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NATURAL CAPITAL ACCOUNTING IN SOUTH AFRICA AND ITS VISION

G20 Bio-Economy Working Group meeting
28 May 2025
Riaan Grobler
Director: Environmental Economic Accounts
Statistics South Africa

28 May 2025

Overview

- Introduction and framing
- NCA in South Africa and its vision
- Stats SA Natural Capital series
- Experimental Biodiversity-Based Tourism Estimates for South Africa
- Experimental Biodiversity Economy Satellite Accounts for South Africa in development
- Key lessons and take-home messages

Introduction and framing

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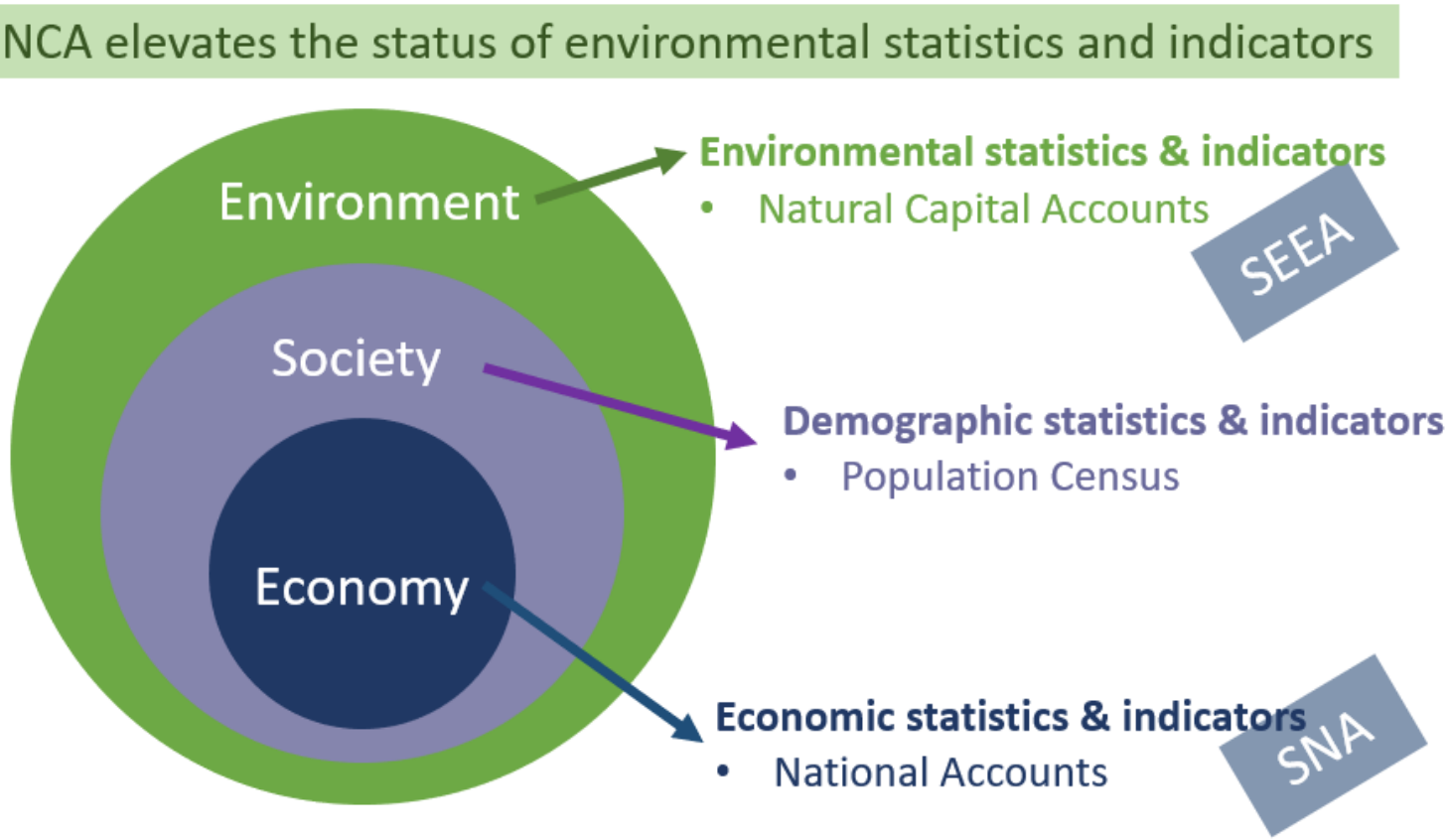
Natural Capital Accounts

→ Response to global environmental crisis

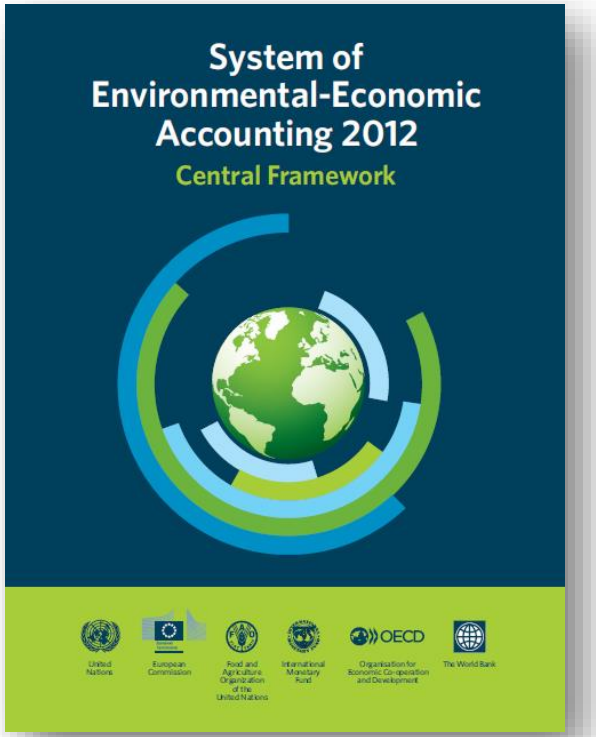
Need to understand what's happening in the natural environment and its implications for the economy and society

The underlying premise of NCA

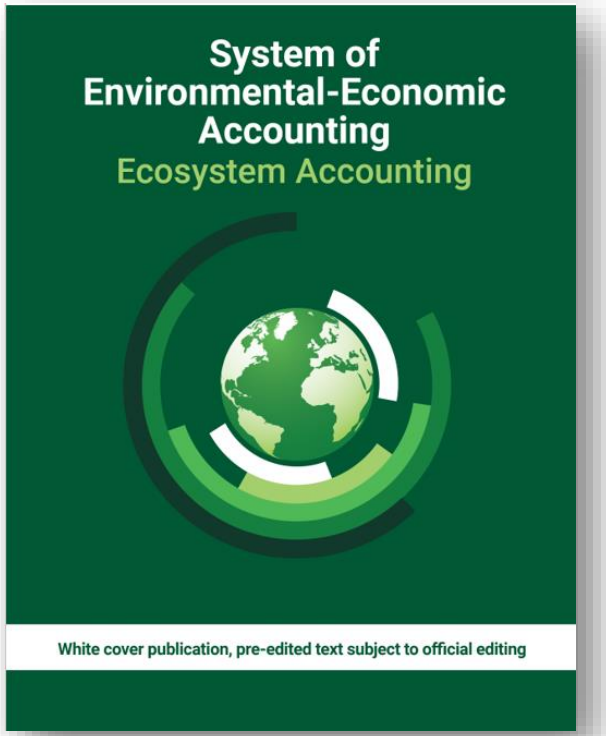
- The environment is essential to society and the economy
- It should be recognised as something that must be maintained and managed
- Its contributions should be better integrated into decision-making



The measurement framework for NCA is the SEEA



Central Framework: Deals with accounts for stocks and flows of **individual natural resources,** e.g. minerals, water, timber, fish

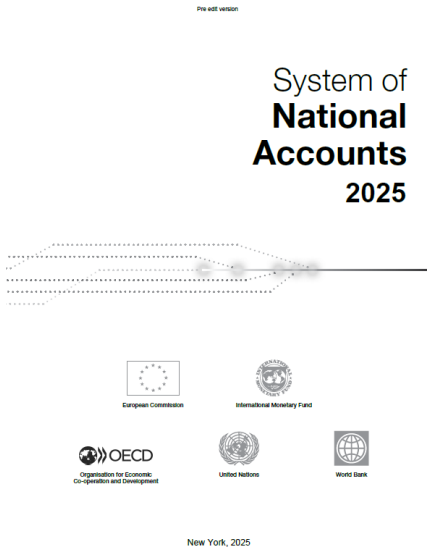


Ecosystem Accounting: Deals with accounts for **ecosystem assets** and **ecosystem services**

System of Environmental Economic Accounting

SEEA Ecosystem Accounting adopted by the UN Statistical Commission in March 2021

Has the same status as the SNA, used to calculate GDP



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Natural Capital Accounting in South Africa and it's vision

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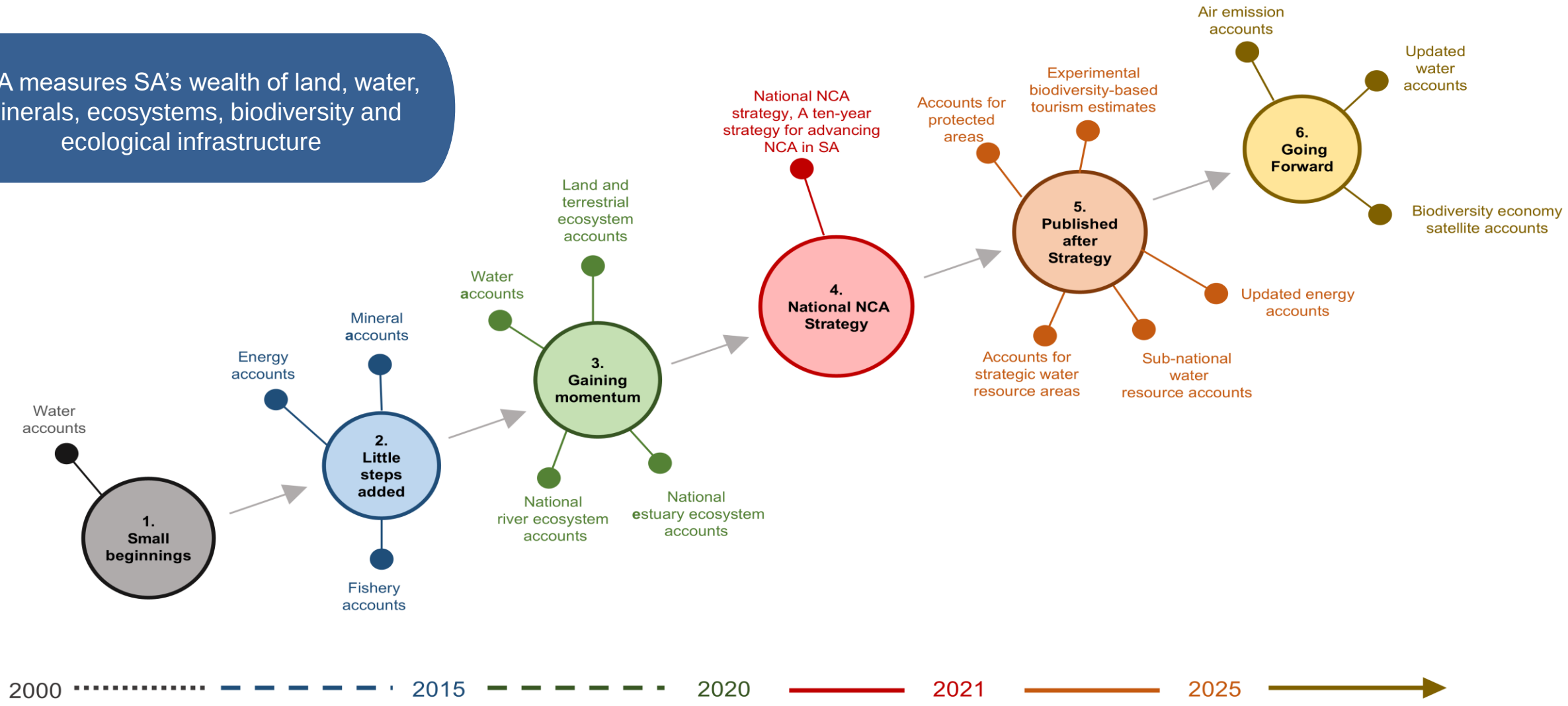
NCA in South Africa: A two-decade journey

NCA measures SA's wealth of land, water, minerals, ecosystems, biodiversity and ecological infrastructure



From early beginnings with national water accounts in 2000, momentum has grown.
Since 2014, donor funded projects have helped to increase capacity, especially for ecosystem accounting.

National NCA Strategy to take NCA forward in South Africa

Published by Stats SA in June 2021

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REPORT
04-01-00

National Natural Capital Accounting Strategy

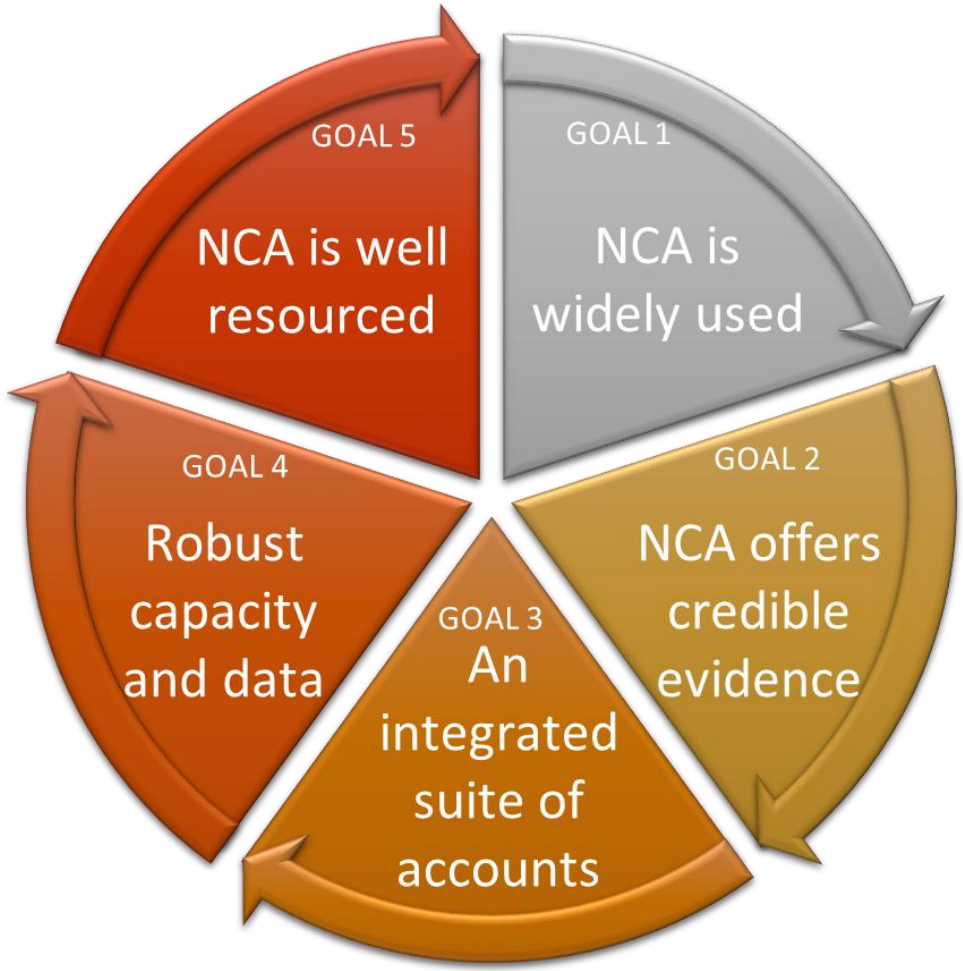
A ten-year strategy for advancing Natural Capital Accounting in South Africa

June 2021

Embargoed until:
3 June 2021
11:30

Vision:

Natural capital accounting is widely used to provide credible evidence for integrated planning and decision-making, in support of the development needs of the country



Intensive co-development process with range of stakeholders over three years

NCA in South Africa is done through collaboration

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South African NATIONAL PARKS

Stats SA Natural Capital series

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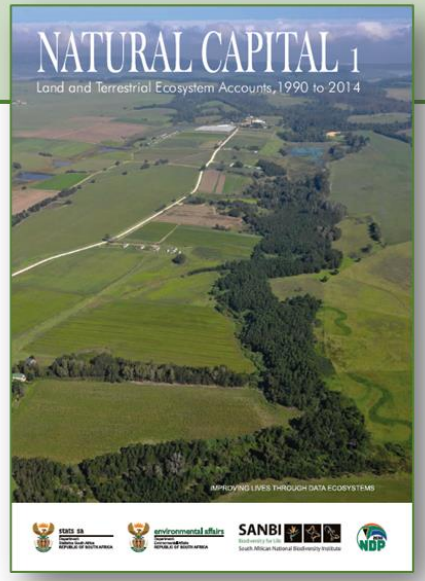
Stats SA's *Natural Capital* series

Land and Terrestrial Ecosystem Accounts, 1990 to 2014: Released in December 2020

1



Accounts for Protected Areas, 1900 to 2020: Released in October 2021

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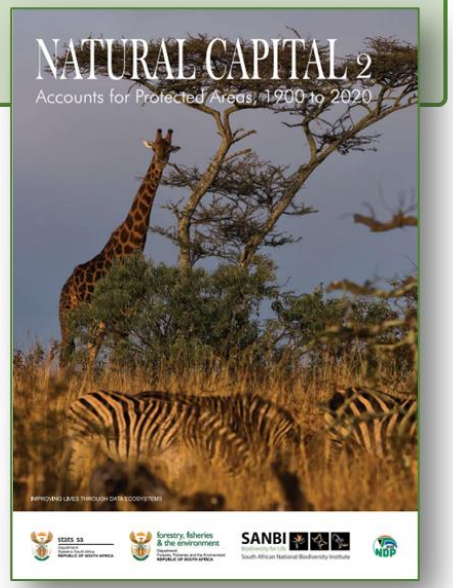
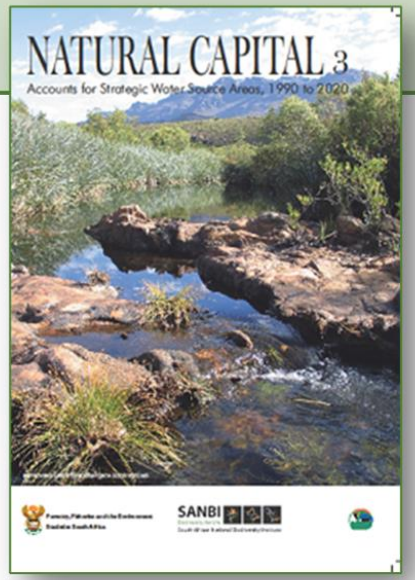


Accounts for Strategic Water Source Areas, 1990 to 2020: Released in March 2023

3



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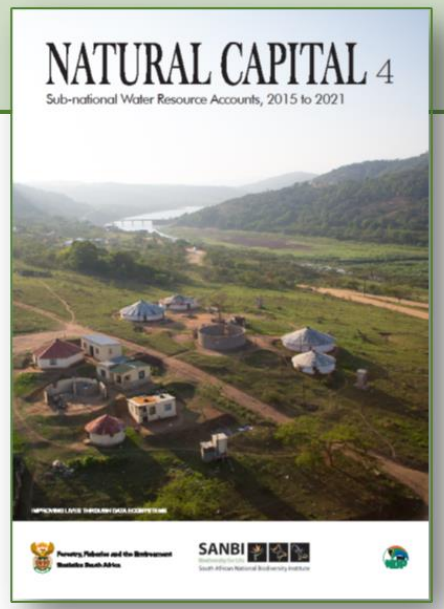
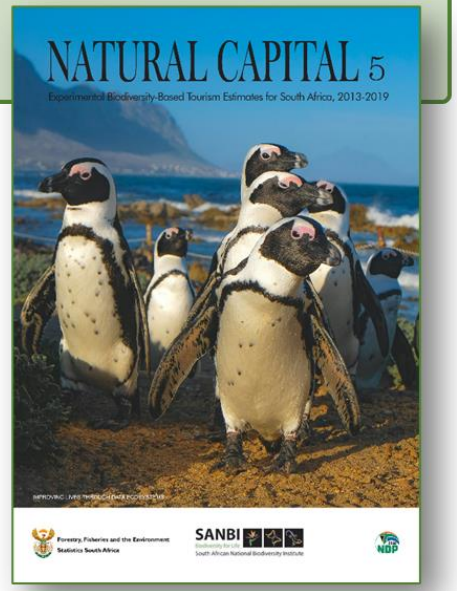
Sub-national Water Resource Accounts, 2015 to 2021: Released in March 2024

4



Experimental Biodiversity-Based Tourism Estimates, 2013 to 2019: Released in June 2024

5



Physical Energy Flow Accounts for South Africa, 2015 to 2021: Released in March 2025

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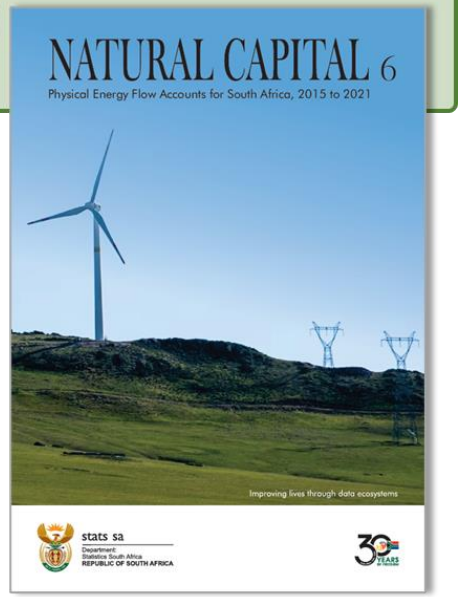

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Experimental Biodiversity-Based Tourism Estimates for South Africa

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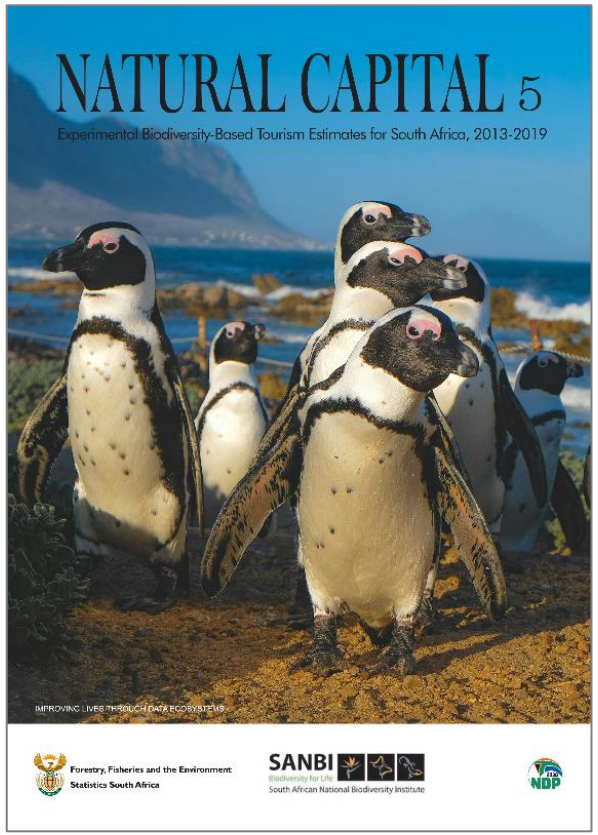
Natural Capital series 5: Experimental Biodiversity-Based Tourism Estimates for South Africa



1. Was released on the Stats SA website (www.statssa.gov.za) on 11 July 2024.
2. Was compiled by Stats SA, but working in partnership with SANBI, DFFE, NDT and SA Tourism.
3. Provides the first estimates of biodiversity-based tourism expenditure to the South African tourism sector and the South African economy, which is directly linked to the Tourism Satellite Account (TSA) for South Africa.
4. The Experimental Biodiversity-Based Tourism Estimates build upon and expand the work previously conducted by the SANBI and Stats SA concerning biodiversity-based tourism employment, as part of the last National Biodiversity Assessment 2018 (NBA 2018).
5. It contributes to the implementation of South Africa's National Natural Capital Accounting (NCA) Strategy, which was published by Stats SA in June 2021.
6. Statistics that come from the Experimental Biodiversity-Based Tourism Estimates for South Africa, 2013 to 2019 will be used for the compilation of the BESA (biodiversity tourism sub-sector of the Biodiversity Economy)

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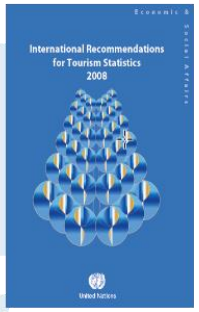
NC Series 5: Experimental Biodiversity-Based Tourism Estimates, 2013 to 2019

Tourism

Tourism refers to the activity of visitors. A visitor is a traveller taking a trip to a main destination outside his/her usual environment, for less than a year, for any main purpose (business, leisure or other personal purpose) other than to be employed by a resident entity in the country or place visited. These trips taken by visitors qualify as tourism trips.



Biodiversity Assets

Biodiversity is the variety of life, including the genes of individual plants or animals, the huge number of species and the different ecosystems in which they live. Biodiversity assets includes species, ecosystems and other biodiversity-related resources that generate ecosystem services, support livelihoods, and provide a foundation for economic growth, social development and human wellbeing.

Biodiversity-based tourism

Biodiversity-based tourism is tourism that involves the use or enjoyment of biodiversity assets, including trips and visits by domestic and inbound same-day visitors and tourists to partake in and experience South Africa's ecosystems and species. This includes making use of these biodiversity assets for recreational or leisure purposes. Thus biodiversity-based tourism activities occur in or with one or more natural ecosystems and/or with one or more indigenous species.

No formal definition or internationally agreed standard

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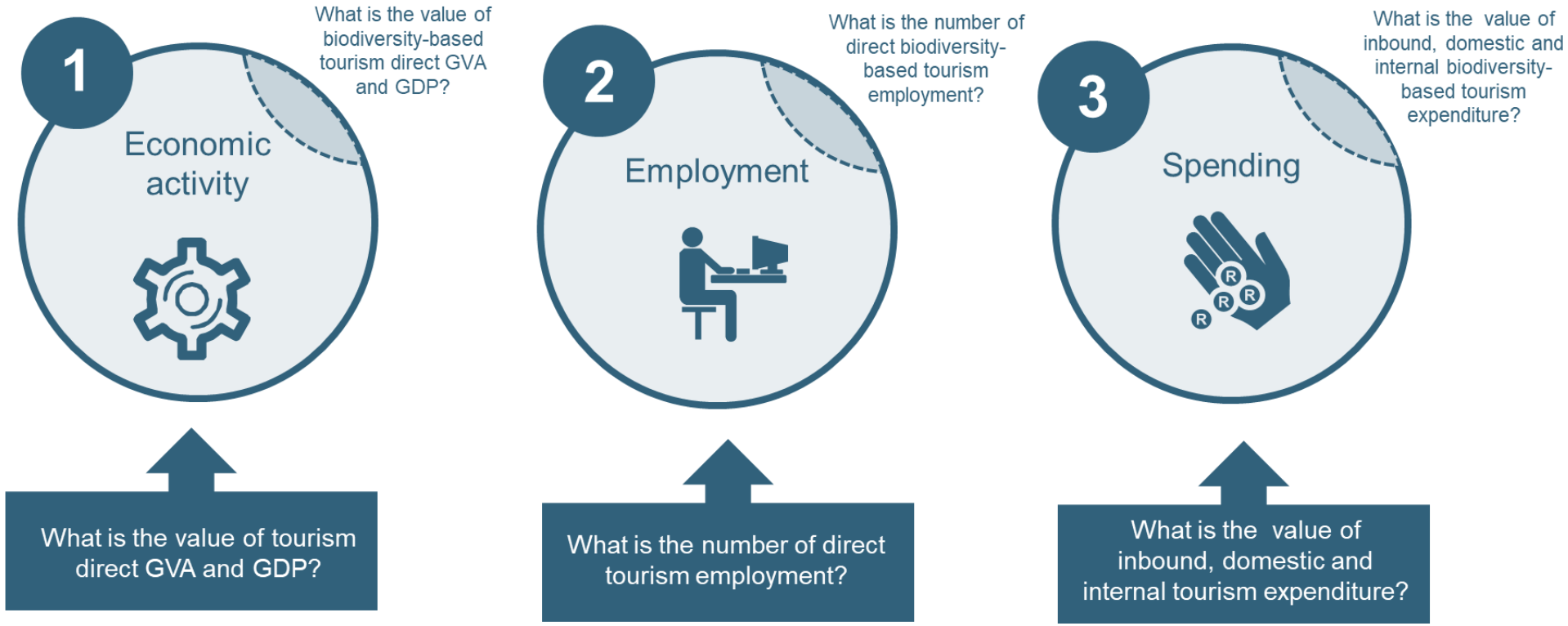
Stats SA's *Natural Capital* series 5

The Tourism Satellite Account (TSA) covers the following related to the tourism sector



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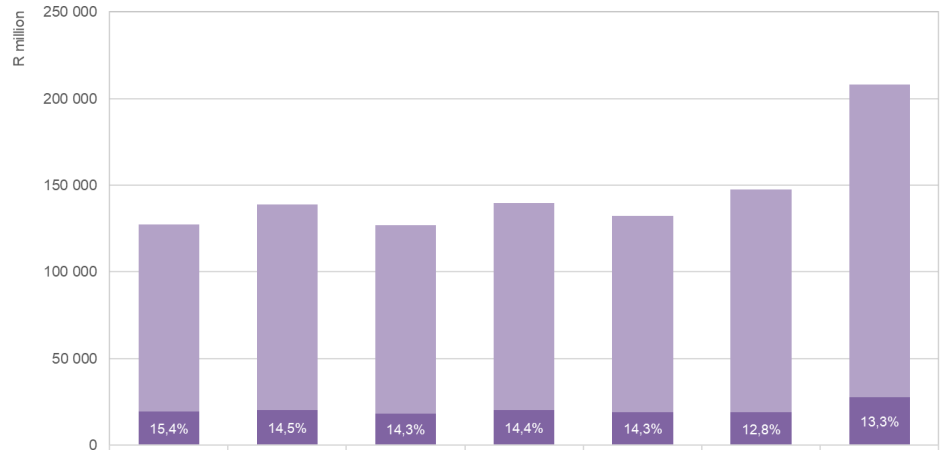
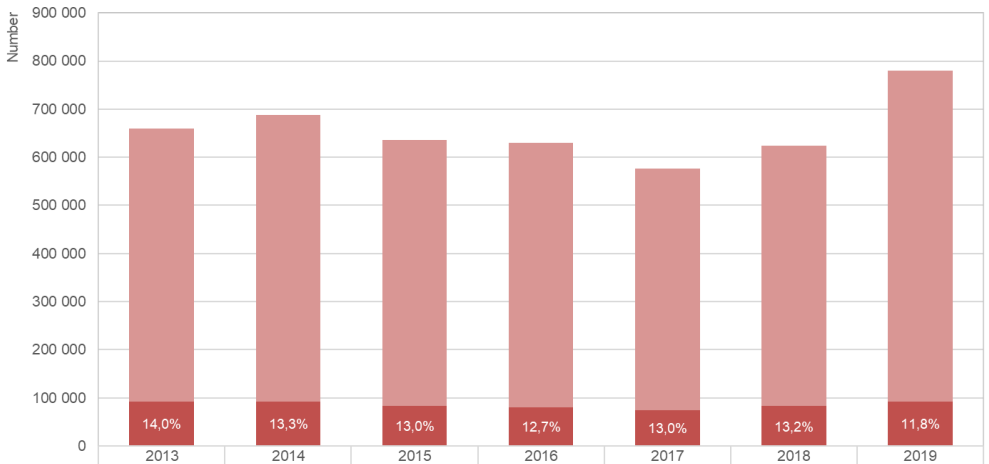
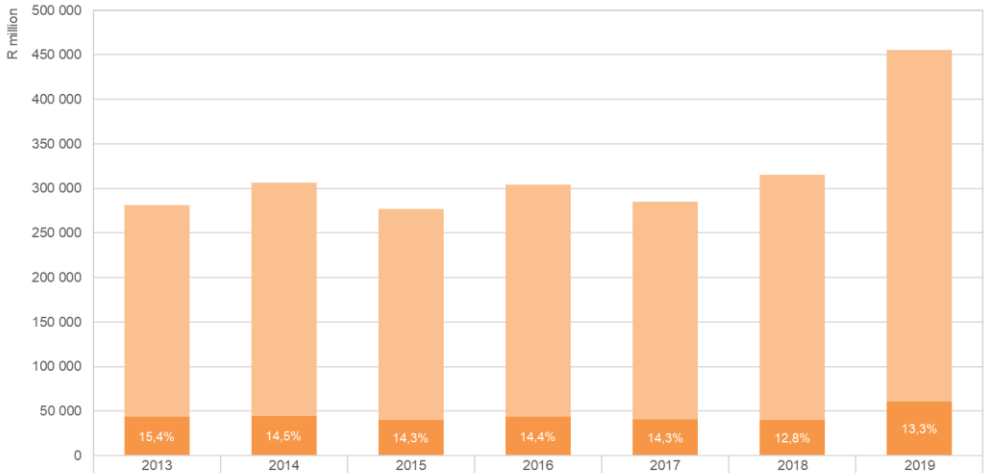
Biodiversity-Based Tourism Estimates : economic activity, employment and spend



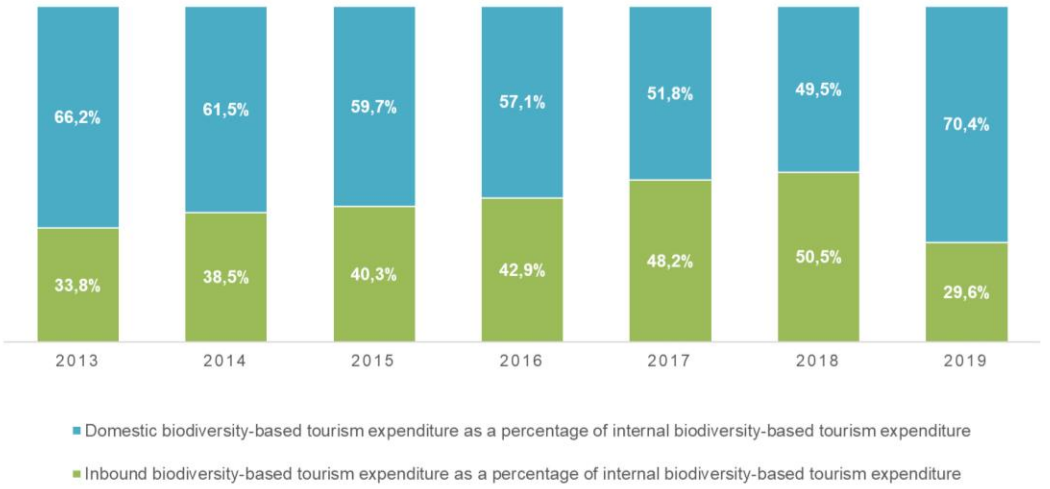
	2013	2014	2015	2016	2017	2018	2019
Tourism direct gross domestic product	127 251	139 073	127 135	139 700	132 366	147 587	208 316
Biodiversity-based tourism direct gross domestic product	19 622	20 164	18 225	20 145	18 882	18 859	27 726



	2013	2014	2015	2016	2017	2018	2019
Direct tourism employment	658 907	688 560	635 544	630 509	575 910	623 514	780 096
Direct biodiversity-based tourism employment	92 036	91 816	82 619	80 189	74 981	82 526	91 836



	2013	2014	2015	2016	2017	2018	2019
Internal tourism expenditure	281 378	306 789	277 228	304 419	284 664	315 471	455 784
Internal biodiversity-based tourism expenditure	43 389	44 480	39 740	43 897	40 606	40 311	60 663



Experimental Biodiversity Economy Satellite Account for South Africa – in development

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Defining the Biodiversity Economy

From South Africa's **National Biodiversity Economy Strategy**:

The biodiversity economy consists of businesses and other economic activities that either ***directly depend* on biodiversity** for their core business or that ***contribute* to conservation of biodiversity** through their activities

Adapted from a definition proposed by van Paddenburg et al. 2012

Defining the biodiversity economy is not straightforward, and there is no international consensus on a definition. Not the same as *green economy* or *bioeconomy.*

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Conceptual framework for the Biodiversity Economy

Biodiversity-related economic activity

A. Conserving biodiversity
(sectors/activities that <u>contribute directly</u> to conserving or managing biodiversity)

- A1. Protecting and managing biodiversity assets
- A2. Maintaining and restoring ecological infrastructure
- A3. Research and professional services

B. Using biodiversity
(sectors/activities that <u>depend directly</u> on utilising biodiversity)

- B1. Non-consumptive use of biodiversity
- B2. Extractive use of biodiversity

Focus is on natural or semi-natural ecosystems and indigenous species

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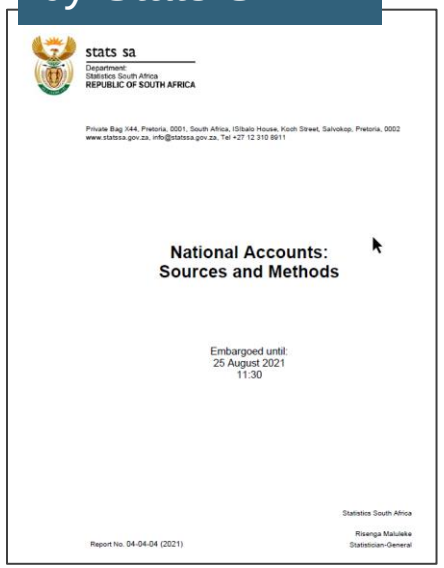
Why a satellite account approach for measuring the Biodiversity Economy?

- Satellite accounts:
  - -Allow experimentation with new concepts and methodologies
  - -Fully embedded in the traditional set of national accounts, and enable analysis of a range of economic statistics (GDP, jobs etc)
  - -Stats SA have experience in satellite accounts compilation(e.g. tourism satellite account)
- There are other ways to measure the biodiversity economy (e.g. ecosystem service valuation, Green GDP) but no standardised or regularly produced approaches exist.
- The BESA is intended to complement accounts that are being produced in South Africa through the System of Environmental-Economic Accounting (SEEA) Ecosystem Accounting (EA).
- BESA will focus on ecosystems and species to activities that fall inside the SNA production boundary.

Draft experimental BESA – where did we start?

Benchmarked new Supply and Use-tables time-series – released 25 August 2021 by Stats SA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www.statssa.gov.za, info@statssa.gov.za, Tel +27 12 310 8911

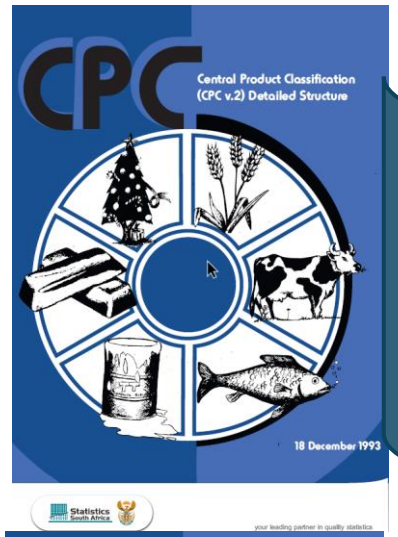
National Accounts:
Sources and Methods

Embargoed until:
25 August 2021
11:30

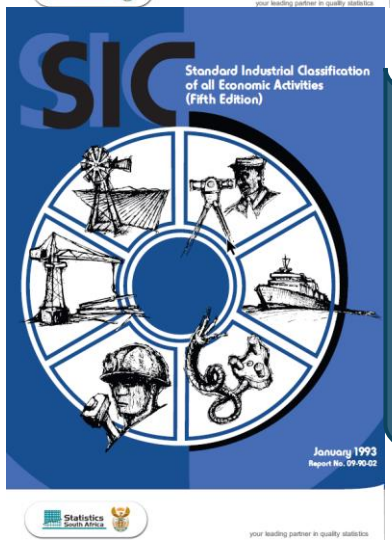
Statistics South Africa

Risenga Maluleke
Statistician-General

Report No. 04-04-04 (2021)



SUT compilation level: 118 product groupings
SUT publication level: 108 product groupings



SUT compilation level: 213 industry groupings
SUT publication level: 124 industry groupings

Feb 2020

- Initial one day scoping workshop used for planning of work, identifying key stakeholders, and agreeing on adopting the conceptual framework for the biodiversity economy from the NBA.
- **COVID March 2020 – BESA work only got restarted in 2021/2002 financial year again.**

Apr – Aug 2021

- 12 scoping work sessions with the core working group - roughly two hours per session.
- Invitations to join these sessions were extended to a broader reference group comprising subject matter experts in specific areas e.g. marine ecosystems, agriculture, forestry, biomass and others.
- Focused on linking the conceptual framework for the biodiversity economy to the industry and product classifications used for compiling South Africa's national accounts (SUTs).

Sept 2021

- DFFE provided Stats SA draft BESA scoping document (EXCEL workbook) in order to start compiling a draft BESA for 2018 according to the scoping requirements provided.

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Biodiversity Economy industry and product scoping

Each individual industry (SIC) code and product (CPC) code was assessed in respect of five parameters:

- Inclusion within the biodiversity economy (yes or no).
- Degree of inclusion (indicated as a percentage range).
- Rationale for inclusion, with examples.
- Category and sub-category of the biodiversity economy into which it best fits.
- Areas of research for further refinement or increased certainty.

Based upon 7 principles:

1. Use the definition of the biodiversity economy, and keep coming back to it.
2. Where an activity is considered part of the biodiversity economy, no part of that activity is excluded because it has a negative environmental impact.
3. All economic activities related to indigenous species are included.
4. All economic activities that directly depend on natural ecosystems are included.
5. Non observed activities in the biodiversity economy are included (inclusive of subsistence, informal and illegal activities).
6. Activities are included even where the proportion related to biodiversity is currently estimated to be negligible.
7. Activities that may be considered to be part of the green economy more broadly but that are not directly related to biodiversity are excluded.

Draft experimental BESA, 2018 – where did we start?

Table 4. Summary of results of product codes

Proportion related to biodiversity	Number of CPC codes	% of total number of codes
All or most (>80,0%)	3	2,5%
Some (20,0-80,0%)	1	0,8%
Few (<20,0%)	35	29,7%
None	79	66,9%
Total	118	100%

Source:. Driver et al, 2021.

Table 3. Summary of results of industry codes

Proportion related to biodiversity	Number of SIC codes	% of total number of codes
All or most (>80,0%)	2	0,9%
Some (20,0-80,0%)	1	0,5%
Few (<20,0%)	36	16,9%
None	174	81,7%
Total	213	100%

Source:. Driver et al, 2021.

Table 8. Proposed proportions to be used to calculate the economic contribution of the industries and products identified as biodiversity-related to GDP and employment

Group to which industry/product code allocated	Proposed proportion to be used to extract data from SUTs	Alternative proportions that could be used for sensitivity testing	
		Conservative	Generous
All or most (estimate >80,0% related to biodiversity)	85,0%	80,0%	90,0%
Some (estimate 20,0-80,0% related to biodiversity)	40,0%	30,0%	50,0%
Few (estimate <20,0% related to biodiversity)	3,5%	1,0%	5,0%

Source:. Driver et al, 2021.

3 different approaches
3 different answers

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Draft experimental BESA – where did we start?

Supply and use tables	-SUT Directorate released updated 2018 SUT and new 2019 SUT end March 2022.
BESA system development	-Draft 2018 BE SUT (automated system), based upon the updated 2018 SUT - and system checking. -3 Draft 2018 BESA (proposed, conservative and generous) (automated system), based on draft 2018 BE SUT and DFFE, SANBI and Stats SA draft BESA scoping – and system checking
Initial macro indicators	-Draft BE gross value added (GVA) and gross domestic product (GDP) – 3 approaches. -Draft BE taxes less subsidies - 3 approaches. -Draft BE exports- 3 approaches.
BESA employment	-Ongoing engagements - how must BE employment be disaggregated – what would DFFE and SANBI want to monitor and report on for BE employment for policy.

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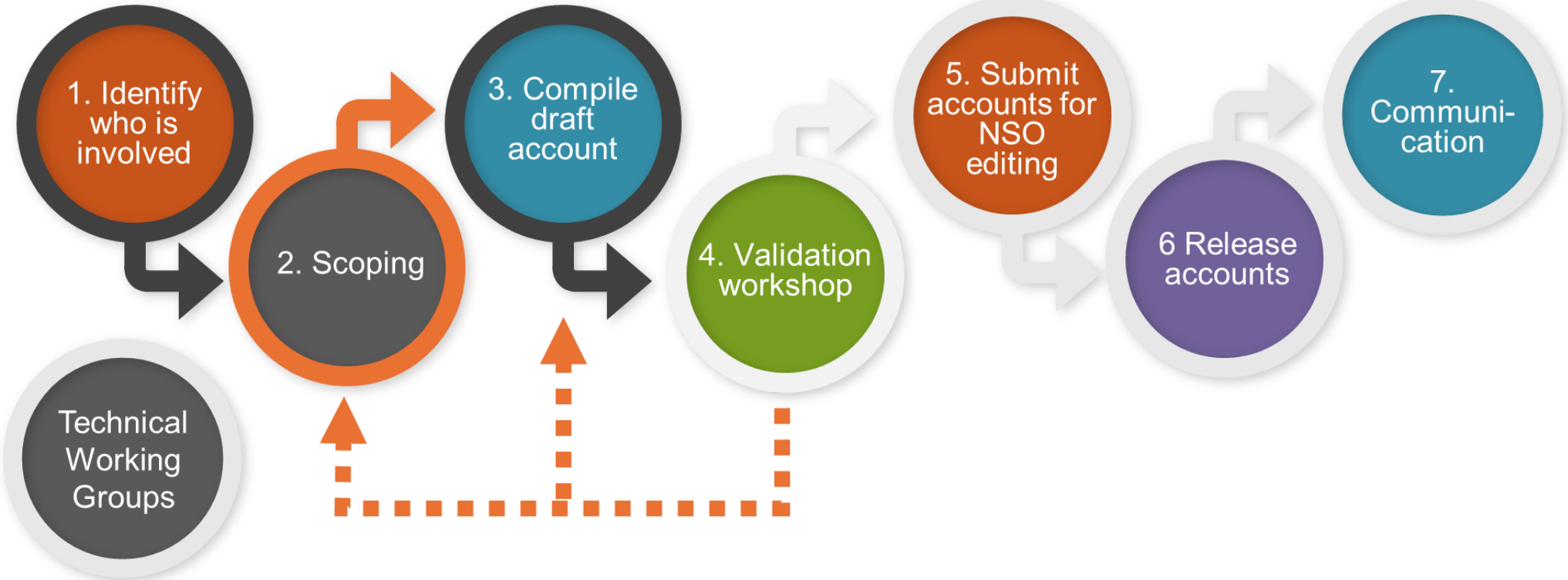
The process for the compilation of natural capital accounts



Re-scoping exercise of the BESA industry ratios 2024/2025

Biodiversity economy - industry ratio estimates - working document - draft 4 provided to BESA TWG members January 2025

Draft working document

Biodiversity Economy Satellite Account

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B1: Non-consumptive use ... 37
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Draft working document

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Summary of industry ratios across sub-sectors of the biodiversity economy ... 59

Table 2: Descriptive terms for assessing the level of certainty in the estimates of the industry ratios.

Level of certainty	Explanation
Low	Speculative. The estimate is based on very limited evidence and large gaps remain. Significant assumptions are needed to arrive at an estimate. Accuracy is uncertain
Medium	Probable. The estimate is supported by some relevant, available evidence, although there are still some uncertainties that might affect accuracy.
High	Reliable. The estimate is backed by reasonable and consistent evidence, although minor uncertainties may still exist. Accuracy is relatively certain.

Re-scoping exercise of the BESA industry ratios 2024/2025

Draft working document

than a dependency. If the underlying natural resource, the ecosystems, reduces in condition, the spending in these industries will increase due to the increased risk (a negative relationship). This is counter to the other sub-sectors included, in which economic activities benefit from a higher condition of the underlying resource (a positive relationship).

Organic fertiliser

The SIC contains a specific class for the production of organic fertiliser such as compost (116; Table 29). It is likely that this production relies to some extent on natural micro-organisms.

Table 29: Standard Industrial Classification classes (Stats SA, 1993) related to organic fertiliser.

		Industry ratio	Confidence
Direct dependency			
116	Production of organic fertiliser	50.0	Medium

Many organic fertilisers are created through composting, which involves the breakdown of organic materials by microorganisms like bacteria and fungi. A diverse range of microbes in the compost pile accelerates the decomposition process and leads to a richer, more effective fertilizer. Often, natural micro-organisms will be relied on for the composing process, although it is possible to introduce decomposing bacteria and organisms from elsewhere. Hence, the industry is moderately dependent on biodiversity. Other types of organic fertiliser include animal manure from domestic animals. A suggested estimate is that 50.0% of the industry relies on natural micro-biodiversity.

The confidence in the estimate is medium, as there is a single SIC class related to organic fertiliser, a large proportion of which is likely to be biodiversity-relevant. Remaining research questions include:

- What portion of organic fertiliser production in South Africa involves decomposition?
- To what extent does organic fertiliser production rely on indigenous microbes?

B2: Consumptive use

Ocean fisheries

South Africa has a long coastline of more than 3 200 km and a rich marine biodiversity of more than 10 000 species. [79] There are 22 commercial fisheries in the country that produce an estimated 600 000 tonnes of fish annually.[79] Hake, Cape horse mackerel, rock lobster and small pelagic fish are the largest fisheries.[80] Indigenous wild fish stocks are a biodiversity resource, that is also highly dependent on water quality and nursery spaces.

Table 30: Standard Industrial Classification classes (Stats SA, 1993) related to ocean fisheries.

			Industry ratio	Confidence
Direct dependency				
131	Fishing, operation of fish hatcheries and fish farms			
	1310	Ocean and coastal fishing	100.0	High
	1311	Fish hatcheries and fish farms	10.0	Low
301	Production, processing and preservation of meat, fish, fruit, vegetables, oils and fats			
	3012	Processing and preserving of fish and fish products	50.0	Medium
Indirect dependency				
612	Wholesale trade in agricultural raw materials, livestock, food, beverages and tobacco			
	61221	Wholesale trade in foodstuffs		
622	Retail trade in food, beverages and tobacco in specialised stores			
	62209	Other retail trade in food, beverage and tobacco n.e.c.		

The wild harvested species are the direct resource of ocean fisheries. If fisheries collapse, so do the economic sectors that rely on them. Saltwater, wild-caught fish is highly dependent on nursery habitats and the genetic diversity of the populations[81]. Thus, the entire industry class for 'ocean and coastal fishing' (1310; Table 30) is considered to be dependent on biodiversity. Aquaculture farms rely far less on biodiversity as they may use exotic fish species and constructed pools, but fish farms located in the ocean or estuaries still rely on biodiversity for water quality and animal feed.[81] Aquaculture remains a very small part of the fisheries sector in South Africa, contributing only 5 418 tonnes (0.8%).[82] The remainer is wild-caught fish.

Since the fish species themselves are the product, it is fair to include the processing of fish as a direct dependency. Not all fish products sold in South Africa come from local fisheries, some are imported. But, South Africa is a net exporter of fish.[83] South Africa imported 149 879 tonnes of fish products in 2023 and exported 402 181 tonnes (73%).[84] This implies that of the fish used for local markets, approximately 200 000 tonnes (57.0%) are locally caught (600 000 – 402 181) and 149 879 imported (43.0%). Thus, at least 50.0% of fish processed in South Africa comes directly from wild harvesting in our oceans.

The confidence in the estimate for ocean fisheries is high, as the dependency of ocean fisheries on biodiversity is well established and a single SIC class covers all ocean fishing, so the entire class can be included. Confidence in fish farming is low, as there is little information available on the industry in South Africa to determine its dependence on indigenous fish species, food or water quality. The degree to which fish processing is based on indigenous, wild caught fish compared to imported fish is also uncertain, leading to a medium confidence in that estimate. Remaining research questions include:

- Is there any portion of ocean and coastal fishing that is not dependent on indigenous species?

Table 2: Descriptive terms for assessing the level of certainty in the estimates of the industry ratios.

Level of certainty	Explanation
Low	Speculative. The estimate is based on very limited evidence and large gaps remain. Significant assumptions are needed to arrive at an estimate. Accuracy is uncertain
Medium	Probable. The estimate is supported by some relevant, available evidence, although there are still some uncertainties that might affect accuracy.
High	Reliable. The estimate is backed by reasonable and consistent evidence, although minor uncertainties may still exist. Accuracy is relatively certain.

Pollinators do not get 'consumed' or used up during production of crops, hence this sub-sector does not fit perfectly within the 'extractive use' sector of the biodiversity economy, and may be more correctly included under 'non-consumptive use'. However, it is included here with other agricultural and production activities.

Table 31: Standard Industrial Classification classes (Stats SA, 1993) related to pollinator-dependent crops.

			Industry ratio	Confidence
Direct dependency				
111	Growing of crops			
	1111	Growing of cereals and other crops n.e.c.	4.6	Medium
	1112	Growing of vegetables, horticultural specialities and nursery products	95.0	Medium
	1113	Growing of fruit, nuts, beverage and spice crops	70.0	Medium
Indirect dependency				
301	Production, processing and preservation of meat, fish, fruit, vegetables, oils and fats			
	3013	Processing and preserving of fruit and vegetables		
612	Wholesale trade in agricultural raw materials, livestock, food, beverages and tobacco			
	6121	Wholesale trade in agricultural raw materials and livestock		
	61221	Wholesale trade in foodstuffs		
622	Retail trade in food, beverages and tobacco in specialised stores			
	62201	Retail trade in fresh fruit and vegetables		

[79] Stats SA (2016) Environmental Economic Accounts Compendium. Statistics South Africa, Pretoria.
[80] DFFE (2022) Status of the South African marine fishery resources 2022. Department of Forestry,
[81] ENCORE (2024) Exploring Natural Capital Opportunities, Risks and Exposure. https://encorenature.org/en
[82] DAFF (2019) A profile of the South African aquaculture market value chain. Department of Agriculture, Forestry and Fisheries, Pretoria.
[83] FAO (2024) Fishery and aquaculture country profiles: South Africa. Food and Agriculture Organisation. https://www.fao.org/fishery/en/facp/zaf
[84] DTIC (2024) Trade statistics, SA Import Value US$ (Annual). Department of Trade, Industry and
[85] Klein, A.M., Vaissiere, B.E., Cane, J.H., Steffan-Dewenter, I., Cunningham, S.A., Kremen, C. & Tscharntke, T. (2007) Importance of pollinators in changing landscapes for world crops. Proceedings of the Royal Society B: Biological Sciences, 274(1608): 303–313.
[86] FAO (2019) The State of the World's Biodiversity for Food and Agriculture, J. Bélanger & D. Pilling (eds.). FAO Commission on Genetic Resources for Food and Agriculture Assessments. Rome. 572 pp. http://www.fao.org/3/CA3129EN/CA3129EN.pdf
[87] SANBI (2019) National Biodiversity Assessment 2018 Supplementary Material: Compendium of

Way forward 2025/2026 –experimental BESA for South Africa

- Stats SA to recompile and apply the new BE industry ratio's for a next version of the draft BESA for SA – also develop new product ratios – an integrated process.
- DFFE, SANBI and Stats SA to engage further on the labour market related variables which are relevant for the biodiversity economy.
- Employment is disaggregated in the experimental BTE already for the BE tourism sub sector in the BESA and in line with TSA disaggregation of employment (by tourism industry and by population group and gender within industry).
- Decisions on the inclusion of more detailed employment data will depend on the labour market issues that are considered of special significance for policy and research by DFFE and SANBI for the biodiversity economy.
- BESA for a single reference year (as a start – latest reference year) or a BESA time-series for release?

Key lessons and points to take home

stats sa
Department:
Statistics South Africa
REPUBLIC OF SOUTH AFRICA

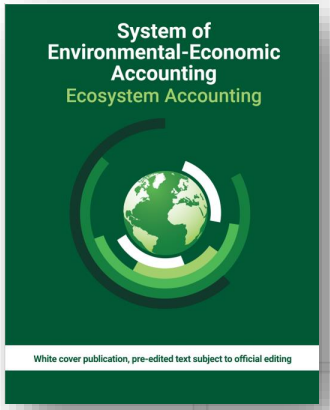
forestry, fisheries & the environment
Department:
Forestry, Fisheries and the Environment
REPUBLIC OF SOUTH AFRICA

SANBI
Biodiversity for Life
South African National Biodiversity Institute

Communicating the value of nature

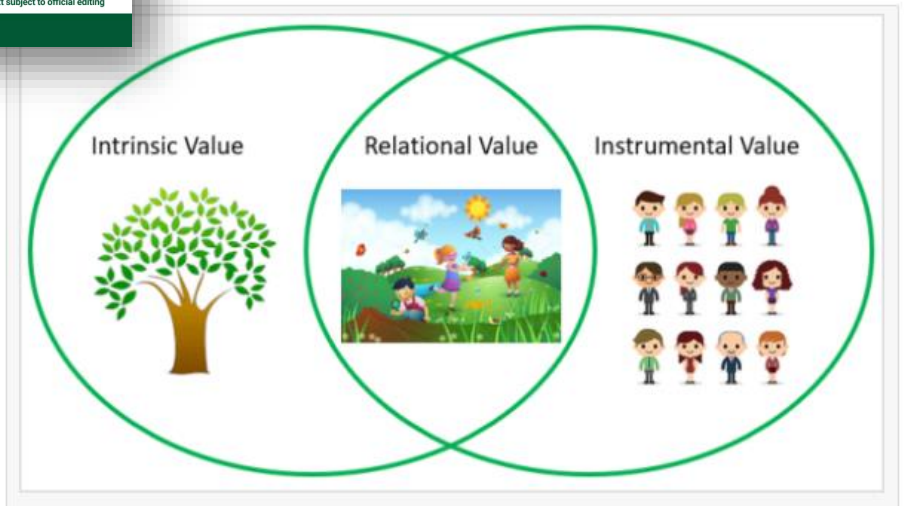
Hope of gain is more effective than fear of loss

SEEA EA can support multiple value perspectives on nature



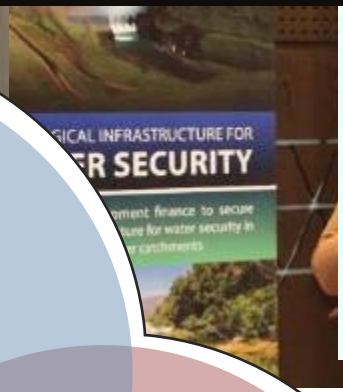
Accounting is not always about money!

Biophysical metrics



Solidarity
Equality
Sustainability

Putting attention to process makes a difference to impact



Technical process

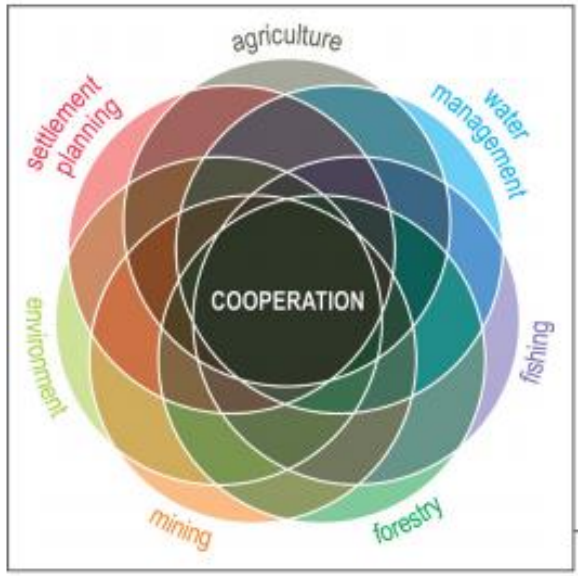
Institutional process

Social process

Policy process

Building capacity and nurturing collaboration is key

- NCA is catalysing new relationships and partnerships
- Growing demand
- Sustaining existing capacity and building capacity is a challenge (donor-funded, cost-containment in gov)
- Sharing information regularly with national, regional and global CoP



Natural Capital Accounting Community of Practice Africa

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