



DEPARTMENT OF ECONOMIC AND SOCIAL AFFAIRS
STATISTICS DIVISION
UNITED NATIONS



System of
Environmental
Economic
Accounting

System of Environmental-Economic Accounting— Ecosystem Accounting

Global Consultation on the complete document: Comments Form

Deadline for responses: 30 November 2020

Send responses to: seea@un.org

Name:	Michael Vardon, Heather Keith
Organization & country:	Australian National University Griffith University

The comments form has been designed to facilitate the analysis of comments. There are six guiding questions in the form, please respond to the questions in the indicated boxes below. To submit responses please save this document and send it as an attachment to: seea@un.org.

All documents can be found on our website at: <https://seea.un.org/content/global-consultation-complete-draft>

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General comments

Question 1: Do you have comments on the overall draft of the SEEA Ecosystem Accounting?

The overall coherence of the document is very good. Writing is generally clear and we have suggested clarifications are noted in comments on the individual chapters. The structure of the document is very good. The separation into sections and chapters is effective, especially for the parts dealing with valuation: Section D (Chapters 8-11) and their separation from Chapter 11 on “Complementary approaches to valuation” in Section E.

Our main concern is in the treatment of ecosystem capacity and its relations to ecosystem condition and ecosystem services. The overview of responses document circulated with the draft for consultation noted that the issue had been raised in comments of previous drafts (on p. 5 under point 6) and on p. 6 the 2nd and 3rd paragraphs provide an overview of the changes made to address the issue. Our concern and interest in the issue was expressed in previous comments submitted us (See https://seea.un.org/sites/seea.un.org/files/24_seea_eea_chapters_6-7_comments_mv_hk_final.pdf). In the previous version circulated there was very little on capacity and a note saying it would be added.

The text on capacity and the definition of capacity is not what I was expecting. Setting that issue aside for the moment, while capacity has been added it is not integrated into the overall model of ecosystem accounting (e.g. it is not shown in Figs. 2.1 or 2.3 nor discussed in Section 2.2.3 nor is it in Table 2.1 showing the list of accounts). The current draft does not appear to have developed the explanation about the role of capacity, and in fact, has become vaguer since its representation in Figure 2.2 in the Technical Recommendations.

Capacity is mostly discussed in Chapter 6 under ecosystem services, when I (we) think capacity should be viewed as a characteristics of ecosystem assets and as is stated in several places in the document:

- Para 2.17 “. . .in broad terms, the capacity of an ecosystem asset to provide services into the future”
- Para 3.32 (p. 22) recognizes ecosystems as stores of value and again links this to ecosystem capacity.
- Para 2.38 (p. 23-4) also links capacity to ecosystem extent and condition.
- Para 5.2 (p. 70), “Condition is assessedand support its capacity to supply ecosystem services”.
- Para 5.12 (p. 71), “The relationship between ecosystem condition and service provision is central to the concept of ecosystem capacity (see chapter 6).”
- Para 5.69 (p. 83), “Regular reporting of an ecosystem condition indicator account is intended to support an extensive, and ecologically informed, discussion of both the effectiveness of strategies aimed at improving ecosystem condition and the changing capacity of ecosystems to supply ecosystem services”
- Para 5.110 (p. 95), “The connection between these stocks and flows is encapsulated in the concept of ecosystem capacity. Measurement of ecosystem

capacity is related to, but different from the measurement of ecosystem condition”

- Para 5.112 (p. 95), “Since the value of an ecosystem asset will be related to future flows of ecosystem services, there are connections among the concepts of ecosystem condition, ecosystem capacity and ecosystem degradation. However, they are not the same concept and it need not be the case that declines in condition necessarily imply ecosystem degradation.”
- 5.115 (p. 96), “information to assess the capacity of ecosystems to supply ecosystem services is an important application for the purpose of informing policy on the future availability of ecosystem service flows from ecosystem assets”

Ecosystem capacity is mentioned in a range of other places too:

- Para 6.11 (p. 102), notes the link to the ecosystem services literature, where the potential to supply ecosystem services is taken to be the ecosystem service (i.e. it does not have to be used by people to be called a service) and again links to Section 6.5
- Para 6.27 (p. 104-105) mentions ecosystem capacity is passing and in this separates it out from the measurement of ecosystem condition.
- Para. 6.54 (p. 114) mentions ecosystem capacity is passing and again links to Section 6.5
- Para 6.55 (p. 114), “biodiversity can then be viewed as an emergent property of a set of ecosystem assets and the community assemblages within them. These interact and support multiple ecosystem processes that underpin the capacity for current and future ecosystem service supply.” A link here is made to Chapter 13 which focuses on thematic accounts, and from the para content can be assumed to be the biodiversity accounting.

Section 6.5 is the one specifically on ecosystem capacity. In this there are two dot points under 6.112. I would not have the dot points but if they are to remain then I would add a 3rd dot point, something like: “The extent to which the actual or potential use of the ecosystem services reflect the condition of the ecosystem asset”. This is different from dot point 2 and gets to the view that ecosystem capacity is characteristic of an ecosystem asset related to the actual or potential flow (generation) of services. This is reflected to some degree in Para 6.124. this gets to the definition of ecosystem capacity.

The *proposed* definition of ecosystem capacity is in para 6.125: “**Ecosystem capacity is the ability of an ecosystem to generate an ecosystem service under current ecosystem condition, management and uses, at the highest yield or use level that does not negatively affect the future supply of the same or other ecosystem services from that ecosystem.**”

Firstly, in this capacity is defined as a characteristic of an ecosystem asset (hence it should be with the discussion on asset accounts in Section B). (In the Technical Recommendations, capacity is described in the chapter on accounting for ecosystem assets in monetary terms, and referred to the overall ecosystem asset and an expected basket of ecosystem services.

Next the focus is on a single ecosystem service, not a bundle of services, and then on establishing a threshold for sustainable use of service, that is related to the condition of the ecosystem. In this, I think the definition should not attempt to define what is sustainable use.

To achieve the objective of making the SEEA EA as widely applicable as possible, it would seem more appropriate to not restrict a definition of ecosystem capacity to be related to single services. An approach of the SEEA EA guidelines to be as broad as possible, in this case encompassing the bundle of ecosystem services, and then having the option to be more specific with single services if necessary or more feasible.

The description of a single or bundle of ecosystem services in 6.127 is rather convoluted, particularly in terms of *“focus on a single ecosystem service in this definition, the measurement of capacity will require consideration of the management and use of the ecosystem asset as a whole.”* It would be simpler if the definition of capacity could include single or a bundle of services.

I think the definition should be: **“Ecosystem capacity is the ability of an ecosystem to generate ecosystem services under current ecosystem condition, management and uses.”** In this, the word “generate” is important, as the ecosystem service would not have to be used to be included in the calculation of ecosystem capacity. Next the revised definition is on multiple services, so here I disagree with the text in paras 6.127 – 6.129. I would simply delete from here and move it to a discussion on a thematic account on sustainable development in Chapter 13.

References to ‘thresholds’, ‘tipping points’, ‘targets’ do not seem appropriate in the guidelines for the main accounts or for statistical rigour. They could be defined and applied in the analysis of accounts in a thematic section. A similar decision was made concerning appropriate metrics for reference conditions.

The text in the paras following 6.130 could be amended to reflect either the view of ecosystem capacity to be a characteristic of ecosystem assets (and hence moved to new chapter called “Accounting for ecosystem capacity” which would be in Section B, following the current chapter 5 (Accounting for ecosystem condition).

In this there is also a disconnect between the way ecosystems are valued (based on the flow of services used and the NPV technique in particular, Para 8.34, p. 155) and the way ecosystem assets are measured (currently only extent and condition). Accounts of ecosystem capacity in physical terms could help to reconcile the disconnect between the physical and monetary accounts. In this, the unused capacity may be reflected in monetary values associated with transactions of land with particular ecosystem types on them.

Related to the issues of capacity the overall description model of ecosystem accounting is the importance of differentiating final and intermediate use of ecoservices. Again, this is not shown in Figs. 2.1 and 2.2 nor discussed in Section 2.2.3. Para 2.30 that describes the recording of flows of intermediate services would be better in Section 2.2.3 and explained as part of the logic of the ecosystem accounting framework, which is more appropriate

than under “economic considerations”. The inclusion and place for intermediate services is important in order to make the accounting approach comprehensive.

This also gets to the interactions of ecosystems, which is explicitly in the definition of ecosystem assets: “ecosystem type (ET) which reflects a distinct set of abiotic and biotic components and their interactions” (e.g. Para 3.6 p. 35). The flows between ecosystems were previously known as inter ecosystem flows. The notions of inter and intra ecosystem flows are not covered. Recognition of such flows in the overall accounting model would help with the discussion of both intermediate ecosystem services and capacity. Some of inter ecosystem flows would be intermediate ecosystem services, while others would not. The inter ecosystem flows that are not intermediate ecosystem services plus the flows that are, could be the capacity of the ecosystem. Intra ecosystem flows may also fit into this type of model (i.e. flows between the units of observation (BSUs) of the same ecosystem type that have been aggregated to a larger area).

Valuation is a key part of the accounting and needs to be included. If it is not included, then there is danger that work in this area will go in many directions and mean that ecosystem accounts that include valuation will not be easily compared. People may choose not to value, but for those that do want to include valuation the SEEA – EA provides a standard starting point. It is noted that chapters 9 and 10 describe a range of techniques compatible with the notion of exchange values. It is not clear if the order of the valuation techniques represents some kind of priority order (e.g. Table 9.2, p. 171) and the text begs the question of which are the most appropriate in particular circumstances. Also in Chapter 10 there is no mention of transacted ecosystems – areas of land with different ecosystem types are regularly bought and sold and this is a directly observable market exchange. Ecosystems with different conditions and/or different capacities would presumably sell for different prices. It would seem useful to add some text on this ahead of the text on NPV in Section 10.3.

It is good to note that the paper accompanying the complete draft says on page 3 that: “The referencing of material in support of the SEEA EA has not yet been finalised.” Additional references will be needed, and it seems that there is much focus on Europe. Much work in the Africa, Asia, Australia, South America and USA has not yet been noted/cited. It is understood that this is a rapidly developing field, but more would be useful. Previous comments supplied by us on chapter 6 and 7 (see https://seea.un.org/sites/seea.un.org/files/24_seea_eea_chapters_6-7_comments_mv_hk_final.pdf), note this issue and it seems that none of the references we suggested were added

I also note that there is no mention of the London Group Meetings of the past few years that have included Sessions on ecosystem accounting. Acknowledging these sessions and discussion as well as referencing the papers and presentations would be appropriate. The references can be added at the end of the document and it would also be appropriate to acknowledge the London Groups sessions and their participants upfront (presumably an Acknowledgements section will be added to the document).

Annex 1.1 is an important part of the document but is not yet done. While we appreciate that it cannot be finalised until after the other parts of the document are finalised, a draft would have been useful and enable us to focus on the areas of change when reviewing the draft.

Comments by sets of chapters

Question 2. Do you have comments on Chapters 1-2 of the draft SEEA Ecosystem Accounting?

Chapter 1.

Listing the relationships to other global environmental measurement initiatives (1.4.5) is a useful section and will help to explain to non-SEEA users the potential for application.

Some additional text and references on the applications could be added. In this a sentence or two could be added to para 1.50 and the publications resulting from the Policy Fora led by the World Bank, which include a range of examples of the applications and use of ecosystem accounts, would be appropriate and some suggested references are below.

Vardon, M. and Bass, S. (Eds) (2020). Natural Capital Accounting for Better Policy Decisions: Measuring and Valuing Natural Capital to Improve Landscape Management and Governance. Proceedings and Highlights of the 4th Forum on Natural Capital Accounting for Better Policy Decisions. World Bank WAVES, Washington D.C. <https://www.wavespartnership.org/en/knowledge-center/natural-capital-accounting-better-policy-decisions-measuring-and-valuing-natural>

Vardon, M., Bass, S., and Ahlroth, S. (Eds) (2019). Natural Capital Accounting for Better Policy Decisions: Climate Change and Biodiversity. Proceedings and Highlights of the 3rd Forum on Natural Capital Accounting for Better Policy Decisions. World Bank WAVES, Washington D.C. <https://www.wavespartnership.org/en/knowledge-center/natural-capital-accounting-better-policy-decisions-climate-change-and-biodiversity>

Ruijs, A. and Vardon, M. (Eds) (2018) 2nd Policy Forum on Natural Capital Accounting for Better Decision Making: Applications for Sustainable Development - Part 1 Takeaways and Part 2 Case Studies. World Bank WAVES, Washington D.C. <https://www.wavespartnership.org/en/policy-forum-natural-capital-accounting-better-decision-making>

Vardon, M., Bass, S., Ahlroth, S. and Ruijs, A. (Eds) (2017). Better Policy Through Natural Capital Accounting: Taking Stock and Moving Forward. World Bank WAVES, Washington D.C. <https://www.wavespartnership.org/en/knowledge->

[center/forum-natural-capital-accounting-better-policy-decisions-taking-stock-and-moving](#)

A1.16 could have a dot point added on water as a natural input. This is an area of overlap between SEEA CF and SEEA EA with water as a natural input and water as a provisioning service. Here an artificial reservoir is akin to a cultivated resource (this gets back to a long running debate about the production boundary). The papers by Nagy et al. and the related response in relation to development of the SEEA Central Framework relevant to this. There is also then the issue of accounting for multiple ecosystem services relating to the supply of water products, e.g. see Vardon et al. (2019) for water filtration, water provisioning, water as a natural input, water as a product.

Nagy, M., Alfieri, A., Vardon, M., 2012. Water in artificial reservoirs –a produced asset? Paper for the 14th Meeting of the London Group on Environmental Accounting Canberra, 27–30 April 2009.

Vardon, M., Keith, H., Lindenmayer, D. 2019. Accounting and valuing the ecosystem services related to water supply in the Central Highlands of Victoria, Australia. *Ecosystem Services: Volume 39*, October 2019, 101004. <https://doi.org/10.1016/j.ecoser.2019.101004>

Section 1.6 is stated to include a research agenda.

Suggested items for a research agenda:

1. Research is required to derive the spatial distribution of ecosystem types. This will involve defining characteristics of ecosystem types that can be detected remotely and thresholds in these characteristics to differentiate ecosystem types. In determining appropriate characteristics, a distinction is required between the definition of an ecosystem and that of a land cover type.
2. Methods for valuation of ecosystem services with no obvious exchange value and including non-use values. A further issue is how to integrate these complementary valuation methods with exchange values, and to demonstrate whether they are comparable.
3. Development of methods and examples of the use of information in ecosystem accounts for application to land management policy, including national and international conventions and policy instruments. Methods are needed for presentation of the data in policy-relevant forms and use of the data in further analysis and interpretation.

Chapter 2

It would be useful to add in material on alternative presentations of information in Chapter 2 after current paragraph 2.51. A range of alternative presentations have been presented in currently available ecosystem accounts.

Something along the lines of:

“Alternative presentations of accounting information is a way of providing information for particular issues or areas of interest. For example, ecosystem services could be shown as being supplied and use by particular environmentally defined areas (e.g. river basins)

or by land use and management classes (e.g. national parks and other protected areas), rather than by each ecosystem type within these areas.”

This brief note could then be expanded upon in Chapter 3 and Chapter 6

The definition of the value of an ecosystem (2.34) as “Ecosystem accounting accommodates a perspective founded on accounting and economic principles wherein the value of an ecosystem is embodied in the expected future flows of services” does not fully encompass the values of ecosystems as understood in the assessment based on their physical measures of ecosystem extent and condition (this gets to the general comments on valuation made earlier). It is a little ambiguous in this paragraph whether this is the definition that is to be used for ecosystem accounting.

The broader understanding of values to include intrinsic and non-anthropocentric perspectives is briefly described in 2.64. It would be clearer if paragraph 2.34 included a statement that ecosystem accounting recognises multiple perspectives about the value of ecosystems from intrinsic to instrumental.

Question 3. Do you have comments on Chapters 3-5 of the draft SEEA Ecosystem Accounting?

Table 4.1 – it appears inconsistent to use two terms for the row entries of ‘Reductions in extent’ but ‘Managed and natural regression’. Is there a reason for using both reduction and regression? ‘Regression’ used in this sense is an unusual word to use for a statistical document when it has a statistical meaning as well. ‘Reductions’ seems appropriate for both row entries.

A comment on ecosystem conversions (4.24) is that the time period over which changes may occur as expansions or reductions can be highly variable for both managed and natural changes in extent and condition. This is a conceptual and practical issue that needs to be resolved.

Describing ecosystem conversions as “the ecosystem is considered to have changed sufficiently in terms of its ecological structure, composition and function to be considered a different ecosystem type” (4.25), would be aided by explaining that thresholds need to be set on ecosystem condition variables to determine the boundaries of the ecosystem types and the conversion from one type to another.

The statement in 4.28 “...ambition of ecosystem extent accounting is to record differences in the composition of ecosystem types compared to a natural condition” would be better to include ‘composition, structure and function’ as these are the components used to define ecosystem types.

Question 4. Do you have comments on Chapters 6-7 of the draft SEEA Ecosystem Accounting?

Additional text on land management and land use is good. This leads on to the issues of presenting ecosystem accounts by type of land management or land use or land zoning. An example of this for Uganda was presented at the 2020 London Grouping by Steve King et al. (2020, Table 3), and the NSO of Uganda presented accounts with supply of ecosystem services by river basins (UBOS 2020). This naturally leads to alternative presentations and we have suggested that text on this be added to chapter 2.

King, S. et al. (2020). Integrated accounting for biodiversity and key economic sectors in Uganda. Paper for the 26th Meeting of the London Group.

UBOS (2020) Towards Ecosystem Accounts for Uganda. UBSOS, Kampala.
<https://drive.google.com/file/d/1XZ16GyPJEWaE94SZPvFZdY964EIMdtfK/view>

The description and inclusion of intermediate ecosystem services, as well as final services, is helpful for promoting a comprehensive approach (6.2.3). However, it is not clear how the intermediate services are actually treated in the accounts and it would be helpful if this was referenced to section 7.2.4.

Measurement of global climate regulation services and the measurement scope of the carbon stock (6.97). The scope should include carbon stored in total biomass and not be limited to aboveground. Belowground biomass, as roots, is an important component of the carbon stock that is at risk of change. Ecosystem types vary in their root:shoot ratios and so excluding roots would bias results across ecosystem types. Measurement should also include living and dead biomass. The total carbon stored in biomass above- and below-ground and debris) and soil is listed in 6.93.

Consistency of terms in the climate regulation section is very important to ensure clarity among different disciplines, particularly the IPCC and climate change literature. This was explained in our comments on Ch 6 but has not been fully implemented. Equivalent terms can be given in brackets at their first use and thereafter used consistently. Removals (uptake/capture). Emissions (release/loss). Note that 'capture' is not the opposite of 'removal' in this context.

Paragraph 6.95 definition of the climate regulation service: "ecosystems supply a carbon retention service through the avoided release of carbon to the atmosphere". In previous comments on Ch 6, I recommended adding "and accumulation of carbon stocks". I still believe this expanded definition is a more accurate representation of the concept for the service.

Description of the carbon retention service (6.96). In our previous comments on Ch 6 we noted an important addition to this definition that has not been incorporated in the current version, and we would now like to reiterate the need to expand this definition to include quality and quantity. The value of carbon retention depends on the volume (quantity) stored AND the quality (safety) of the storage. Both factors must be included in the measurement of the ecosystem service. Assessing the quality of the storage can be achieved by using a classification of ecosystem condition of the assets, for example

natural, semi-natural or production ecosystems within the ecosystem type classification. This issue is critical for the next stage of assigning monetary terms to the ecosystem service flows. The value of the service depends on the condition/quality of the asset. Note that inclusion of both quantity and quality in quantifying ecosystem services aligns with the objectives for SDGs, for example SDG 15 Life on Land that recognises quantity and quality in indicators.

Paragraph 6.99 has been added since circulation of Ch 6 and I think it is unhelpful and potentially confusing if different formulations of the ecosystem service are used, and then cannot be compared. The net stock change is calculated as part of the carbon stock account, and hence data about a net positive increase (sequestration) can be extracted from the stock account. This could be reported in addition to carbon retention as the stock, but should not be used instead of reporting the stock. Only reporting on sequestration, and not on the stock, reverts to the original problems of providing the wrong policy signals. If a positive change can be recorded, but not a negative change, then this could create even more problems. I strongly recommend that this paragraph be removed.

Ecosystem capacity is described in Section 6.5. This is the first substantive text we have seen on this topic. In the previous version of Chapter 6 we commented on the need to see more on capacity and how it fitted into the overall accounting framework. Comments on this issue are made in our response to Question 1.

Question 5. Do you have comments on Chapters 8-11 of the draft SEEA Ecosystem Accounting?

The inclusion of information about how to produce accounts across cross-cutting themes is good.

A one stage accounting for the environmental theme of water was included but now this has fallen from the list. It would be appropriate to add in an expanded list of some examples of themes (e.g. sustainable development, forests, water, wetlands, protected areas, agricultural areas) that could be covered in thematic ecosystem accounts in Section 13.1 and then say the four examples are provided as they have particular policy interest. References to other material could be included as footnotes (e.g. SEEA-Water, SEEA-AFF, Forest Source Book).

Question 6. Do you have comments on Chapters 12-14 of the draft SEEA Ecosystem Accounting?

Para 13.58 should be “uptake (managed expansion) of carbon from the atmosphere and release (managed contraction) of carbon by the economy”.

