Natural Capital Accounting & Valuation of Ecosystem Services Project – South Africa

Assessment Report

towards the development of a national strategy

for advancing environmental-economic and ecosystem accounting

in South Africa

December 2018

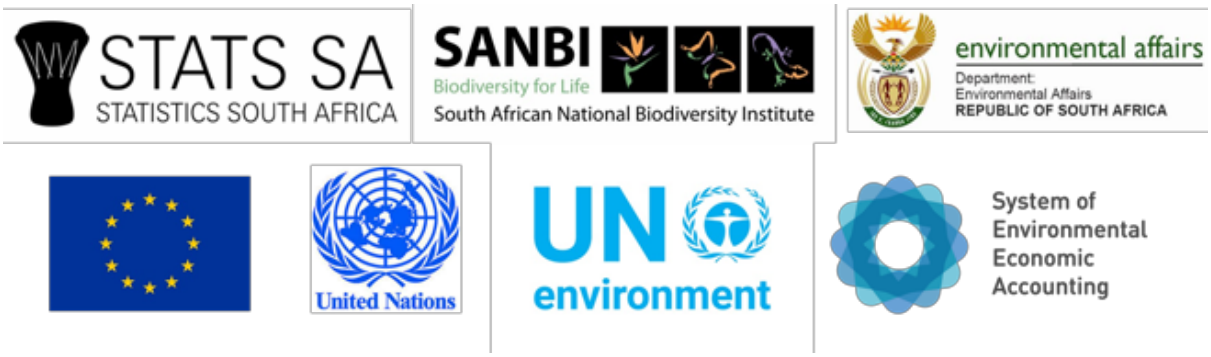

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Table of Contents

Acronyms

Acronym	Description
AMCEN	African Ministerial Conference on the Environment
ANCA	Advancing Natural Capital Accounting
ARC	Agricultural Research Commission
ASB	Accounting Standards Board
ASS	African Statistical System
BIOFIN	Biodiversity Finance Initiative
CBD	Convention on Biological Diversity
CSI	Committee for Spatial Information
CSIR	Council for Scientific and Industrial Research
CWRR	Centre for Water Resources Research at the University of KwaZulu-Natal (UKZN)
DAFF	Department of Agriculture, Forestry and Fisheries
DBSA	Development Bank of Southern Africa
DEA	Department of Environmental Affairs
DoE	Department of Energy
DMR	Department of Mineral Resources
DPME	Department of Planning, Monitoring and Evaluation
DPSA	Department of Public Service and Administration
DRDLR	Department of Rural Development and Land Reform
DST	Department of Science and Technology
DWS	Department of Water and Sanitation
ECA	UN's Economic Commission for Africa
EDD	Economic Development Department
EU	European Union
EWT	Endangered Wildlife Trust
GDSA	Gaborone Declaration on Sustainability in Africa
GRAP	Generally Recognised Accounting Practice
GDP	Gross domestic product
GWM&ES	Government-wide Monitoring and Evaluation System
IIF	Integrated Indicator Framework
IPBES	Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services
IUDF	Integrated Urban Development Framework
M&E	Monitoring and Evaluation
MDG	Millennium Development Goals
MINMEC	Minister and Members of Executive Councils Committee
MINTEC	Ministerial Technical Committee
MoU	Memorandum of Understanding
MTSF	Medium-Term Strategic Framework
NBBN	National Business and Biodiversity Network
NBF	National Biodiversity Framework
NBSAP	National Biodiversity Strategy and Action Plan
NCA	Natural capital accounting
NCA&VES	Natural Capital Accounting and Valuation of Ecosystem Services
NCC	National Coordinating Committee
NDP	National Development Plan
NEPF	National Evaluation Policy Framework
NGI	National Geo-spatial Information (a component of DRDLR)
NGO	Non-governmental organisations
NPAES	National Protected Area Expansion Strategy
NPC	National Planning Commission
NRM	Natural resource management

NSDF	National Spatial Development Framework
NSDS	National Strategy for the Development of Statistics
NSIF	National Spatial Information Framework
NSS	National Statistical System
OECD	Organisation for Economic Cooperation and Development
PAGE	Partnership for Action on Green Economy
PAIA	Promotion of Access to Information Act (No. 2 of 2000)
PFMA	Public Finance Management Act (No. 1 of 1999)
PICC	Presidential Infrastructure Coordinating Committee
R,D&E	Research, Development and Evidence
RDI	Research, Development and Innovation
SAEON	South African Environmental Observation Network
SAICA	South African Institute of Chartered Accountants
SALGA	South African Local Government Association
SAMBF	South African Mining and Biodiversity Forum
SANBI	South African National Biodiversity Institute
SANParks	South African National Parks
SASDI	South African Spatial Data Infrastructure
SASQAF	South African Statistical Quality Assessment Framework
SAWS	South African Weather Service
SDG	Sustainable Development Goal
SDI	Spatial Data Infrastructure
SEEA	System of Environmental-Economic Accounting
SEEA EEA	System of Environmental-Economic Accounting - Experimental Ecosystem Accounting
SHaSA	Strategy for the Harmonisation of Statistics in Africa
SIPS	Strategic Integrated Projects
SNA	System of National Accounts
SPLUMA	Spatial Planning and Land Use Management Act (No. 16 of 2013)
Stats SA	Statistics South Africa
SWG	Sectoral Working Groups
SWPN	Strategic Water Partners Network
UKZN	University of KwaZulu-Natal
UN Environment	United Nations Environment Programme
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNSD	United Nations Statistics Division
WRC	Water Research Commission
Acronym	Description
AGIS	Agricultural Geo-Referenced Information System
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ANCA	Advancing Natural Capital Accounting
ARC	Agricultural Research Commission
ASB	Accounting Standards Board
ASS	African Statistical System
BGIS	Biodiversity Geographical Information System
BSCCRS	Biodiversity Sector Climate Change Response Strategy
BIOFIN	Biodiversity Finance Initiative
CBD	Convention on Biological Diversity
CITES	Convention on the International Trade in Endangered Species
CoGTA	Department of Cooperative Governance and Traditional Affairs
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EbA	Ecosystem-based Adaptation
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EI4WS	Ecological Infrastructure for Water Security Project
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NCCAS	National Climate Change Adaptation Strategy
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PARIS21	Partnership in Statistics for Development in the 21st Century
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SWSA	Strategic Water Source Areas
UN	United Nations
UN Environment	United Nations Environment Programme
UNCCD	United Nations Convention to Combat Desertification
UNFCCC	United Nations Framework Convention on Climate Change
UKZN	University of KwaZulu-Natal
UNSD	United Nations Statistics Division
WCMC	World Conservation Monitoring Centre
WRC	Water Research Commission

Executive Summary

This Assessment Report has been prepared by the South African National Biodiversity Institute (SANBI) and Statistics South Africa (Stats SA) as part of the Natural Capital Accounting and Valuation of Ecosystem Services (NCA&VES) Project, in consultation with the Department of Environmental Affairs, the United Nations Statistics Division (UNSD), the United Nations Environment Programme (UN Environment) and the Delegation of the European Union to South Africa. The purpose of the Assessment Report is to assess the national situation for advancing natural capital accounting as an input into a larger process of strategic planning to build statistical and institutional mechanisms that will strengthen statistical systems and statistical production processes and enable South Africa to produce natural capital accounts. The report is based on desk study and meetings with key stakeholders.

Natural capital accounting (NCA) refers to the use of an accounting framework to provide a systematic way to measure and report on stocks and flows of natural capital, analogous to accounts for other forms of capital. It is a broad term that includes accounting for individual environmental assets or resources, both biotic and abiotic (such as water, minerals, energy, timber, fish), as well as accounting for ecosystem assets and ecosystem services. NCA provides a common framework for measuring and tracking over time the contribution of ecosystems and natural resources to social and economic goals, such as water security, food security and job creation, and provides a wealth of information that can improve planning and decision-making related to the management of natural resources.

Using an accounting framework provides well-accepted, broadly based and globally consistent information on the nature of humanity's connection to the environment and how this is changing over time. Regular production of natural capital accounts can therefore provide standardised statistical information (comparable between countries, or between administrative units within a country, and over time) for tracking and reporting on progress towards sustainable development, including goals and targets set out in policies, frameworks and plans at international, continental, national, provincial or local levels.

NCA can therefore provide dynamic information to inform economic policy and decision-making for sustainable development.

This Assessment Report includes:

- Background on NCA;
- The assessment itself, which covers: South Africa's commitments to sustainable development; policies and frameworks related to national statistical systems; key stakeholders in the institutional setting; relevant institutional mechanisms; information and knowledge; and capacity needed to do accounts;
- Recommendations for a national strategy for advancing NCA in South Africa. Recommendations are made as to the form and institutional home of such a strategy, the process of developing it, and its content.

The Assessment Report will be used as an input to and guide in the development of a national strategy for advancing NCA in South Africa.

1. Introduction

1.1. What is the purpose of this Assessment Report?

1. **This report is prepared as part of the Natural Capital Accounting and Valuation of Ecosystem Services (NCA&VES) Project** (see Section 2 below)**.** The need for a document of this nature was identified in a previous project on Advancing Natural Capital Accounting (ANCA) and confirmed in the inception mission for the current project (refer to Appendix 5.1 for a history of projects on advancing natural capital accounting (NCA) and the System of Environmental-Economic Accounting - Experimental Ecosystem Accounting (SEEA EEA) in South Africa).

2. **The purpose of the Assessment Report is to review the national situation** in terms of policy priorities, country interests, data availabilities, existing initiatives, statistical infrastructure and operations, relevant stakeholders and capacities for the SEEA implementation in South Africa. This report is based on desk study and meetings with key stakeholders.

3. **Based on this review, the Assessment Report**:

    a. identifies gaps and opportunities to improve and harmonize the statistical processes of collection, compilation and dissemination of basic data consistent with the SEEA concepts, definitions and classifications;

    b. makes recommendations to ensure a sustainable and cost-efficient statistical production process of SEEA accounts, statistics and indicators over time;

    c. points to implications for a national strategy for advancing environmental-economic and ecosystem accounting (hereafter referred to more broadly as the *national strategy for advancing NCA*) in South Africa.

4. **The Assessment Report is thus an input into a larger process of strategic planning to build statistical and institutional mechanisms that will strengthen statistical systems and statistical production processes and enable South Africa to produce natural capital accounts.** Doing so should enable decision-making and trade-off analysis that supports sustainable development. This should make the case for greater/sustained investment in NCA over time.

1.2. Who should read this Report?

5. **The Report is intended for stakeholders interested in advancing NCA in South Africa**.

6. While this is a final report, readers who wish to contribute further information or suggestions that could be useful for the development of the national strategy, or who would like to be added to the project mailing list, are welcome to contact Robert Parry (RobertP@statssa.gov.za).

1.3. How is the Report structured?

7. Beyond this introduction the report has four parts:

    a. **Background** on NCA and clarification of concepts and terms.

b. **Assessment section**, covering South Africa's policy commitments to sustainable development; policies and frameworks related to national statistical systems; key stakeholders in the institutional setting; relevant institutional mechanisms; information and knowledge; and capacity needed to develop accounts.

c. **Recommendations** for a national strategy for advancing NCA in South Africa.

d. **Appendices** containing more detailed information on specific topics mentioned in the report (such as a history of projects on NCA in South Africa, and more information on the statistical value chain).

2. Background

2.1. Natural Capital Accounting &Valuation of Ecosystem Services Project

8. **The NCA&VES Project was launched in 2017 by the United Nations Statistics Division (UNSD) and United Nations Environment Programme (UN Environment) with funding from the European Union (EU).** The NCA&VES Project aims to assist five participating partner countries (Brazil, China, India, Mexico and South Africa) to advance the knowledge agenda on environmental and ecosystem accounting and initiate pilot testing of the System of Environmental-Economic Accounting (SEEA) Experimental Ecosystem Accounting (EEA), with a view to improving the management of natural biotic resources, ecosystems and their services at the national level as well as mainstreaming biodiversity and ecosystems in national level policy, planning and implementation.

9. The NCA&VES Project is one of several global projects over the past ten years focusing on advancing the SEEA EEA. Appendix 5.1 provides a history of projects on advancing the NCA and the SEEA EEA in South Africa.

10. The purpose of these projects is to link current South African environmental-economic accounting initiatives and policy requirements with the United Nations (UN) System of Environmental-Economic Accounting (SEEA) and other international statistical frameworks.

2.2. Why Natural Capital Accounting?

11. **Natural capital accounting (NCA)** refers to the use of an accounting framework to provide a systematic way to measure and report on stocks and flows of natural capital, analogous to accounts for other forms of capital. It is a broad term that includes accounting for individual environmental assets or resources, both biotic and abiotic (such as water, minerals, energy, timber, fish), as well as accounting for ecosystem assets and ecosystem services.

12. **NCA is intended to provide information to policy and decision-makers that will support sustainable development.** In broad terms, sustainable development means “meeting the needs of the present generation without compromising the ability of future generations to meet their own needs” (Report of the Brundtland Commission, Our Common Future, 1987). To achieve this, it is recognised that there is a need to understand, calculate, incorporate (and articulate) the social and economic values of ecosystems into decision-making frameworks.

13. **The relationship between the environment, society and economy in a sustainable future can be presented as a set of nested dependencies** (Figure 1) in which: human society is wholly dependent on the environment (the planet we live on and rely on for food, clean water, fresh air, fertile soil and other natural resources); and people in societies create economies (that can be changed if it is found that current economic models are not working to improve quality of life).

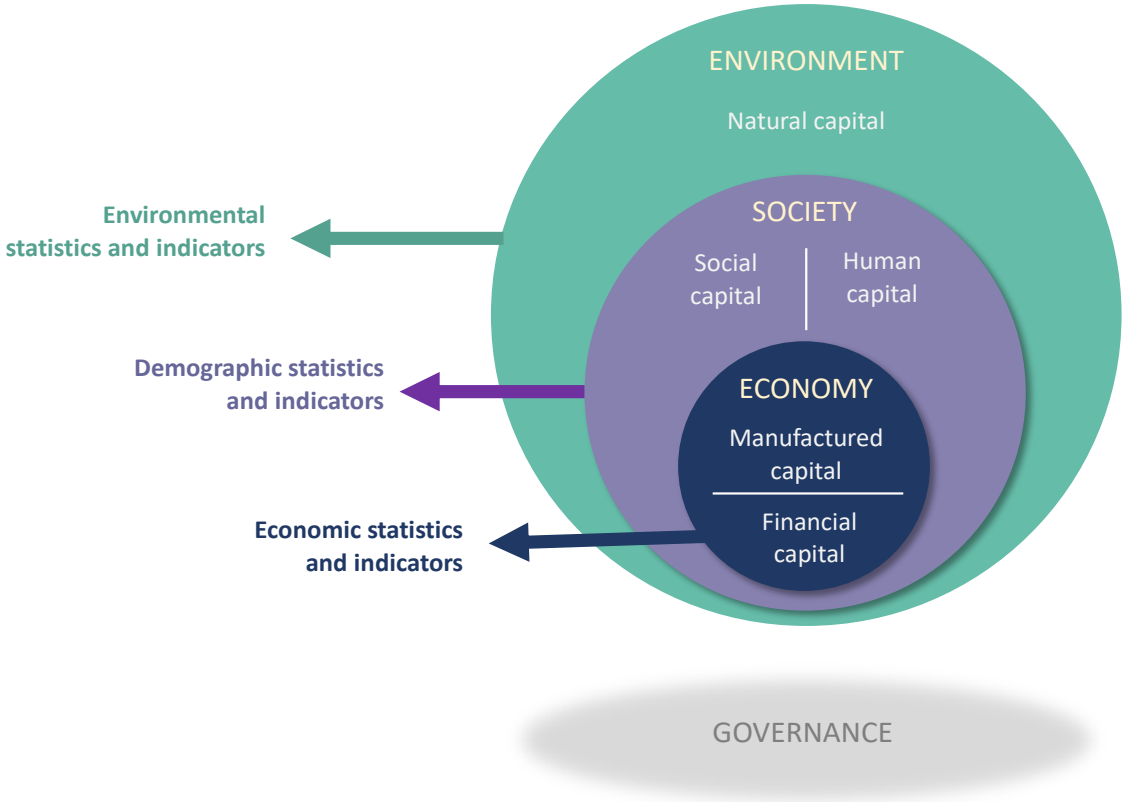

Figure 1. The relationship between the environment, society and economy in a sustainable future, with five types of capital illustrated within this model as well as broad (and typically separate) groupings of statistics and indicators. The economic, social and environmental systems are underpinned by institutions and systems of governance.

14. **To achieve sustainable development (and address underlying causes of biodiversity loss), countries need to more effectively and comprehensively consider the contribution of, and dependence on, natural capital, as one of the five types of capital (financial, manufactured, social, human and natural capital) from which society derives the goods and services needed to improve quality of life and achieve development goals.** The premise is that if a resource or commodity is important to society and the economy, it should be recognised as an asset that must be maintained and managed. In addition, how much is available and changes in availability should be tracked, and the value[1] of nature and its contributions (services) could be better integrated into the System of National Accounts[2].

15. **Understanding our dependence on ecosystems and the services they provide requires the provision of well-accepted, broadly based and globally integrated (statistical) information on the nature of humanity's connection to the environment and how this is changing over time.** Integrated information about national and global economic activity is available via the standard economic and national accounts and statistics (e.g. gross domestic product (GDP)), enabling a good understanding of our economic performance and history at the national and global level. On the social side, while the information is more diverse, there are relatively standardised approaches to measuring changes in population, education and health, among many other variables, and a

[1] A note on 'value': The social, ecological and economic values of nature (biodiversity assets, ecosystems and ecosystem services) can be assessed using a number of approaches and methods, only some of which involve monetary valuation.
[2] The System of National Accounts (SNA) is "used by nations to measure economic activity and by decision makers to evaluate performance, develop the appropriate policies, and monitor and report on progress" (DEA 2017a). The SNA does not currently capture the value of natural capital nor the impacts of its loss.

relatively advanced understanding of the links between economic and social activity. However, on the environmental dimension, information sets are more disparate, a set of headline indicators is not yet agreed, and a common understanding of the relevant issues is under-developed.

16. **The lack of coherence among environmental measurement initiatives poses challenges in answering fundamental questions about natural resources including ecosystems and their contribution to human well-being in South Africa**. The degree of dependence of South Africa's population on ecosystems for water, food, materials and employment is not well known. What is the contribution of ecosystems and their services to the economy, social wellbeing, jobs and livelihoods? How can natural resources and ecosystems be best managed to ensure continued services such as energy, food supply, water supply, flood control and carbon storage? What are the trade-offs between resource exploitation and land allocation with long-term sustainability and equity?

17. **NCA can provide the necessary well-accepted, broadly based and globally consistent information.** The SEEA has been established as an international statistical standard and is recommended as a common measurement framework for several environment, biodiversity and sustainable-development related international initiatives, including the Post-2015 Development Agenda Sustainable Development Goals (SDGs), the Convention on Biological Diversity (CBD) Aichi Targets, the Organisation for Economic Cooperation and Development (OECD) Green Growth initiative, the World Bank led Wealth Accounting and Valuation of Ecosystem Services (WAVES), the United Nations Development Programme's (UNDP) Biodiversity Finance Initiative (BIOFIN), and Sustainable Consumption and Production initiatives.

18. **In the SEEA framework, the Central Framework sets out the methodology for accounting for environmental assets (such as timber resources, soil resources and water resources) as individual resources, and the SEEA EEA sets out the approach for ecosystem accounting** (see Section 2.3).

19. **NCA provides a common framework for measuring and tracking over time the contribution of ecosystems to social and economic goals,** such as water security, food security and job creation, and provides a wealth of information that can improve planning and decision making related to the management of natural resources.

20. **Regular production of natural capital accounts can therefore provide standardised information** (comparable between countries, or between administrative units within a country, and over time) **for tracking and reporting on progress towards sustainable development**, including goals and targets set out in policies, frameworks and plans at international, continental, national, provincial or local levels.

21. **NCA can provide dynamic information to inform integrative policy analysis and decision-making for sustainable development** (UN 2017). This is enabled by SEEA, which uses the same accounting principles that underlie the System of National Accounts so that data from environmental-economic and ecosystem accounts can be directly related to the set of economic accounts encompassing measurement of national income, national wealth and institutional sectors (UN 2017). This can enable analysis of inter-dependencies and trade-offs between different areas of the economy. To illustrate this, Figure 2 provides an example from Australia of an integrated display of socio-economic and environmental indicators. In principle it would be possible to add

an indicator related to ecosystem accounting, which could contribute to better integration of biodiversity and ecosystem considerations into national policy and planning.[3]

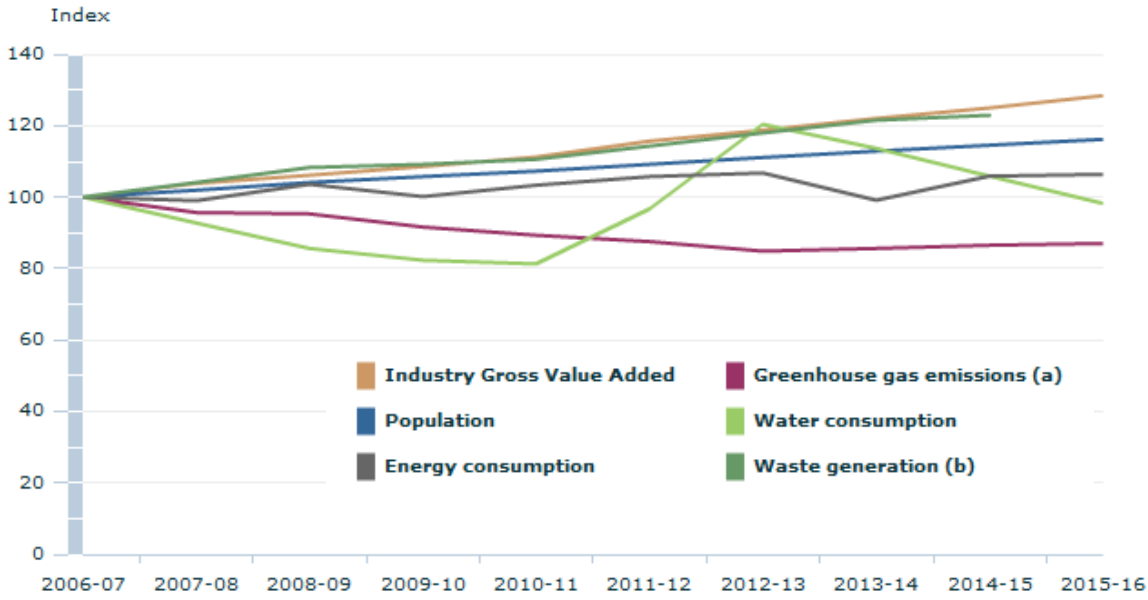

Figure 2. Selected socio-economic and environmental indicators in Australia show that since 2006-07 the Australian economy (measured by Gross Value Added) has been growing at a faster rate than both the population and environmental consumption (measured by greenhouse gas emissions, energy consumption, water consumption). Source: Australian Bureau of Statistics 2018

22. **Policy analysis and development and management decisions should be based on evidence** (The Presidency 2011). **Statistics are used in order to monitor developments and take decisions in order to influence them. In this context, accounting is a source of statistical information** (UN 2002). These links are illustrated in Figure 3, which depicts the **NCA value chain**: Geospatial and non-geospatial **data and information** on the links between natural resources, ecosystems and socio-economic priorities, can be integrated in natural capital **accounts**, which provide a framework for numerically describing and analysing large quantities of information in a consistent way to provide reliable **indicators** (that measure past trends), which in turn provide impartial information, both as an input to **planning** and as an instrument to measure the extent of progress or otherwise towards achieving goals and targets identified in **policy.** Standardised production of accounts delivers robust indicators measuring past trends and current status, which can provide evidence on public policies, programmes, projects and functions to assess issues such as relevance, performance (effectiveness and efficiency), value for money, impact and sustainability. This evidence should play a central role in policy formulation, planning and decision-making. Policy analysis and planning projections may also inform indicators required, and the design and compilation of accounts (illustrated by dotted feedback arrows).

[3] Refers to Aichi Biodiversity Target 2, and NBSAP Activity 3.6.2.

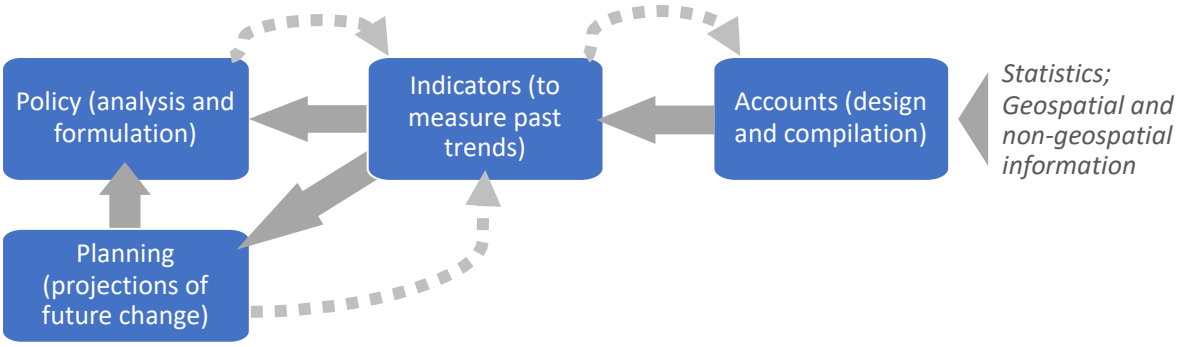

Figure 3. Links between data, statistics, accounts, indicators and policy and planning (adapted from UNSD 2002 with consideration of Stats SA 2015), henceforth referred to as the 'NCA value chain'.

23. **In conclusion, statistical systems and statistical production processes that are strengthened through integration of NCA will enable planning, scenario and trade-off analysis, and decision-making that supports sustainable development and transitioning to a green economy**. There is increasing international interest in establishing integrated statistical systems for this purpose, including through pilot projects such as NCA&VES.

2.3. System of Environmental-Economic Accounting (SEEA)

24. The **SEEA**[4] organises and presents statistics on the environment and its relationship with the economy. It is a statistical system that brings together economic and environmental information into a common framework to measure the condition of the environment, the contribution of the environment to the economy and the impact of the economy on the environment. The SEEA contains an internationally agreed set of standard concepts, definitions, classifications, accounting rules and tables to produce internationally comparable statistics and indicators for policymaking, analysis and research. The SEEA consists of several components, including the SEEA Central Framework, SEEA Water, SEEA Agriculture, Forestry and Fisheries, and SEEA EEA.

25. The **SEEA Central Framework**[5] was adopted by the UN Statistical Commission in 2012 as the first international standard for environmental-economic accounting in 2012. It covers measurement in three main areas: environmental flows, stocks of environmental assets, and economic activity related to the environment. The Central Framework brings together, in a single measurement system, information on water, minerals, energy, timber, fish, soil, land, pollution and waste. The SEEA Central Framework is made up of a number of different accounts that draw information together into one coherent system. This is done by applying the same accounting concepts, structures, rules and principles to different sets of environmental information. Because these concepts are aligned with those of the System of National Accounts, this environmental information can then be integrated with economic information.

26. The **SEEA EEA**[6] complements the SEEA Central Framework by taking a different perspective. The Central Framework looks at 'individual environmental assets', such as water resources, energy resources, etc. and how those assets move between the environment and the economy. In

[4] https://seea.un.org/content/about-seea
[5] https://seea.un.org/content/seea-central-framework
[6] https://seea.un.org/ecosystem-accounting

contrast, the SEEA Experimental Ecosystem Accounting takes the perspective of ecosystems and considers how individual environmental assets interact as part of natural processes within a given spatial area. Ecosystem accounting takes a spatial approach and ecosystem assets are delineated as spatial areas containing a combination of biotic and abiotic components and other characteristics that function together. These ecosystem assets provide ecosystem services, which are the contributions and benefits of ecosystems to economic and other human activity.

27. **The intent of ecosystem accounting described in SEEA EEA is application of the framework at a national level, linking information on multiple ecosystem types and multiple ecosystem services with macro level economic information** such as measures of national income, production, consumption and wealth. The SEEA EEA framework is used as the common platform for the integration of (i) information on ecosystem assets and ecosystem services (i.e. ecosystem extent, ecosystem condition, supply and use of ecosystem services, and ecosystem capacity), and (ii) existing accounting information on economic and other human activity dependent upon ecosystems and the associated beneficiaries (households, businesses and governments).

28. **SEEA EEA and its accompanying Technical Recommendations** (UN 2017) **provide a synthesis of the current knowledge in the area of ecosystem accounting** and can provide a starting point for the development of ecosystem accounts at national or sub-national levels. While the SEEA EEA does not give precise instructions on how to compile ecosystem accounts, it represents a strong and clear convergence across the disciplines of ecology, economics and statistics on many core aspects related to the measurement of ecosystems and thus there is a strong base on which further research and development can build.[7]

29. **SEEA EEA sets out a framework for production of five core ecosystem accounts** that each have independent merit and that together reflect a system of accounts that present a coherent and comprehensive view of ecosystems (UN 2017).

30. Figure 4 illustrates the broad steps in compiling the five core ecosystem accounts.

[7] A process to revise and further formalise the SEEA EEA is underway and is likely to be completed in 2020 (https://seea.un.org/content/seea-experimental-ecosystem-accounting-revision).

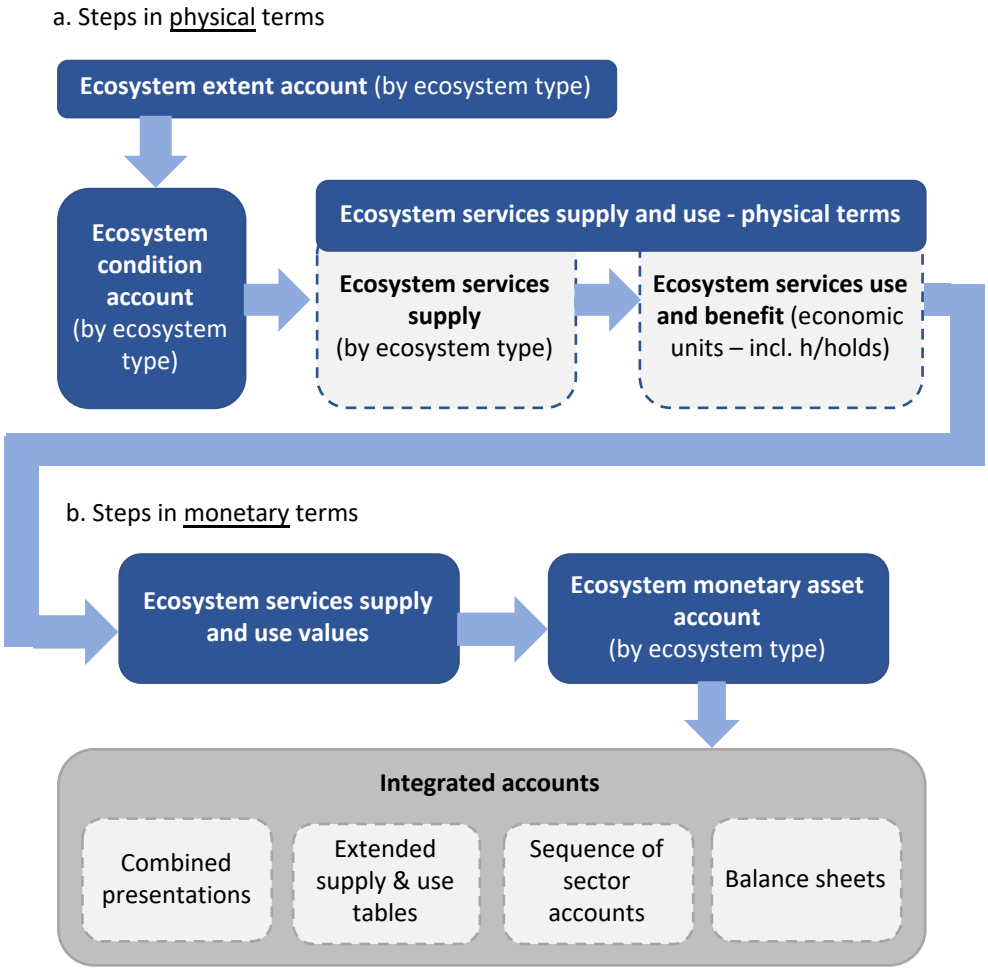

Figure 4. Broad steps in ecosystem accounting, through the five core ecosystem accounts (dark boxes). Measurement of ecosystem condition, ecosystem services supply and use may often be completed concurrently, and for some provisioning services direct estimation of monetary values may be undertaken without developing the physical accounts. Source: UN 2017.

3. Assessment

3.1. South Africa's policy commitments to sustainable development

31. **This section focuses on policies that set the national priorities for the South African government related to sustainable development, involving the integrated management of environment, society and economy.**

32. **National policies include:**

a. **National Development Plan 2030 (NDP)**[8]

National Planning Commission (NPC) 2012

The NDP is the long-term South African development plan through which the Government of South Africa mobilises society to develop a future South Africa in line with the vision of the Constitution. It reflects the Government of South Africa's policy priorities, to achieve sustainable economic growth, poverty reduction, employment creation, a more equitable society, a low-carbon economy, food security and water security. South Africa "needs to protect the natural environment in all respects, leaving subsequent generations with at least an endowment of at least equal value" (NDP 2030 p.37). Government plans and strategies propose to accomplish this by implementing green economy and climate change adaptation initiatives, while conserving and managing South Africa's ecosystems and natural resources. Other aspects of sustainability can be seen in elements such as food and nutrition security, clean water, health and well-being, and clean and accessible energy. It proposes several measures to protect the country's natural resources, including:

- **An environmental management framework**: To ensure that policies and programmes address long-term needs, and that unavoidable environmental losses are offset by investments in related areas. The framework will also ensure that appropriately targeted land, estuaries, coastal areas and oceans are protected.
- **A target for the amount of land and oceans under protection**, and
- **A set of national indicators for natural resources** to inform policy through which specific and increased needs for official statistics are defined. DEA is playing a lead role in developing national indicators for natural resources.

[8] The National Framework for Sustainable Development (NFSD, 2008), which promoted effective stewardship of natural, social and economic resources and led to the release of the National Strategy for Sustainable Development (NSSD) and Action Plan (NSSD1 2011-2014), has been superseded by the NDP in 2012.

b.	**Medium-Term Strategic Framework (MTSF)** Government's strategic plan for the 2014-2019 electoral term.	Reflects the vision of the NDP for South Africa to transition to an environmentally sustainable, climate-change resilient, low-carbon economy. Strategic planning is reflected in a set of 14 outcomes embedded in the MTSF (2014-2019). These outcomes link back explicitly to the NDP and identify Actions, Ministers, Indicators, Baseline indicators and Targets according to sub-outcomes. The Outcome 10 vision reflects language used in NCA, being "a South Africa where environmental *assets* and *natural resources are valued*, protected and continually enhanced" (emphasis added). Through Outcome 10, a key focus of the MTSF is addressing natural resource degradation and depletion of ecological infrastructure by increasing coverage of protected areas, protecting wetlands and river ecosystems to enhance quantity and quality of water, and reducing climate change impacts. Several of the other 14 outcomes (e.g., those related Health, Safety, Economy, Infrastructure, Rural Development) also link to the effective use of natural resources.
c.	**New Growth Path (NGP) Framework (2010-2020)** Economic Development Department (EDD) 2010	Aimed at enhancing growth, employment creation and equity, the NGP's principal target is to create five million jobs and reduce unemployment from 25% to 15% by 2020. It identifies strategies for equitable and inclusive growth in South Africa across economic sectors. Central to the NGP is a massive investment in infrastructure (with key areas for investment in energy, transport, communication, water and housing) as a critical driver of jobs across the economy. It also identifies five other priority areas to create jobs through partnerships between the State and private sector: • Green economy[9]: through expansions in construction and production of technologies for solar, wind and biofuels, clean manufacturing and environmental services. • Agriculture: through addressing high input costs, export marketing, stalled land transfers, and supporting small holder agriculture. • Mining: through support for beneficiation on the final manufacture of consumer and capital goods, and enhanced resource exploitation. • Manufacturing: through improving performance through innovation, skills development and reduced input costs, and investment in research and development. • Tourism and other high-level services, including through South Africa becoming a higher education hub of the African continent. Calls for alignment in **Growth and Development Strategies** adopted by different spheres of government, such as provinces.

[9] Described in the Green Economy Accord (No. 4 of the New Growth Path, signed in 2011).

d.	**National Infrastructure Plan** PICC 2012	In order to address structural problems in the economy identified by the New Growth Path, Cabinet established the Presidential Infrastructure Coordinating Committee (PICC) to coordinate, develop and accelerate implementation of a National Infrastructure Plan (with a 20-year planning framework) that will be monitored and centrally driven. Under their guidance, 18 strategic integrated projects (SIPS) have been developed. The SIPs cover social and economic infrastructure across all nine provinces (with an emphasis on lagging regions). The SIPs include catalytic projects that can fast-track development and growth.
e.	**Spatial Development Frameworks (SDFs)** Government led (DPME / provinces / municipalities)	Promoted by the Spatial Planning and Land Use Management Act (SPLUMA) (No. 16 of 2013) at four different levels namely, national, provincial, municipal and regional planning levels. The aim of developing SDFs is to ensure that all plans and programmes are coordinated, consistent and in harmony with each other, i.e. SDFs will give specific and definite geographical expression to influence the space economy of South Africa. SDFs promote inclusion of social, environmental and economic aspects into development planning, and align with the NDP proposal that their development involve government, businesses and civil society to create a collective vision.
f.	**National SDF (NSDF)** DPME together with DRDLR[10] In development	Will represent the long-term spatial development vision of national government, representing the integration and trade-off of all relevant sector policies and plans, guide planning and development decisions across sectors of government and coordinate and integrate across provincial and municipal spatial development frameworks. The NSDF must contribute to and give spatial expression to national development policy and plans, enhance coordination of land development and land use management, and take cognisance of relevant environmental management instruments.

[10] DPME is the Department of Planning, Monitoring and Evaluation; DRDLR is the Department of Rural Development and Land Reform.

g.	**Integrated Urban Development Framework (IUDF)** Department of Cooperative Governance and Traditional Affairs (CoGTA) 2016	Aimed at transforming the national space economy by developing urban nodes to provide economic and social opportunities through a new approach to urban investment in South African cities and towns. The IUDF illustrates different options for more effective and efficient urban space development, contributing to the NDP's aim for cities to be the country's economic drivers through improved spatial transformation and inclusion. The IUDF advocates integrated spatial planning for coherent development, integrated transport and mobility, integrated and sustainable human settlements, integrated urban infrastructure, efficient land governance and management, inclusive economic development, empowered active communities and effective urban governance to manage the intergovernmental dynamics of cities. The IUDF also creates an interface with the various planning instruments promulgated at a local level. It responds to the Sustainable Development Goals (SDGs) and the NDP.
h.	**National Biodiversity Strategy and Action Plan (NBSAP)** DEA 2015[11]	Guides the conservation, management and sustainable use of biodiversity to ensure equitable benefits to the people of South Africa, now and in the future. It is a requirement of contracting parties to the Convention on Biological Diversity (CBD), and was revised for the period 2015 – 2025. It identifies the priorities for biodiversity management in South Africa for this period, aligning these with the priorities and targets in the global agenda, as well as national development imperatives. *Integrating the value of biodiversity into national accounting and reporting systems* is a high priority activity of the revised NBSAP.
i.	**National Biodiversity Framework (NBF)** DEA 2018[12] (draft for public comment)	Developed in fulfilment of the requirements of the National Biodiversity Management: Biodiversity Act (No. 10 of 2004), Section 38(2) to coordinate and align the efforts of the many organizations and individuals involved in conserving and managing South Africa's biodiversity in support of sustainable development. The NBF recommended acceleration measure towards the integration of the value of biodiversity into national accounting and reporting systems (NBSAP Activity 3.6.2) is the development of a National Strategy for Ecosystem Accounting.

[11] First edition published in 2005 (DEAT 2005), and revised in 2015 (DEA 2015).
[12] First edition published in 2008 (DEAT 2008) and revised in 2018.

j.	**Biodiversity Economy Strategy** DEA 2016a	Provides an implementation framework to achieve economic benefits from the commercialisation of biodiversity targeting the wildlife and bio-prospecting economies. It aims to provide national coordination, leadership and guidance on the commercialisation and trade of biodiversity assets to support inclusive economic opportunities and contribute to reduction in poverty in rural areas through sustainable commercial use of biodiversity. The Biodiversity Economy Strategy has a 2014-2024 timeframe. In 2016 the Department of Tourism and DEA initiated the **Biodiversity Lab** to develop detailed implementation plans to achieve ambitious targets in support of the Biodiversity Economy Strategy.
k.	**Framework for Investing in Ecological Infrastructure** SANBI 2014	Developed in collaboration with partners, the Framework draws lessons from projects, programmes and research related to maintaining and restoring ecosystems for the provision of ecosystem services which also support socio-economic development (including payment for ecosystem services projects). Through this experience, collective thinking clarified seven principles for investing in ecological infrastructure and the Framework guides action and supports collaboration for investing in ecological infrastructure. The framework provides a brief background to investment in ecological infrastructure and how this contributes to national development goals; it identifies key role players; it outlines the scope for resource mobilisation for investing in ecological infrastructure; and identifies next steps and research needs going forward. This Framework is not static, and will be added to and expanded as experience in this field is gained.
l.	**National Protected Area Expansion Strategy (NPAES)** DEA 2016b[13]	A strategy to guide cost-effective expansion of land-based and marine protected areas in South Africa to increase ecosystem representivity, promote ecological sustainability, strengthen resilience to climate change, and support diversification of rural livelihoods and local economic development. It sets national-level protected area expansion targets (for ecosystems), provides maps of priority areas for expansion, identifies gaps, and recommends mechanisms for achieving the targets. Detailed spatial planning and roll-out to achieve the targets is carried out at provincial level, through provincial protected area expansion strategies and biodiversity plans. The NPAES enables coordination between the many role-players involved in protected area expansion by providing a common set of targets and spatial priorities.

[13] First edition 2008 (DEA 2008), revised edition developed in 2016 (DEA 2016) and published for public comment in October 2018.

m. **National Framework for Marine Spatial Planning in South Africa**

DEA 2017a

Provides high-level direction for marine spatial planning in South Africa's ocean space. Marine spatial planning is the governance process of collaboratively assessing and managing the spatial and temporal distribution of human activities in the marine environment to achieve economic, social and ecological objectives. The Framework seeks to provide for co-ordination across different sectors to unlock the ocean economy and sustainable ocean economic development, enhance achievement of societal benefits, promote a healthy marine environment and sustainable use of marine resources, and contribute to good ocean governance. It lays the basis for the development of Marine Spatial Plans that will play a similar role to SDFs.

n. **Biodiversity Finance Plan**

DEA 2017b

Developed through the Biodiversity Finance Initiative (BIOFIN) – South Africa[14], the Biodiversity Finance Plan aims to ensure adequate funding of conservation and management interventions to protect and maintain South Africa's unique and valuable biodiversity. It proposes a set of 16 priority finance solutions clustered around three biodiversity outcomes:

- Protected areas: protected area revenues; property rates reforms; revolving land trusts; biodiversity tax incentives; biodiversity offsets; and making the case for public funding of protected areas.
- Ecosystem restoration: government grants for ecological infrastructure; water tariffs; natural resource management (NRM) value-added industries; global climate funding; carbon tax offsets; and NRM land-user incentives.
- Sustainable use: Tourism Conservation Funds; biodiversity-related fines and penalties; and wildlife-ranching.

o. **Strategic Framework and Overarching Implementation Plan for Ecosystem-based Adaptation (EbA)**

DEA and SANBI 2016

Has the overall aim of placing EbA at the core of South Africa's approach to climate change adaptation, to enable a long-term, socially-inclusive transition to a climate-resilient society and economy. The Strategy sets out a vision and four key outcome areas, related to: co-ordination, communications and learning; research, monitoring and evaluation; mainstreaming into policy and practice; and demonstration projects. Under each of these outcome areas, the Framework identifies priority activities, for which institutional roles, timeframes and resource requirements are clearly described. The Strategy also identifies a number of key areas that should be strengthened to promote more effective implementation of EbA.

[14] BIOFIN was conceived by the UNDP in response to CBD COP-10 and the Strategic Plan for Biodiversity (2011-2020) and is intended to help countries to better mobilise and align domestic and international finance to finance the implementation of NBSAPs.

p.	**National Climate Change Adaptation Strategy (NCCAS)** DEA 2017c	Provides a common reference point and vision for climate change adaptation efforts and climate resilience in South Africa in the short to medium-term. It provides guidance across all levels of government and sectors affected by climate variability and change. It situates the concept of climate resilience within the broader context of socio-economic development, and provides a framework for the country to understand and manage interconnections of material flows and resource systems in the SA economy at various scales with climate change resilience and development goals. The vision draws on the National Climate Change Response Policy (2011) and the adaptation component of its Nationally Determined Contribution (NDC).
q.	**Intended Nationally Determined Contribution (NDCs)** DEA 2015	South Africa's intended NDC for the reduction in greenhouse gas emissions was adopted when South Africa ratified the Paris Agreement in 2015. It includes an element related to accounting in the mitigation component: "Planning processes, assumptions and methodological approaches including those for estimating and accounting for anthropogenic greenhouse gas emissions and, as appropriate, removals". There is an intention to reduce uncertainty in data on agriculture, forestry and other land use emissions over time, "with a view to a comprehensive accounting approach for land-based emissions and removals".
r.	**Biodiversity Sector Climate Change Response Strategy (BSCCRS)** DEA 2014	Aligned with the National Climate Change Response Policy/Framework (2011) and outlines principles and key elements of the biodiversity sector's strategic response to the risks posed by climate change. The Strategy identifies three strategic directions and key kinds of activities such as follows: monitoring and evaluation; Ecosystem-based Adaptation (with emphasis placed on maintaining in good ecological condition, and restoring degraded, key ecological infrastructure, improved land-use planning (incorporating climate change criteria), improved vulnerability assessment and climate-proofing communities); and protection of natural capital (with emphasis on measures to keep biodiversity priority areas intact – or to restore degraded ones, and increasing the extent of the protected area estate).

s. **National Water Resource Strategy (NWRS2)**

Department of Water and Sanitation (DWS) 2013

Building on the first NWRS (2004), the NWRS2 aims to ensure that national water resources are protected, conserved, used, developed, managed and controlled in an efficient, equitable and sustainable manner, to meet South Africa's development goals over the next five to ten years. It identifies three objectives, six key principles and seven strategic themes, one of which focuses on environmental protection and conservation of water resources (which is covered in Chapter 5). Of particular relevance to the biodiversity sector are strategic actions identified in Chapter 5 on Water Resource Protection, including those to: invest in Strategic Water Source Areas (SWSAs); maintain and rehabilitate water ecosystems; maintain Freshwater Ecosystem Priority Areas in a good ecological state; protect riparian and wetland buffers and groundwater recharge areas; rehabilitate strategic water ecosystems to maintain water quality and quantity; and monitor ecological health to inform management.

t. **National Water and Sanitation Master Plan**

DWS 2017 Draft for consultation (DWS 2017a)

Sets out a schedule of key and urgent actions needed for the period to 2030 to create a water sector that can meet national objectives as set out in the NDP and the SDGs. It sets out the critical actions and investments the country must implement between now and 2030 to overcome challenges and ensure a water secure future, including investment in ecological infrastructure. The Master Plan also sets out the roles and responsibilities, targets, timeframes and how performance will be monitored. For ease of engagement, the Master Plan is accompanied by a **Call to Action** (DWS 2017b), which addresses Water Management and the Enabling Environment in two sections. The draft Master Plan includes in the Action Plan for Industries, mining and Power Generation Sectors the development of a web-based Standardised Water Accounting Framework (SWAF) by DWS to address the high-level key water conservation/water demand management issue of poor reporting and monitoring tools.

33. **Regional and international policies** to which South Africa is signatory and that inform work on NCA in South Africa:

a. **Sustainable Development Goals (SDGs)**

A set of 17 goals set by the UN General Assembly in 2015 and cover social and economic development issues including global warming, water, environment, energy, social justice, and health. South Africa, as a member state of the UN, adopted the 2030 Development Agenda, which included the SDGs, at the UN Sustainable Development Summit in 2015. Target 15.9 is the integration of ecosystem and biodiversity values into national and local planning, development processes, poverty reduction strategies and accounts. Countries are required to report on progress towards SDG Targets. Stats SA are convening the compilation of South Africa's SDG report (refer to Section 3.4 for institutional mechanisms set up to support the coordination of SDGs). The SDG Indicator Baseline Report for South Africa was published in 2017 (Stats SA 2017), with a baseline suite of indicator values for those

indicators that have a universally accepted definition, method of computation and collection methodology, for which metadata and the necessary data to report progress on already existed within the country or elsewhere.

b. **UN Convention on Biological Diversity (CBD)**

Ratified by South Africa in 1996. Includes the requirement for an NBSAP as an integrated and coherent national strategy for conservation, management and sustainable use of the country's biodiversity to ensure equitable benefits for all. The 2014 Conference of Parties 12 saw the discussion of the CBD Strategic Plan for Biodiversity 2011-2020 and its Aichi Biodiversity Targets. South Africa's first NBSAP was developed in 2005 and was revised in 2015 to align with the Strategic Plan and the Aichi Targets. DEA is the National Focal Point and leads on country reporting to the UN CBD, Cartegena Protocol of Biosafety, Nagoya Protocol on Access and Benefit Sharing.

c. **UN Convention to Combat Desertification (UNCCD)**

Ratified by South Africa in 1997. South Africa has subsequently developed a National Action Plan, a process in which government, local communities and land users consider ways in which to combat desertification.

d. **Agenda 2063**

A strategic framework for socio-economic transformation on the continent over a 50-year period, 2013-2063 set by the African Union at the 16th Session of the African Ministerial Conference on the Environment (AMCEN) under the theme of *Investing in Innovative Environmental Solutions to accelerate implementation of Sustainable Development Goals and Agenda 2063 in Africa*. Agenda 2063 identifies several aspirations for the continent and sets out the goals, priority areas, targets and strategies to achieve them. Towards Aspiration 1: *A prosperous Africa, based on inclusive growth and sustainable development*, it identifies two strategies related to environmental-economic accounting, namely: the need to integrate economic, social, cultural, educational and ecological values of Africa's unique biodiversity into decision-making processes and indicators of economic growth including national accounting systems; and building valuation of blue/ocean capital into national accounting system (African Union Commission 2015).

e. **Gaborone Declaration on Sustainability in Africa (GDSA)**

South Africa is a member country of the GDSA, which was launched in 2012 with the overall objective "to ensure that the contributions of natural capital to sustainable economic growth, maintenance and improvement of social capital and human well-being are quantified and integrated into development and business practice". The first of the GDSA's three commitments encourages member countries to take action towards "incorporating the value of natural capital in public and private policies and decision-making". Under this commitment the GDSA Secretariat (GDSA 2015, 2016) has adopted a Communiqué on Natural Capital Accounting that

includes the recognition of the SEEA Central Framework as the initial version of the international standard for environmental-economic accounting. The GDSA is included on the agenda of the AMCEN.

f. **Paris Agreement** — Ratified by South Africa in 2016. An agreement negotiated at the 21st Conference of Parties of the United Nations Framework Convention on Climate Change (UNFCCC), and adopted in December 2015, dealing with greenhouse-gas-emissions mitigation, adaptation, and finance, starting in the year 2020.

34. **Natural capital accounts provide several important pieces of information in support of policy and decision making.** Table 1 provides a summary, although not exhaustive, of ways in which NCA can provide information to support policy analysis and formulation, planning and decision-making in South Africa.

Table 1. Key policy commitments by South Africa to sustainable development with a summary of ways in which NCA can provide information to support policy analysis and formulation, planning and decision-making.

Policies	Ways in which information from natural capital accounts may be useful
National government strategies and plans e.g. NDP; MTSF; NGP and Provincial Growth and Development Strategies; National Infrastructure Plan & SIPs	• Economic modelling and fiscal risks related to sustainable development, climate change and transitioning to a low-carbon economy. • Setting limits in natural resource and carrying capacities, pollution standards, standards of living and distributional, cultural and political standards for economic activities can be used to turn the analysis of sustainability of growth into one of the 'feasibility' of development, through which consensus around different scenarios can be explored. • Formalising environmental data and official statistical indicators for natural resources called for by the NDP (DEA is leading this process). • Audits, performance and financial reporting (e.g. link to municipal Standard Chart of Accounts for local government reporting). • Socio-economic / cost benefit analysis in determining trade-offs and environmental costs (link to Budget Facility for Infrastructure, and guarantees to state owned entities). • Evaluation of policy, environmental taxes, and return on investment (extent to which expenditure on a specific programme/policy has made material impact on ecosystems).
Spatial development planning e.g. SDFs; NSDF; IUDF	• Spatial development planning at all levels, by tracking changes over time in a spatially explicit manner e.g. looking at patterns in land use change. • Providing detailed, spatial information on ecosystem services supply, enabling better understanding of linkages between healthy nature and healthy people with implications for local and provincial government e.g. implications of lowering ecosystem condition in areas where there is a high dependence on ecosystem services). • Evaluation of policy at a city region level, environmental performance plans and the use of grant funding to incentivise change.

Policies	Ways in which information from natural capital accounts may be useful
Biodiversity related policies and strategies e.g. NBSAP, NBF, Framework for Investing in Ecological Infrastructure, NPAES, EbA Strategy, BSCCRS	• Monitoring the status of ecosystem assets and tracking progress in meeting national targets. • Providing consistent framework for, for example, numerical analysis of protected area information. • Contributing towards achieving specific activities (such as NBSAP Activity 3.6.2 and the NBF measure to develop a National Strategy for Ecosystem Accounting). • Prioritising ecological infrastructure for investment. • Monitoring and assessing return on that investment in ecological infrastructure. • Demonstrating the benefits of new public investment in protected areas or other ecological infrastructure to decision makers at national and provincial levels. This capacity can be enhanced by providing information, analysis, communication material to defend and increase budgets.
Water related policies strategies e.g. NWRS2, NWSMP	• Supporting a web-based Standardised Water Accounting Framework (SWAF) to be developed by DWS (DWS 2017a, p6-57). • Monitoring of change over time in ecological condition in water-related ecosystems or strategic water source areas (SWSAs) over time.
Regional and international policies and strategies e.g. SDGs, CBD, Agenda 2063, GDSA	• Tracking progress in and meeting international and regional obligations, such as SDG Target 15.9 and Aichi Biodiversity Target 1 and 2, Agenda 2063 Aspiration 1 and GDSA commitments. • Enhanced credibility through applying SEEA, as the international standard for environmental-economic account accounting used by other governments, research communities, and entities such as the United Nations, European Commission, Food and Agriculture Organisation of the United Nations, International Monetary Fund, Organisation for Economic Co-operation and Development, and The World Bank Group.

3.1.1. Implications for the national strategy

35. **South Africa's policy context supports the integration of information from natural capital accounts, including biodiversity and ecosystem values, into policy and decision-making.** The management, conservation and sustainable use of South Africa's natural resource base, including ecosystems and biodiversity assets, is embedded in South Africa policy and seen as part of sustainable development, including in the NDP and MTSF. The foundation for this is the State's responsibility to respect, protect, promote and fulfil the environmental right contained in the Constitution (Section 24), and the Principles of the National Environmental Management Act (No. 107 of 1998, Section 2), which guide all environmental management decision making and apply to the actions of all organs of state that may significantly affect the environment. In addition, as a country that is a signatory to the CBD and SDGs, South African policy is aligned with relevant regional and international policies.

36. **NCA will provide information relevant to the evaluation and consideration of several policies in South Africa.** For example, information from NCA could provide important indicators to track the implementation of policies including the overall set of indicators being developed for the NDP. Reliable statistics from NCA will help government evaluate and improve policies, and support

government being transparent and accountable about the delivery of development results. *The national strategy should: identify the key policies and indicators that will use information from different types of natural capital accounts; assess gaps in development or updating of accounts; prioritise natural capital accounts to meet policy needs; and address engagement with relevant Departments responsible for identified key policies to ensure uptake of information.*

37. **NCA should provide another source of statistical information that adds to the richness of evidence available to policy and decision-makers**. Accounts provide a framework for numerically describing and analysing, in a consistent way, large quantities of information to provide good, reliable statistics. *The national strategy should support this through alignment with relevant policy and institutional mechanisms that exist to ensure evidence-based policy and decision making. It should also support an adaptive management approach through feedback loops between outcomes of policies and decisions and knowledge generation, and promoting effective mechanisms for accessing and interpreting the relevant knowledge base*. The next section looks at the policy and frameworks related to national statistics and information on sustainable development.

3.2. Policies and frameworks related to national statistics

38. This section considers the South African government's policies and frameworks that relate to strengthening national statistics and improving information on sustainable development for evidence-based policy and decision making. These policies and frameworks include:

a.	**Stats SA's Strategic Plan (2015-2019) and Work Plan** Stats SA 2015	Guides statistical reform and coordination among stakeholders. The Strategic Plan includes a focus on Sustainable Resource Management, which can serve as an umbrella for SEEA Central Framework and SEEA EEA initiatives. It also states that statistical information systems that inform planning, monitoring, evaluation and reporting on sustainable development must align with SEEA. Stats SA published a thematic report on environmental statistics from a household perspective in order to inform policy and strategy on sustainable resource management (Stats SA 2018). These will be updated every five years. Mention is made of leading legislative reform towards Stats SA taking a leadership role in providing and coordinating spatial statistics to inform policy processes (as required by the NDP). The Strategy makes specific mention of consultation and advocacy processes in strengthening the South African National Statistical System (NSS) and in developing the South African National Strategy for the Development of Statistics (NSDS).
b.	**South African National Statistical System (NSS)** Stats SA	The South African NSS is intended to comprehensively include all organs of state that are producing official statistics, employ code of ethics and sound practices for official statistics, harmonise the production and dissemination of statistics, promote the use of official statistics in policy development, policy monitoring and evaluation as well as decision-making efforts, elevate and sustain the elevation of official statistics throughout the organs of state and civil society and provide a framework for the development of the South African NSDS.

c.	**National Strategy for Development of Statistics (NSDS)** Stats SA Under development	A statistical strategy with action plans to strengthen the statistical capacity of the South African NSS. "It shows what and how statistics will be collected and published and identifies the financial, human and technical resources that will be available to the NSS. The core element is the medium-term objectives of the statistics system. The statistics strategy is an explicitly political document and requires authorisation and active participation from decision makers" (Stats SA 2015). Stats SA will lead the process of developing the first NSDS for South Africa, beginning in April 2019 (see Appendix 5.2 for summary of contents of NSDS).
d.	**South African Statistical Quality Assessment Framework (SASQAF)**[15] Stats SA 2009	Provides a framework for quality assessment across the statistical value chain (see Appendix 5.3), developed to ensure good quality statistical products (ensuring that both the underlying data and the statistical product adhere to relevant standards). It is part of the process by which statistical information in South Africa is improved in terms of its comparability and accuracy by institutionalising an end-to-end quality management system in line with the Fundamental Principles of Official Statistics and the African Charter on Statistics. SASQAF is used for self-assessment by data producers (government departments and others) as a standard for assessing the quality of statistics. Self-assessments are then reviewed by a Data Quality Assessment Team in context of the NSS for certifying statistics as official, as stipulated in the Statistics Act (Act No.6 of 1999). SASQAF, although translatable for any statistics, was not developed with spatial or environmental data quality in mind.
e.	**Integrated Indicator Framework (IIF)** Stats SA Under development	The IIF aims to align indicators required for reporting on SDGs, NDP, Agenda 2063 and the MTSF. The IIF will not include all indicators, but rather a core set of national indicators that Stats SA have approved, and will help to ensure relevant, replicable, up-to-date and standardised indicators and coordination to avoid duplication of monitoring efforts.
f.	**South African Spatial Data Infrastructure (SASDI)**[16] DRDLR	Established through the Spatial Data Infrastructure (SDI) Act (2003), it is administered by the Department of Rural Development and Land Reform (DRDLR). It is established as a national technical, institutional and policy framework to facilitate the capture, management, maintenance, integration, distribution and use of spatial information through cooperation among organs of state. It promotes the use and sharing of spatial information in support of planning, socio-economic development and related activities. *SDI*

[15] Available at http://www.statssa.gov.za/standardisation/SASQAF_Edition_2.pdf
[16] South African Spatial Data Infrastructure (SASDI) Website – http://www.sasdi.gov.za/

Regulations and *SASDI Compliance Guidelines* can also be published through the SDI Act (2003). These would set out spatial information standards and prescriptions to: facilitate sharing and integration of spatial information that must be adhered to by data custodians and data vendors.

g. **Policy framework for the Government-wide Monitoring and Evaluation System (GWM&ES)**

The Presidency 2007

Provides the overarching policy framework for monitoring and evaluation (M&E) in the South Africa Government and is applicable to all entities in the national, provincial and local spheres of government. It highlights the importance of M&E in providing an evidence base for public resource allocation decisions and more effective government through evidence-based decision making.[17] It identifies three data terrains that together comprise the sources of information on government performance: (i) evaluations (in terms of the *National Evaluation Policy Framework*), (ii) Programme Performance Information (in terms of National Treasury's Framework for *Managing Programme Performance information*) and (iii) social, economic and demographic statistics (official statistics certified in terms of SASQAF). It assigns to accounting officers[18] the accountability for the frequency and quality of monitoring and evaluation information; the integrity of the systems responsible for the production and utilisation of the information; and it requires prompt managerial action in relation to M&E findings.

h. **Framework for Managing Programme Performance Information**

National Treasury 2007

Aims to define roles and responsibilities and clarify standards for performance information, supporting regular audits of non-financial information where appropriate. The document outlines key concepts in the design and implementation of management systems to define, collect, report and utilise performance information in the public sector. National Treasury, in accordance with the Public Finance Management Act (PFMA) (No 1 of 1999), must promote and enforce transparency and effective management in respect of revenue, expenditure, assets and liabilities of departments, entities and constitutional institutions. National Treasury supports this through a *Performance Information Handbook* (National Treasury 2011), which encourages the inclusion of financial, economic and environmental sustainability performance information concepts (including 'accounting for sustainability').

i. **National Evaluation Policy Framework (NEPF)**

The NEPF is the last of the three policy elements introduced in the Policy Framework for the GWM&ES - the other two elements being programme performance information and quality of statistical data (SASQAF). This Policy Framework provides the basis for a minimum system of evaluation across government. Evaluation is defined as the systematic collection and objective

[17] Defined by The Presidency (2007) as "the systematic application of the best available evidence to the evaluation of options and to decision making in management and policy settings. Evidence can come from any of the three data terrains outlined in the GWM&E system, as well as from research studies and local community information".

[18] It is a statutory requirement in terms of the PFMA Section 27(4), that national departments' accounting officers must submit measurable objectives with their draft budgets to Parliament and provincial accounting officers submit to provincial legislatures. It is a requirement that a monitoring and evaluation system for the institution be established.

	DPME 2011	analysis of evidence on public policies, programmes, projects, functions and organisations to assess issues such as relevance, performance (effectiveness and efficiency), value for money, impact and sustainability, and to recommend ways forward. It seeks to ensure that credible and objective evidence from evaluation is used in planning, budgeting, organisational improvement, policy review, as well as ongoing programme and project management, to improve performance. Key elements focus on 5-yearly evaluation of large or strategic programmes such as government's 12 Outcomes and five areas of public interest (health, crime, jobs, rural development and education) and rolling three year and annual national and provincial evaluation plans.
j.	**Environment Sector Research, Development and Evidence (R,D&E) framework** DEA 2012	This framework falls within the national research agenda of the country as framed by the National Research & Development Strategy in 2002, the Ten-Year Innovation Plan of 2008 and the 2012 Global Change Research Plan, led by the Department of Science and Technology (DST). The framework identifies environmental sector priorities, under several themes, that inform evidence needs. Priorities are drawn from DEA's State of Environment report (which reports on improvement or degradation of the South African environment) and the agenda for the sector set through Outcome 10 and Sector Plan priorities. This agenda was further aligned to the research and evidence drive of the DPME in The Presidency as well as the Department of Public Service and Administration (DPSA) on guiding improvement of the efficiency and efficacy of the public administration.

39. International and regional policies include:

a.	**Cape Town Global Action Plan for Sustainable Development Data** UN 2017	The Cape Town Global Action Plan for Sustainable Development Data was informally launched at the first UN World Data Forum on 15 January 2017 in Cape Town South Africa, and adopted by the United Nations Statistical Commission at its 48th Session in March 2017. It outlines the necessary actions to generate quality and timely data on a routine basis to inform sustainable development. Its six strategic areas includes strengthening national statistical systems, addressing coordination, multi-stakeholder partnerships and strategic leadership on data for sustainable development, addressing monitoring needs of the 2030 Agenda, dissemination and use of sustainable development data, as well as to identify new and strategic ways to efficiently mobilize resources. It replaces the 2011 Busan Action Plan for Statistics and the 2004 Marrakech Action Plan for Statistics.
b.	**Strategy for the Harmonisation of Statistics in Africa (SHaSA)**	SHaSA is coordinated by the Statistics Division of the African Union and was passed by African Heads of State and Government to give effect to the African Charter on Statistics, thus providing a framework for the African Statistical System (ASS). The vision of the ASS is to generate timely, reliable, and harmonised statistical information, covering all aspects of political,

African Union 2010	economic, social, and cultural integration for Africa. It aims to produce and coordinate the production of quality statistics for Africa, to build sustainable institutional capacity in the ASS, and to promote a culture of quality decision-making. Addressing challenges in statistics around current and topical issues such as HIV/AIDS, environment, climate change, food and financial crises is considered important in reflecting African realities.

40. **Statutes that underpin these policies and are particularly relevant in terms of the institutional and legal frameworks to support NCA are:**

a.	**The Statistics Act** (No. 6 of 1999) Stats SA	Is in the process of being revised. The Statistics Act mandates the Statistician-General as head of Statistics South Africa, who is responsible for the collection, production and dissemination of official and other statistics, to formulate quality criteria and establish standards, classifications and procedures for statistics produced by all organs of state and other agencies that produce statistics and to designate as official, statistics or class of statistics produced by any organ of state. The purpose of this Act is to advance the planning, production, analysis, documentation, storage, dissemination and use of official and other statistics. Official statistics are intended to assist organs of state, businesses, other organisations or the public in planning, decision-making or other actions, monitoring or assessment of policies, decision-making or other actions.
b.	**Spatial Data Infrastructure (SDI) Act** (No. 54 of 2003) DRDLR	Applies to organs of state which hold spatial information and to users of spatial information. The South African Spatial Data Infrastructure (SASDI) is established as the national technical, institutional and policy framework to facilitate the capture, management, maintenance, integration, distribution and use of spatial information. The Act provides for the determination of standards and prescriptions to facilitate sharing of spatial information, the capture and publishing of metadata to avoid duplication of capture and matters concerned therewith (e.g. appointment and responsibilities of data custodians). The Act is administered by the Department of Rural Development and Land Reform (DRDLR).
c.	**Promotion of Access to Information Act (PAIA)** (No. 2 of 2000)	PAIA was enacted to give effect to the Constitutional right of access to information. Its objectives include: to promote transparency, accountability and effective governance of all public and private bodies; to assist members of the public to effectively scrutinise and participate in decision making by public bodies; to establish voluntary and mandatory mechanisms or procedures which give effect to the right of access to information in a speedy, inexpensive and effortless manner.

d.	**Integrated Planning Framework Bill** Released in 2018 for public comment.	Seeks to provide for the functions of the DPME; support effective monitoring and evaluation of government programmes aimed at improved service delivery and positive impact on society (implementing the NDP); and provide for the continued existence of the National Planning Commission (NPC); and promote better coordination, collaboration and alignment of Planning, Monitoring and Evaluation between and across the national, provincial and local spheres of government, and including public entities. The Bill states that DPME must "analyse and disaggregate trends and data, including statistical information, in order to inform planning processes across all spheres of government", establish a central information repository to ensure that planning, monitoring and evaluation is evidence-based and informed by research and analysis, collect data, be a repository, enable forecasting and modelling and enable production of maps and models of future scenarios.

3.2.1. Implications for the national strategy

41. **South Africa has policies and frameworks that provide for the systems and institutional mechanisms through which the production of natural capital accounts would be supported.** These include the Presidency's evaluation-related policy frameworks that emphasise the importance of data to support evidence-based decision-making; National Treasury's Performance Information-related policy and frameworks that require the inclusion of financial, economic and environmental sustainability performance information concepts (including 'accounting for sustainability'); Stats SA's policy and frameworks through which official statistics are coordinated, produced, certified and disseminated; and DRDLR's policy on spatial data infrastructure that is so important to the compilation of ecosystem accounts in particular. *The national strategy should align with these existing policies and frameworks.*

42. **Statistical information systems that inform planning, monitoring, evaluation and reporting on sustainable development are already required to align with SEEA** (Stats SA 2015)**, and there are opportunities to further embed this**. *The national strategy should address opportunities to enhance or leverage existing policy and frameworks that are under review or development towards further alignment with SEEA and advancing NCA in South Africa*. For example:

    a. **Stats SA's Strategic Plan is for the period 2015-2020.** When this Strategic Plan is revised there may be opportunities to further strengthen the integration of SEEA as the framework for environmental-economic information.

    b. The **process to development the NSDS** will begin in 2019, providing an important opportunity to include environmental statistics.

    c. **SASQAF could be enhanced** to include considerations of spatial and environmental data quality. *The national strategy may give consideration to prioritising indicators based on natural capital accounts as candidates for certification as "official statistics" in terms of SASQAF.*

    d. **Influencing geospatial information standards and prescriptions through SDI Regulations and/or SASDI Compliance Guidelines** (published in terms of the SDI Act,

2003) to facilitate sharing, integration and standardisation of spatial information relevant to natural capital accounts.

43. **Stats SA's mandate to coordinate the development of statistics underpins its role in coordinating the compilation of information and statistics for the SDG report**. Reporting on SDGs requires coordination and integrative work across departments and other entities. Similar co-ordination would be required in producing natural capital accounts, and could build on the institutional mechanisms that have been established for SDG reporting.

44. **There are opportunities for further expanding the implementation of the SEEA Central Framework and testing the SEEA EEA to provide integrated and comprehensive statistics on the links between natural resources, ecosystems and socio-economic priorities, which would support SDG reporting**. SEEA should provide the framework for environmental-economic information in the South African NSS and NSDS in particular.

45. **There are existing national indicator frameworks and initiatives to monitor the status of sustainable development policy, and efforts to integrate indicator frameworks for reporting on these plans and goals**. However, it is not clear whether existing indicators constitute an optimal set from which to measure progress and assess trade-offs between competing objectives that are inevitable in sustainable development. There is work needed to include standardised, Stats SA approved indicators from natural capital accounts in relevant indicator frameworks such as the national indicators used to report on SDGs, the NDP, Agenda 2063 and the MTSF, and thereby the IIF. A recommended priority for environmental accounting is to feed into the IIF.

46. **The relationship between and roles of Stats SA (implementing the Statistics Act), DPME (implementing the still to be finalised Integrated Planning Framework Bill) and DRDLR (implementing the Spatial Data Infrastructure Act) in terms of coordination and storage of information, in particular geospatial information, requires some investigation.** Although the Statistics Act makes no explicit mention of geospatial data, the Stats SA Strategic Plan makes mention of legislative reform towards Stats SA taking a leadership role in providing and coordinating spatial statistics. In such an evolving legislative context, the institutional arrangements are likely also to evolve. *The national strategy should help to clarify institutional arrangements for the production of environmental-economic accounts and ecosystem accounts, and in particular should address the respective roles of Stats SA, DPME and DRDLR in relation to the geospatial data that underpins these accounts.*

3.3. Relevant institutional mechanisms

47. **This section focuses on key multi-sectoral institutional mechanisms that enable coordination across the breadth of stakeholders involved in NCA, and could play a role in supporting the production and/or uptake of natural capital accounts.** They include national and international mechanisms.

48. **Institutional mechanisms focused on implementing policies and plans related to sustainable development in South Africa and/or information on sustainable development in South Africa include**:

a. The **National Planning Commission (NPC)**

Convened by The Presidency

Is the apex national planning body in the country with members including the Minister of the Presidency (overseeing the DPME) and members appointed by the President. Its purpose is to advise on and provide strategic direction in the implementation of the NDP, develop monitoring and evaluation mechanisms to ensure effective implementation of the NDP, and evaluate effectiveness of its implementation. The Commission meets monthly and may establish committees and for purposes of research. The Commission established its own expert panels consisting of experts from both inside and outside government. The expert panels provided advice on issues such as water security, food security, and economic development, social security, education, climate change, social cohesion, spatial issues, health and human resource development.

b. **National intergovernmental structures for coordinating environmental management**

Convened by DEA

Provide the basis for cooperative governance, and enable consideration of trade-offs between competing objectives and decision-making that supports sustainable development. These include:

- **Minister and Members of Executive Councils (MEC) Committee (known as MINMEC),** which is a forum that meets quarterly to promote co-operative governance between national ministers and their respective counterparts (MECs) at provincial level. The Environment MINMEC comprises the Minister of Environmental Affairs, the Director-General of DEA and the provincial MECs for Environmental Affairs (as mandated by Intergovernmental Relations Framework Act (No.13 of 2005)).
- **Ministerial Technical Committee (MINTECH)**, which is a forum that meets quarterly to facilitate coordination between DEA and the provincial environmental departments. It comprises the Director-General of DEA, representatives of public entities including SANBI and South African National Parks (SANParks), and the heads of the provincial departments responsible for environmental management and biodiversity conservation (as mandated by Intergovernmental Relations Framework Act of 2005).
- **A series of MINTECH Working Groups,** which bring together senior officials in national and provincial government, including Working Groups that deal with Biodiversity and Conservation, Air Quality, Environmental Sector Coordination and Information Management, Compliance and Enforcement, Integrated Environmental Management/Authorisation, Job Creation and Expanded Public Works Programmes, Oceans and Coasts, Waste and Chemical Management, Climate Change, Law Reform and Policy Development, and Communications. The Working Groups also meet quarterly, ahead of MINTECH and MINMEC meetings.

c.	**Interdepartmental Committee on Inland Water Ecosystems** Convened by DWS	Convened twice a year and brings together all organs of state whose mandates are relevant to the management of freshwater ecosystems, including DEA, DAFF, SANBI, SANParks, WRC and others.
d.	**Interdepartmental Project Implementation Committee** DMR & DEA	Established with representation of DEA, DWS and DMR, with the aim of ensuring aligned implementation of the three Acts from which these departments draw their mandates, i.e. the National Environmental Management Act of 1998, the National Water Act of 1998 and the Mineral and Petroleum Resources Development Act of 2002.
e.	**Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES)** Hosted by DEA	Is a body that assesses the state of biodiversity and of the ecosystem services it provides to society, in response to requests from decision makers. IPBES is hosted in South Africa by DEA, as part of its commitment to evidence-based decision and policy making for the conservation and sustainable use of biodiversity, long-term human well-being, and sustainable development. IPBES is driving the agenda for the biodiversity theme of the Environment Sector R,D&E framework and supports commitments to the CBD and UNCCD.
f.	**Intergovernmental coordinating and multi-stakeholder forums on R, D & E** Convened by DEA	Should be convened according to the Environment Sector R,D&E framework. This has not yet taken place, other than in relation to the biodiversity theme with DEA's Biodiversity Research and Evidence Indaba (June 2018). The forums are aimed at improving the sector's ability to identify priority evidence needs for effective management, conservation and sustainable use of environmental assets and natural resources by working with others (national, provincial, local, private, civil society, NGOs, research institutions and academia).
g.	**BIOFIN-SA Steering Committee** DEA	BIOFIN South Africa is guided by a national Steering Committee, and receives technical input from a national Technical Reference Group. It is also a standing item on MINTECH Working Group 1 convened by DEA. The BIOFIN Steering Committee oversees the project's implementation, including the development of the Biodiversity Finance Plan and its implementation. The Steering Committee includes representatives from National Treasury, SANBI, SANParks, Stats SA and DEA.

49. **Multi-sectoral institutional mechanisms focused on strengthening statistical systems to produce reliable statistics and coordinate compilation of information on sustainable development in South Africa and/or NCA initiatives**:

a. **National Coordinating Committee and Working Group structure to address information needs for the SDGs**

Coordinated by Stats SA

The National Coordinating Committee (NCC) is the overarching structure established to discuss and adopt reporting on implementation of commitments made under the SDGs (previously the Millennium Development Goals (MDGs)), the NDP and Agenda 2063. The NCC involves high-level government officials, heads of institutions, and should include representatives from NGOs, private sector, organised labour and civil society. Supporting the NCC, there is a Working Group structure involving:

- **Sectoral Working Groups (SWG)** namely social, economic, environment and peace, safety and governance SWGs. Sub-structures of the SWGs will be created based on workload. SWGs provide a pathway for various role-players including government, private sector, academia, NGOs etc. to significantly address data gaps in country indicators. The Environment SWG includes, but is not limited to DEA, DWS, Department of Energy (DoE), SANBI and Department of Human Settlements.
- **Technical Working Group**
- **Extended Report Drafting Team**
- **Report Drafting Team**

b. **Committee for Spatial Information (CSI)**[19]

Convened by DRDLR

Established through the Spatial Data Infrastructure Act, 2003. Members are appointed by the Minister of Rural Development and Land Reform in terms of Section 5 of the SDI Act, 2003, and must include representatives from Stats SA, the National Geo-Spatial Information (NGI) component of DRDLR,[20] national government departments, provincial and local government, professional GIS association, academia, public entities, and any other data custodians. The Committee must facilitate, promote and safeguard an environment for the efficient collection, management, distribution and utilisation of spatial information and must monitor and acquire information relating to the functioning of structures or measures under the SDI Act, in particular the SASDI. Members of the CSI include, but are not limited to, representatives from: DRDLR, Stats SA, DWS, Department of Transport, DPME, provincial Premier's Offices, South African National Space Agency, CSIR, and two municipalities.

[19] Subcommittees: **Policy and legislation subcommittee** to develop policies, legislation in support of SASDI; **Data subcommittee** to promote availability, accessibility and dissemination of data; **Systems subcommittee** to develop technical systems in support of SASDI; **Standards subcommittee** to develop standards for SASDI; **Education and training subcommittee** to build capabilities for SASDI through education and training; **Marketing and communications subcommittee** communicate SASDI and CSI activities.

[20] http://www.ngi.gov.za/

c.	**National Spatial Information Framework (NSIF)** DRDLR	Is an initiative led by DRDLR to coordinate the development of infrastructure needed to support the utilisation of spatial information in decision making. It aims to build the Spatial Data Infrastructure (SDI) and ensure geospatial information is an enabler in assisting government in achieving its development goals as outlined in the NDP. This building includes policies, institutional arrangements, developing human resources and standards for geospatial information. Its purpose is to develop and implement SASDI, be the secretariat to the CSI, and ensure and support compliance with the SDI Act. The NSIF (and CSI) perform administrative and support functions on behalf of the Minister of rural Development and Land Reform. NGI is a key contributor to this initiative as well as being the largest custodian of geospatial information.
d.	**A Strategic Advisory Committee for Ecosystem Accounting** Dormant	Established for the ANCA Project, but with no impetus or resources for long-term functioning. A sub-objective of the GEF-funded, DBSA-implemented and SANBI executed Ecological Infrastructure for Water Security Project (2018-2023), is to strengthen capacity, institutional arrangements and time series data to enable regular production of relevant natural capital accounts through, amongst other activities, convening a Strategic Advisory Committee for Ecosystem Accounting.

50. Regional platforms:

a.	**AMCEN** Coordinated by African Union	Convened every second year since 1985 with a mandate to "provide advocacy for environmental protection in Africa; to ensure that basic human needs are met adequately and in a sustainable manner; to ensure that social and economic development is realised at all levels; and to ensure that agricultural activities and practices meet the food security needs of the region".[21] AMCEN recognises that natural capital underpins the continent's economy, and is fundamental towards achievement of the United Nations 2030 Agenda on Sustainable Development and SDGs, and the African Union Agenda 2063.[22]
b.	**NCA community of practice** Established by GDSA	Established for the purpose of promoting learning and sharing of approaches, experiences and best practices in NCA among the GDSA countries via south-south exchanges, dialogues by both practitioners and decision-makers on NCA, and training opportunities as appropriate, including both technical practitioners (account producers and analysts) and decision-makers (account users). The NCA community of practice is intended to meet annually for 2-4 days, pending funding.

[21] https://europa.eu/capacity4dev/unep/events/african-ministerial-conference-environment-amcen

[22] AMCEN/15/3. Ministerial policy dialogue: managing the natural capital of Africa for sustainable development and poverty eradication. Available at http://web.unep.org/sites/default/files/amcen6/amcen-15-3-eng.pdf

c.	**UN Economic Commission for Africa (ECA)**	Established in 1958 as one of the UN's five regional commissions, ECA's mandate is to promote the economic and social development of its member States, foster intra-regional integration, and promote international cooperation for Africa's development. A founding member, South Africa was expelled in 1963 and resumed official participation in 1995. South African departments and cooperating organisations participating in ECA include all Government Departments, the Development Bank of Southern Africa (DBSA), South African Reserve Bank and Committee of Heads of Scientific Councils. The ECA offers specialised regional advisory services and meaningful capacity development support to member States across several priority areas, including promoting the proper management of natural resources for Africa's transformation. The theme of the most recent ECA Conference was *Towards an Integrated and Coherent Approach to Implementation, Monitoring and Evaluation of Agenda 2063 and the SDGs.*

51. Multi-stakeholder institutional mechanisms that bridge the public, non-governmental organisation, civil society and private sectors:

a.	**The Natural Capital Coalition**	An international multi-stakeholder collaboration that unites the global natural capital community representing business, finance, accounting, conservation, academia and policymakers. Through the Coalition the *Natural Capital Protocol* was developed to offer a standardising framework for organisations to identify, measure and value their impacts and dependencies on natural capital, therefore creating new opportunities for value creation. It is intended to enable businesses to assess and better manage their direct and indirect interactions with natural capital.
b.	**The Green Economic Coalition**	The Green Economic Coalition, in partnership with the African Centre for Green Economy and Trade and Industrial Policy Strategies, are coordinating and consulting widely with various partners in South Africa towards understanding the transition to a green economy. Supporting companies and governments to understand the value of nature in their economic decisions is part of this.
c.	**The National Business and Biodiversity Network (NBBN)** EWT & DEA	Assist businesses from various sectors to integrate and mainstream biodiversity issues into their strategies and operations. It was launched by the Endangered Wildlife Trust (EWT) in collaboration with DEA and numerous private sector partners, and holds annual NBBN Indabas.
d.	**The Partnership for Action on**	Launched in 2013 as a response to the call at Rio+20 to support those countries wishing to embark on greener and more inclusive growth

	Green Economy (PAGE) DEA	trajectories. PAGE brings together five UN agencies whose mandates, expertise and networks combined can offer integrated and holistic support to countries on inclusive green economy, ensuring coherence and avoiding duplication. PAGE in South Africa aims to strengthen cooperation, coordination and capabilities required to implement the country's planned green economy transition. PAGE in South Africa has undertaken a green economy learning assessment, green economy industry and trade analysis and green economy inventory for South Africa, and coordinates sectoral and thematic stakeholder consultations and training workshops related to the green economy.
e.	**South African Mining and Biodiversity Forum (SAMBF)**	Established in 2005 in an effort to enhance biodiversity management in the mining industry. The Forum brings together stakeholders from industry, conservation bodies and government, with the aim of providing an opportunity for cross-sectoral interaction and cooperation aimed at improving biodiversity conservation, management and performance in the mining industry within the South African legislative framework**.**
f.	**Strategic Water Partners Network (SWPN)** Host and secretariat: NEPAD Business Foundation	Promotes discussion and collaboration between public and private sector parties on water issues and improved management. A partnership between the public sector (primarily the DWS), the private sector and civil society working collectively to close a 17% gap between water supply and demand that is anticipated to manifest by the year 2030 in South Africa. Established in 2011, it strives to contribute to efficient, equitable and sustainable water supply and access to water for all South Africans through the identification and application of innovative and cost-effective solutions and programmes.

3.3.1. Implications for the national strategy

52. **A number of multi-sectoral institutional mechanisms exist that can support and enable the production and uptake of natural capital accounts in South Africa.** These are illustrated in

53. Figure 5. Those focused on implementing policies and plans towards sustainable development and/or information on sustainable development in South Africa are considered likely supporters and/or users of information generated through NCA, while those focused on strengthening statistical systems to produce reliable statistics in South Africa and/or NCA initiatives are considered important in influencing the production of natural capital accounts. *The national strategy should carefully consider use of existing institutional mechanisms (structures) to mainstream NCA into existing statistical plans and processes. These include structures guiding the development of the NSDS and SDG reporting*.

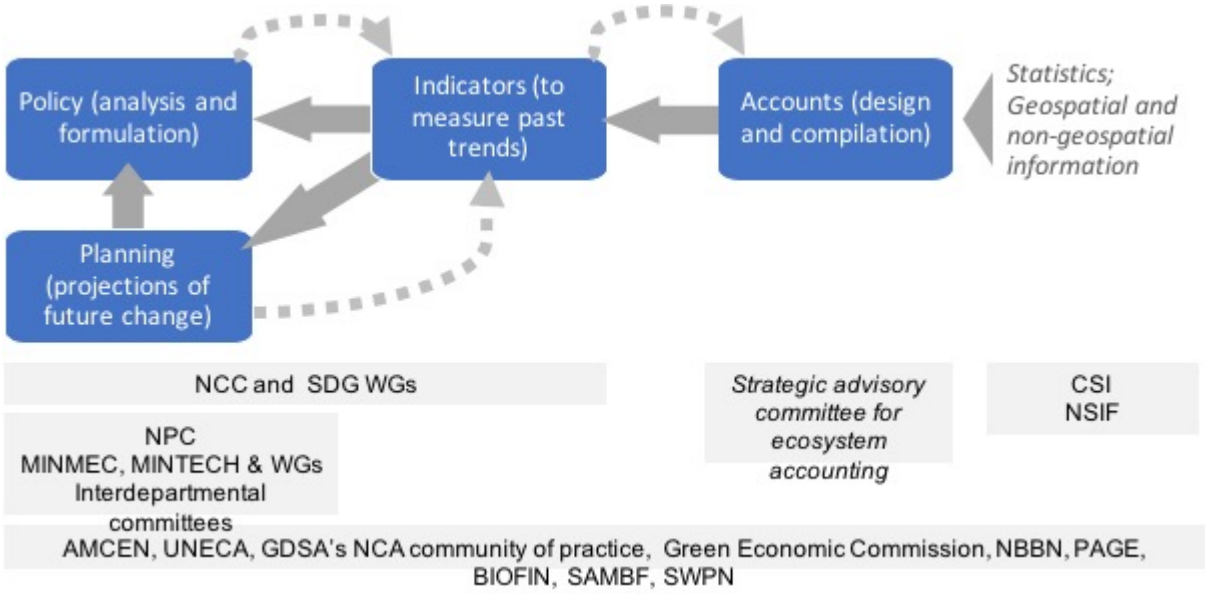

Figure 5. Distribution of existing institutional mechanisms across the NCA value chain

54. **There is fairly good collaboration at the technical level between key stakeholders** such as Stats SA, SANBI, DEA, DWS, DRDLR and DPME (e.g. through the NCC, CSI and SDG Working Groups).

55. **Stats SA has an important role on the CSI** that can be used to influence geospatial data standards nationally, facilitate work on spatial frames for environmental data, and play a key role in engaging other departments in collaborative efforts to harmonise geospatial data.

56. **The NCC and SDG Working Group on environmental indicators provides an important platform through which links can be made between the SEEA and SDGs.** The SEEA framework for NCA would support information that ensures a coherence of data and appropriate integration of geospatial data and indicators that are compatible with international standards. The GDSA NCA Community of Practice may also provide an NCA-focused platform through which experience and lessons learnt through application of SEEA might be shared.

57. **It is important to note that often the effectiveness of these structures and mechanisms depends on the officials who champion them.** The effectiveness and functionality of particular institutional mechanisms is a factor to consider when evaluating how they might support the advancement of NCA in South Africa. *How to make most effective use of existing structures should be given careful consideration in the development of the national strategy* (e.g. in terms of who the champions are and their views on NCA, which structure(s) may best support particular objectives and functions related to NCA, and so on). It should be recognised that there is an emergent quality to this and an adaptive approach may be required.

3.4. Key stakeholders in the institutional setting

58. Based on the review of relevant policies and relevant institutional mechanisms in the sections above, a set of key stakeholders has been identified. These are the organisations that support and enable the planning, monitoring, evaluation and reporting on sustainable development in South

Africa, and that strengthen national statistics, the production of accounts and provision of information on sustainable development.

59. The role of these stakeholders is described in terms of their main relationship (or main potential relationship) to natural capital accounts, categorised into three non-exclusive groups:

    a. Producers of natural capital accounts

    b. Users of information from natural capital accounts

    c. Interested parties and potential users

60. The key national stakeholders are considered to be:

    a. **The Presidency** has the key role of the coordination, monitoring, evaluation and communication of government policies and programmes with the aim of facilitating an integrated and coordinated approach to governance. The Presidency, which includes the President, Deputy President, Minister and Deputy Minister of Performance, Monitoring and Evaluation and the Minister of Women, aims to evaluate the implementation of government strategy, including its impact as measured against desired outcomes.

    b. **Stats SA** as the country's national statistical office, responsible for the implementation of the Statistics Act (No. 6 of 1999). The Statistics Act gives the Statistician-General, appointed by the President, power to designate statistics produced by other organs of state as official statistics, to comment on the quality of national statistics produced by another organ of state, and to publish such other department's statistics. Stats SA is a key enabler of NCA as through the South African NSS it must "promote the use of official statistics in policy development, policy monitoring and evaluation as well as decision-making efforts, elevate and sustain the elevation of official statistics throughout the organs of state and civil society and provide a framework for the development of the South African NSDS". Stats SA has convened the compilation of South Africa's SDG reporting. Stats SA currently maintains a small unit that has produced environmental accounts. There is currently flux in the publication of environmental accounts but Stats SA maintains the relationships needed for their production.

    c. **DPME** as the Department in The Presidency that is responsible for setting government priorities (with the main instrument being the NDP), monitoring and evaluation, and that will implement the Integrated Planning Framework Bill (2018) once it is finalised. DPME currently works in terms of general Constitutional mandate (Clause 85) for the President to coordinate the functions of state departments and administrations and obtaining Cabinet approval for each new aspect of DPME work. DPME collaborates with National Treasury in supporting all Departments to develop Performance Information Plans and Systems. DPME is the custodian of the GWM&ES and should be a key user of information from natural capital accounts.

    d. **National Treasury** as the Department responsible for ensuring that information on inputs, activities, outputs and outcomes (programme performance information)

underpins planning, budgeting, implementation management and accountability reporting to promote economy, efficiency, effectiveness and equity, as well as transparency and expenditure control.

e. **DRDLR** as the Department that oversees geospatial information in South Africa and the implementation of the Spatial Data Infrastructure Act (No. 54 of 2003). DRDLR influences spatial data infrastructure important to the production of accounts.

f. **DEA** as the Department with an environmental mandate including a responsibility for reporting on the state of the environment, the National Focal Point for the CBD, as well as a key role in AMCEN and BIOFIN. DEA is the mother department for public entities that provide data important for the production of accounts (including SANBI), and also itself provides some data important for the production of accounts. DEA is also an important user of information from natural capital accounts, responsible for several national strategies for which the implementation might be monitored through information from natural capital accounts.

g. **SANBI** as the organ of state that has a mandate in terms of the National Environmental Management: Biodiversity Act (No. 10 of 2004) to monitor and report on the state of ecosystems, making SANBI a natural partner in the production of ecosystem accounts. SANBI's mandate includes gathering and managing much of the foundational knowledge on ecosystems that underpins the development of ecosystem accounts. SANBI is the executing agency for the **Ecological Infrastructure for Water Security Project**[23] which has an outcome on developing natural capital accounts to enable policy, planning and decision-making in favour of ecological infrastructure.

h. Several government departments, such as **DoE, DWS, Department of Agriculture, Forestry and Fisheries (DAFF) and Department of Mineral Resources (DMR)**, have mandates that overlap with the environment and could provide data important in the production of environmental accounts. They may also use information from accounts e.g. DWS might use information related to the contribution of water resources (which it is mandated to manage and protect) to society and the economy.

i. The **Water Research Commission (WRC)** as a statutory body under DWS with a mandate to promote coordination, cooperation and communication in the area of water research and development, and enhance knowledge and capacity building. The WRC has funded the development of Water Accounts in partnership with Stats SA. They are also a sub-executing agency of the aforementioned Ecological Infrastructure for Water Security Project.

j. **DST** as drivers of the Global Change Challenge and Research Plan.

k. **CSIR** as a research and development organisation that has advanced spatial analysis and modelling capacity as well as expertise in national freshwater and estuarine aquatic ecosystem assessment, and was a key partner in the ANCA Project. CSIR could

[23] The Ecological Infrastructure for Water Security Project is a 5-year, GEF-funded, DBSA-implemented and SANBI executed project. Implementation began in February 2018.

play a key role in supporting the development of accounts going forward, both through links with their Geospatial Analysis Platform (GAP), which is a meso-scale geospatial platform for the assembly, analysis and sharing of strategic geospatial information, and through the Natural Resources and Environment division, which would contribute especially to ecosystem accounting.

61. Key international and regional stakeholders are considered to be:

    a. **UNSD** as the global organisation responsible for leading the development and implementation of SEEA, and a lead partner in the NCA&VES Project globally.

    b. **UN Environment** as the leading global environmental authority and a lead partner in the NCA&VES Project globally.

    c. **GDSA Secretariat** as committed to working with the member countries of the GDSA, providing technical and policy support and facilitating a platform for learning, capacity building, identifying partnerships and mobilising financial resources.

62. **This is not a full list of stakeholders interested in NCA, it is rather a list of the key stakeholders influential in the production and uptake of NCA in South Africa at this time.** A more comprehensive and growing list of stakeholders is provided in Appendix 5.4, which includes a description of each stakeholder's mandate and an indication of whether the stakeholder is a provider of data used in the production of accounts and/or a producer of accounts and/or a user or potential user of information from natural capital accounts.

3.4.1. Implications for the national strategy

63. **Key national stakeholders should be involved in the development of the national strategy.** Key regional and international stakeholders should be informed as to progress so that they may provide input, support and advice where appropriate.

3.5. Information and knowledge

64. **South Africa has good foundations of environmental, social and economic data.** South Africa's ecological data is comprehensive and spatially disaggregated; demographic data is spatially explicit; but economic data is generally not spatially disaggregated. Appendix 5.5 provides an initial list of available environmental, social and economic data. Data sources for environmental data foundations stem largely from national government departments and associated public agencies (such as the WRC, SANBI, CSIR, Agricultural Research Commission (ARC), South African Weather Service (SAWS), and South African Environmental Observation Network (SAEON). SANBI leads the National Biodiversity Assessment, currently in its third iteration (NSBA 2004, NBA 2011, NBA 2018 is under development), which provides the impetus to collate, consolidate and further develop spatial data on ecosystems across the terrestrial, inland water and marine realms. Spatial data on ecosystems is thus readily available to support the production of ecosystem accounts.

65. **Data quality and data management are being continuously improved.** There are coordinated efforts underway to improve data quality (e.g. through policies and institutional mechanisms already mentioned) and management of environmental data, for example:

a. SAEON is in the process of developing a metadata system for South Africa as part of the SDI Act.

b. DEA is working to improve the consolidation and management of environmental datasets in South Africa. A central repository of environmental data will enable integrated planning as called for in the Integrated Planning Framework Bill. DEA also has a recently restructured Knowledge and Information Management Chief Directorate that will further enable data management, interpretation and dissemination.

c. SANBI is developing a National Biodiversity Information System (NBIS), which includes co-ordinating and providing access to data on species and ecosystems.

66. **Relevant geospatial data are collected and curated by several organisations.** DRDLR's NGI component plays a key role with respect to geospatial data management (including through convening the CSI) and oversees national land cover and land use data and classification. DEA hosts an Environmental GIS (E-GIS) web-based platform (http://egis.environment.gov.za) and works with the CSI towards a fully integrated spatial data infrastructure in South Africa. SANBI hosts a website for serving spatial biodiversity information (including maps of ecosystem types) – Biodiversity GIS (BGIS) (http://bgis.sanbi.org). DAFF hosts an Agricultural Geo-Referenced Information System (AGIS) (www.agis.agric.za). Provincial environmental affairs departments and conservation authorities also gather and manage spatial and other data related to natural capital.

67. **South Africa has some coordinated initiatives to support research and address evidence needs**, such as through:

    a. DST's "Ten-Year Innovation Plan: Towards a knowledge-based economy", which recognises the importance of science and technology in improving the country's competitiveness and economic growth. The DST has, in partnership with other organisations and as part of the Global Change Challenge and Research Plan[24], developed several Research, Development and Innovation (RDI) Roadmaps for South Africa:

        i. Waste RDI Roadmap (with CSIR) (https://www.wasteroadmap.co.za/),

        ii. Water RDI Roadmap (2015-2025) (WRC 2015 with DWS),

        iii. Information and communication technology RDI Roadmap (with CSIR).

    b. The Environment Sector R,D&E framework and coordinating structures.

    c. The WRC, which establishes water research needs and priorities.

68. **Broadly speaking, there is a culture of data availability and data sharing in South Africa**, promoted by the Promotion of Access to Information Act (PAIA) (Act No. 2 of 2000).

[24] The Global Change Research Plan identifies four major cross-cutting knowledge challenges and 18 key research themes. The Four knowledge challenges are: understanding a changing planet; reducing the human footprint; adapting the way we live; and innovation for sustainability. Available at http://www.dst.gov.za/index.php/resource-center/strategies-and-reports/2318-10-year-global-change-research-plan-for-south-africa

a. Stats SA accesses data from other government departments for statistical purposes through establishing general Memoranda of Understanding (MoUs) and then specific Service Level Agreements for individual projects.

b. Concerns around sensitive information such as health or economic data can be addressed by aggregating data to ensure confidentiality to meet ethical requirements.

69. **Policies, frameworks and institutional arrangements exist to develop standards and guidelines for the development, management, curation, archiving and dissemination of credible, quality and comprehensive statistics / indicators**. These include:

    a. SASQAF and the statistical value chain. In addition, the unit in Stats SA responsible for developing environmental-economic accounts has a systematic approach to the development of accounts based on first undertaking a feasibility study, then developing a position paper on a particular account, and finally publishing a discussion document with the account and its interpretation.

    b. CSI standards and guidelines

    c. Electronic Metadata Catalogue[25]

70. **Natural capital accounts have been developed in South Africa by Stats SA and through pilot projects focused on ecosystem accounting**. See Appendix 5.1 for a history of these and summary of accounts published.

71. **Valuation studies for several ecosystem services exist in South Africa**, which provide a good basis for the project to build on to compile some accounts in monetary terms. The spatial resolution of these studies varies.

3.5.1. Implications for the national strategy

72. **South Africa has substantial amounts of geospatial and non-geospatial data available to enable the production of accounts.** The required data are largely in the public domain so major issues or constraints in accessing most of the data are not foreseen.

73. **As NCA requires the integration of comprehensive geospatially-referenced national data that is comparable over multiple time periods, there are a number of data challenges that will need to be addressed going forward**:

    a. Data needed for natural capital accounts are not necessarily produced on a recurring basis and there is a lack of consistent time series associated with these data.

    b. The spatial frameworks and resolution of these datasets are often different, which creates difficulties in linking and comparing the various datasets.

    c. Available geospatial data is heavily reliant on imagery (aerial and satellite), but due to budget constraints there is not always sufficient ground-truthing work to verify data.

[25] Electronic Metadata Catalogue – http://www.sasdi.net/

d. There is a lack of consistent administrative records at local, provincial and national level.

e. Data agreements tend to be one-way, rather than based on shared and supervised data integration. That is, Stats SA enters into an MoU to obtain data for statistical purposes from other Departments. In addition, there are few research initiatives that aim to integrate environmental, social and economic data from multiple sectors.

74. **There are also challenges around gathering data and getting it into a form that can be used for accounts, and then producing accounts – this relates to the collaboration and coordination required to produce natural capital accounts**: drawing data from various primary collectors; agreeing on the use of standard concepts and definitions; collecting the right variables in line with international requirements; and developing an agreed set of indicators (Stats SA 2015).

75. **Several initiatives exist that have already developed components of a statistical infrastructure, which could be further integrated by applying the SEEA EEA**:

    a. Stats SA work on water, mineral, fishery and energy accounting,

    b. Stats SA, SANBI, DWS and CSIR work on river ecosystem accounts,

    c. DEA work on state of environment reporting,

    d. Other government departments such as ARC's AGIS and DRLDR's online cadastral data.

76. **DEA's Knowledge and Information Management Chief Directorate is well placed for uptake, interpretation and dissemination of information from NCA for a range of policy applications**.

3.6. Capacity

77. **A range of capacity, in terms of human resources and infrastructure, is needed to produce natural capital accounts**: coordination and convening capacity to facilitate cooperation; technical capacity across disciplines e.g. ecological, social and economic; and interpretation and communication capacity.

78. **South Africa has substantial capacity around the data foundations, geospatial and non-geospatial, that would be used in accounts.** This capacity lies across government departments, provincial departments, public entities and in the private sector and NGOs. This capacity is the basis upon which NCA can be built in South Africa. However, this capacity is generally fully utilised and often stretched and in need of support to maintain and improve data foundations.

79. **There is a range of existing technical capacity upon which the implementation of the SEEA EEA in South Africa can be built**:

    a. Stats SA has engaged other Departments and provided some training on environmental-economic accounting.

    b. SANBI has engaged other Departments in producing the National Biodiversity Assessment.

c. Several Departments have good technical capacity in reporting and linking indicators through e.g. reporting on the NDP indicators, the approach used is to define 14 high-level outcomes in the MTSF.

d. Several Departments have developed capacity for reporting on the SDGs and through the NSSD.

e. There is much related national and international academic research. Academics are in some cases well engaged with government environmental initiatives.

f. Coordination between technical capacity across sectors is enabled through institutional mechanisms such as the CSI.

80. While technical capacity is good for specific environmental statistics and environmental-economic accounting, **there is only a small core of experts and experienced scientific and technical support capable of developing and interpreting ecosystem accounts**. This core of experts has been mobilised to undertake ecosystem accounts through donor funded projects, but remains small at this stage.

81. **There is a small unit responsible for production of environmental-economic accounts in Stats SA** that has been responsible for the publication of the Environmental-Economic Accounts Compendium (see Appendix 5.1). This unit is currently in flux and under-capacitated due to budget constraints and needing to shift from supply-led drivers to demand-led drivers for its sustainability or expansion.

82. **There is convening capacity to bring together a community of practitioners, but this capacity relies on donor funding at this stage.** Convening capacity is limited to a regional NCA community of practice convened periodically by GDSA and stakeholder forums organised through donor funded NCA-related projects. An active community of practice that brings together stakeholders involved in the production of data, development of accounts, standardisation of approaches, interpretation of accounts and their policy application would bring a range of benefits for advancing NCA.

83. **There is equally limited capacity in terms of understanding and demonstrating the policy applications of NCA.** This capacity is important for advancing the use of NCA. The capacity that exists is largely within Stats SA, SANBI, DEA and CSIR.

84. **Thus far, NCA work has been largely supply-driven** (supply of available data to do energy accounts, water accounts, or land and ecosystem accounts), with links to policy and other potential applications not fully explored. The value of NCA needs to be communicated and the use of the accounts demonstrated and embedded in order to move towards the production of demand-driven natural capital accounts.[26] DEA (2017d) suggests that accounts need to be developed to address common questions of policy-makers (What is the problem? What can I do

[26] DEA (2017d) point to potential use of NCA including, but not limited to: as an organising framework for information in the environmental and economic dimension; in terms of the development of national level development plans and strategies with NCA-based information can define and measure associated targets and measures; NCA frameworks can be used to support national level discussions in resource allocations across sectors and industries.

about it? Who wins? Who loses? How much does it cost?) and provide policy options in the form of carrots (incentives), sticks (policy or legislation) or sermons (communication and advocacy).

3.6.1. Implications for the national strategy

85. **The fact that SEEA EEA can be successfully piloted in South Africa is made possible because of past and current investment in relevant information, data, skills, institutional mechanisms and policies, on which NCA initiatives have been able to build.** These investments, together with the capacity of individuals involved in NCA, need to be maintained and strengthened in order to advance NCA in South Africa.

86. **Overall capacity is limited, with the small core of people with relevant skills being largely fully utilised and often over-stretched.** To date, this core of experts has been mobilised to do ecosystem accounts largely through donor funded projects.

87. **Development of natural capital accounts over the long term will need to explicitly be built into the key performance areas** of individuals within relevant government departments and public entities.

88. While Stats SA has to date held the only unit focused on environmental-economic accounts, Stats SA is not the primary collector of data for these accounts and **the full capacity to produce a range of natural capital accounts is likely to sit across more than one organisation**, drawing on the technical capacities that sit in organisations other than Stats SA alone. Such cross-organisational work will require dedicated resources for co-ordination. *A national strategy for advancing NCA in South Africa would have to address the coordination required for multiple departments and entities to collaborate in the production of natural capital accounts*. This would include identifying and clarifying the benefits of investing in this coordination, by demonstrating the value of natural capital accounts to policy makers and in terms of national planning, monitoring, evaluation and reporting (linked to the NDP, MTSF, Agenda 2030 and SDGs). This is similar to what is required to develop the NSDS.

89. This also points to the convening and partnership skills necessary to develop a culture and way of working required to successfully produce natural capital accounts.

90. The value added to the **credibility of environmental statistics** through the data quality checks, quality improvement and data analysis involved in development of environmental-economic accounts is not necessarily fully recognised by all stakeholders, and should be emphasised in the national strategy.

91. Training and collaborative work experience is needed to develop capacity to do NCA, particularly ecosystem accounts. Training is needed to improve understanding about NCA and ecosystem accounts, and grow a community of practice. South Africa may benefit from the participation of international experts who have experience in coordinating and producing ecosystem accounts. Training could focus on:

    a. Building a common conceptual base among a varied group of participants (e.g. What is the accounting approach? What is recommended in SEEA EEA and what is optional?),

    b. Developing and interpreting ecosystem accounts,

c. Providing guidance on how the results of ecosystem accounts can be used to inform environmental, social and economic policy.

3.7. Stocktake of current environmental accounting work in SA

92. **South Africa has a relatively long history of producing natural capital accounts following the SEEA Central Framework and more recent experience with SEEA EEA.** Table 2 provides a list of natural capital accounts that have been produced and those that are in production or planned. There are a range of policy applications for the accounts listed, examples of which are included in the table and which informed the rationale for the selection of those accounts that will be produced as part of the NCA&VES Project.

Table 2. List of current natural capital accounting work in South Africa with examples of policy links

Account	Lead organisation	Date of publication	Examples of policy links
Water Accounts	Stats SA & WRC	2000, 2002, 2007, 2019*	National Water Act, NWRS, National Water and Sanitation Master Plan, NBSAP, Aichi and SDG targets
Energy accounts	Stats SA	2002, 2009, 2012, 2014-2017	Department of Energy's Post 2015 National Energy Efficiency Strategy, Energy Efficiency Targets
Mineral accounts	Stats SA	2010-2017	Department of Mineral Resources planning
Fisheries accounts	Stats SA	2010, 2012-2017	Fisheries Management, Agriculture, Forestry and Fisheries Market and Trade Development Strategy
KZN Land and Ecosystem Accounts	Stats SA & SANBI in ANCA Project	2015, 2019*	Provincial SDF, Provincial Protected Area Expansion Strategy
National River Ecosystem Accounts		2015	NWRS, National Water and Sanitation Master Plan, NBSAP, Catchment Management Strategies
KZN ecosystem service accounts	Stats SA & SANBI in NCA&VES Project	2019*	SDFs, Provincial Growth and Development Strategy, municipal planning, NBSAP
National land and ecosystem accounts		2019*	NDP, NSDF, Sustainable Land Reform, NBSAP, SDGs and Aichi targets
Accounts for protected areas		2019*	NPAES, biodiversity stewardship programmes, Biodiversity Finance Plan, NBSAP, Aichi and SDG targets
Land and ecosystem accounts for selected city-regions		2019*	Integrated Development Plans, SDFs (for cities and their peri-urban and rural hinterlands), NBSAP
Marine ecosystem account		2019*	Marine Spatial Planning, NPAES, fisheries management, NBSAP, Aichi and SDG targets
Accounts for species or groups of species of special concern		2019*	National Strategy for Plant Conservation, Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), managing wildlife trade and poaching, NBSAP, Aichi and SDG targets
Accounts for Strategic Water Source Areas	SANBI through EI4WS Project	>2020*	NWRS, National Water and Sanitation Master Plan, city-level water management, Catchment Management Strategies, NBSAP, Aichi and SDG targets

Account	Lead organisation	Date of publication	Examples of policy links
Ecological infrastructure accounts		>2020*	NBSAP, National Water and Sanitation Master Plan, Framework for Investing in Ecological Infrastructure, Natural Resource Management programmes
Detailed catchment-level water accounts	CWRR	2016,2017, 2019-2022*	NWRS, National Water and Sanitation Master Plan, Catchment Management Strategies
Estuary accounts	CSIR	2019*	Estuary Management Plans, National Water and Sanitation Master Plan

* Intended year of publication

93. **Ecosystem accounts are produced, at this stage, primarily through donor-funded projects**, namely the *ANCA Project* (2014-2015), *NCA&VES* project (2018-2020) and the Ecological Infrastructure for Water Security (EI4WS) Project (2018-2023).

94. Figure 6 illustrates the accounts to be produced through the two current projects.[27]

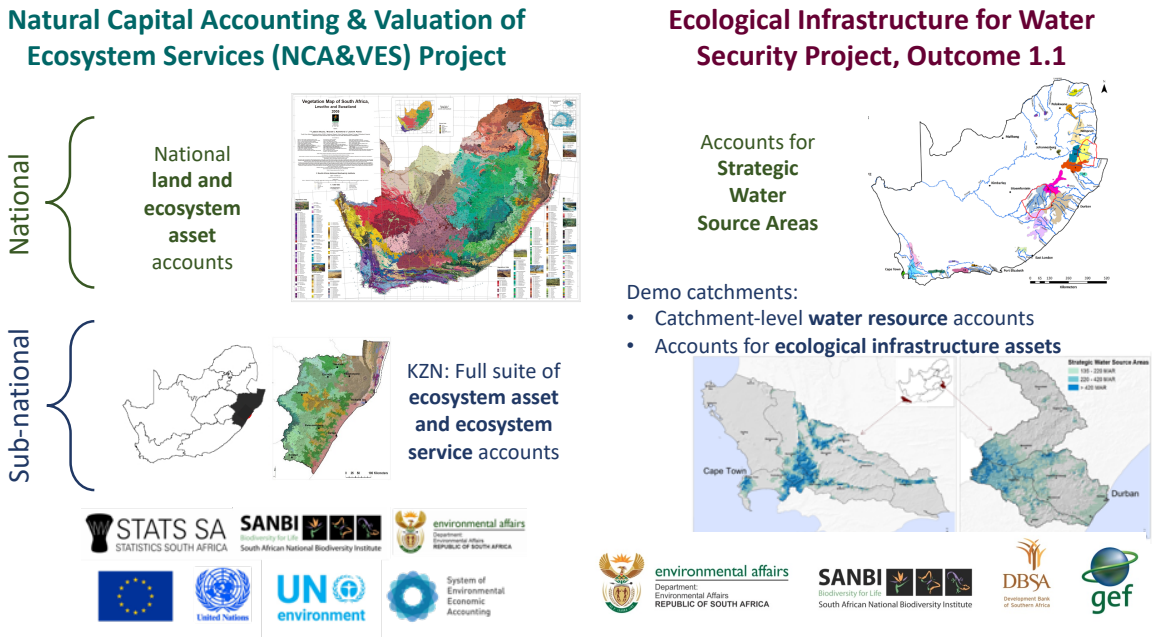

Figure 6. Illustration of ecosystem accounts that will be produced in South Africa through two donor funded projects currently underway.

95. **A process to test ecosystem indicators derived from accounts developed using SEEA is part of the NCA&VES Project**. This includes work underway by UN Environment's World Conservation Monitoring Centre (UNEP-WCMC) to assess linkages between global indicator initiatives, SEEA Modules and the SDG Targets, through which indicators will be selected to test in South Africa. Through this process the NCA&VES Project Management Unit in South Africa undertook a review of national indicator sets from a SEEA perspective. A list of relevant indicators that might be priority to NCA in South Africa was compiled and a proposal was made for an additional SEEA Account category, namely Protected Areas Accounts. This is not a category of accounts in the

[27] Not all of the accounts to be produced in the NCA&VES Project are shown in the figure. The additional accounts are listed in Table 2.

existing SEEA guidelines but there are several examples of protected area accounts from countries that are doing SEEA work.

3.7.1. Implications for the national strategy

96. **The national strategy should identify priorities for natural capital accounts to be developed beyond those accounts already planned.** For instance, other accounts that have been identified as candidate accounts through stakeholder engagement in the NCA&VES Project are:

    a. Environmental protection expenditure accounts: some foundation work is required for their development; would be useful for informing budget allocations.

    b. Carbon accounts: a feasibility study is required to investigate the development of this account; would be useful for informing carbon taxes and carbon trading, reporting on international commitments (such as SDGs).

97. **Prioritisation of potential accounts should be based on a combination of factors, including policy applications/questions, technical feasibility and stakeholder input**.

98. The national strategy will need to address sustainable production of natural capital accounts beyond donor funded projects.

4. Recommendations for a national strategy for advancing NCA in South Africa

99. **The national strategy should focus the efforts of the Stats SA and partners on developing priority natural capital accounts and effective statistical systems and related institutional mechanisms to inform South Africa's sustainable development policy objectives.** This intention is explained in the Implementation and Diagnostic Tool for advancing SEEA experimental ecosystem accounting (SEEA undated). It identifies four major steps towards a coherent, integrated and comprehensive platform for integrating environmental statistics and indicators with social and economic ones, so as to support cross-sectoral decision-making and planning for sustainable development. As illustrated in

100. Figure 7, the steps are:

- **a.** to support and enable a process for strategic planning,
- **b.** to build statistical and institutional mechanisms ,
- **c.** that will strengthen statistical systems and statistical production processes,
- **d.** and enable South Africa to produce accounts of natural capital.

Doing so should enable decision-making and trade-off analysis that supports sustainable development. This in turn will help to make the case for greater/sustained investment in NCA over time.

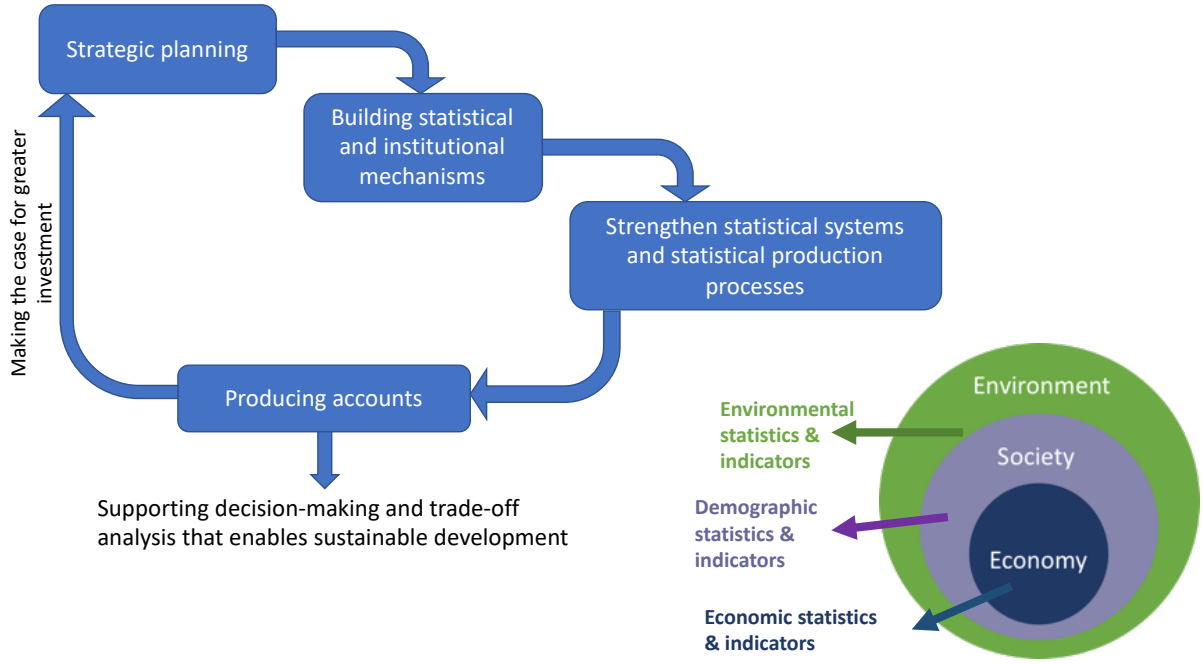

Figure 7. Illustration of process explained in Implementation and Diagnostic Tool for advancing SEEA experimental ecosystem accounting (SEEA undated)

101. **South Africa has the necessary policies to provide the potential hooks for uptake and application of natural capital accounts, and outputs of NCA should provide information relevant to the**

implementation and evaluation of these policies. *A strategy for advancing NCA must be informed by the context created by these policies, and prioritise accounts in relation to national policy priorities* (i.e. meet demand for information that can be best provided through NCA).

102. **South Africa has a range of policies and frameworks that relate to strengthening national statistics and improving information on sustainable development, and a range of organisations responsible for their implementation**. *A strategy for advancing NCA would need to link to these policies, frameworks and responsible institutions across the NCA value chain* (refer back to

103. Figure 3).

104. **Measuring progress towards achieving global and national commitments to sustainable development is driving demand for standardised, robust and official statistics**. *The national strategy should respond actively to this opportunity*, building on the process of developing indicators for the SDGs in South Africa (coordinated by Stats SA), and indicators called for in the NDP (which are still under development).

105. **South Africa's policy context provides a foundation for mainstreaming NCA into policy and implementation in South Africa.** South Africa is committed to evidence-based policy-making and NCA adds richness to that evidence.

106. **Collaboration and coordination are required to advance NCA**:

    a. **From collaboration and coordination required in gathering data and production of accounts…**: drawing data from various primary collectors; addressing various data challenges; agreeing on the use of standard concepts and definitions; collecting the right variables in line with international requirements; and developing an agreed set of indicators (Stats SA 2015);

    b. **…to that required to advance the use of NCA**: iterative engagement around demonstration accounts for understanding the specific issues and also to foster demand from decision makers; convening processes through which policy applications of NCA can be demonstrated and understood, and through which the policy needs that can be met by NCA are identified; understanding these and interpreting accounts for easy use by targeted stakeholders (

    c. Figure 8).

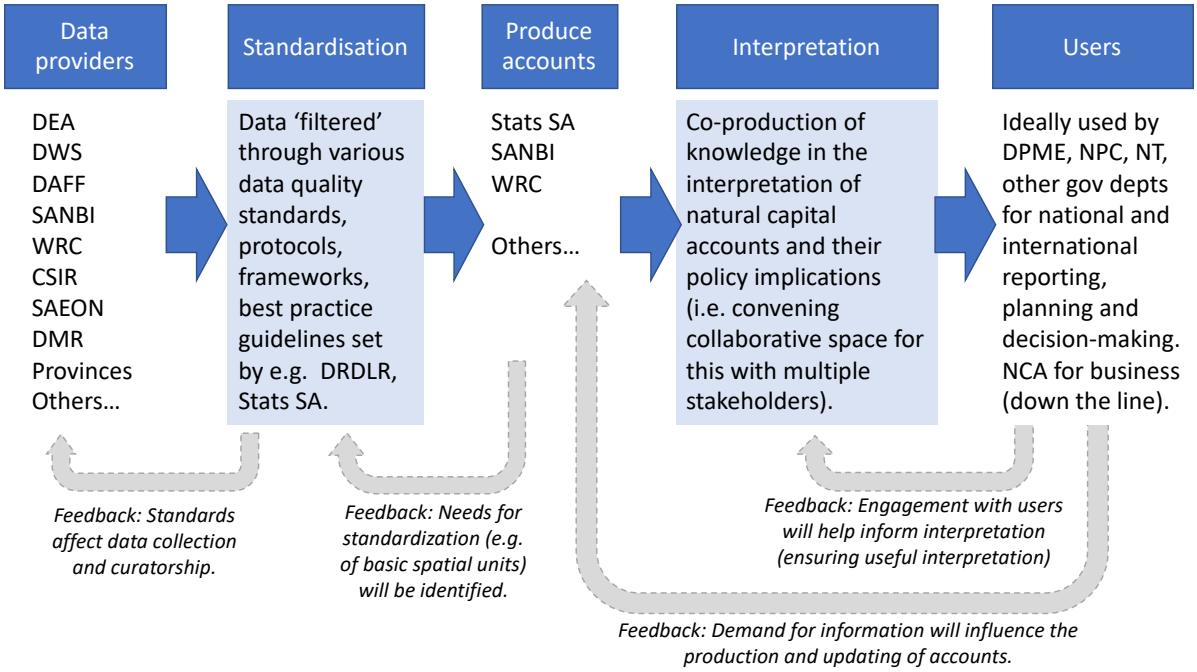

Figure 8. Indicative illustration of organisations involved in production and use of natural capital accounts, and the feedback loops involved (enabled through collaboration and coordination).

4.1. Recommendations for the form and institutional home of the national strategy

107. **The assessment phase has identified that the national strategy could take the form of**:

- A standalone national strategy for advancing NCA in South Africa; and/or
- A chapter or section in the NSDS, which is in the early stages of being developed by Stats SA. The NSDS will be based on four pillars: economic, social, environmental and governance.

108. **The recommendation of this Assessment Report is that the national strategy should be published by Stats SA as the national statistical office.** Part of all of the national strategy could be integrated into the National Strategy for the Development of Statistics (NSDS).

109. In addition to the development of the national strategy for advancing NCA, **opportunities to mainstream NCA into other national strategies, policies or plans may be identified**. For example, there may be opportunities to strengthen inputs into the accounts through standards, protocols etc. that relate to data providers and standardisation of data, or to formalise uptake and use of information from accounts in strategies or plans of NCA users or potential users.

110. **NCA is inherently multi-disciplinary, requiring expertise, data and information from various organisations, and NCA information is or could be used by a wide range of organisations.** It discourages the traditional "silo approach" and requires that different organisations collaborate to produce statistics beyond their respective thematic areas, essentially moving towards "developing a one data, one information set from which various sectors can draw the relevant information to inform their decisions and policies" (DEA 2017a). **It is therefore a recommendation that, while Stats SA should be the primary institutional home of the Strategy, other relevant**

departments should be closely involved in the process of developing and implementing the strategy, as discussed further in Sections 4.2 and 4.3 below. DPME as a cross-sectoral government department in The Presidency and DEA with its environmental mandate, for example, will play key roles in the uptake and implementation of the national strategy.

4.2. Recommendations for the process of developing the national strategy

111. **The development of the national strategy should be led by Stats SA** as the country's national statistical office with a lead role to play in implementing the SEEA. The process of developing the strategy should:

112. **Engage stakeholders**, taking advantage of the existing stakeholder engagement processes and resources through the NCA&VES Project and the Ecological Infrastructure for Water Security Project, and ensuring involvement by representatives of the key stakeholders identified in this report. The national NCA forum that will be convened during 2019 as part of the NCA&VES Project will be an important opportunity for stakeholder engagement on the national strategy.

113. **Get agreement on a vision, goal and objectives for advancing NCA in South Africa**, including confirmation of the scope of the strategy.[28] This could be achieved at the national NCA forum.

114. **Seek alignment with the development and revision of other relevant national strategies,** including the NSDS which is under development.

115. **Use existing institutional mechanisms to support the development of the national strategy** wherever possible, rather than establishing new institutional mechanisms. These include structures guiding the development of the NSDS and SDG reporting. For instance, the NCC and SDG Working Group on environmental indicators provide platforms already convened by Stats SA, through which links can be made between the SEEA and SDGs. The Strategic Advisory Committee for Ecosystem Accounting envisaged as part of the Ecological Infrastructure for Water Security Project could be used to give guidance on aspects of the national strategy dealing specifically with ecosystem accounts.

116. **Consider institutional mechanisms for taking forward the implementation of the strategy**. Wherever possible, existing institutional mechanisms should be considered. Institutional mechanisms for advancing NCA should ideally help to navigate challenges, address barriers, and identify and leverage opportunities to advance NCA. Key stakeholders identified in this report, such as Stats SA, DEA, SANBI, DRDLR (linked to the CSI and NGI) and DPME (linked to the NPC) should be involved in these discussions.

117. **Actively build partnerships and working relationships in the course of developing the national strategy.** It can take substantial time to put in place partnerships and arrangements to support the coordination and collaboration that will be required for successful implementation of the national strategy. It will be important to acknowledge this and give time to the process, but without unduly delaying directed progress.

[28] For example, whether the strategy should focus on the full suite of environmental-economic accounts and ecosystem accounts.

118. **Once a draft national strategy has been developed, use existing intergovernmental structures to raise awareness of and gain support for advancing NCA**, starting at the Environment MINTECH and its Working Groups with presentations for noting, and exploring other opportunities including some of the intergovernmental structures set out in Section 3.4 of this report. This will help to ensure the NCA is brought to the attention of different sectors and all spheres of government – national, provincial and local.

4.3. Recommendations for the content of the national strategy

119. **Set out a vision, goal and objectives** for advancing NCA in South Africa.

120. **Have a 10-year timeframe**, with a mid-term review at five years.

121. **Aim to mainstream NCA nationally and be aligned with national priorities as well as international commitments such as the SDGs and Aichi targets**.

a. **Highlight links between NCA and environmental indicators for the SDGs as a starting point.** The SDGs promote synergies amongst organisations, both internationally and nationally, and there is an opportunity for NCA (or the SEEA) to help provide a common language and one information system, with standardised standards and classifications, that different organisations feed into and draw from to address multiple SDGs. This speaks to UNSD's drive towards creating a sustainable development information system across national statistical systems (One System) that applies One Method (the SEEA), and uses One Data (the information system) and One Map (a central, shared geospatial information system).

122. **Identify clear priorities for natural capital accounts to be developed.** Prioritisation of potential accounts should be based on a combination of factors, including policy applications/questions, technical feasibility and stakeholder input, as shown in

123. Figure 9.

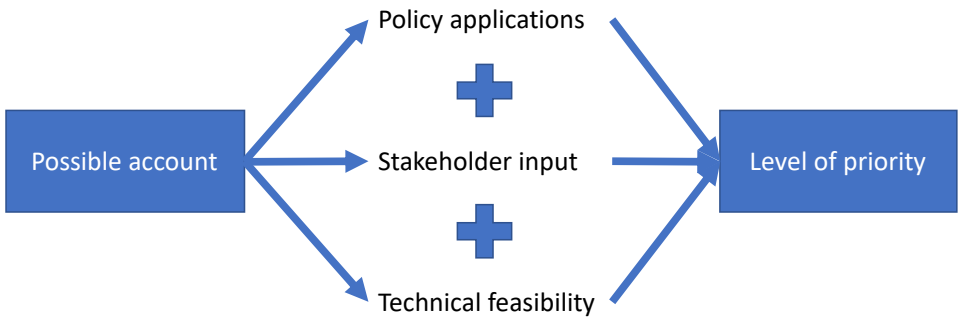

Figure 9. Priority natural capital accounts should be identified through consideration of a combination of policy applications, stakeholder input and technical feasibility.

124. **Focus on national level environmental-economic and ecosystem accounts.** Although some accounts being produced through the NCA&VES Project are at the provincial level in KZN, these are pilot accounts to test methodology for application at a national level. Provincial accounts as

separate and different to national accounts are not recommended. Rather, information from national accounts should be extracted for use at provincial and local levels.

125. **Address revitalising existing environmental-economic accounts** through engagement with ultimate users of NCA information and linking to national policy applications and international imperatives.

126. **Address the need for strategic guidance for NCA** and identify institutional mechanisms for achieving this.

127. **Address the importance of coordination and collaboration** in the production of natural capital accounts, and the institutional arrangements required to achieve this.

128. **Where possible, be clear about organisations (including divisions and directorates within Departments) involved in implementation.** Where not possible, identify the processes through which this might be clarified.

129. **Address resource mobilisation,** recognising the current reliance of NCA work in South Africa on donor funding and the need to embed production of accounts in government budgets.

130. **If possible, develop both a high-road and a low-road scenario**:

    a. Low road activities that can be undertaken with existing human and financial resources, thus recognising the constraints of the current fiscal climate.

    b. High road activities that would be possible with additional resources (more than one high road might be identifiable if there are more or less likely funding options).

131. **Make recommendations to donors as to where and how funds might best be spent to support implementation of the national strategy**. For example, considering the substantial coordination effort that is required for NCA but often not covered by existing capacity, funding for coordination capacity in an appropriate institution over an extended period might best support implementation and sustainability.

132. **Include a stakeholder communication and engagement plan that recognises different levels of engagement with different stakeholder groups.** Three broad stakeholder groups are identified in Figure 10, which illustrates different levels of engagement and involvement that has implications for a stakeholder communication and engagement plan.[29] The objective of communication and engagement would be to:

    a. Raise awareness and improve understanding about the contribution of ecosystems to society and the economy.

    b. Demonstrate the value and usefulness of NCA work (motivating for continued/greater investment and strengthened capacity in monitoring and accounting).

    c. Disseminate progress, outputs, and share lessons of doing NCA work.

[29] Drafted during a break-away group at the National Stakeholder Workshop on NCA in March 2018.

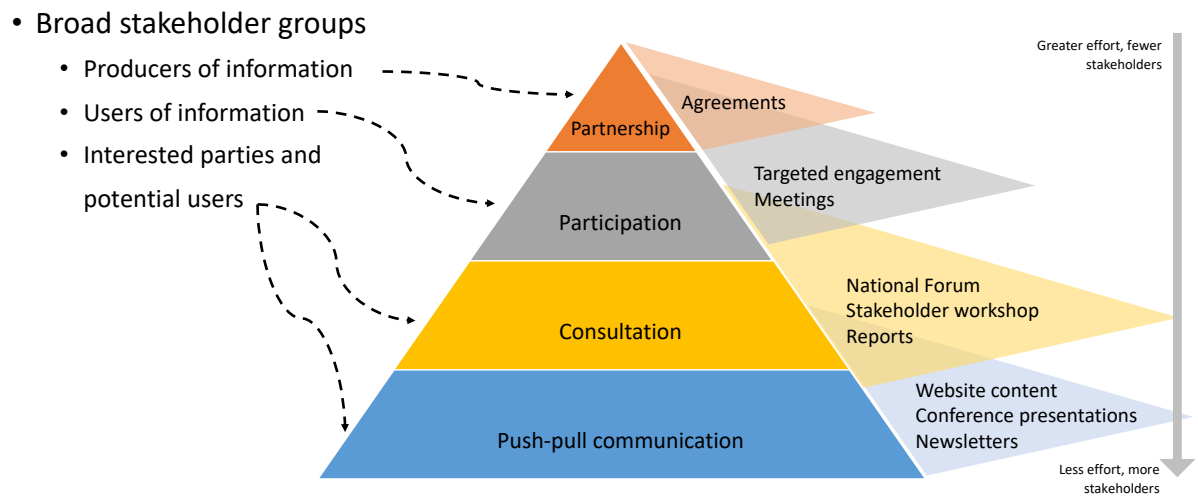

Figure 10. NCA requires different types of engagement involving varying degrees of effort across three broad stakeholder groups.

133. **Require the development of a glossary of terms.** NCA has introduced a fairly large lexicon of terms that is new to many people and that can be misinterpreted in a multi-disciplinary context. As a multi-disciplinary area of work, there are communication and language barriers between the economists, natural scientists, politicians and decision makers with respect to terms and definitions that need to be bridged to enable effective advancing of NCA (DEA 017a). For example, the term 'asset' means different things in a financial accounting, government budgeting or ecosystem context. A glossary of terms would be a useful contribution to better enable effective communication and engagement between and with an emerging multi-disciplinary community of practice.

134. **Call for a national NCA Community of Practice to be established, with goals, structure and activities that support the implementation of the strategy and are in line with the NCA community of practice of the GDSA.** Most practitioners of NCA face several complex and overlapping hurdles, which a community of practice could help address and provide a platform for co-generated solutions. A Contact Point for this community of practice should be nominated, with the responsibility for communication and information exchange in relation to NCA-community of practice matters (GDSA 2016).

5. Appendices

5.1. History of projects advancing natural capital accounting in South Africa

135. Stats SA has been undertaking NCA for many years, producing accounts for water, energy, fisheries and minerals:

a. Water accounts for South Africa:

i. First developed as environmental-economic accounts for Water SA in 2000 (http://www.statssa.gov.za/?page_id=1854&PPN=Report-04-05-01)

ii. In 2002 following the SEEA guidelines[30] (http://www.statssa.gov.za/?page_id=1854&PPN=DiscussWaterAcc).

iii. In 2007 following System of Environmental-Economic Accounts for Water (SEEA-Water) guidance (UN 2007[31]) (http://www.statssa.gov.za/?page_id=1854&PPN=D0405.1).

iv. Updated water accounts are in the process of being finalised and will be published by WRC in partnership with Stats SA.

b. Energy accounts for South Africa have been published seven times (included in the Compendium from 2014-2017). They cover energy supply and use for the period 2002-2013 and are available on Stats SA website at http://www.statssa.gov.za/?page_id=1854&PPN=D04051.1&SCH=5148). Although no longer published as a discussion document Stats SA continues to develop the accounts.

c. Mineral accounts for South Africa have been published seven times (included in the Compendium from 2014-2017). They cover gold, coal and platinum group metals for the period 1990-2014 and are available on Stats SA website at (http://www.statssa.gov.za/?page_id=1854&PPN=D0405.2&SCH=5482). Although no longer published as a discussion document Stats SA continues to develop the accounts.

d. Fishery accounts for South Africa have been published seven times (included in the Compendium from 2014-2017). They cover hake, west and south coast rock lobster, abalone, and cape horse mackarel for the period 1990-2015 and are available at (http://www.statssa.gov.za/?page_id=1854&PPN=D0405.0&SCH=5463). Although no longer published as a discussion document Stats SA continues to develop the accounts.

e. Energy, minerals and fisheries accounts were combined into an environmental-economic accounts Compendium which was produced annually from 2014-2017 (http://www.statssa.gov.za/?page_id=1854&PPN=Report-04-05-20&SCH=7007).

[30] United Nations Statistics Division (UNSD), 2003. System of Environmental-Economic Accounting 2003: Handbook on integrated environmental and economic accounting. UNSD, New York. Available at https://unstats.un.org/unsd/envaccounting/seea2003.pdf. Later updated: United Nations, 2014. System of Environmental-Economic Accounting 2012 – Central Framework. New York. Available at https://seea.un.org/content/seea-central-framework.

[31] United Nations Statistics Division (UNSD), 2007. System of Environmental-Economic Accounting for Water (SEEW), 2007. System of Environmental-Economic Accounting for Water. UNSD. New York. Available at https://seea.un.org/content/water.

136. In 2014, South Africa was one of seven pilot countries involved in a global initiative called *Advancing Natural Capital Accounting* (ANCA) (also referred to in some documents as Advancing SEEA Experimental Ecosystem Accounting (AEEA)), led by the UNSD in partnership with UN Environment and the Convention on Biodiversity, with funding from the Government of Norway.

    a. The UNSD led two missions to South Africa, convened by Stats SA, through which were produced: a Draft Assessment Report and Programme of Work for Advancing NCA in South Africa; and a draft National Plan for Advancing Environmental-Economic Accounting in South Africa.[32] These, together with funding, provided an opportunity to conduct initial pilot SEEA and SEEA EEA training and to engage a range of stakeholders to identify priorities, additional stakeholders who should be involved, and options for priority accounts and institutional arrangements.

137. In 2015, through the ANCA Project, Stats SA and SANBI worked in partnership with the CSIR, Ezemvelo KZN Wildlife, DWS and DEA to:

    a. Establish the Strategic Advisory Committee on Ecosystem Accounting, which met twice that year (March and September).

    b. Produce two pilot accounts, namely the Land and Ecosystem Accounts for KwaZulu-Natal (KZN) and National River Ecosystem Accounts (available at http://biodiversityadvisor.sanbi.org/planning-and-assessment/experimental-ecosystem-accounting/).

    c. Host the third UNSD mission for the ANCA Project to engage senior stakeholders in the planning for SEEA Central Framework implementation in South Africa and to review the two case studies produced under the project.

138. Since 2015, the WRC has funded two research projects related to the development of a methodology for compiling catchment level water resource accounts. WRC Project K5/2205 was completed in 2015 and WRC Project K5/2512 is due for completion in March 2019. These accounts are intended to inform catchment level water resource policy and management decisions, but if compiled nationally could be aggregated up to inform national level policy and management. These accounts were developed using the Water Accounting Plus (WA+) accounting framework, which provides a simpler catchment level view of water resources, but could be adapted to fit the SEEA-Water framework. The lack of suitably detailed measured data at a catchment scale led to the use of hydrological modelling approach to estimating some components of the accounts. This research was led by the Centre for Water Resources Research (CWRR) at the University of KwaZulu-Natal (UKZN).

139. In 2017, the *NCA&VES Project*, was launched by the UNSD and UN Environment with funding from the European Union. The NCA&VES Project aims to assist five participating partner countries (Brazil, China, India, Mexico and South Africa) to advance the knowledge agenda on environmental and ecosystem accounting and initiate pilot testing of SEEA EEA, with a view to improving the management of natural biotic resources, ecosystems and their services at the national level as well as mainstreaming biodiversity and ecosystems in

[32] This draft National Plan helped to inform this assessment report, and includes useful content that could be drawn on in the development of the national strategy.

national level policy, planning and implementation. The focus of the NCA&VES Project is strongly on ecosystem accounting as a subset of NCA.

140. In 2018, implementation of the NCA&VES Project in South Africa began, led jointly by Stats SA and SANBI, with project co-leaders from Stats SA and SANBI respectively, and a Project Management Unit based in SANBI.

    a. Implementation of the overall project will take place for a period of 26 months over the calendar years 2018 to end of March 2020.

    b. Deliverables of the overall project will include: pilot ecosystem accounts in South Africa in physical and monetary terms; a national strategy for advancing environmental-economic accounting; guidelines and methodology that contribute to the in-country implementation and global research agenda of the SEEA EEA; an indicator set based on SEEA EEA in South Africa in the context of the 2030 Sustainable Development Agenda, Aichi Targets or other international indicator initiatives; and a national forum and national training workshop to enhance capacity and enlarge the ecosystem accounting community of practice.

141. Also in 2018, the Ecological Infrastructure for Water Security Project (EI4WS) was launched. The Project is funded by the Global Environment Facility (GEF), implemented by the Development Bank of Southern Africa (DBSA), and executed by SANBI in partnership with others, including DWS, WWF and Stats SA. An outcome of the project is that *Natural capital accounts developed to enable policy, planning and decision-making in favour of ecological infrastructure.* The accounts developed will be accounts for strategic water source areas (SWSAs), ecological infrastructure asset accounts and water resource accounts at a catchment level in the Project's Greater uMngeni and Berg-Breede demonstration catchments. The EI4WS Project is aligned with the NCA&VES Project and will support the implementation of the national strategy for advancing NCA.

Table 3. Summary of natural capital accounts published in South Africa (the symbol refers to accounts that are under development)

Accounts	2000	2001	2002	2003-2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	>2020
Water Accounts																⊗		
Energy accounts																		
Mineral accounts																		
Fisheries accounts																		
Compendium of environmental accounts																		

Accounts	2000	2001	2002	2003-2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	>2020
KZN Land and Ecosystem Accounts																	⊗	
KZN ecosystem service accounts																	⊗	
National River Ecosystem Accounts[33]																		
National land and ecosystem accounts																	⊗	
Accounts for protected areas																	⊗	
Land and ecosystem accounts for selected city-regions																	⊗	
Marine ecosystem account																	⊗	
Species accounts																	⊗	
Accounts for SWSAs																		⊗
Ecological infrastructure accounts																		⊗
Detailed catchment-level water accounts																	⊗	⊗

[33] Nel and Driver (2015)

5.2. National Strategy for Development of Statistics (NSDS)

142. NSDS are technically supported by the Partnership in Statistics for Development in the 21st Century (PARIS21)[34] consortium, which was created and is supported inter alia by the European Commission. The PARIS21 consortium have developed materials to support the development of NSDS in developing countries and since 2006 has published an annual progress report on the status of NSDS in International Development Association borrower countries, Least Developed Countries, Low and Lower-Middle Income Countries, and some Upper-Middle Income Countries (in order to report on the whole of the African continent). The following brief summary of NSDS is extracted from *Statistics in development cooperation - National Strategies for Development of Statistics*[35].

143. Why define a strategy for the development of statistics?

    a. To ensure that quality statistical data is available.

    b. To meet the demand for statistical data.

144. What should a strategy for the development of statistics be?

    a. It is a political document, with authorisation and active participation from decision makers.

    b. It should be based on and consistent with:

        i. national (overall) development strategies;

        ii. their related performance assessment framework, and;

        iii. the national budget.

    c. It should define the vision of the medium-term objectives of the national statistical system.

    d. It should define what statistics will be collected and published, and how.

    e. It should identify and analyse the constraints of the national statistical system:

        i. the legal framework of official statistics;

        ii. budget and finance of the NSS;

        iii. institutional coordination inside the NSS;

        iv. physical resources of the NSS;

        v. human resources of the NSS.

    f. It should be accompanied with an action plan, typically for five years.

145. Action points for statistics strategies:

[34] PARIS21 "brings together decision makers, data analysts, and national, regional, and international statisticians. Its objective consists in developing the capacities of national statistical systems in developing countries, by assisting them to design and implement their NSDS. PARIS21 is supported by a Secretariat based in Paris, hosted within the Development Cooperation Directorate (DCD) of the OECD". Extracted from *NSDS approach in a nutshell* booklet available at http://www.paris21.org/sites/default/files/NSDS_booklet_en.pdf

[35] ISSN 2443-8219. Available at http://ec.europa.eu/eurostat/statistics-explained/index.php/Statistics_in_development_cooperation_-_National_Strategies_for_Development_of_Statistics

a. Strategies for the development of statistics must be demand-driven, modest and realistic.

b. Strategies for the development of statistics should build on existing processes.

c. Strategies for the development of statistics should take a realistic approach to managing for development results, i.e. focus on key indicators.

d. Strategies for the development of statistics should take into account limited national capacity and resources.

e. Strategies for the development of statistics should focus and coordinate donor support on country priorities for statistics.

f. Implementation of the strategies should be monitored.

146. National Strategies for the Development of Statistics (NSDS) is the recommended methodology for elaborating a strategy to develop statistics.

a. The choice of methodology is for the partner country to take for itself.

b. The most common methodology is the National Strategy for the Development of Statistics.

c. The main alternative to the NSDS methodology is the 'Plan for Change': it is of interest to countries that are working closely with the IMF on general data dissemination system (GDDS) compliance and where advocacy at the decision-making level is less of an issue.

d. The methodology is described in PARIS21's "Guide to Designing a NSDS" and in the "NSDS Approach In A Nutshell" booklet.

5.3. Statistical Value Chain

147. The Statistical Value Chain is described in the SASQAF. Stats SA have adapted what was developed by the Joint UNECE/Eurostat/OECD Work Session on Statistical Metadata (METIS) in 2008. The Statistical Value Chain is the statistical process of developing national statistics and involving a range of statistical operations, which are enabled by various support functions.

Table 4. Phases and sub-processes in the statistical value chain and quality dimensions and indicators that accompany them.

Statistical value chain		SASQAF quality dimensions and indicators	
#	Phase	Sub-process	Quality indicators
1	**Need**	This first phase involves all the necessary planning when a need for new statistics is identified, or feedback about current statistics initiates a review. It determines whether there is a presently unmet demand, externally and/or internally, for the identified statistics and whether the statistical organisation can produce them.	**Prerequisites of quality** e.g. Responsibility for producing statistics is clearly specified, Standards and policies are in place to promote consistency of methods and results, Data sharing and coordination among data-producing agencies are clearly specified. **Relevance** e.g. have both internal and external users of the data been identified? Are user needs and the usage of statistical information analysed? **Timeliness** e.g. periodicity of release **Accessibility** e.g. Legal arrangements are in place to allow access to administrative records **Methodological soundness** e.g. the scope of study is consistent with accepted standards, guidelines and good practices **Integrity** e.g. Choice of source data, techniques and dissemination decisions are informed solely by statistical considerations.
2	**Design**	This phase describes the development and design activities and any associated practical research work needed to define the statistical outputs, concepts, methodologies, collection instruments and operational processes. This occurs in the first iteration or whenever improvement actions are identified (e.g. in phase 9 (evaluate)).	**Prerequisites of quality** e.g. Resources are commensurate with the needs of the statistical programme (staff, facilities, computing resources, financing) **Accuracy** e.g. Register/frame maintenance procedures are adequate (updates, quality assurance), data collection systems are sufficiently open and flexible to cater **Comparability and coherence** e.g. data across comparable series or source data are based on common frames, identifiers, concepts etc **Methodological soundness** e.g. concepts, definitions, and classifications or methodologies used follow accepted standards, guidelines or good practices (national, international, peer-aligned).
3	**Build**	This phase builds and tests the production systems to the point where they are ready to use in the 'live' environment. This occurs in the first iteration generally.	

Statistical value chain		SASQAF quality dimensions and indicators	
#	Phase	Sub-process	Quality indicators
4	**Collect**	This phase collects all necessary data, using different collection modes and loads them into the appropriate data environment.	
5	**Process**	This phase describes the cleaning of data records and their preparation for analysis. It is made up of sub-processes that check, clean, and transform the collected data, and may be repeated several times. Applies to data from both statistical and non-statistical sources.	**Comparability and coherence** e.g. A common set of identifies (for the purpose of record matching) exist and have been agreed upon by data producers.
6	**Analyse**	In this phase, statistics are produced, examined in detail, interpreted, and made ready for dissemination. Sub-processes and activities include those that enable statistical analysts to understand the statistics produced, and are generic for all statistical outputs regardless of how the data were sourced.	**Accuracy** e.g. Measures of sampling errors for key variables are calculated. Among others these are: standard error; coefficient of variation (CV); confidence interval; mean square error; design effect, or measures of non-sampling errors are calculated (e.g. frame coverage errors, systematic errors, measurement errors, processing or model assumption errors) **Comparability and coherence** e.g. Statistics are consistent or reconcilable over time, statistics are checked for consistency with those obtained through other data sources.
7	**Disseminate**	This phase manages the release of the statistical products to customers. The sub-processes can occur sequentially, in parallel and be interactive. They include updating output systems, producing products and quality statements, and managing the release of products.	**Accuracy** e.g. Data from the primary source have been quality assessed **Timeliness** e.g. Average time between the end of reference period and the date of the final preliminary results (and of the final results). **Accessibility** e.g. Are statistical products available to the public? Rules governing the restricted availability of administrative records. Types of media and/or channels used for sharing data amongst stakeholders are adequate and preserve confidentiality **Interpretability** e.g. Documented metadata are sufficient to understand data, statistics are presented in a clear and understandable manner. **Methodological soundness** e.g. Are revisions schedule followed? Studies of revisions made public. **Integrity** e.g. Terms of conditions under which statistics are produced are publicly available and follow UN principles of official statistics
8	**Archive**	This phase manages the archiving and disposal of statistical data and metadata. This may include disposal of intermediate files from previous iterations.	

Statistical value chain		SASQAF quality dimensions and indicators	
#	Phase	Sub-process	Quality indicators
9	**Evaluate**	This phase manages the evaluation of a specific instance of a statical business process. It takes place at the end of the instance of the process, but relies on inputs gathered across the phases. For statistical outputs produced regularly it should occur with each iteration, assessing the need for improvements and/or future iterations.	Prerequisites of quality e.g. measures to oblige response are ensured through law Relevance e.g. is there a process to determine the satisfaction of users with the statistical information?

5.4. Stakeholders

148. Includes organisations that are providers of data used in natural capital accounts, and/or organisations that are producers of accounts, users of accounts, and/or (supporters of) interested parties and potential users of accounts.

Table 5. Summary of stakeholders involved in strengthening statistical systems and/or producing, using and/or supporting information for sustainable development in South Africa

Name	Description of role with regard to production or use of NCA	Data provider	Producer of accounts	User (including potential users)	Other (e.g. funder, setting standards)
SOUTH AFRICAN ENTITIES					
Accounting Standards Board (ASB)	The ASB, overseen by National Treasury, is required by the Public Finance Management Act, Act No. 1 of 1999 (PFMA), to serve the public interest by setting standards of Generally Recognised Accounting Practice (GRAP) (ASB 2014) and providing guidance for financial and other performance information reported by the public sector. The Standards of GRAP that the Board develops include Standards, Interpretations and Directives. The PFMA also allows the Board to prepare and publish guidelines concerning these Standards. The Board has the following responsibilities: determine the work programme and approve the appointment of members of project groups; approve the standards to be issued as standards of GRAP for the preparation of annual	No	No	No	Potentially supporters of standardised approaches to accounts.

Name	Description of role with regard to production or use of NCA	Data provider	Producer of accounts	User (including potential users)	Other (e.g. funder, setting standards)
	financial statements of all spheres of government; prepare and publish directives, interpretations and guidelines concerning the standards of GRAP; recommend to the Minister of Finance effective dates for the implementation of these standards by different categories of institutions to which these standards apply; perform any other function incidental to advancing financial reporting in the public sector; and issue and publish recommended practices on its own authority, if satisfied as to need, usefulness and practicality, following a process of consultation with stakeholders.				
Agricultural Research Council (ARC)	The ARC conducts research in support of the development of the agricultural sector. In collaboration with DAFF and provincial agriculture departments, they have developed AGIS, an online, integrated spatial database of selected agricultural, climate, soil and demographic data. The platform could serve as an example of integrated web mapping and as an input to testing the SEEA EEA.	Yes	No	Yes	
Council for Scientific and Industrial Research (CSIR)	The CSIR is a world-class African research and development organisation established through an Act of Parliament in 1945. The CSIR undertakes directed, multidisciplinary research and technological innovation that contributes to the improved quality of life of South Africans. The organisation plays a key role in supporting government's programmes through directed research that is aligned with the country's priorities, the organisation's mandate and its science, engineering and technology competences. The CSIR undertakes advanced spatial analysis and modelling work that is useful in the production of NCA, has advanced spatial analysis and modelling capacity and expertise in national freshwater and estuarine aquatic ecosystem assessment, and was a key partner in the ANCA Project. CSIR could play a key role in supporting the development of accounts going forward, both through links with the Geospatial Analysis Platform (a meso-scale geospatial platform for the assembly, analysis and sharing of strategic geospatial information) and through the Natural Resources and Environment division, which would contribute especially to ecosystem accounting.	Yes	Yes	Yes	
Department of Agriculture, Forestry and	DAFF is responsible for supporting and overseeing the agricultural sector as well as ensuring food safety and security. Under the MTSF, they are responsible for reporting on: (1) the implementation of the Agricultural Policy Action Plan, (2)	Yes	Potentially	Yes	

Name	Description of role with regard to production or use of NCA	Data provider	Producer of accounts	User (including potential users)	Other (e.g. funder, setting standards)
Fisheries (DAFF)	the Agriculture, Forestry and Fisheries Market and Trade Development Strategy, (3) spatial imbalances in economic opportunities with respect to agriculture, (4) rural poverty and hunger reduction, (5) improved land administration and spatial planning for integrated for integrated development in rural areas, (6) improved food security, (7) agrarian transformation, (8) impact indicators with respect to selected marine fish stocks and (9) combat land degradation. As a data provider, DAFF could support testing the SEEA EEA by providing harvest and catch data, as well as spatial data on the locations of harvesting activities. As a user, DAFF would benefit from an integrated spatial data biodiversity and socio-economic data.				
Department of Cooperative Governance and the Department of Traditional (CoGTA)	CoGTA supports a functional and developmental local government system that delivers on its Constitutional and legislative mandates within a system of cooperative governance. It works to ensure that all municipalities perform their basic responsibilities and functions consistently by, amongst other things, ensuring sound financial management and accounting. CoGTA coordinates the Integrated Urban Development Framework, and manages and transfers the Municipal Infrastructure Grant (MIG), which aims to eradicate municipal infrastructure backlogs to poor communities. It supports local economic development and the community work programme.	No	No	Yes	
Department of Environmental Affairs (DEA)	DEA is mandated to give effect to the right of citizens to an environment that is not harmful to their health or wellbeing, and to have the environment protected for the benefit of present and future generations. To this end, the department provides leadership in environmental management, conservation and protection towards sustainability for the benefit of South Africans and the global community. DEA is the National Focal Point for the CBD and UNCCD and hosts IPBES. It is responsible for reporting on and publishing general environmental statistics, through a range of publications and has developed a Delivery Agreement around the MTSF Outcome 10, which identifies the partnerships necessary and targets for specific outputs: - Output 1: Enhanced quality and quantity of water resources	Yes	Potentially	Yes (e.g. in State of the Environment Reporting and the Environmental Outlook, or Environmental Sustainability Indicators.)	

Name	Description of role with regard to production or use of NCA	Data provider	Producer of accounts	User (including potential users)	Other (e.g. funder, setting standards)

	- Output 2: Reduced greenhouse gas emissions, climate change impacts and improved air/atmospheric quality
	- Output 3: Sustainable environmental management
	- Output 4: Protected biodiversity
	  ○ Sub-output 4.4: Valuing the ecosystem services
	  ▪ 4.4.1 Environmental costs related to the provision of resource based services.
	DEA acts as the lead organization in the development of the National Strategy for Sustainable Development and Action Plan (NSSD1 and NSSD2), the National Biodiversity Strategy and Action Plan (NBSAP), and the National Biodiversity Economy Strategies (NBES).
	It also collaborates with other institutions to produce reports such as: a Green Economy Modelling Report (with UN Environment) focussing on the employment-generation potential in Natural Resources Management, Agriculture, Transport and Energy sectors. It leads the implementation of BIOFIN, in collaboration with National Treasury, for the UNDP.
	DEA is a key partner in terms of providing data and using outputs from testing the SEEA EEA. Links to CBD and TEEB will enhance use of SEEA EEA in international reporting. SEEA EEA would provide an underlying measurement framework and quantitative data to streamline many of their reporting activities. Activities to address Aichi Targets could be linked to SEEA EEA testing Programme of Work.
	The department has proposed a TEEB Country Study for South Africa that would focus on addressing Sub-output 4.4 (above) by: collating existing valuation studies, reporting on biodiversity values, identifying valuation research gaps and conducting additional research on valuation and decision making in selected landscapes.				

Department of Energy (DoE)	With respect to environmental issues in the MTSF, the Department of Energy is responsible for indicators on (1) an effective climate change mitigation and adaptation response and (2) sustainable human communities (in terms of renewable energy).	Yes	No	Yes	

Name	Description of role with regard to production or use of NCA	Data provider	Producer of accounts	User (including potential users)	Other (e.g. funder, setting standards)
	The DoE could be a partner in testing the SEEA EEA through providing data (e.g., on energy infrastructure, biofuel consumption) for ecosystem asset and production accounts, as well as a user of an integrated spatial framework.				
Department of International Relations and Cooperation (DIRCO)	DIRCO is responsible for reporting internationally on progress towards the MDGs and SDGs. Under the MTSF, this is included in terms of enhancing global cooperation through governance systems and capacity. Since there is a clear linkage between the SDGs and the testing of the SEEA EEA, DIRCO could be engaged as a partner in the testing of the SEEA EEA as a supporter and user of high-level indicators on biodiversity values, ecosystem protection and degradation.	No	No	Yes (e.g. reporting on SDGs)	
Department of Mineral Resources (DMR)	DMR oversees the mining industry in South Africa. It sets as its vision "to enable a globally competitive sustainable and meaningfully transformed minerals and mining sector." Under the MTSF, they are responsible for reporting on (1) increasing mining exploration and investment, (2) a national coal policy, and (3) mitigating negative environmental impacts in the exploitation of mineral resources. They also maintain an inventory of large land owners.	Yes (e.g. data on mining)	No	Yes (e.g. DMR could benefit from a broad framework for assessing its impacts.)	
Department of Planning, Monitoring and Evaluation (DPME)	DPME is under the Minister of the Presidency and is responsible for setting governmental priorities, monitoring and evaluation. The main instrument for setting priorities is the National Development Plan and the approach used is to define 14 high-level outcomes. The National Planning Commission is an independent agency, answering to the President. It is responsible for developing a long-term vision and strategic plan for South Africa. The Commission will also advise on crosscutting issues that impact on South Africa's long-term development. As a supporter and user of the results of testing the SEEA EEA, DPME would benefit from having access to a coherent and coordinated measurement and reporting framework for selected MTSF indicators.	No	No	Yes (e.g. NCA information for NSDF)	
Department of Rural Development and Land	The Minister of Rural Development and Land Reform oversees spatial information in South Africa through the Spatial Data Infrastructure Act (No. 54 of 2003). The Director-General of DRDLR administers the SA Spatial Data Infrastructure (SASDI)	Yes	No	Yes (e.g. Spatial Planning and Land Use Management)	Setting standards through CSI

Name	Description of role with regard to production or use of NCA	Data provider	Producer of accounts	User (including potential users)	Other (e.g. funder, setting standards)
Reform (DRDLR)	DRDLR is responsible for cadastral surveying, deeds registration, and land reform. Their responsibilities under the MTSF include: (1) improved land administration and spatial planning for integrated development in rural areas and (2) sustainable land reform contributing to agrarian transformation. They maintain a spatial cadastral data viewer, which could contribute land use data to a pilot ecosystem asset account. As a data provider, DRLDR could support testing the SEEA EEA by providing cadastral and land use data. DRLDR would also benefit from the SEEA EEA's integrated spatial database on ecosystem assets, conditions, biodiversity and socio-economic information.				
Department of Science and Technology (DST)	DST provide leadership, an enabling environment, and resources for science, technology and innovation in support of South Africa's development. Much of the scientific research and work it undertakes is carried out by the public entities: National Research Foundation (NRF), Council for Scientific and Industrial Research (CSIR), Technology Innovation Agency, South African National Space Agency, and the Human Sciences Research Council. DST implement the Global Change Challenge and Research Plan in partnership with other stakeholders. NCA could support this plan through providing information relevant to planning and decision-making towards sustainable futures.	No	No	Yes	Allocate funds to data providers & support capacity building in this field.
Department of Water and Sanitation[36] (DWS)	DWSs primary responsibility is to formulate and implement water policy. It has an overriding responsibility for water services provided by local government. DWS has worked with CSIR to produce State of Rivers Reports as part of the River Health Programme. They maintain an ecological status database for rivers (by subscription). According to the MTSF, DWS is responsible for providing information on strategies for water conservation, protecting water resources and maintaining and improving watershed services in key rural areas. DWS holds substantial data on the ecological status of rivers and would also benefit from linkage to economic and social priorities as part of testing the SEEA EEA's land, water, ecosystem asset and ecosystem service accounts.	Yes (e.g. State of Rivers Reports)	Potentially	Yes	

[36] The department was known as the Department of Water Affairs (DWA) prior to May 2014 and as the Department of Water Affairs and Forestry (DWAF) prior to May 2009.

Name	Description of role with regard to production or use of NCA	Data provider	Producer of accounts	User (including potential users)	Other (e.g. funder, setting standards)
Delegation of the European Union to SA	Based in Pretoria and is focal point for EU in South Africa. The EU has funded work the NCA&VES Project.	No	No	No	Yes
Ezemvelo KZN Wildlife	KZN Wildlife is a provincial governmental organisation responsible for maintaining protected areas and biodiversity in KwaZulu-Natal province. The organisation is actively involved in biodiversity planning and has produced case studies on valuing ecosystem goods and services in the province. KZN wildlife, as a partner in testing the SEEA EEA could both provide data (on species, ecosystems, ecological condition and ecosystem services) and benefit from integrated spatial data and standard classifications	Yes (e.g. KZN land cover)	Yes	Yes	
National Geo-spatial Information (NGI)	NGI, known as South Africa's national mapping organisation, is a component of DRDLR whose functions are mandated by section 3 A of the Land Survey Act (No. 8 of 1997). It manages an integrated survey system, which expedites and facilitates orderly development, and provision of extensive topographic mapping, land cover and aerial imagery coverage of the country, which facilitate sustainable development. NGI established, manages and controls an active control survey network of continuously operating GNSS base stations covering South Africa. It is a key contributor to the SASDI as well as being the largest custodian of geospatial information.	Yes (e.g. Mapping and aerial imagery coverage of the country)	No	No	
National Treasury	The National Treasury, under the Ministry of Finance, is responsible for macro-economic policy and manages the government's budget preparation process and implementation. The National Treasury is considering a national carbon tax and has been conducting modelling and forecasting in preparation. As with DPME, the National Treasury is a potential supporter of testing the SEEA EEA, since a streamlined environmental data collection and reporting process would have potential cost savings for government.	No	No	Yes	
South African Environmental Observation Network (SAEON)	Funded by NRF through the DST, its vision is to establish a South African observation and research facility that provides understanding, based on long-term information, needed to address environmental issues. The core of SAEON is to create a framework that permits collection, transmission and interpretation of data on long term ecological changes, new understanding brought about through SAEON will inform suitable policies and appropriate procedures	Yes	No	No	

Name	Description of role with regard to production or use of NCA	Data provider	Producer of accounts	User (including potential users)	Other (e.g. funder, setting standards)
	(actions) for dealing with the inevitability of environmental change and its consequences for the livelihoods of South Africa's people.[37]				
South African National Biodiversity Institute (SANBI)	SANBI derives its mandate from the National Environmental Management: Biodiversity Act (No. 10 or 2004) and "leads and coordinates research, and monitors and reports on the state of biodiversity in South Africa". In 2004 and again in 2011, SANBI published a National Biodiversity Assessment (NBA), which focused on terrestrial, freshwater, coastal and marine ecosystems. The NBA 2018 is currently underway and will be published in 2019. SANBI is the custodian of the National Ecosystem Classification System, which provides foundational information for the development of ecosystem accounts, including maps and classification systems for terrestrial, river, wetland, estuarine, inshore and offshore ecosystems. SANBI collaborates closely with other related departments and is often the convenor of relevant initiatives and communities of practice.	Yes (e.g. through National Biodiversity Assessment)	Yes (e.g. Developed National River Ecosystem Accounts in partnership with Stats SA, DWS and CSIR)	User	
South African Weather Service (SAWS)	Public entity of under DEA. Provides weather data and forecasting.	Yes	No	No	No
Statistics South Africa (Stats SA)	Stats SA is South Africa's national statistical office (NSO). The Statistician General of South Africa is responsible for both the operations of Stats SA and the National Statistical System. That is, the position includes the mandate to influence the nature and quality of data collected by other agencies. Stats SA implement the System of National Accounts 2008 (SNA2008), which includes an enhanced focus on natural resources, their valuation, and their depletion. The Government of South Africa has adopted a South African Statistical Quality Assessment Framework (SASQAF), which sets standards for not only Stats SA's products. Stats SA engages with its stakeholders internationally, regionally and nationally. Their role in environment statistics is concentrated in environmental-economic	Yes (e.g. general household survey data)	Yes (e.g. Integrated report on Environmental-Economic Accounts covering energy, fisheries, mining and selected socio-economic indicators; and a Water Quality	Producer	Sets standards for statistics. Builds capacity (e.g. pilot training program for the SEEA Central Framework Accounts in 2014.)

[37] Pg 35 of Environment Sector Research, Development and Evidence (R,D&E) framework (approved by MINMEC in 2012) available at http://www.sagreenfund.org.za/wordpress/wp-content/uploads/2015/04/DEA-Research-Document.pdf

Name	Description of role with regard to production or use of NCA	Data provider	Producer of accounts	User (including potential users)	Other (e.g. funder, setting standards)
	accounting (established in 1999). They do not have a general environmental statistics program. They have been asked to assess the quality of selected government environmental datasets, but are unable to keep up with the demand. Stats SA accesses data from other government departments for statistical purposes through establishing general Memoranda of Understanding (MoUs) and then specific Service Level Agreements for individual projects. Stats SA have established a core environmental-economic accounting capacity, a pilot SEEA training program and institutional relationships that could all be expanded to incorporate ecosystem accounting by testing the SEEA EEA. The need for improved quality assurance services are opportunities to integrate specific environmental indicators with SEEA EEA and to ensure environment sector data comply with minimum quality standards.		Account published in 2006).		
Water Research Commission (WRC)	The WRC was established in terms of the Water Research Act (Act No 34 of 1971), and is a statutory body under DWS. It is a global water knowledge node and South Africa's premier water knowledge hub active across the Innovation Value Chain that: informs policy and decision making; creates new products, innovation and services for socio-economic development; develops human capital in the water science sector; supports the national transformation and redress project; and develops sustainable solutions and deepens water research and development in South Africa, Africa and the developing world. It has funded the Water Research Accounts.	Yes (e.g. through funding research that provide data useful in water accounts and freshwater ecosystem accounts)	Yes (e.g. through funding projects that generate accounts such as Water Accounts and Agricultural water accounts)	No	Funds and publishes
INTERNATIONAL ENTITIES					
FAO Country Office	The FAO Country Office works with DAFF to "provide technical support to ensure food security and rural development". This includes institutional strengthening and technical capacity development. The office could advise testing the SEEA EEA on the use of FAO global land cover and soil data at a national level.	No	No	Yes	Works with DAFF
Gaborone Declaration for Sustainability	The GDSA is a transformative action platform for achieving sustainable development in Africa. It was initiated as a regional policy framework in May 2012 and announced at Rio +20 by the ten African countries to take action	No	No	Yes	Supports NCA (e.g. through coordination and

Name	Description of role with regard to production or use of NCA	Data provider	Producer of accounts	User (including potential users)	Other (e.g. funder, setting standards)
in Africa (GDSA) Secretariat	towards sustainable development. The functions of the GDSA Secretariat have been delegated to Conservation International until December 2018. As such, CI is working on NCA in Africa under the mandate of the Declaration's stated commitments They work with the twelve member countries to move the GDSA initiative forward. A team of experts based in Gaborone provides members with technical and policy support and facilitate a platform for learning, capacity building, promoting national and global dialogues and linkages, identifying partnerships and mobilising financial resources to achieve the sustainable development goals.				producing publications on NCA in Africa, case studies, information sheets, progress reports etc).
ICLEI Africa	ICLEI is a global network committed to building a sustainable future through supporting local government for sustainability. It supports technical, organisational, financial and social solutions to transitions to a more sustainable future. ICLEI Africa's Secretariat both contributes to, and taps into, the organisation's international network of local government leaders and professional staff who share tools, strategies and good practices for promoting the overall goal of sustainable development through the 17 SDGs.	No	No	Yes	Capacity building and tool production
Organisation for Economic Cooperation and Development (OECD)	In 2013, the OECD released its Environmental Performance Review of South Africa: "…the Review recommends to broaden and deepen initiatives to integrate biodiversity into economic and social development." This recommendation could be addressed by testing the SEEA EEA.	No	No	Yes (e.g. in Environmental Performance Review of South Africa)	
Statistics Division of the African Union	Coordinates the Strategy for Harmonising Statistics in Africa (SHaSA). South Africa has proposed the creation of a theme on Environmental-Economic Accounting, but this has not yet been agreed by the organisations that would need to sponsor such an activity (UN-Economic Commission for Africa, African Union Commission, and the African Development Bank). Testing the SEEA EEA would be an opportunity to engage other African nations in developing programs on ecosystem accounting.	No	No	Yes	Supports through standardisation / setting statistic standards
United Nations Development	UNDP "South Africa Country Programme is guided by national policy as stated in the MTSF, draft National Development Plan: Vision 2030, the Joint Evaluation Report, the Partnership Framework Agreement and the UNDAF (2013-17)."	No	No	Yes	Supporter

Name	Description of role with regard to production or use of NCA	Data provider	Producer of accounts	User (including potential users)	Other (e.g. funder, setting standards)
Program (UNDP)	Managing the implementation of the Biodiversity Finance Initiative (BIOFIN), in partnership with the European Commission and the Governments of Germany and Switzerland. One of 29 countries participating in BIOFIN, BIOFIN is implemented in SA by DEA in collaboration with the National Treasury. BIOFIN aims to develop a comprehensive national resource mobilising strategy, improve cost effectiveness through the mainstreaming of biodiversity into national development and sectoral planning, and develop a methodology for quantifying the biodiversity finance gap at national level.				
United Nations Environment Programme (UN Environment) South Africa Liaison Office	The UN Environment South Africa Liaison office is also the Regional Coordination office for Southern Africa. They have collaborated with DEA in producing the Green Economy Modelling Report. UN Environment is also linked with regional organisations such as the African Environment Ministers and the African Environmental Information Network	No	No	Yes (e.g. in Green Economy Modelling Report (with DEA))	Supporter

5.5. Key data sources

The tables below summarise some of the key data sets that could be used in ecosystem accounting. Further exploration will take place over the course of the NCA&VES Project. This appendix should be considered a living document as they will be progressively added to as new and additional information become available.

Environmental data

At the technical level, South Africa has relatively good foundational data on ecosystems obtained from various sources such as the National Biodiversity Information System, National Biodiversity Assessments, pilot studies on ecosystem accountings and other indicators and reporting system. A National Ecosystem Classification System, coordinated by SANBI, exists and is currently in the process of being refined for the National Biodiversity Assessment 2018.

Data	Spatial	Scale	Data origin, custodian and access
Mean annual precipitation	Yes	1 x 1 minute grid cell resolution	South African atlas of agro-hydrology and climatology (Schulze 1997)
Nested hydrological catchments	Yes	(primary, secondary, tertiary and quaternary) Mapped at approximately 1:50,000 resolution	Originally sourced from Water Resources Assessment 1990 (Midgely et al. 1994), but there is a revised set of these catchments developed by Weepener using SRTM90 data in a WRC project and available from DWS.
Homogenous rainfall zones	Yes	9 zones attributed to groups of quaternary catchments in the Water Resources Assessment 1990 (Midgely et al. 1994)	
Mean annual runoff	Yes	Quaternary catchment resolution	
Mean annual groundwater recharge	Yes	Quaternary catchment resolution	
Mean annual baseflow	Yes	Quaternary catchment resolution	
Quaternary catchments	Yes		DWS (2012)
Digital Elevation Model (DEM)	Yes	25m and SRTM, 30m	NGI, NASA
Soils and geology	Yes	Available freely at 1:1000,000 scale; finer scales need to be purchased	Council of Geosciences
Vegetation types & Biomes	Yes	Mapped at variable scales, but suitable for 1:50,000 scale	Mucina and Rutherford (2012); available on http://bgis.sanbi.org SANBI is data custodian.
River ecosystem types	Yes	National data for 1:500,000 rivers	NFEPA rivers; Nel et al. (2011a); available on http://bgis.sanbi.org. SANBI is data custodian.

Data	Spatial	Scale	Data origin, custodian and access
Wetland ecosystem types	Yes	National data for 1:500,000 wetlands	National Wetland Map; Originally from Nel et al. (2011a) (available on http://bgis.sanbi.org), now updated in Van Deventer et al. (2018). SANBI is data custodian.
National Land Cover 2014	Yes	National data; 30 m grid cell resolution	Full version not freely available; lumped land cover categories available DEA's website (freely available)
KZN Land Cover (with condition) 2005, 2008, 2011, 2017	Yes	20m	Ezemvelo KZN Wildlife
Invasive alien plant maps 1999	Yes	Mapped at a variety of scales but most suitable for use at 1:250,000 scale	Data available from CSIR on request; contact Dr David Le Maitre; E-mail: DLMaitre@csir.co.za; Tel: +27 (0)21 888 2407
Invasive alien plant maps 2010	Yes	Mapped at a 1:50,000 scale and interpolated to other areas	Data available from Agricultural Research Council on request; contact Mr. Ian Kotzé; E-mail: KotzeI@arc.agric.za; Tel: +27 (0)21 887 4690
River ecological integrity	Yes	NFEPA data for 1:500,000 rivers	Nel et al. (2011a); available on http://bgis.sanbi.org SANBI is data custodian.
Dams	Yes	Taken from 1:50,000 resolution topographic maps	NGI, All wetlands coded as "artificial" on the National Wetland Map 4; Nel et al. (2011a); available on http://bgis.sanbi.org DWS has two other datasets that include dams, (1) WARMS database, (2) registered dams from the dam safety office
Protected areas	Yes		DEA
Carbon Sink Assessment	Yes	~1.2 km	DEA (2015)

Social and economic data

Data	Spatial	Description and scale	Data custodian and access
Country boundary	Yes		DRDLR
Administrative areas	Yes	Provincial and municipal	Provinces Municipalities
Cadastral (ownership or deeds) data	Yes	Data are and are available in digitized spatial format on the DRLDR web site. The web maps are viewable on a plot basis, but not downloadable as a single national spatial database.	Currently managed by Chief Surveyor General
Road Centreline dataset	Yes	Municipality scale	2012, obtained from AfriGIS; Stats SA is data custodian

Data	Spatial	Description and scale	Data custodian and access
Stats SA Geospatial Information Frame	Yes	Province, Metro, Local municipality, Main place name, Sub-place name, Small area, Enumerator area, Dwelling Frame.	Stats SA
Stats SA Survey data	Yes	10-yearly population census with other more frequent surveys in between. More frequent social surveys are the General Household Survey, Income and Expenditure Survey, Living Conditions Survey, Quarterly Labour Force Survey, and Community Survey. Can be disaggregated to municipal or even small area layer.	Stats SA website; Supercross platform (available to the public)
Business Register (BR)	No	Not spatially referenced and therefore unable to map local economic activity such as turnover and employment information into a spatial area.	Stats SA
Dwelling frame	Yes	Point data – 14 million dwellings	Stats SA
Household livelihood survey data	No	Excel spreadsheet, on harvested resources (woody, non-woody, wild foods and medicines etc)	From previous studies (EGSA, iSimangaliso)
Short term indicators on turnover and volumes in various sectors of the economy	No	These statistics are compiled on a monthly and quarterly basis on industry related activities in the primary, tertiary, services and transport sectors of the economy.	Stats SA
Large Sample Survey of Industry Sectors	No	Large Sample Surveys on turnover and volumes in various sectors of the economy. Provides information on turnover and volumes in various sectors of the economy. These statistics are compiled on an annual basis on industry related activities in the primary, tertiary, services and transport sectors of the economy.	Stats SA
Annual agricultural surveys and a Commercial Agriculture Census every five years	Excel	Information is collected via post, email, telephone, Internet and personal visits to individuals or groups engaged in commercial farming across South Africa. This collected information is specific to the agricultural sector, and aims at establishing and evaluating trends and challenges in the sector in the form of time series data, as well as income generated in crop and livestock production, employment, current and capital expenditure and farming debt in the agricultural sector. District summaries	Stats SA

Data	Spatial	Description and scale	Data custodian and access
Employment and Price statistics	No	The CPI and PPI are the key monthly economic indicators informing price stability. The CPI measures the change each month in the prices of a basket of goods and services purchased by South African households. The PPI measures the change each month in the prices of a basket of commodities at a producer level. The QES is a business survey and collects statistical information on employment and earnings in formal non-agricultural industries. Employment statistics are collected on a quarterly basis on the composition and characteristics of the work force in the South African Business and government sector.	Stats SA
Household budget surveys	Yes	Income and Expenditure survey provides statistical information on household's acquisition and consumption expenditure patterns from all types of settlements, which are used to update the CPI basket. The survey is conducted after every five years	Stats SA
Annual financial statistics	No	Financial statistics tracks public sector spending and the financial performance of private sector organizations.	Stats SA
National Accounts (GDP)	No	The key outcome required is that is that the annual income national accounts accurately describe the real level of activity in the South African economy, and that the quarterly accounts accurately measures the real growth in the economy.	Stats SA
Domestic Tourism Survey		Published annually. The DTS is aimed at addressing this need by collecting accurate statistics on the travel behaviour and expenditure of South African residents traveling within and outside the borders of South Africa.	Stats SA
Geo-analysis platform; GAP	Yes	Mesozones are meso-scale units that have been demarcated for the whole of South Africa (mean area = 49 km^2) so as to nest within administrative and physiographic boundaries (Naude et al. 2007)	http://www.gap.csir.co.za/download-maps-and-data
South Africa's EEZ	Yes		
Property sales data	Excel & GIS		Municipalities, contact towns and municipalities individually
Urban green open spaces	GIS		OpenStreetMap
Grazing capacity	Yes		DAFF (2017)

Data	Spatial	Description and scale	Data custodian and access
KZN tourism statistics (2005-2015	Excel		KZN Tourism, Stats SA
Park visitor statistics (2005-2015)	Excel		Ezemvelo KZN Wildlife
Wazimap	Unknown	Wazimap provides easy access to South African census and elections data. Populations and financial figures are broken down by category: Elections, Demographics, Service Delivery, Economics and Education.	https://wazimap.co.za/
Central access point for public government data	Unknown	South Africa's Open Data Portal	http://dgz.code4sa.org/showcase. html
Provincial Government Handbook	Unknown	The Provincial Government Handbook: South Africa is a comprehensive guide to the more than 200 government departments and entities that make up South Africa's provincial government	http://www.provincialgovernment.co.za/
National Government Handbook	Unknown	Explore South Africa's national government and its related institutions and entities by government cluster.	http://nationalgovernment.co.za/
CoGTA: Integrated Development Planning Information Management System (IDPIMS)	Unknown	Integrated Development Planning Information Management System (IDPIMS) which was formerly known as the IDP Nerve Centre is a spatially enabled document management system as well as a portal for relevant planning information. It allows multiple stakeholders, involved in municipal service delivery, to access a core set of planning, funding, programme and project based information over a multi-year period in a consistent manner, thereby enhancing ease of use and promoting integrated planning.	http://idpnc.cogta.gov.za/Home.aspx
SALGA Municipal Barometer	Unknown	Municipal data that includes: Demographics trends, Economic Growth and Development, Access to Basic Services, Access to Social Services, Environmental resilience, municipal finance, good governance and accountability, coherent municipal planning and municipal capacity building, HR and Labour Relations.	http://www.cmra.org.za/content/salga-municipal-barometer
SA Cities Network	Unknown	State of the Cities Report: Economy of cities, built environment, city governance, financial state of cities.	http://www.sacities.net/state-of-cities-reporting/45

Data	Spatial	Description and scale	Data custodian and access
CSIR'S STEPSA Regional Profiler	Unknown		
National Treasury	Unknown	The core dataset is the State of Cities Report 2016 Almanac which contains over 400 indicators of city performance	
National Treasury	Unknown	Spatial trends impacting on development in cities, towns and settlements.	http://sa-cities-almanac-prototype. herokuapp.com/
Human Sciences Research Council	Unknown	Municipal budgets and performance	http://stepsa.org/
The Government Gazette of South Africa	Unknown	National and Provincial budgets	Municipal Money citizen portal – https://municipalmoney.gov.za Municipal Money API – https://municipaldata.treasury.gov.za National Treasury Youtube account (contains all the videos that are also on the Municipal Money citizen portal https://www.youtube.com/channel/ UCtW2TTlhSw9RFw8L7OhCx5g Municipal Finance data: http://mfma.treasury.gov.za/Documents/Forms/AllItems.aspx
UCT DataFirst	Unknown	Online access to survey and administrative microdata (data at unit record level) from South Africa and other African countries.	https://www.datafirst.uct.ac.za/dataportal/index.php/catalog/central
Youth Employment	Unknown	Interactive portal showing youth employment and other detailed statistics based census 2011 – down to sub-place	http://www.youthportalsa.co.za/
Quantec	Unknown	South African and Global macroeconomic data and analysis. South Africa's economic structure by industry. Data and analysis on South Africa's international trade. Detailed regional economic data and analysis for the South African economy down to district, town council and lower sub-national levels.	http://www.quantec.co.za/easydata/

Data	Spatial	Description and scale	Data custodian and access
IHS Global insight	Unknown	Examples of SA Databanks: • Abstract of Agricultural Statistics • Detailed trade statistics - SARS Customs and Excise • Mineral production and sales • Monthly vehicle sales • Preliminary trade statistics • Price and Index Pages • Property indices • South African Reserve Bank general macroeconomic indicators • Statement of the National Revenue, Expenditure and Borrowing • Statistical releases from StatsSA • Miscellaneous financial and other economic indicators	http://www.ihsglobalinsight.co.za/Products/ EconoStat/
Department of Performance, Monitoring & Evaluation	Unknown	Evaluations of government programmes, as undertaken by the Department of Performance Monitoring and Evaluation.	http://evaluations.dpme.gov.za/
SA Reserve Bank	Unknown	Inflation rates, market rates, economic and financial data, monetary operations contributions.	https://www.resbank.co.za/Pages/ default.aspx
South African Police Services: crime statistics	Unknown	Annual crime statistics generated by SAPS. SAPS is working in partnership with Statistics South Africa to ensure the quality and integrity of South African crime statistics.	https://www.saps.gov.za/services/crimestats.php http://www.statssa.gov.za/?cat=26
Companies and Intellectual Property Commission (CIPC)	Unknown	Registration of Companies, Co-operatives and Intellectual Property Rights (Trade Marks, Patents, Designs and Copyright) in South Africa.	http://www.cipc.co.za/za/
Department of Home Affairs	Unknown	Data regarding births and deaths. In November 2016, DHA and Stats SA announced a partnership to undertake the digitization of births and deaths registration: http://www.statssa.gov.za/?p=9152	http://www.statssa.gov.za/?cat=17

Data	Spatial	Description and scale	Data custodian and access
DeedsWeb	Yes	DeedsWeb provides you with a web-based interface to up-to-date land registration information located on the Deeds Registration System database. The data includes: the registered owner of a property the conditions affecting such property interdicts and contracts in respect of the property purchase price of the property rules of a sectional title scheme a copy of an ante nuptial contract (ANC), deeds of servitude, mortgage bonds, etc. a copy of a sectional title plan or the rules of a Sectional	DeedsWeb
Health Statistics: National Department of Health	Unknown	A range of health related data is to be found in the Department of Health's Documentation Portal.	https://ndoh.dhmis.org/owncloud/index.php/s/R5cmdp0gY4Fa43Z http://www.statssa.gov.za/?cat=27

- Data on water supply and demand is not consistent across the country since data on withdrawals are managed by regional water boards and not systematised at the national level. Unpublished data on water security may be available from DWS.

Other relevant data

- **Fisheries data** (already in use in Stats SA's environmental-economic accounts) for five commercial marine species are derived using catch data to continually update a projection model which estimates Total Allowable Commercial Catch. The possibility of overlaying this with SANBI's marine habitat types or marine biodiversity priority areas could be further investigated.
- A **national land use classification** is underway by DRLDR, but has not yet been finalised. Nor does Stats SA have access to DRDLR's cadastral data.

Opportunities for linking data on ecosystems with data on the economy and people

The following opportunities for linking data on ecosystems with data on the economy and people were identified during the second mission in 2014 as part of the ANCA Project, as potential input to further work for testing the SEEA EEA.

- Benefits of ecosystems
  - How poverty-stricken regions compensate through ecosystems (subsistence agriculture, biofuels); Ecosystems as a source of household energy; Use of wood as biofuel for heating and cooking; effects on natural vegetation
  - Resource harvesting information (reeds, fish)
- Data improvements
  - Use big data, for example, get data on establishments from company web sites or citizen science for obtaining new data on ecosystem condition
  - Georeference the Business Register; Conduct a Business Survey that collects local business information (protection expenditures, conditions, dependence on ecosystems)
  - Conduct a survey of business dependence on ecosystem services & link to economic & employment stability
- Economic measures
  - Link ecosystems with jobs/area by sector and GDP in that area (revenues)
  - Land prices (deeds) analysis by location
- Employment
  - Number of jobs related to ecosystems (or number of real green jobs); Employment in nature sectors per local area; Nature-based income per admin area
- Agriculture
  - Compare agriculture yield with employment
  - Make better use of agricultural surveys (practices, conditions, water use)
  - From Agricultural Census data, compare employment rate with river conditions
  - Productive capacity of agricultural land
  - Ecosystem health and incomes from agricultural products; Health of grassland ecosystems compared with the number of households, and number of subsistence farmers
- Impacts on ecosystems
  - The effects of population density on ecosystem health/condition; Quality of ecosystems vs population
- Mining
  - Mining activity vs water quality; Degradation of rivers relating to mining activities

    - Mining data + population + health risks + ecosystem condition
    - Mineral deposits (GeoScience) and impacts on ecosystems
- Demand for ecosystem services
    - Demand for essential ecosystem services
    - Include questions on General Household Survey that included questions on the benefits households receive from ecosystems, ecosystem condition
    - Non-monetary valuation of ecosystem services; Identify activities (recreation, cultural) and value them; Valuing ecosystem services of specific ecosystems and ties benefits to the community/people; Benefits of wetland purification of water
    - Relate ecosystem services to insurance valuations (e.g., flood risk, draught)
- Water
    - Water provision to areas in need; Access to water (piped, river, groundwater); Water supply to water demand per area; Water use, i.e., river water to the quality of water in the river that is being used; Water use licenses issued
    - River data + water quality + source of water supply + income level; Water quality in direct source dependent (no purification) with water-related diseases; Quality of river systems vs household access to water
    - Waste and recycling of wastewater
- Additional data sources (other than the ones implied in the above exercise) include:
    - Western Cape: there's an organisation called Fruitlook – detailed info on fruit production in the Western Cape, done by Andre Roux
    - KZN: the provincial education department has done a recent detailed survey on a range of socio-economic issues
    - AgriGIS
    - Agro-hydrological atlas – there's a national atlas, and a finer scale one in KZN (possibly other provinces)
    - KZN has bioresource units (linked to agriculture)
    - DEA has data on the wildlife economy and biosprospecting
    - South African Weather Service

5.6. Summary of stakeholder engagement

Table 6. Stakeholder engagement around advancing NCA / environmental-economic and ecosystem accounting from 2014 to present.

Phase	Date	Event	Place
ANCA Project	2014, 22 Jul	National River Ecosystem Accounts: Technical Workshop	Pretoria
	2014, 25-29 Aug	First UNSD mission to South Africa (included meetings with government officials from Stats SA, the Department of Water and Sanitation, South African National Biodiversity Institute (SANBI), Council for Scientific and Industrial Research (CSIR), the Department of Environmental Affairs, (DEA), the Department of Water and Sanitation (DWS), the National Treasury, Department of Planning, Monitoring and Evaluation (DPME), UN Environment and the University of Pretoria.	Pretoria
	2014, 10-14 Nov	Second UNSD mission to South Africa (included a stakeholder workshop and pilot training attended by Stats SA, SANBI, DEA, CSIR, DWS, the Department of Energy (DoE), Ezemvelo KZN Wildlife, Prime Africa (Consultants), and UN Environment).	Pretoria
	2014, 13-14 Nov	National Introductory Workshop on Advancing Experimental Ecosystem Accounting	Pretoria
	2015, 24 Feb	Technical Reference Group for Ecosystem Accounting – first meeting	Durban
	2015, 17 Mar	Strategic Advisory Committee on Ecosystem Accounting – first meeting	Pretoria
	2015, 21 Apr	Stakeholder Workshop on Experimental Ecosystem Accounts in KZN	Durban
	2015, 12 May	Work session on national river ecosystem accounts	Pretoria
	2015, 10 Sep	Technical Reference Group for Ecosystem Accounting – second meeting	Durban
	2015, Wk of 5 Oct	Third UNSD mission to South Africa	Pretoria
	2015, 8 Oct	Strategic Advisory Committee on Ecosystem Accounting – second meeting	Pretoria
NCA&VES Project	2017, Sept	Inception Mission for the NCA&VES Project	Pretoria
	2018, Mar	National Stakeholder Engagement Workshop	Pretoria
	2018, June	Spatial frames meeting	Pretoria
	2018, Nov	Spatial frames follow-up meeting	Pretoria

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