



DEPARTMENT OF ECONOMIC AND SOCIAL AFFAIRS
STATISTICS DIVISION
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System of
Environmental
Economic
Accounting

System of Environmental-Economic Accounting 2012 – Experimental Ecosystem Accounting Revision

First Global Consultation on:

Chapter 6: Ecosystem services concepts for accounting

Chapter 7: Accounting for ecosystem services in physical terms

Comments Form

Deadline for responses: 20 August 2020

Send responses to: seea@un.org

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The comment 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 the following e-mail address: seea@un.org.

All documents can be also found on the SEEA EEA Revision website at:

<https://seea.un.org/content/seea-experimental-ecosystem-accounting-revision>

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Questions related to Chapter 6

Question 1: Do you have comments on the concepts and definitions for ecosystem services, benefits and associated components of the ecosystem accounting framework?

The concepts and definitions of the ecosystem services need to be seen in the context of ecosystem assets as well as the coverage of SEEA Central Framework and SNA. This is not yet clear. This can only be assessed with a full draft of the document, and particularly the definition and position of 'ecosystem capacity', so not possible now.

The discussion of the definition of ecosystem services is good. It notes the various definitions and interpretations in Section 6.2 and related footnotes. In this the footnotes could be part of the main text as it would help raise the recognition of the existing vast literature on ecosystem services as well as reinforce the need for a common consistent definition of ecosystem services. The history and context of other uses of the term ecosystem services is particularly valuable for gaining acceptance of the ecosystem accounting approach by the existing disciplines working on ecosystem services.

In the definition of ecosystem services (para 6.7) as "ecosystem services are recorded as flows between ecosystem assets and economic units", it would be useful to expand on this to describe the fact that 'flows' are not restricted to physical flows and can include characteristics of the existence of an asset and that the asset does not need to be transformed. The intuitive concept of physical flows often limits peoples' understanding of ecosystem services. This distinction is raised in footnote (4) describing types of consumption, but I think is an important concept to describe at the beginning about ecosystem service flows.

Para 6.9 last sentence "a rate or total flow per unit of time" – this sounds ambiguous as a 'rate' is an amount per unit time, suggest changing this sentence by deleting 'rate' or changing to 'rate, that is , the total flow per unit of time'.

The use of the logic chain (e.g. Table 6.1) is good and clearly shows that ecosystem services are supplied via a combination of factors, some of which can be managed by people. A possible addition to Table 6.1 under 'Factors determining supply' is the location, related to the point below about the separation of supply and use. Forest near, or downwind, of the pollutant source supplies a greater ecosystem service.

This then gets to the apparent paradox of the supply being determined by the use and is not addressed (e.g. a forest far from roads or a city and hence with no pollution to absorb does not provide ecosystem services, where a forest next to a city does).

It is good that the abiotic flows are included. It would be good to be clear that there are abiotic ecosystem services, and water provisioning in particular is included.

There are three groups of flows from the environment that are used by people, that need consideration. The first is ecosystem services from human-made infrastructure or are due to human management (e.g. water provisioning from artificial reservoirs – which gets to a recurring issue in the SEEA and SNA of defining the production boundary). The second is

services from nature that flow to people but are not currently within the Central Framework nor the proposed Ecosystem Accounting. The shielding of UV light by the atmosphere would be one of these (and again this gets to another issue of how the atmosphere is to be considered in the SEEA. The atmosphere is certainly an asset and it could be a separate asset in the Central Framework, a part of ecosystem assets, or both). Gravity and its role in hydropower and in water flows used for transport are interesting cases addressed in the text and seem reasonable. A third group of ecosystem services are those used by people but not related to human management or infrastructure e.g. pollination, aesthetic values of nature. The flows of aesthetic values (what some might call existence values) or cultural values are of particular interest (and difficult to pin down).

Para 6.34 introducing the concept of 'ecosystem resilience' is important for the discussion about the role of biodiversity in ecosystem services. Recognising that there is huge literature about this and that references here need to be selective, the current reference is not comprehensive, references to Brian Walker and the Stockholm Resilience Centre would be more appropriate, eg Walker B. 2019 Finding Resilience – change and uncertainty in nature and society. CSIRO Publishing.

Thompson I, Mackey B, McNulty S, Mossler A 2009 Forest resilience, biodiversity, and climate change – a synthesis of the biodiversity/resilience/stability relationship in forest ecosystems. CBD Technical Series No. 43, Secretariat of the Convention on Biological Diversity, UNEP.

The discussion and treatment of ecosystem disservices (did someone say COVID19?) is an important area, with the Section 6.2.10 not yet done.

Question 2. Do you have comments on the content and descriptions in the reference list of selected ecosystem services?

The list in Table 6.2 is very good. A few notes:

- Global climate regulation services in the Table is carefully written and does not mention the possibility of there being two separate components to this, broadly identified as carbon storage and carbon sequestration. The text in 6.4.2 is good and an area of ongoing discussion.
- The description of global climate regulation services should include 'through the retention of carbon and other precursors of greenhouse gases in ecosystems'.
- Water purification and the water supply services can overlap and depending on the situation be recorded separately or together.
- Some method/confidentiality issues to do with "Spiritual, symbolic and artistic" within the cultural services (e.g. Table 6.2, Section 6.4.3). These are important as indigenous lands over a large proportion of Australia. Also raises the issue of the same flow being covered in different services as is recognised (e.g. biomass provisioning and cultural services, para 6.60).

The inclusion of intermediate services where there is a link to final services as a supply chain is a welcome compromise so that some of these critical ecosystem processes, which often occur in a different location, can be recognised.

Some clarification would be helpful regarding the classification or differentiation in the ecosystem services for Water supply in Table 6.2.

Water supply is classed as a provisioning service described as the combined ecosystem contributions of water purification and water regulation but water purification and water regulation are separately classed as regulating and maintenance services. Seems to be some inconsistency here in the approach.

Question 3. Do you agree with the proposed treatments for selected ecosystem services described in Section 6.4 for biomass provisioning services, global climate regulation services, cultural services, water supply and abiotic flows?

Biomass provisioning services

The distinction in the ecosystem service between (1) growth of the biomass, and (2) harvest of the biomass, is important in determining the point at which an ecosystem service is supplied. This distinction is made in Para 6.52 in relation to joint production by ecosystems and human inputs, but has wider implications for defining the service. Is the boundary at which the ecosystem service supplied different for different ecosystem types and biomass provisioning, e.g. from a native forest or a plantation?

The recommendation to report biomass harvested by broad production contexts, such as intensive or extensive (para 6.60), is very useful and will help to link ecosystem service accounts spatially to the condition of ecosystem assets. This form of classification should be encouraged in reporting for accounts.

Losses in biomass production (para 6.60): reporting biomass flows in gross terms is highly supported, and flows of the various components such as residues, losses and discarded should all be recorded and assigned a 'use' which may often be 'waste'. This can then form the input to a waste account.

Climate regulation services

Section 6.4.2 some suggested changes/additions to terminology to maintain consistency with the IPCC and current climate change literature. It may be useful to use several terms in brackets to show equivalence. Removals (uptake/capture). Emissions (release/loss). Consistency in the use of these terms needs to be ensured throughout the document. The term 'capture' in particular has associations with technological mitigation activities that are not related to ecosystems.

It is important to recognise that the language about carbon flows from the perspective of the IPCC/GHG inventories/climate scientists refers to what the 'atmosphere sees', whereas the approach from ecosystem accounting refers to what the 'ecosystem does'. We want to make the language as clear and transparent across disciplines as possible.

Para 6.61 The role of ecosystems is to store carbon, but other GHG gases should also be included, such as methane and nitrous oxides.

Para 6.63 More specific guidelines would be useful about the comprehensiveness of measurement of carbon stocks. For example, all stocks within ecosystem types should be included, but assets not involved in the ecosystem accounting area, such as fossil fuel deposits may not be included.

Para 6.64 Suggest adding to the definition to provide a more complete understanding: “ecosystems supply a carbon retention service through the avoided release of carbon to the atmosphere and accumulation of carbon stocks”.

Para 6.65 The analogy of carbon retention with the services supplied by a storage company is useful. However, 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.

Para 6.66 – it is preferable not to use the term ‘sub-soil fossil fuel deposits’ but to use ‘geological fossil fuel deposits’. ‘Sub-soil’ refers to part of the soil profile not below the soil profile.

Agree that harvested wood products should be considered as part of the economy, however to maintain equivalence in the supply and use tables the links between gains and losses in carbon stocks with entries in other parts of the accounts will need to be shown, for example the provision of biomass from the ecosystem to the forestry industry, the transfer of biomass from harvested trees to wood products in an industry sector, the transfer of biomass to the energy sector, the transfer of biomass from the ecosystem to various forms of waste.

Cultural services

Para 6.68 – first sentence missing word or extra word need to be added (e.g contribute OR comprise”).

Para 6.70 – remote experience by people are excluded? This is a large exclusion and justification in the paragraph is not strong. This exclusion is considered quite problematic. If the ecosystems did not exist then the produced goods eg movie, photo, could not be made. A movie that requires a constructed film set would have this infrastructure included in the SNA. Goods produced from this remote experience of ecosystems contribute a significant amount to the economy

Water supply

Para 6.80 Could the conclusion that water abstracted from deep aquifers is not an ecosystem service be better explained and justified? While not a product of current ecosystems, it is a product of past ecosystems and exchanges through the hydrological cycle. There are many policy issues related to the competition or trade-offs for the use of groundwater, impacts of pollution of groundwater, climate impacts, etc, where data from ecosystem accounts would provide useful information. This gets to the cross-over with the Central Framework and the recurring issue about whether natural inputs of water are equivalent to water provisioning services. It seems the answer is that, yes, except for groundwater. The treatment of rain and sea water extracted are related issues (are the ocean and atmosphere providing a water provisioning service. Could be intermediate ecosystem service at least).

The possible treatments of the ecosystem services involved with water supply (i.e. water provision, water filtration and water storage services) closely align with previously expressed views and it would be appropriate to refer to paper, Vardon et al. (2019) that was published on this in the relevant section (6.4.4 treatment of water supply) as it expands significantly on the issues. A version of Fig 2 from the above mentioned paper could added.

There could also be reference to accounting for water use by wildlife as this is an area of interest in many countries and especially those in areas with low rainfall, lots of wildlife that is the basis for tourism and competing water use. Again, there is a paper on this which can be referred too (Vardon et al. 2017).

References:

Vardon, M., Keith, H., and 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>

Vardon, M. Pule, O. B., and Galegane, D. (2017). Accounting for water use by wildlife—conceptual and practical issues and a case study from Botswana, *Water Resources and Economics* Vol 20 Oct 2017, 31–39. <https://doi.org/10.1016/j.wre.2017.09.005>

Abiotic flows

The distinction between abiotic flows and ecosystem services is explained well, however it would be useful to describe where abiotic flows are reported within accounts and how they are used, given the examples in 6.4.5. This is explained in Ch 7.49 and Table 7.5 as additional rows in the supply and use table, but it would be helpful in Ch 6 to briefly explain that abiotic flows can be reported alongside ecosystem services (and, moreover, which flows are ecosystem services and which are not).

Question 4. Do you have any other comments on Chapter 6?

Annex 6.1 is useful.

If a diagram showing the recording of water supply is not included, as suggested in the response to Question 3 (above) then it should be added to Annex 6.1 (and it could be in both places).

References do not reflect Australia experiences, or non-EU experiences more generally.

Questions related to Chapter 7

Question 5. Do you have comments on the proposed recording approaches for ecosystem services supply and use tables described in section 7.2?

Table 7.1 is excellent as is the associated text.

Para 7.4 The description of applications of physical supply and use account is helpful, but we think it worth making the point that ecosystem services can be quantified in physical terms and this has many applications and does not necessarily mean that all ecosystem services have to be translated into monetary terms.

Inclusion of intermediate services by other ecosystems in the supply and use tables is a helpful way to present and understand the supply chain, and to show that these intermediate services are not left out.

Table 7.4: In the last row for IS: pollination services, the cells for ecosystem assets Forest and Grassland should not be grey, i.e. other ecosystem assets could use intermediate services.

It would be useful if the supply of services could also be shown by the economic units that own or manage the ecosystems. This would essentially show the supply of ecosystem services by industry and sector. This is I think what is being referred to in para 7.50. The alternative supply use account would be different to Table 7.2, 7.3, etc (and why “farmer” rather than “agriculture” in these tables?). This alternative presentation would facilitate policy applications and links to SEEA Central Framework and SNA presentations and the discussion in Section 7.4 Connections to the SEEA Central Framework.

Treatment of imports/export is described well (e.g. in para 7.38) and are some public services (for want of better term) in para 7.39. There are some related scale issues which are touched upon

Question 6. Do you have any other comments on Chapter 7?

The exclusion of some flows (e.g. in para 7.48) gets to the issue of where flows are not in the Central Framework and not in the ecosystem accounting could be recorded. This is important for the wind and solar energy and applications to policy/management. And in this we think wind is probably an ecosystem service from the atmosphere. Solar less clear. The issue is being clear on where they can be recorded (and hence a reference to the energy accounts in the Central Framework would be appropriate).

The discussions of baselines (Section 7.3.2) would benefit from a worked example of one of the services shown in Table 7.6.

Para 7.63: preferable to refer to “well-structured soils” rather than “well-developed”.

Para 7.70: second sentence would benefit from some punctuation to identify which services are excluded.