National Biodiversity Research & Evidence Strategy

(2015-2025)

Strategy document

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Contents

CHAPTER 1: OUR NEED FOR BIODIVERSITY RESEARCH AND EVIDENCE

1.1 Introduction

There is an increasing demand for knowledge and evidence to support policy and decision making relating to the protection of biodiversity and the realisation of benefits from our natural systems. South Africa is part of a global community that aspires to the goal of sustainable development, which means meeting our human development needs while staying within the planet's ecological boundaries. This is a challenging vision that requires new knowledge and new ways of thinking and will need to be supported by interdisciplinary research and inclusive approaches. The National Biodiversity Research and Evidence Strategy (NBRES) seeks answers to important questions that relate to the future of South Africa's rich and unique living heritage and its benefits to the people of South Africa.

- What biodiversity do we have and how much do we need to know about it to conserve it effectively and ensure sustained benefits for society?
- How do we manage our biodiversity, especially in the context of global environmental change?
- What evidence do we need to make the case for biodiversity within the context of a national development agenda?
- How do we manage our biodiversity to inform policy formulation and delivery, and ultimately increase delivery of societal, economic and environmental benefits?

This document sets out the strategy for Biodiversity Research & Evidence between 2015 and 2025. It broadly describes the needs for evidence to support achievement of the National Biodiversity Strategy and Action Plan (NBSAP) and other policy priorities. Chapter 2 of this document provides the context for the National Biodiversity Research & Evidence Strategy (NBRES). Chapter 3 describes the strategic goals and objectives to address these questions and to provide better evidence and understanding to support policy and decision making.

This strategy document is accompanied by an annual implementation plan, which details what evidence is needed in the short to medium term to inform policy decision-making, and the medium to long-term evidence that provides the foundational knowledge for the sector. The implementation plan will be regularly updated to ensure that it remains current.

1.2 Background to the Research & Evidence Strategy

One of the biggest challenges for our society is the need to establish a sustainable relationship with the living world in which the intrinsic value of our biodiversity is respected and where the benefits derived from living systems are realised and used in such a way that they add value to people's lives without being degraded. There is a growing awareness that healthy ecosystems are fundamental to building a healthy South African society because loss and degradation of our natural infrastructure compounds problems of poverty, social inequality, food insecurity and poor health. Current and future economic development and efforts to alleviate poverty depend on proper management of our ecological infrastructure and natural assets that deliver goods and services, as well as an understanding of the social and economic factors that influence our relationship with the environment. Our Government, society and

business need to have access to knowledge and innovations that will enable them to meet this challenge and this document outlines a National Biodiversity Research & Evidence Strategy for South Africa that addresses some of these needs.

Our South African environment is made up of a complex and diverse set of interacting ecological systems with numerous different organisms occurring in our oceans, along our coasts and from deserts to moist grasslands and forests. Over the past three centuries exploration and documentation of our biological diversity has shown that South Africa is particularly rich in the number of species that are found here and we belong to a small group of countries that have a disproportionately large amount of the global diversity of living organisms. Despite considerable progress in documenting our biological diversity, we still do not have basic lists for much of our diversity and we know relatively little about important components such as the marine environment and organisms in the soil. Equally important, we have only just started to document and classify diversity at other levels of organisation, such as at the genetic or ecosystem level and we are at a very early stage in terms of monitoring ecosystem health. These important foundations for further knowledge generation are described in Chapter 4.1 in the implementation plan.

We are also making decisions regarding biodiversity within the context of global environmental change where we need a greater understanding of interacting factors that influence our biodiversity so that we can undertake biodiversity planning and management more effectively. Until recently, we have also tended to regard the management of biodiversity as an enterprise that is separate from issues of human wellbeing and often in conflict with our human development needs. Over the past decade, we have seen the emergence of a new paradigm where people are recognised as an integral part of ecological systems where we recognise our role as forces of change but we also acknowledge that our wellbeing depends on the flow of goods and services from ecological systems. We need to improve national capabilities to manage natural living resources, mitigate risks, adapt to changing climates, and provide evidence to support the development and implementation of policies that reduce biodiversity loss and improve sustainable benefits to society. These issues are dealt with in Chapter 4.2 in the implementation plan.

Making the case for biodiversity is an important challenge for our society. Biodiversity scientists and practitioners have been making the case that biodiversity and ecosystem services are critical to our wellbeing and economic development. There is a growing body of evidence to support this view but there is still insufficient information to guide policy, or to influence key development decisions in different sectors of the economy. Research and evidence needed to support making the case is outlined in Chapter 4.3 of the implementation plan.

Finally, having good science does not necessarily result in good evidence nor does it mean that evidence will be used by policy and decision makers. We need mechanisms that provide a bridge between the generation and application of knowledge, which may include forums for exchange, adaptive funding systems and scientific assessments. These priorities are presented in Chapter 4.4 of the implementation plan.

2.1 Introduction

Biodiversity research and evidence contributes significantly to a number of government priorities.

- **Strengthening the economy and livelihoods**
  Ecological infrastructure and its component species provide significant inputs into the economy through resources such as fish, medicinal plants and game as well as nature based tourism and ecosystem services for water provision, energy, food security and health. Rural and coastal livelihoods in particular have direct links to ecological infrastructure and biodiversity whereas urban areas are removed from direct interactions but still depend on these resources. Understanding the ecological basis for important stocks and flows, as well as the social and economic drivers is an important contribution to sustainable development.

- **Improving efficiencies in government spending and delivery**
  Government already invests substantial resources in biodiversity through activities such as the establishment and management of national parks and other protected areas, regulation and monitoring of wildlife trade, managing of invasive species, and restoration of ecological infrastructure. All of these activities can benefit from research so that increased efficiencies based on better knowledge can save the government money.

  In addition, government is aiming to increase accountability through performance measures such as the Minister's Delivery Agreement (Outcome 10). Research can help to identify appropriate measures that will be effective for complex adaptive systems, such as those relating to environment and development.

- **Management of environmental risks**
  Environmental risks associated with flooding, coastal surges, climate change, fire, pollution, biological invasions and the release of genetically modified organisms can have economic and social costs. Research can increase our understanding of these risks and evaluate different mitigation options.

- **Adapting to climate change**
  Ecosystem based adaptation is one of the strategies being adopted to cope with the anticipated impacts of climate change. Government policy frameworks recognise the need for research to better understand how the management of ecosystems can help human societies deal with climate change.

- **Strengthening links in Africa**
  South Africa's rich biodiversity has been recognised as a factor that gives South Africa a strategic advantage for the development of science. Biodiversity science also provides opportunities for scientific engagement in Africa where there are other hotspots of biodiversity as well as economies that have a strong reliance on biodiversity and ecosystem services.

2.2 National policy direction for biodiversity research and evidence

There are several documents that set the national policy direction for biodiversity research and evidence. These include the national Biodiversity Strategy and Action Plan (NBSAP) for South Africa, and in particular its vision and associated strategic objectives and outcomes. They also include the National Environmental Management Act, the Biodiversity Act, the Protected Areas Act, various multilateral agreements, and the Environment Sector Research, Development and Evidence Framework (Environment Sector R, D&E Framework).

2.2.1 National Biodiversity Strategy and Action Plan

The National Biodiversity Strategy and Action Plan (NBSAP) is a requirement of contracting parties to the Convention of Biological Diversity (CBD). South Africa's NBSAP was recently revised and is valid from 2015 to 2025. It identifies the priorities for biodiversity management in South Africa for the period in question and aligns them with global priorities and targets, as well as national development imperatives. The NBSAP aims to ensure that the management of biodiversity assets and ecological infrastructure continues to support the country's development path and play an important role in underpinning the economy (DEA, 2015). It is the key policy document that sets the framework for research and evidence in the biodiversity sector.

The NBSAP contains a vision and a number of strategic objectives which need to be met in order to realise this vision. The vision is to "conserve, manage and sustainably use biodiversity to ensure equitable benefits to the people of South Africa, now and in the future". This vision emphasises the concepts of sustainability and equity, both of which are key elements of South Africa's framework of environmental legislation. In addition, the NBSAP features six strategic objectives in support of the vision. Each of these objectives is broken down into a comprehensive set of outcomes, which constitute the priorities for the strategic objective in question. In turn, each outcome is addressed through a number of actions. Here follows a brief description of each of the NBSAP's strategic objectives (DEA, 2015):

1) Management of biodiversity assets and their contribution to the economy, rural development, job creation and social wellbeing is enhanced

The strategic objective suggests that the management of biodiversity assets needs to be improved so that they can contribute more substantially to the economy, rural development, job creation and social wellbeing. The outcomes listed in the NBSAP necessitate the following: having a network of protected

areas and conservation areas that features a representative sample of ecosystems and species, and that is well managed; managing species of special concern sustainably; expanding, strengthening and transforming the biodiversity economy particularly to the benefit of the rural poor; and ensuring that biodiversity conservation supports the land reform agenda and creates socio-economic opportunities for communal landowners (DEA, 2015). These outcomes also suggest the need to mainstream biodiversity management into the policy, strategy and actions of other sectors, and particularly those listed as part of this strategic objective.

2) Investments in ecological infrastructure enhance resilience and ensure benefits to society

The strategic objective suggests that investments in ecological infrastructure are pivotal to enhancing the resilience of South Africa's ecosystems and communities, thereby ultimately also benefitting society. Ecological infrastructure can be viewed as the nature-based equivalent of built infrastructure, and can be equally important for providing services and underpinning socio-economic development. The services provided by ecological infrastructure include water and climate regulation, as well as soil formation and disaster risk reduction. Examples of ecological infrastructure are healthy mountain catchments, rivers, wetlands, coastal dunes and nodes and corridors of natural habitat, which, together, make up a network of interconnected structural elements in the landscape (SANBI, 2016). The NBSAP's outcomes for this strategic objective refer to the need to restore, maintain and secure important ecological infrastructure in a way that contributes to rural development, long-term job creation and livelihoods. The concept of ecosystem-based adaptation (EbA) is also mentioned as something important which can achieve multiple benefits in the context of sustainable development (DEA, 2015).

3) Biodiversity considerations are mainstreamed into policies, strategies and practices of a range of sectors

According to this strategic objective, biodiversity considerations should be integrated into the planning and decision-making of various sectors. The outcomes associated with this objective include having effective science-based biodiversity tools that can be used to inform planning and decision-making; the inclusion of biodiversity considerations in national, provincial and municipal development planning and monitoring as well as in the processes of development and implementation of policy, legislative and other tools; ensuring that development authorisations and decision-making are both strengthened and streamlined; monitoring and enforcing compliance with authorisations and permits; and ensuring that resources are appropriately allocated to key sectors and spheres of government to enable the effective management of biodiversity (DEA, 2015).

4) People are mobilised to adopt practices that sustain the long-term benefits of biodiversity

The strategic objective highlights the need for the South African public to become involved in practices that conserve biodiversity and sustain the long-term benefits it has to offer. In order for this to be achieved, more effective coordination and messaging will be needed to enhance people's awareness of the value of biodiversity (DEA, 2015).

5) Conservation and management of biodiversity is improved through the development of an equitable and suitably skilled workforce

The strategic objective speaks to the need to develop scarce skills amongst all population groups in order to be able to better conserve and manage the country's biodiversity. Skilled staff needs to be developed and retained both in terms of biodiversity management and science. The NBSAP lists the following outcomes for the strategic objective: macro-level conditions are enabled for skills planning, development and evaluation of the sector as a whole; an improved skills development system incorporates the needs of the biodiversity sector; and partnerships are developed and institutions are capacitated to deliver on their mandates towards improved service delivery (DEA, 2015).

6) Effective knowledge foundations, including indigenous knowledge and citizen science, support management, conservation, monitoring and sustainable use of biodiversity

According to the strategic objective, there is a need for effective knowledge foundations to support all aspects of biodiversity management and use. Such foundations should, however, represent a move away from strictly science-based foundations and should also include indigenous knowledge and citizen support in order to increase understanding of the use and management of biodiversity amongst the South African population. These would include projects funded by government, NGO and also alternative sources of evidence such as community projects. The NBSAP strategic outcomes include having relevant and well-coordinated foundational data sets on species and ecosystems; regularly monitoring and assessing the status of species and ecosystems; identifying geographic priority areas for the management, conservation and restoration of biodiversity assets based on best available science; undertaking management-relevant and policy-relevant research and analysis through collaboration between scientists and practitioners; and ensuring that the knowledge base is accessible and presented in a way that informs decision-making (DEA, 2015). This latter point could be achieved through a formal registration of research resources on systems such as the DEA metadata system and the DTI-SAEON metadata system. This would ensure accessibility of the research report, relevant metadata and (most importantly) the research data itself.

2.2.2 The National Environmental Management Act

The National Biodiversity R & E Strategy has been developed to meet the needs for biodiversity research within the environmental sector and is therefore strongly influenced by policies, strategies and legislation within the environmental sector. At a high level, the National Environmental Management Act (NEMA) of 1999 sets out guiding principles for environmental management. Those principles that are relevant to the development of NBRES are listed here:

- Environmental management must place people and their needs at the forefront of its concern, and serve their physical, psychological, developmental, cultural and social interests equitably.
- Development must be socially, environmentally and economically sustainable.

- Sustainable development requires the consideration of all relevant factors including: that the disturbance of ecosystems and loss of biological diversity are avoided, or, where they cannot be altogether avoided, are minimised and remedied.
- The use and exploitation of non-renewable natural resources is responsible and equitable, and takes into account the consequences of the depletion of the resource.

More specific biodiversity policy frameworks, in addition to the NBSAP, are laid out in the Biodiversity Act of 2004, the Protected Areas Act of 2003, the National Biodiversity Assessment (NBA), existing research strategies and the country's commitments to various multilateral agreements that deal with biodiversity. Here follows a brief description of each.

2.2.3 Biodiversity Act

The National Environmental Management: Biodiversity Act of 2004 provides the main legislative framework for the management of biodiversity and highlights the need for an evidence base to support regulations and other policy tools, which include:

- Threatened or Protected Species regulations (TOPS)
- Bioprospecting, Access and Benefit Sharing regulations (BABS)
- Alien & Invasive Species regulations (AIS)
- Regulations to support the national implementation of the UN Convention on International Trade in Endangered Species of Fauna and Flora (CITES)
- Norms & standards for elephant management
- Norms & standards for damage causing animals.
- Norms & standards for biodiversity management plans for species
- Norms & standards for biodiversity management plans for ecosystems
- Norms & standards for hunting
- Listing of threatened and protected ecosystems
- Bioregional planning

2.2.4 Protected Areas Act

One of the aims of the National Environmental Management: Protected Areas Act 57 of 2003 (and its amendments) is to provide for the protection and conservation of ecologically viable areas that are representative of South Africa's biological diversity and its natural landscapes and seascapes. This is supported by subsidiary objectives to: effect a national system of protected areas in South Africa as part of a strategy to manage and conserve its biodiversity; and to promote sustainable utilisation of protected areas for the benefit of people, in a manner that would preserve the ecological character of such areas. These are critical areas that require evidence to support the expansion and consolidation of the protected area network as well as an

understanding of the ecological systems in order to manage these areas effectively. Moreover, in terms of the Protected Areas Act, the Minister may establish indicators for monitoring performance with regard to the management of national protected areas and the conservation of biodiversity and these indicators require an evidence base to support and validate such indicators.

2.2.5 The National Biodiversity Assessment

The latest National Biodiversity Assessment, published in 2012, presents a comprehensive assessment of South Africa's biodiversity. The background documents provide very detailed assessments of research needs and Chapter 13 of the NBA outlines high level knowledge gaps and research priorities for strengthening the NBA. Three key needs were identified:

- To build the foundations for assessment, especially the need for an ecosystem classification system;
- To strengthen the mapping and measuring of ecological condition; and
- Research on the links between biodiversity and human wellbeing.

The next NBA is scheduled for 2017/2018 and the intention is to reduce the knowledge gaps identified through the research and interventions outlined in this strategy.

2.2.6 Existing Research Strategies

Within the past ten years, research strategies have been developed focusing on specific biomes (fynbos, thicket, succulent karoo, grasslands) and themes (systematics, biosafety, desertification and global change). Recently, the Department of Science and Technology (DST) and the National Research Foundation (NRF), in collaboration with relevant stakeholders, started a process to develop a National Marine Research Plan, which will ultimately culminate in a National Marine Research Strategy. The questions and issues raised in these strategies will be incorporated into this overarching biodiversity research strategy.

2.2.7 Multilateral agreements

South Africa has ratified numerous multilateral environmental agreements (MEAs) and these require scientific inputs. Improving the knowledge base enables South Africa to have a greater impact in these international agreements, including:

- UN Convention on Biological Diversity
- UN Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)

- UN Framework Convention on Climate Change
- UN Convention to Combat Desertification
- RAMSAR Convention on Wetlands
- Convention on Migratory Species
- Agreement on the Conservation of Albatrosses and Petrels (ACAP)
- Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR)
- International Whaling Commission
- Antarctic Treaty
- Cartagena Protocol on Biosafety
- SADC Instruments

As a contributor to these agreements, South Africa has agreed to new targets to reduce the rate of loss of biodiversity and enhance the benefits from ecosystem services and the 20 Aichi targets set out in international agreements depend on verifiable evidence. The international community has further recognised the need for a more effective interface between science and policy, resulting in approval for the Intergovernmental Platform for Biodiversity and Ecosystem Services (IPBES).

IPBES is the intergovernmental body which assesses the state of biodiversity and the ecosystem services it provides to society, in response to requests from decision makers. IPBES functions under the auspices of four United Nations entities – the United Nations Environment Programme (UNEP), the United Nations Educational, Scientific and Cultural Organization (UNESCO), the Food and Agriculture Organization (FAO) and the United Nations Development Programme (UNDP), and is administered by UNEP. One thousand scientists from all over the world, who are nominated by their government or an organisation and are subsequently selected by the Multidisciplinary Expert Panel (MEP), currently contribute to IPBES on a voluntary basis.

The mission of IPBES is to strengthen the science-policy interface for biodiversity and ecosystem services for the conservation and sustainable use of biodiversity, long-term human well-being and sustainable development. It aims to do so by meeting four objectives and implementing 28 deliverables. The objectives are to:

1) Strengthen the capacity and knowledge foundations of the science-policy interface to implement key functions of the Platform;
2) Strengthen the science-policy interface on biodiversity and ecosystem services at and across the subregional, regional and global levels;
3) Strengthen the science-policy interface with regard to thematic and methodological issues; and
4) Communicate and evaluate Platform activities, deliverables and findings: and 28 deliverables (IPBES, 2016).

These initiatives require an integrated system for generating and applying biodiversity knowledge and information and highlight the need for an integrated Biodiversity R & E Strategy that will deliver the knowledge, information, and tools required to inform decision making and that will enable South Africa to manage its biodiversity and respond more quickly and effectively to risks and opportunities.

2.2.8 Environment Sector Research, Development and Evidence Framework

Within South Africa, government has been promoting an evidence based approach to policy development and decision making. The Environment Sector R, D & E Framework outlines three levels of strategy development. The national research agenda is framed by the National Research and Development Strategy, 10- Year Innovation Plan and 10-Year Global Change Research Plan all led by the DST. These are followed by the Environment Sector R, D & E Framework, which was approved by MINMEC on 08 June 2012 which zooms into sector specific policy evidence needs context. This provides a common framework for the collection of evidence that can be used in support of environmental sector policy decisions and for the achievement of sector priorities as outlined in Outcome 10 of government's delivery agreement, the Environmental Sector Plan and the South African Environment Outlook Report. The Environment Sector R, D & E framework identifies eight thematic strategies comprising: sustainable development and green economy (including sustainable consumption and production), biodiversity, climate change, air quality, ocean and coasts, chemical and waste, impact management and compliance and enforcement. Thematic strategies, such as this National Biodiversity R & E Strategy must be developed under each specific theme.

Figure 1: The Environment Sector Research, Development and Evidence Framework

The Environment Sector R, D& E Framework identified priority areas where knowledge and evidence was required, based on an analysis of the South African Environment Outlook. Issues relating to our biodiversity that were flagged as red or amber and where better evidence was required to support actions or to measure progress included the following:

- Slowing the rate of habitat loss and habitat degradation
- Reducing the threat status of South Africa's indigenous species
- Reducing land degradation and desertification
- Reducing and reversing declines in ecosystem health
- Rehabilitation and restoration of ecosystems
- Improving the status of freshwater and marine ecosystems, including transformed wetlands and estuaries
- Decreasing the spread of invasive alien species
- Minimising over-harvesting of indigenous species

This strategy and associated implementation plan will help ensure that, over time, all these requirements for evidence can be met.

2.3 Developing the Biodiversity Research and Evidence Strategy

The process of developing the National Biodiversity R & E Strategy consisted of two parts. In order to identify the short-to-medium term priorities for evidence, the Biodiversity Branch of the DEA sent out a survey to policy-makers within the biodiversity sector asking them to identify "the main issues where better evidence or knowledge is needed to support policy-making". It was also specified that these issues could be "broad areas of work or work in specific locations, or collaborative work with other government departments". In addition, the respondents were asked to provide up to five priority needs for evidence or knowledge for each of the issues identified. Eighteen completed surveys were returned and the responses contained in them were compiled and used as inputs for a workshop hosted by the Biodiversity Branch for DEA biodiversity staff and other sector stakeholders.

The workshop participants were asked to work in groups and map all of the survey responses (i.e. policy issues and priority needs) against each of the six NBSAP strategic objectives described earlier in this document, and other priority policy needs. They were then asked to group issues together as well as to identify any obvious gaps that might have become evident during the mapping exercise. After the workshop, the maps were consolidated into a table of short-to-medium term priorities for biodiversity evidence. This table is presented as Table A in the implementation plan and features (from left to right) NBSAP strategic objectives and associated outcomes as identified during the survey and consolidated during the mapping exercise, priorities to address the objectives as identified in the survey and an indication of the urgency of the evidence needs (within one year, or within two to five year). This table was then sent out to the same stakeholders who initially received the survey, for further comments and inputs.

The second part of the process of developing the National Biodiversity R & E Strategy was to ask stakeholders at the workshop mentioned above to map relevant policy issues and priority needs to the NBSAP strategic objective that deals with foundational research in order to help identify medium-to-long term

priorities for evidence. The output of this mapping exercise was combined with the outcomes of a national workshop with stakeholders from across the sector held in 2014, as well as results from questionnaires and interviews focused on the medium-to-long-term priorities for evidence for the biodiversity sector. This process was targeted at the scientific community in particular. This two pronged approach has helped DEA to identify important questions that have been incorporated into a table of medium-to-long-term strategic objectives and priorities for evidence to address them. This table is presented as Table B in the implementation plan and features (from left to right) strategic objectives (taken from NBSAP and the stakeholder inputs) and associated outcomes, the urgency of the evidence need (either two to five years or six to ten years), and priorities to address the objectives. Perceived barriers to achieving the strategic objectives that were identified during the stakeholder engagement process were also taken into consideration during the development of the implementation plan associated with this strategy.

It is important to note that South Africa is not alone in trying to identify research and evidence needs relating to biodiversity. The international research community has identified priorities relating to the Millennium Ecosystem Assessment, the Aichi Targets of the Convention on Biological Diversity as well as general ecological questions of high policy relevance. These references have been considered during the development of the strategy.

The short-term demand driven policy issues and questions that predominantly emanated from policy-makers, and the medium-to-long term supply driven issues that predominantly emanated from the scientific community are both equally valid and important, and together comprise the set of issues for which the Biodiversity sector needs to collect evidence in future.

3.1 Introduction

The strategy is based on a central goal to ensure that research and evidence provides appropriate and sufficient support to decision making. Scientific research (used here in its broadest sense) is a long-term investment and the strategy therefore recognises that investment in institutions and human capacity, as well as ongoing funding commitments must be prioritised in the overall planning and budgeting process. The strategy also recognises the need for innovation. Addressing the issues facing biodiversity and society cannot just be about understanding risks and threats. Moving forward also has to be about innovation and exploring new opportunities. Addressing the gaps in taxonomy, developing the green economy, identifying and addressing trade-offs between conservation and development, responding to global change, identifying the drivers of behaviour change, and seeking creative ways to mitigate risks will need innovative thinking, new technologies, and new tools.

3.2 Principles

The National Biodiversity R & E Strategy and its associated implementation plan are guided by several principles, linked to the principles that underpin the Environment Sector R, D & E Framework.

3.2.1 Using a broad definition of 'robust' four types of evidence

Effective decisions will be based on a broad definition of evidence which recognises not only formal knowledge from a wide range of disciplines, but also information which may be practical or context-specific. Taking an evidence-informed approach does not mean simply searching for evidence to confirm predetermined decisions. Evidence can also explain complex relationships, enrich our understanding of an issue, challenge received wisdom and scope opportunities for change. DEA recognises four different but related categories of evidence:

- Statistical and administrative data, whose purpose is to describe the state of an issue. It also includes distribution and trend data;
- Analytical (research) evidence, whose purpose is to explain causal relationships or explore the complexity of an issue;
- Evidence from evaluations, whose purpose is to tell us what has worked in the past, for whom, under what circumstances, and why;
- Evidence from citizens and stakeholders, whose purpose is to inform us of what different people value and what they consider to be legitimate. This type of evidence may be collected using research methods, but participatory processes of engagement are equally important.

3.2.2 Linking evidence needs to policy priorities

It is important that the evidence generated through this strategy does not just contribute to academic debates but is relevant to the needs of decision makers and the issues that affect society. The strategy includes operational components that promote dialogue between generators and users of evidence to facilitate processes that enable researchers to ask relevant questions and implementers to put existing evidence to work within an appropriate context.

DEA operates a quarterly early warning system for addressing immediate challenges and opportunities within the environmental sector ('QETWOS'). It scores impacts on key issues on a scale from -10 (devastating adverse impacts) to +10 (impressive positive impacts). A decision is then made as to whether the issue a) requires further research, b) is potentially significant and should be mainstreamed into DEA's work, and c) is insignificant at present or d) requires on-going monitoring. Impacts on biodiversity, sensitive habitats and sensitive species are among the core QETWOS indicators. The outputs from this early warning system will help identify the short- and medium-term evidence requirements for the sector, and will feed into the process of updating the annual implementation plan.

The Biodiversity R, E Strategy will build on existing research structures that have delivered good results in the past and will seek to strengthen these systems while addressing gaps in research. This means building on biodiversity research investments within DEA (e.g. Oceans & Coasts, Natural Resource Management programmes, SANBI and SANParks), DAFF (Resources Research), DST/NRF (e.g. research chairs, Centres of Excellence, and national facilities), research councils (e.g. ARC and CSIR) and universities.

Information on biodiversity that is generated by research must be accessible to government and society. As a result, the strategy includes components aimed at improving the collection and collation of existing information and making it accessible and ensuring that systems are in place to make future data and information accessible.

3.2.3 Linking an evidence-informed approach to planning, reporting and budgeting

Evidence is required to report on progress towards the achievement of and NBSAP, as well as to inform decisions. There are resource costs to all evidence, and these need to be planned so that resources can be allocated as effectively as possible. There are many role players and stakeholders across the sector who could contribute evidence: DEA, other government entities, Research Councils, universities, private sector and non-government organisations. The R&D Strategy and Implementation Plan will provide a vehicle for determining who is best placed to respond to each evidence need, and whether this can be done singly or in partnership with others.

While the Biodiversity Research & Evidence Strategy has been developed to primarily address the NBSAP strategic outcomes, evidence requirements for Outcome 10 will gradually be incorporated into the R & E Strategy as appropriate. The implementation plan will be updated and recosted on an annual basis to account for this.

3.2.4 Inclusive and participatory processes

Evidence is not just a service provided to decision-makers. The processes of decision-making are complex and sometimes lengthy. There is a wide range of role players and stakeholders in the sector who need to be involved, throughout, in decisions about what evidence is needed, how it is prioritised, and how it is funded.

Strategic partnerships are an important component of acquiring evidence. Over the next financial year, the Biodiversity Branch aims to establish strategic partnerships with a number of local and international partners in order to facilitate the implementation of its National Biodiversity Research and Evidence

Strategy. While no resources are immediately available for this initiative, it is expected that collaboration will lead to funding for relevant projects in due course.

IPBES has also recently taken a decision to invite the secretariats of the multilateral environmental agreements related to biodiversity and ecosystem services, as appropriate, to work with the Bureau to develop strategic partnerships. In addition, the Platform encouraged the self-organisation of an inclusive, open-ended network of stakeholders, which in the meantime has been established, and indicated that mechanisms would need to be developed to structure and facilitate the relationship between the Platform and this stakeholder network.

3.2.5 Co-production of evidence and policy

Evidence should enable innovative solutions through experimental testing of ideas and technologies, modelling, piloting, and scenario testing. The collaborative development and implementation of new tools and technologies is relevant across the entire range of evidence envisaged in this strategy and must be seen as an important component of evidence activities.

3.3 What does the strategy aim to achieve?

The National Biodiversity R & E Strategy features two sets of strategic evidence objectives and associated outcomes (both short-to-medium term and medium-to-long-term). Short-term needs for evidence will help address specific questions that need to be answered to support policy teams' ability to diagnose the problem and to formulate, implement and evaluate appropriate policies. Medium-term evidence needs will help respond to anticipated future policy priorities, or help build up knowledge in key areas of strategic importance to biodiversity policy. Long-term evidence needs provide the essential underpinning knowledge for the sector. The categories inevitably overlap to an extent and within each one it may be necessary to prioritise further (distinguishing between 'need to have' and 'nice to have'), to ensure scarce resources are allocated effectively. The strategic objectives together with their associated outcomes support a single overarching goal: **to provide the knowledge and evidence base for informed policy and decision making relating to the management of South Africa's biodiversity and its benefits to society.**

The strategy aims to look at the best ways to strengthen knowledge generation and feedback to the decision making process. It furthermore recognises that a dynamic link exists between informed decision making, monitoring and assessment and research. This means that issues of relevance to government and society may be identified by decision makers and referred to researchers for further study, but can equally emerge from research that identifies risks or issues that have not yet been recognised by broader society (e.g. climate change). As a result, the strategy emphasizes the need for ongoing and dynamic interaction between the research community and policy and decision makers in order to ensure that research responds to the knowledge gaps that hinder good decision making and that decision makers have access to the latest knowledge.

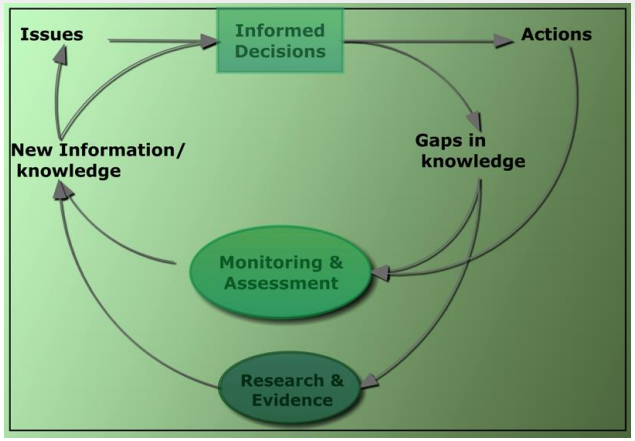

Figure 2: The Evidence to Policy Process

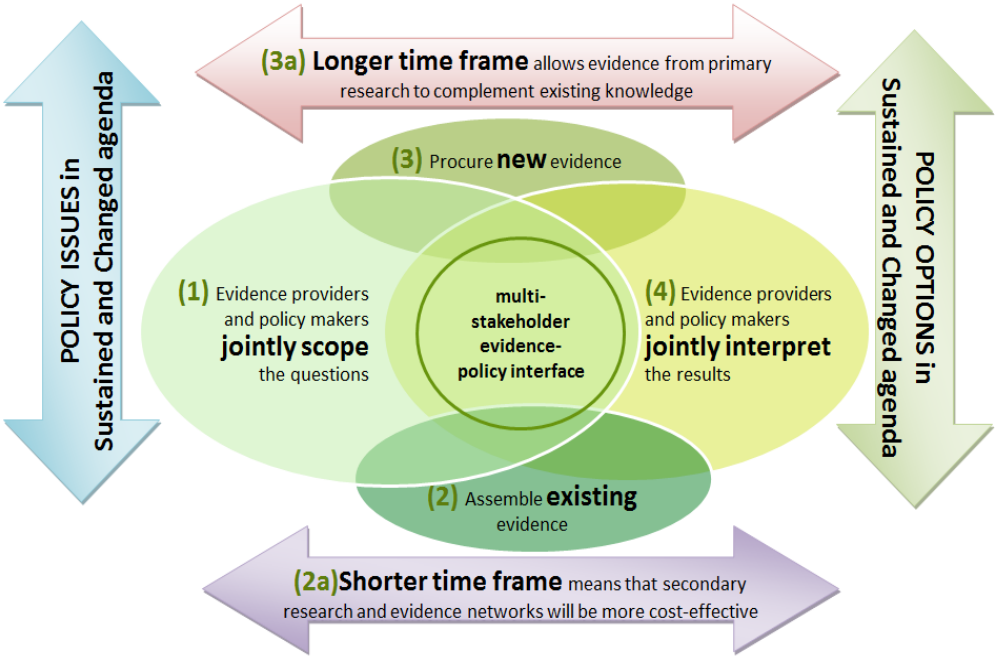

Figure 3: DEA's approach to the four processes underpinning evidence informed policy making

DEA's Research, Development & Evidence Framework notes that this interaction between science and policy takes place via four processes, as shown in Figure 3. These are: jointly scoping of the question, assembling existing and emerging evidence, procuring new evidence as necessary, and jointly interpreting the evidence to inform policy decisions. Ideally these are all done via multi-stakeholder processes.

3.4 Implementing the strategy

This Research & Evidence Strategy is intended to last for ten years. Its general direction is provided by NBSAP, although it is intended to be flexible enough to incorporate other policy priorities as they emerge. Because it is impossible to predict exactly when evidence will be needed and what evidence that should be, the strategy is accompanied by a rolling implementation plan which sets out the short, medium and long-term needs for evidence. This will be updated on an annual basis and will do two things:

- Synthesise the current understanding of the priority and foundational needs for evidence over the next ten years;
- Communicate those needs widely across the sector.

The process of monitoring and updating the implementation plan will be led by the Director, Science-Policy Interface for the Biodiversity and Conservation Branch. Various levels of involvement are envisaged, with stakeholders in Working Group 1 being required to take part. Other stakeholders in the sector will be invited to take part on a voluntary basis. The process is set out in detail in the implementation plan document.

CONCLUSION

This is the first step in a concerted effort to improve the evidence base for decision-making in the biodiversity and conservation sector. Our intention is to be more strategic in planning to acquire the evidence we need, so that we can make best use of the resources available across the sector. We know that this document is not perfect: in this early stage it has not been possible to be as systematic and thorough as we would like, both in involving all stakeholders and covering all the evidence. However, we are committed to developing a process that will continually improve both this strategy and its associated implementation plan. We recognise that this may take several years and wide engagement across the sector. During this time we continually welcome comments and suggestions on these two documents.

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