Paper for 28th London Group Meeting - Ecosystem services in biophysical terms
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Accounting for Protected Areas using the SEEA EA

Introduction

Protected Areas (PAs) are defined as areas "designated or regulated and managed to achieve specific conservation objectives" (Article 2 of the CBD). They have long been a key biodiversity conservation management tool. Beyond the conservation benefits of PAs, there is now increased focus on protecting ecosystem services and social benefits delivered by PAs.

According to the World Database on Protected Areas (WDPA), as of August 2022, 15.8% of the land and 8.1% of the ocean were protected (UNEP-WCMC and IUCN, 2022). If adopted, the draft post-2020 Global Biodiversity Framework proposes a substantial expansion of this extent to 30% of the earth's surface by 2030.

Decision makers, including the ones involved in PA creation and management, need clear and regular information over time and space to be able to manage PAs effectively, plan PA expansion or downsizing and consider the trade-offs, opportunity costs and synergies across development objectives this may bring. For this, the provision of key indicators that offer robust, credible evidence is key to informing policy development, planning and to foster management responses that are coherent across environmental and economic policy objectives.

This paper examines the SEEA EA as a framework to support decision makers in providing this 'decision-ready' information on PAs, drawing on existing efforts in this field. The preparation of this papers has been supported by the EU MAIA project (Project Number H2020-SC5-2018-1. Grant Number 817527).

Thematic accounting for protected areas

The SEEA EA supports 'thematic accounting', which recognises policy responses are typically framed using themes, rather than specific accounts. Thematic accounting allows a focus on additional entities outside of the core SEEA EA accounts (e.g., species in the context of accounting for biodiversity), specific geographical areas or ecosystem types (e.g., urban areas or oceans) and by building a set of relevant SEEA EA and other accounts for a theme (e.g., climate change). Whilst thematic accounting for PAs is mentioned in the SEEA EA, there is no specific guidance on how this might be implemented.

As illustrated in Figure 1, the following thematic accounting for PAs can be envisaged (which may be implemented in combination):

1) PAs as accounting entities – this could comprise tracking the extent or coverage of PAs over accounting periods.

2) PAs as Ecosystem Accounting Areas – this would involve applying the SEEA EA to the area bounded by the PA boundary.

3) Integrated accounting for PAs in landscapes – this could include evaluating the synergies and trade-offs between biodiversity conservation, ecosystem services and other economic activities linked to different land use options at landscape scale.

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Figure 1: Possible approaches to thematic accounting for PAs.

Advantages of using the SEEA EA to organise information on PAs

Whilst not widespread, there are major advantages to using the accounting structures, classifications, and concepts of the SEEA EA to organise and integrate data on PAs to support decision-making.

Statistical rigour and consistency

The accounting framework brings statistical rigour and makes data consistent over time and space, allowing information to be compared with confidence across many years. It requires data to be prepared and restructured into a time series of accounts-ready data. This delivers 'decision-ready' data that better supports policy makers by communicating trends and revealing emerging issues. Having the compilation of the PA accounts being coordinated by national statistics offices also brings further robustness via the data quality assurance that underpins national statistics. It also brings statistics on PAs into the central information system of national government, making it visible to a range of audiences. This can then inform a wide range of decision-makers and national reporting obligations.

South Africa's first set of accounts for PAs track the development of the PA estate from 1900 until 2020, showing the size and changing composition in terms of different types of PAs nationally and provincially, as well as the coverage of different terrestrial biomes in the PA network (Statistics South Africa, 2021). Table 1 shows the PA extent account for the period 1990 to 2020. The set of PA accounts yield four main indicators to track progress towards goals related to national, provincial and ecological coverage:

- Size of the PA estate.
- Proportion of the country (or province or biome) protected.
- Percentage change in the size of the PA estate for a given accounting period.
- Composition of the PA estate in terms of different types of PAs.

Bringing data together and making it coherent

The SEEA EA allows information on ecosystem extent, condition, species ecosystem services and associated economic activities from different data sources and of

different data types to be presented in the same framework. This allows trends in ecosystem assets and species, trends in ecosystem services and benefits and land or sea use activities to be compared with one another. This is often crucial information decision-makers need in planning sustainable development and PA management.

As an example, IDEEA Group (2020) provide a set of pilot accounts for the Geographe Marine Park Protected Area in Australia. As shown in Figure 3, the SEEA EA framework allows for multiple data on the marine park to be harmonised and presented to decision-makers in a coherent format. This can support multiple uses, based on a one-off data collection effort. Furthermore, it can help to bring coherence between local and national decisions with respect to PAs and their management.

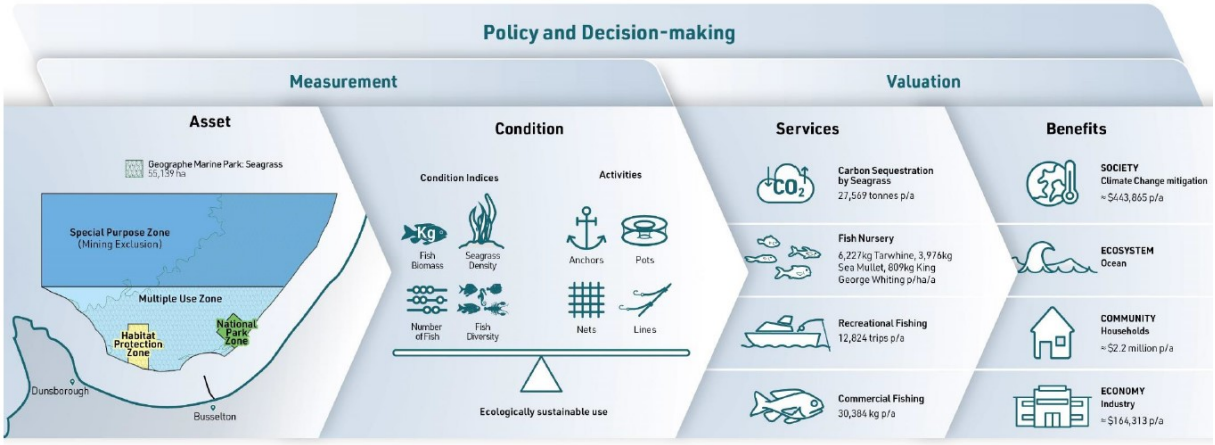

Figure 2: Different information on the Geographe Marine Park Protected Area in Australia organised by the SEEA EA.

Table 1: Accounts for land-based PAs in South Africa for the period 1990 to 2020 (combining five accounting periods), by type of protected area

	National Park	Nature Reserve	Protected Environment	Forest Nature Reserve	Forest Wilderness Area	Mountain Catchment Area	World Heritage Site*	Not protected	Total land area	Total protected (ha)	Total protected (%)
Opening Stock 1990	**3 604 693**	**3 089 386**	**12 022**	**121 996**	**277 433**	**559 421**	**-**	**114 301 502**	**121 966 453**	**7 664 951**	**6.3%**
Additions to stock	279 398	905 194	63 785	6 172	-	2	766	1	1 255 318		
Reductions in stock	-	- 3	-	- 1	-	-	-	-1 255 314	-1 255 318		
Net change in extent	279 398	905 191	63 785	6 171	-	2	766	-1 255 313	-	1 255 313	
Net change as % of opening	*7.8%*	*29.3%*	*530.6%*	*5.1%*	*0.0%*	*0.0%*		*-1.1%*	*0.0%*	*16.4%*	
Closing stock 2000	**3 884 091**	**3 994 577**	**75 807**	**128 167**	**277 433**	**559 423**	**766**	**113 046 189**	**121 966 453**	**8 920 264**	**7.3%**
Additions to stock	199 853	244 307	26 053	-	-	-	213 470	2	683 685		
Reductions in stock	- 2	- 3	-	-	-	- 1	-	-683 679	-683 685		
Net change in extent	199 851	244 304	26 053	-	-	- 1	213 470	-683 677	-	683 677	
Net change as % of opening	*5.1%*	*6.1%*	*34.4%*	*0.0%*	*0.0%*	*0.0%*	*27868.1%*	*-0.6%*	*0.0%*	*7.7%*	
Closing stock 2010	**4 083 942**	**4 238 881**	**101 860**	**128 167**	**277 433**	**559 422**	**214 236**	**112 362 512**	**121 966 453**	**9 603 941**	**7.9%**
Additions to stock	134 965	784 033	701 158	17 624	1	6	38 959	-	1 676 746		
Reductions in stock	-	- 3	-	-	-	-	-	-1 676 743	-1 676 746		
Net change in extent	134 965	784 030	701 158	17 624	1	6	38 959	-1 676 743	-	1 676 743	
Net change as % of opening	*3.3%*	*18.5%*	*688.4%*	*13.8%*	*0.0%*	*0.0%*	*18.2%*	*-1.5%*	*0.0%*	*17.5%*	
Closing stock 2020	**4 218 907**	**5 022 911**	**803 018**	**145 791**	**277 434**	**559 428**	**253 195**	**110 685 769**	**121 966 453**	**11 280 684**	**9.2%**

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Supporting integrated decision-making

Bringing information on PAs into the SEEA EA opens a range of possibilities for more integrated decision-making. The framework allows trade-offs from environmental management decisions to be made explicit. Synergies between objectives can also be revealed and captured. For instance, where investment in PAs can be linked not only to ecological but also economic and livelihood returns. This is crucial for mainstreaming PAs into formal economic and national development planning processes.

For instance, integrated biodiversity and tourism accounts for Uganda (NEMA, 2021) reveal that the wildlife watching tourism sector developed strongly between 2012 and 2019 (Figure 3). Whilst COVID-19 has had a devastating effect on the sector, the accounts highlight the economic importance of maintaining funding to conserve and enhance Uganda's natural ecosystems and iconic species. In this way, the accounts can help mainstream PAs and the biodiversity they protect into tourism sector and national development planning processes.

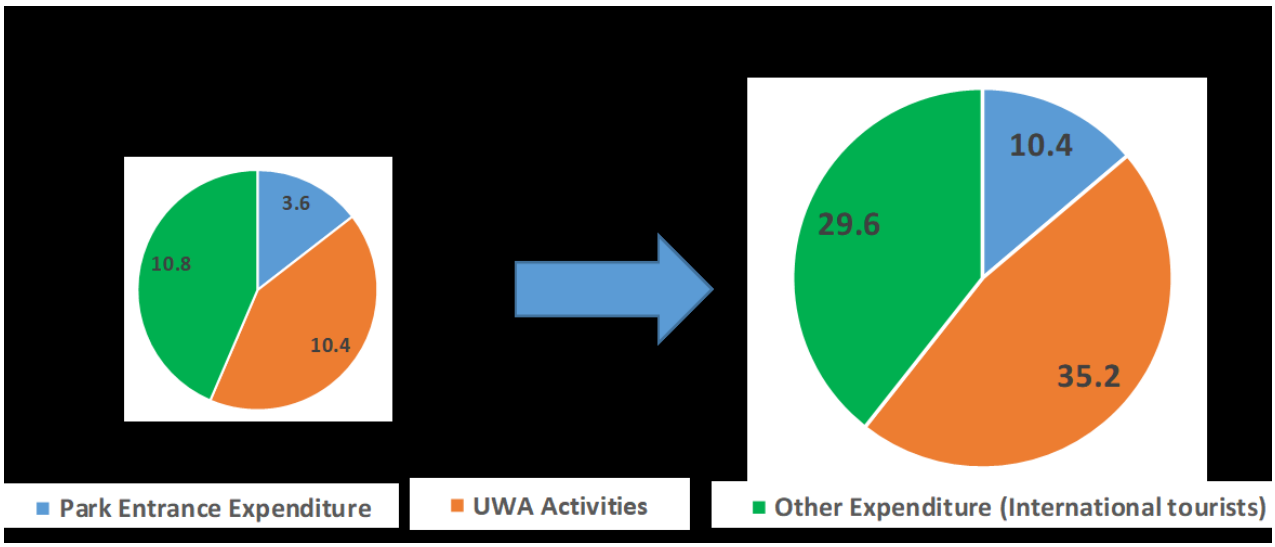

Figure 3: Trend in tourist expenditure related to the use of recreation-related ecosystem services supplied by Uganda's National Parks

The integrated biodiversity and tourism accounts for Uganda reveal where investment in PAs can be linked to economic returns. However, there are a wide range of additional social benefits that can be secured from appropriate expansion of the PA network, in addition to these economic returns. For instance, improving ecosystem services related to water supply, climate change mitigation, public recreation, as well as achieving biodiversity conservation goals. Thus, the SEEA EA can help more transparently demonstrate the return on investment in PAs to meet government objectives for the environment, economic growth and social wellbeing (Varcoe et al., 2015).

Given there are many actors with different objectives at landscape scales, the decision to restrict land use activity associated with PA designation is often viewed as entailing substantial opportunity costs. There will be winners and losers from such decisions, and the SEEA EA can help reveal who they are and even formulate

appropriate compensation mechanisms. For instance, ecosystem accounting (GEP) is being trialled in China to establish eco-compensation payments to local populations in key ecological function zones. These payments support conservation and restoration activities and can be informed using the value of the ecosystem services these zones supply (Ouyang et al., 2020).

As the SEEA EA is coherent with the SNA, opportunity costs associated with lost revenues from restricting economic activities can also be explicitly traded-off against better biodiversity outcomes delivered by protection. Keith et al., (2017) demonstrate this for the trade-off between protecting habitat for threatened species in the central highland forests of Victoria, Australia and gross value added to the economy from timber logging in this area.

Analytical extensions and applications

Using the SEEA EA to organise information on PAs and link it with wider economic and socio-economic data opens up a range of analytical extensions and applications. Possibilities include:

- Using the accounts to better inform revenue sharing with communities local to PAs. The Uganda biodiversity and tourism accounts include statistics on revenue sharing from PA entrance fees with local communities (see NEMA, 2021a).
- Making the links to jobs supported by PAs, to further evaluate their role as a mechanism for social development.
- Making the links to expenditure on PAs, to provide further insights into ecological, social and economic returns on investments. This is identified for future work in South Africa, following the conventions for environmental protection expenditure accounts in the SEEA CF (see Driver et al., 2021).
- Informing Integrated Landscape Management (ILM) approaches, where PA expansion supports the economy and proceeds in a socially inclusive way. This will be particularly important if the target to extend PAs to 30% of the earth's surface under the CBD Post 2020 draft-framework is adopted.

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London Group Questions

- Are there any other 'thematic accounting for protected area' approaches that can be envisaged?
- Can you think of any other advantages that we need to highlight?
- Are there any other analytical extensions or applications that come to mind?
- Are any of you involved in any work related to applying the SEEA EA to PAs?

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