Other Ag and Renewable Resources	0199, Agriculture, agricultural operations and related sciences, other
0908, Veterinary Health Sciences	0915, Veterinary medicine
	0916, Veterinary biomedical and clinical sciences
1503, Biological Sciences	1301, Biology, general
1506, Oceanology	Not found
1599, Other Life Sciences and Physical Sc	1399, Life sciences other
2203, Geography	1405, Geography and cartography
SECONDARY FIELDS OF STUDY	
1502, Atmospheric Sciences	1403, Atmospheric sciences and meteorology
1504, Chemistry	1404, Chemistry
1505, Geology	1406, Geology and earth sciences
1507, Physics	1407, Physics
1508, General Earth Space Science	Not found (possibly included under 1406, geology and earth sciences)

0812, Environmental Engineering and Tech	0813, Environmental / environmental health engineering
2201, Anthropology	2001, Anthropology
2202, Economics	0404, Economics
2206, Sociology	2007, Sociology
GENERIC FIELDS OF STUDY	
0600, Computer Science and Data Processing	0601, Computer and information sciences
	0603, Data processing and information science
2101, Public Administration	1903, Public administration
2299, Other Social Sciences and Social Studies	Not found

APPENDIX A2: Agricultural Extension - Detail of CESM differences between the baseline and mid-term review

Key:

- ☐ Used in the quantitative assessment for the mid-term review
- ☐ Not used in the quantitative assessment for the baseline or mid-term review – illustrates other potentially relevant courses

HSRC baseline (2007)	Mid-term review (2018)
PRIMARY BIODIVERSITY RELATED FIELDS OF STUDY	
0102, Agricultural Extension	Not found
	<i>Alternatives / additions:</i>
	0103, Agricultural production operations
0101 Agricultural Economics	0101, Agricultural business and management
0103 Agricultural Food Technology	0102, Agricultural mechanisation
	0105, International agriculture
	0107, Food science and technology

APPENDIX B: Assumptions used to derive the Number of Enrolments

For All Qualification Levels, By Specific Fields Of Study For 2000, 2007 and 2018

2nd order CESM classification	2000	2007	2018
Agric. production operations			3,164
Agric. Extension	1,478	532	
Agric., agric. ops & related sciences, other			591
Other Ag. and Renewable Resources	888	577	
Renewable natural resources	490	1,300	
Applied horticulture & horticultural bus. services			1,144
Horticulture	995	1,269	
Soil sciences	311	419	962
Forestry & wood sciences	227	247	570
Animal sciences	3,060	3,814	2,876
Zoology/animal biology			2,225
Fisheries	-	14	
Wildlife	547	479	
Plant sciences	1,095	1,310	1,694
Botany/plant biology			2,231
Biology, general			4,204
Biological sciences	7,531	9,562	
Life sciences, other	1,892	2,300	1,169
Oceanology	66	66	
Geography & cartography	5,045	7,686	14,076
Parks, recreation & leisure facilities man.			3,410
Outdoor recreation	474	446	
Vet. medicine			55
Vet. health sciences	936	1,050	
Vet. biomedical & clinical sciences			1,665

Source: HEMIS 2000, 2007 and 2018



Amalgamated categories	2000	2007	2018
Agriculture & renewable resources	2,855	2,409	3,755
Horticulture	995	1,269	1,144
Soil sciences	311	419	962
Forestry & wood sciences	227	247	570
Zoology & animal sciences	3,607	4,306	5,101
Plant sciences & botany	1,095	1,310	3,924
Biological sciences	7,531	9,562	4,204
Life sciences (other)	1,892	2,300	1,169
Geography & related	5,111	7,752	14,076
Parks, recreation & leisure facilities	474	446	3,410
Veterinary medicine & sciences	936	1,050	1,719

APPENDIX C: Survey Detail (Questionnaire)

Background

The Biodiversity Human Capital Development Strategy (BHCDS, 2010-2030) is a 20-year stakeholder-based initiative to improve the availability and demographic transformation of scarce skills for biodiversity across organisations in South Africa. It is led by SANBI and the Lewis Foundation in partnership with multiple other organisations.

Please answer the following questions regarding the BHCDS, transformation and skills for biodiversity. If you have no or little knowledge of the BHCDS, you can still answer those questions of which you do have knowledge. Please also share the questionnaire with anyone else who may be able to answer it, by forwarding them the link sent to you.

The questionnaire consists of 5 sections, and could take up to 30 minutes to complete. Please aim to SUBMIT by 28 September 2020.

Note that your identity will be visible to the researchers only (Nicola Jenkin and Eureka Rosenberg), with the survey findings being presented in an aggregated and anonymised form.

1. Background information

Name & surname

Organisation

Position

Awareness and involvement

2. To what extent have you and/or your organisation been involved in the Biodiversity Human Capital Development Strategy (BHCDS) strategy?
 - I have never heard of the Biodiversity Human Capital Development Strategy. Please proceed to Q10 under Contextual Insights.
 - I have some knowledge of the Biodiversity Human Capital Development Strategy
 - I am very familiar with the Biodiversity Human Capital Development Strategy
3. To what extent have you or your organisation been involved in the implementation of the BHCDS?
 - I have not been involved in the implementation of the BHCDS but others in my organisation may have been. In this case, please share the questionnaire with someone in your organisation that may have been involved, and proceed to question Q10 under Contextual Insights.
 - My organisation and/or I have been involved in the implementation of the BHCDS to some extent, as follows: Please elaborate in the comment field.
 - My organisation and/or I have actively helped to implement the BHCDS, as follows: Please elaborate in the comment field.
4. Why did you or your organisation get involved in the implementation of the BHCDS? Put differently, what made you think it would be a good idea to get involved or what value did involvement offer you?

Evaluation of Its Success and Relevance

5. Please comment on the implementation of the BHCDS as you have experienced it (in your own organisation and/or in other organisations). What was done and how?
6. How relevant were these actions, in your view? You may want to comment on a spectrum of actions you have been involved in or are aware of, from very relevant to less relevant.
7. In your view, what has been achieved with the implementation of the BHCDS (impact and contribution), in terms of:
 - Addressing scarce skills needs / skills gaps:
 - Transformation of organisational leadership
 - Improving effectiveness of organisations
 - Other (including unforeseen positive and/or negative consequences)
8. Improvements can seldom be attributed to one initiative only. Please comment, if you can, on the contribution of the BHCDS implementation, viz a viz other initiatives over the past 10 years e.g. the Environmental Sector Skills Plan (2010), DST's Grand Challenge, the Access programme, SETA skills programmes, SANBI's organisational capacity development, your own (other) organisational efforts (which may or may not be directly related to the BHCDS), etc.
9. Please comment, if you can, on your organisational set-up for implementing the BHCDS. How effective or successful has this set-up been, in your experience? You may comment on strengths and weaknesses, pros and cons, intended and unintended consequences.

Contextual Insights

Please help us understand how the context has changed, or not, in the past decade or so, for organisations with biodiversity-related mandates or interests. For each of the areas that follow, provide a rating on the sliding scale, based on your knowledge of these organisations broadly.

10. Ten years ago, organisations with biodiversity mandates experienced significant levels of unfilled vacancies. Compared to the past decade, what is the current situation with regards to vacancies? [Improved significantly, No change / not sure, Worsened significantly]
11. Ten years ago, some organisations with biodiversity mandates struggled to racially transform their leadership (executives). Compared to the past decade, what is the current situation with regards to the racial profile of executives? [Improved significantly, No change / not sure, Worsened significantly]
12. Ten years ago, some organisations with biodiversity mandates struggled to racially transform their body of professional scientists. Compared to the past decade, what is

the current situation with regards to the racial profile of professional scientists (PhD level)? [Improved significantly, No change / not sure, Worsened significantly]

13. Ten years ago, some organisations with biodiversity mandates struggled to transform their leadership (executives) in terms of gender. Compared to the past decade, what is the current situation with regards to the gender profile of executives? [Improved significantly, No change / not sure, Worsened significantly]
14. Ten years ago, several organisations with biodiversity mandates struggled with a high turnover in Human Resource (HR) leadership. Compared to the past decade, what is the current situation with regards to stability in the HR leadership in organisations? [Improved significantly, No change / not sure, Worsened significantly]
15. Ten years ago, many organisations with biodiversity mandates experienced acute budget constraints. Compared to the past decade, what is the current situation with regards to the adequacy of budgets in relation to mandates? [Improved significantly, No change / not sure, Worsened significantly]
16. Ten years ago, many organisations with biodiversity mandates struggled to find people with suitable skills in some scarce skills areas, even if they had positions available. Compared to the past decade, what is the current situation with regards to critical and scarce skills gaps related to biodiversity? [Improved significantly, No change / not sure, Worsened significantly]
17. Ten years ago, some organisations with biodiversity mandates did not offer adequate mentoring support to new entrants. In your view, what is the current status of mentoring in organisations with biodiversity mandates? [Improved significantly, No change / not sure, Worsened significantly]
18. Ten years ago, some organisations with biodiversity mandates were not desirable places of employment for skilled professionals. Young people tended to leave, due to salary issues, lack of transformation, poor mentoring and so-called 'toxic' work environments. Compared to the past decade, what is the current situation in organisations with biodiversity mandates, as desirable workplaces? [Improved significantly, No change / not sure, Worsened significantly]
19. Ten years ago, employers often found the knowledge and/or skills of graduates with biodiversity-related qualifications to be inadequate. In your view, what is the current situation with regards to the knowledge and skills of graduates entering the workplace? [Improved significantly, No change / not sure, Worsened significantly]
20. Ten years ago, most South African universities offered a good range of biodiversity-related qualifications. To your knowledge, what is the current situation with regards to available courses? [Improved significantly, No change / not sure, Worsened significantly]
21. With reference now to your own organisation or context, please comment as specifically as you can. Indicating "none" where no gaps or challenges exist.

- Which positions if any is your organisation unable to fill? (list as many as is relevant)
- What skills gaps if any do you have in your organisation? (positions may be filled but specific skills still lacking) (list as many as is relevant)
- What are your leadership challenges, if any?
- What are your transformation challenges, if any?
- What in your view are the main reasons for the gaps and / or skills challenges you mentioned, if any?

22. In your view, what specific trends should be considered in order to determine what directions the BHCDS should take in the next 10 years? Please answer each question, elaborate, or indicate “none” as applicable].

- Organisationally (with reference to your own organisation)
- Nationally (national trends e.g. unemployment, institutional and funding shifts)
- Regionally (regional trends e.g. climate change)
- Internationally (e.g. funding directions)

Recommendations

23. In light of your answers, what is needed with regards to a biodiversity skills strategy in the next 10 years? Please comment on the most relevant aspects as you see them. This could be focus, funding, ownership, leadership, implementation models, organisational structures, coordination, or any other aspect you regard as important.

Thank you for taking the time to complete the survey.

24. Would you like to be informed of the outcomes of the Review of the BHCDS, to which this questionnaire contributes? Would you like to be part of stakeholder discussions on the future of the Strategy? If yes, please confirm your contact details below.

- YES, I would like to know the findings of the Review
- YES, I would like to be invited to a Mini-Skills Summit to deliberate the future of the Strategy
- NO, I would prefer not to receive further news in this regard. Please provide a reason (optional) in the comment box below.

Reason:

25. Contact details

Name & surname
Email Address

APPENDIX D: Organisations Surveyed

Africa Geographic	Collage of Science & Technology
Africa Safari Foundation	Conservancies KZN
African Bird of Prey Sanctuary	Conservation Academy
African Centre for Disaster Studies	Conservation at Work
African Conservation Trust	Conservation Management Services
African Environmental Services	Conservation Matters
African Lion Working Group	Conservation Outcomes
African Parks Network (Science Support)	Conservation Solutions
African Rhino Conservation Company	Conservation South Africa
African Wildlife Conservation Foundation	Conservation Support Services
AFRICEGE (African Centre for Green Ecology)	Copper Leaf Consultants
AfriOceans Conservation Alliance	Creating Sustainable Value (CSV)
AGRISETA	CSIR
Agriculture Research Commission (ARC)	Dept. of Agric., Land Reform & rural Development (DALRRD)
AWARD	Development Bank of Southern Africa
Breedlove (Pty) Ltd	Dept. Environment, Forestry & Fisheries (DEFF)
Bellingham Safaris	Delta Environmental Centre
BHCDS Programme	Dept. of Labour: Public Employment Services
BioRiver Solutions	Dolphin Action Protection Group
Birding Africa	Dept. of Sci., Technology & Innovation (DSI)
Birdlife South Africa	DUCT
Blyde WUA	Dept. of Water & Sanitation (DWS)
Botanical Education Trust	Eagle Wing Tours and Safaris
Botanical Society of South Africa (BotSoc)	Earthlife Africa
Boundless Southern Africa	East Coast Fish-Watch Project
Buffelsdrift Game Lodge	Eastern Cape Parks and Tourism Agency
C4 Ecosolutions (Consulting company)	EC Office of the Premier
Cambridge Institute for Sustainability Leadership	ECMA Consulting
Cape Analytical Services Laboratories (Pty) Ltd	Eco Assessments
Cape Environmental Assessment Practitioners	Eco Group Africa
Cape Nature	EcoBound Environmental and Tourism Agency
Cape Peninsula University of Technology: Cradle of Humankind Heritage Site	Eco-Pulse Consulting
Cape Town Environmental Education Trust	ECPTA
Cape Winelands District Municipality	Ehlanzeni District Municipality
CapeNature	EKZN Honorary Officers
CAPFish (SA)	Elephant Specialist Advisory Group (ESAG)
CARMa-Afrika programme	Emanti Management
CATHSSETA	EMNAM Environmental Consulting
CBD Secretariat	EMROSS
Centre for Environmental Rights	Endangered Wildlife Trust

CER	Environmental & Sustainability Solutions CC
CGIAR	Environmental Teaching and Learning
Cheetah Conservation Fund	Equispectives
Citius Energy	ERS
City of Cape Town	ESRI
City of Johannesburg (Climate Change Mitigation)	eThekweni Municipality
City of Tshwane	EWSETA
Climate Systems Analysis Group (CSAG)	Exxaro
Coastal & Environmental Services	Ezemvelo KZN Wildlife
Farmers Association	IUCMA
Federation for a Sustainable Environment	IUCN: South Africa
Flower Valley Conservation Trust	IWR (Rhodes University)
Food & Trees for Africa	Jakkalsfontein Nature Reserve
Forestry Nelspruit	JAYMAT Enviro Solutions
Forestry SA	JG Afrika (Consulting company)
FRC	Johannesburg City Parks
Free State: Dept. of Eco., Small Bus. Dev., Tourism & Env Affairs	Johannesburg City Parks and Zoo
<i>Fundisa for Change</i> (Stellenbosch Univ)	Jonkershoek Environmental Forum
Future Africa	K2C
Game Rangers Association of Africa	KBA Secretariat
Garden Route Botanical Garden	Khamab Kalahri Reserve
Gauteng City-Region Observatory	KZN EDTEA
Gauteng Provincial Government	Lajuma Research Centre
Gauteng: Department of Agriculture & Rural Development	Landmark Foundation
Gauteng: Department of Economic Development and Environmental Affairs	Learning through Nature
Geomeasure Group	LEDET
Geospatial Solutions for Conservation	Lepelle Northern Waters
Get Bushwise	Lewis Foundation
Global Water Partnership	LGSETA
Gouritz Cluster Biosphere Reserve	LIMA
Grassland Society of Southern Africa	Limpopo Department of Economic Development, Environment and Tourism
Great Plains Conservation	Limpopo Transboundary Programme
Greater Pongola River Catchment Protection Association	Living Lands
Green Africa Group (Consulting company)	Mabula Ground Hornbill Conservation Project
Green Skills Academy	Maluleke CPA
GreenCape	Marine and Estuarine Research
GreenMatter	Maruleng LM
Greenpeace	Maruleng Local Municipality
Grootbos Foundation / Walker Bay Conservancy	Mondi
Ground Truth	Mopani District Municipality
Groundwork	Mpumalanga Tourism & Parks Agency
Grow a Tree	Mpumalanga: DEDT

Hans Merensky	MTPA
Healthy Catchment Alliance	Namaqua National Park
Heinrich Boell Foundation (Green Think Tank and international policy network)	National Association for Clean Air
Helderberg Nature Reserve	National Association of Conservancies & Stewardship SA
Highlands Hydrology	National Association of Conservancies & Stewardship SA
Hoedspruit Hub	National Business Initiative
HPP-SA	National Emerging Red Meat Producers Organisation (NEPRO)
ICLEI	Nature's Valley Trust
ICORP	NCC Environmental Services
IDC: Agro-processing & Agriculture	Nedbank Green trust
Impala Water Users Association	Nelson Mandela Metro
Institute for Commercial Forestry Research (ICFR)	Nelson Mandela University: Natural Resource Management
Institute of Marine and Environmental Law	NM Envirotech
Institute of Natural Resources	North West University
International Association of Impact Assessment (IAIA SA)	North West: DEDECT
International Fund for Animal Welfare (IFAW)	North West: Department of Rural Environment and Agricultural Development
International Ocean Institute - Africa	Northern Cape: Agriculture, Land Reform and Rural Development
Northern Cape: DENC	SIWI
Northern Cape: DLRACEA	Slabbert Associates
Orca Foundation	Slipstream Data (environmental data scientist)
Organisation of Tropical Studies (OTS)	Society of South African Geographers
Ouberg Private Nature Reserve	Soil for Life
Palabora Mining	Solid Green Consulting
Paul Phelan Safaris	South African Institute for Aquatic Biodiversity
Peace Parks Foundation	South African Maritime Safety Authority
Pegasys	South African Veterinary Council
People Nature Connect NPC: Education & Capacity Building	South Durban Community Environment Alliance
Pholela Biosphere	Southern African Faith Communities' Environment Institute (SAFCEI)
Plantlife	Southern African Institute of Ecologists and Environmental Scientists (SAIEES)
Predation Management Forum	Southern African Wildlife College
Princess Vlei Forum	Southern Waters
Private Game Reserve	Southern Waters Ecological Research & Consulting
Project Rhino	Space for Elephants Foundation
ProVet Wildlife Vet Services	SRK Consulting
PSETA	Sustainability Institute
PSETA	SWPN
Rand Water	Technical University of Tshwane: Nature Conservation
Resilient Systems Institute (consulting)	Terra Africa
Resilient Waters Programme / All 5 Holding Co.	The African Safari Foundation
Resolute Environmental Solutions	The Beach Co-op
Resource Economic Consultant	The Cirrus Group

Resource Management Services	The Green House
Responsible Traveller	The Guild (consulting: biodiversity economy, CBNRM, offsets, adult education)
Rhodes University	The Msunduzi Municipality
River Futures	The Nature Conservancy
RWP	The Siyazisiza Trust (Rural Economic Development Officer) – Durban area
SA Weather Service	TIPS
SAAMBR	Transfrontein Africa NPC
SABC 50/50	Tree Society of Southern Africa
SADC: Natural Resources & Wildlife Management	Tshwane University of Technology
SAEON	Tsitsa Programme
SAFCOL	Twinstreams Indigenous Nursery
SAIMI	UKZN
SALGA	Umgungundlovu Distict Municipality
SAMSA	UMP
SANBI	Umvoto Africa
Sanbona Nature Reserve	UNDP
SANCCOB	UNEP-WCMC
SANParks	UNISA
Sanwild Wildlife Sanctuary and Rehabilitation Centre	University of Cape Town
Sappi	University of Johannesburg
SAS Environmental Group	University of Limpopo
SAWMA	University of Pretoria
Sawmilling SA	University of Stellenbosch
Sea Search	University of the Free State
Seawatch	University of the Western Cape
Shoprite Checkers	USAID/Southern Africa
Vetshop Pongola Animal Clinic	
Water Group	
Water Integrity Network	
Water Research Commission	
WESSA	
Western Cape: Agriculture and Rural Development	
Western Cape: DEA&DP	
Western Cape: Landcare	
Wildlands Conservation Trust	
Wildlife and Ecological Investments	
Wildlife Conservation Society	
Wildlife Forensic Academy	
Wildlife Ranching SA	
Wits University	
Wits University	
Wolseley Water Users Association	

Working for Fire
WRP Consulting
WWF
York Timbers

