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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>

In case you have any questions or have issues with accessing the documents, please contact us at seea@un.org

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?

We mostly agree with concepts and definitions as explained in 6.1 and 6.2

A suggestion is to add system ecology categories (i.e. biomass, information and interaction) to further enforce the concept of service as ecosystem process, interaction and contribution.

Major comments:

6.3. The definition of ecosystem assets should also require homogeneity in terms of condition (and not only in terms of type). If we don't prescribe that EAs should be "relatively" homogeneous in terms of condition, then the whole Chapter 5 will become problematic. (IMHO this change, which also affects Ch3-4, also creates additional flexibility for the applicants of the accounts so that they could adapt their work to the reality that they try to assess.)

About the three situations described in 6.15: to investigate the private and public nature of benefits is interesting but the two features that traditionally characterize the economic matrix (rivalry and excludability) are here mixed with ownership of the ecosystem. **Land can be owned, ecosystems cannot.** Land ownership cannot signal ecosystem benefits ownerships – unless the owner has an active role in supporting /disturbing the ES.

Agreed that the individual vs. collective use is relevant, but more work is needed on a coherent correspondence of ES that consistently applies to the definition of public good (non-rivalrous and not excludable): e.g. the forests that provide clean air and climate regulation can be privately owned, why ownership matters in point ii for individuals and doesn't matter in point iii for collective use? More ES examples should be provided to fully understand the meaning and purpose of this distinction. E.g.; can a service be no rival even if it is provide to individual? can a service be public although there is rivalry?

In order to avoid misunderstanding, it would be important to rephrase the terminology (specifically "ownership of ecosystem") and clearly frame the collective use -public good concept.

6.20. While we agree with the point, but the example selected seems to be a poor choice. Would it be possible not to use a "sink" service? Although there is no agreement on the proposal that the allocation of those service flows should be attributed to polluters, **the debate is not solved.** To use water purification allocated to water supply companies as an example in 6.20 sounds like a final statement we disagree with.

About '6.2.5 Final and intermediate services':

The issue of considering some services as "intermediate" may depend on the methodology rather than the service itself. If an agriculture production function embodies fertility, pollination and water, then there is no need to add separate flows for these services because they are already there (that would be a fast-track approach). If crop provision assessment does not include pollination or soil retention, then they can (and should) be added as separate flows and they are final (that would require more biophysical modelling).

Moreover, some services can be final for part of their allocation, and they can be allocated to other ecosystem types for the rest of their allocation: this is what can be defined as "inter-

ecosystem flow” and it would be important to explicitly report it. To “label” some ecosystem services (e.g. soil quality regulation services) as “intermediate” is not correct in principle: it really depends on the assessment methodology that is adopted.

6.29-6.30. We think that the “logic chain” is a very useful new concept. From the Ch5 perspective, we would just like to highlight the huge overlap (or even complete match?) between the “factors influencing supply” and the ecosystem characteristics (sensu lato) discussed in Ch5. To maximize alignments between the chapters, we would like to adjust the 2nd bullet in 6.30 this way:

- *“Factors determining supply: In most cases there are several factors that influence the supply of an ES. For example, the availability of air filtration depends on the type and condition of the vegetation and the level of atmospheric pollutant concentrations. Ecological factors that can influence ES supply are considered in Chapter 5 as ‘ecosystem condition characteristics’, whereas other factors which do not fit into the concept of ecosystem condition (e.g. management, accessibility, or stable ecosystem characteristics) are listed as ‘ancillary data’ (5.16). Where there are cases of joint production of benefits... ..”*

And then Table 6.1 (and the Annex) should also be adjusted: please rewrite the header of two columns:

- Col 2: “Ecological” → “Ecosystem condition” (or “Ecosystem condition characteristics”, if there’s enough space)
- Col 3: “Human” → “Ancillary factors” (or “Ancillary data”)

6.2.9: While there is nothing really wrong with the text in this section (well, maybe it is slightly more detailed with more scientific references than the bulk of this chapter and the other chapters in SEEA EEA, which might be seen as a style inconsistency...) it completely misses an important point. Biodiversity is also one of the main (groups of) ‘ecosystem condition characteristics’, so it is already there in the Ch5 condition accounts. To make the guidelines more coherent, we think that this connection should be made in one of the paragraphs here. (And making a link to Ch5 would also connect biodiversity to the “factors determining supply” discussed a few paragraphs above – thus improving the internal coherence of the whole text.)

Other notes:

References for system ecology categories:

S. Jørgensen “Introduction to Systems Ecology” CRC Press (2012) applied to the cascade model in <https://www.sciencedirect.com/science/article/pii/S1470160X16306677>

6.23 – specific publications have addressed the issue of production boundaries for ecosystem services accounting. It would be worthwhile to quote them:

1- <https://www.tandfonline.com/doi/full/10.1080/20964129.2018.1524718>

2- <https://www.sciencedirect.com/science/article/pii/S2212041617307246>

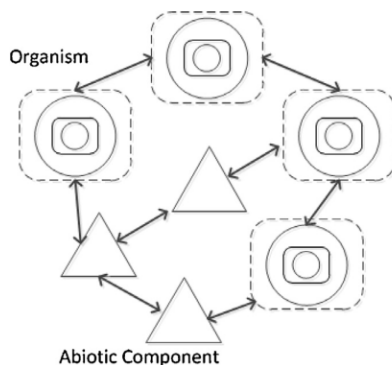
Question 2. Do you have comments on the content and descriptions in the reference list of selected ecosystem services?

For each ecosystem service it is stated whether it is/can be intermediate or final. It would be helpful to complete this statement by explaining whether the service can be allocated as final service to economic units and/or inter-ecosystem flow.

There are three ecosystem services we have concerns about:

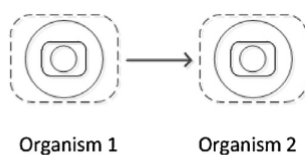
- 1- Rainfall pattern regulation services (at sub-continental scale): is it a service? Doesn't it overlap with water regulation and flood mitigation services?
- 2- Water purification services: We would delete "dilution" from the processes. Dilution is (1) an essentially abiotic process (if organisms are involved it's not dilution any more), and (2) it does not make the pollutants disappear from the water (the benefit is also questionable, it can even be seen as a worsening of the situation, as it is more difficult/expensive to get rid of a diluted pollutant.)
- 3- Ecosystem and species appreciation services: this really risks to overlap with the maintenance service "habitat/species maintenance". For example, could this situation be treated similar to hunting and fishing, and record a cultural ES only when the "appreciation" results in a concrete activity? (In this case there would be no need for "species appreciation" as a standalone cultural ES: the ecosystem contribution necessary for species appreciation could be normally recorded under 'habitat/species maintenance', and whenever this results in concrete activities then there will also be a cultural service recorded under 'recreation-related ES'.) If both of the overlapping ES are kept in the reference list, then the use of system ecology categories could also help to get clearer definitions and explain the difference.

Maintenance service:



The system ecology category "interaction" is the service (ref. visual simplification). The user values the role of the ecosystem in maintaining overall species richness and eventually allows the existence of key species (including e.g. the Siberian tiger).

Cultural service:



The system ecology category "information" is the service (ref. visual simplification). The user

(organism 2) values the fact that emblematic species such as the Siberian tiger exists (organism 1).

Minor notes:

- 4- Point 6.39 and 6.41 report list of full ES relevant for many countries – peculiar countries –small islands for example – might not be reflected in this list – would they prepare their own list?
- 5- It would be good to assign short IDs to the to the final version of this list, which would make it much easier to use the list as a reference.
- 6- We increasingly feel that “sink services” is a relevant subgroup of regulating ES, with a lot of practical implication. We would welcome if these services would be grouped together in the reference list.

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?

Major comments:

About biomass provisioning services, we have serious concerns about the way cultivated crops are treated (6.55 and 6.56): the fact of using gross biomass harvesting fully contradicts the concept of ecosystem service as “contribution” explained in 6.1 and 6.2 and not even with what reported later in 6.60, 7.18, etc.. The proxy suggested is misleading: intensive agricultural systems likely generate higher yields than organic or extensive farming, but the contribution of ecosystem services is lower. If ecosystem contribution is not disentangled the information provided to policy makers is wrong and will not support any sustainability path toward a resilient agri-food system.

This degree of departure from reality cannot be justified as a “simple and pragmatic solution”. Luckily there are also relatively simple “fast track” approaches available for estimating an approximate “flat rate” of ecosystem contributions from SNA statistics (see e.g. the chapter on timber provision in Vallecillo et al., 2019 <http://publications.jrc.ec.europa.eu/repository/handle/JRC116334>). Such a calculation can still be cumbersome, especially if multiple crops and EAAs need to be distinguished, but NSOs are at least familiar with this kind of work. And we are sure that a “demand” for such “ecosystem contribution coefficients” will also be able to trigger intensive methods and models development both on the part of science and NSOs. But only if we send the right message in SEEA EEA, by not accepting the “gross biomass harvested” as an adequate proxy for the underlying ES.

~6.60. We are missing an important point about what to do with crops with a multiannual production cycle (e.g. forestry plantations), that are harvested at once at the end of their cycle. How should this be entered in the “books”? Should the ecosystem contributions (=the ES) be spread out evenly over the whole production cycle? Or should the whole “ES” be recorded at once at the time of the harvest? (Actually, there are arguments for both positions, but given that the ES is the ecosystem contribution, which is spread evenly in time, we would probably vote for option 1. And, just for info, the same question has also emerged in the discussion related to ecosystem capacity, where option 1 also received positive feedbacks).

6.60, 2nd bullet: the list of examples should also include pollination and pest control, which are the most typical examples for “inter-asset” intermediate services.

About the second type of **cultural** benefits (6.69) please refer to what reported in the previous comment on “Ecosystem and species appreciation services”. Overall, 6.69 and 6.70 are unclear about why some benefits are excluded.

6.71. To make the definition of cult ES more coherent with the def of prov/reg ES, and to make it more distinct from the def of ecosystem condition, WE would adjust the text the following way:

“Given this scope of cultural benefits, cultural services are defined as ecosystem contributions to a wide range of cultural benefits based on the existence and functioning of perceived or realized qualities in ecosystems which enable these benefits. With this...”

About water services, we would greatly appreciate if a paragraph is explicitly dedicated to explain the difference between the second approach proposed in 6.78 with the water accounts that are part of the SEEA CF. They look the same and we would like to understand where we are wrong. The problems mentioned for 6.55-56 also affect the “gross amount” of extracted water, which does not reflect ecosystem contributions, and can thus give completely misleading messages for policy. We strongly think that without at least a flat rate estimation for the ecosystem contributions, the gross amount of water extracted should not be used as an ES proxy.

Minor notes:

About “Trade in biomass products” (6.60), a concrete example (even if on a regulating rather than provisioning service) of multiregional input-output analysis is reported in chapter 4 of https://publications.jrc.ec.europa.eu/repository/bitstream/JRC120571/jrc_report_lisbeth_final_1.pdf

6.4.5 For the sake of conceptual clarity, water could be merged among the abiotic flows. But at least it should be mentioned that water is an important special case of abiotics.

6.89 We would delete the words “and dilute” (see also our comments for Q2 above).

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

We like the chapter and agree with most of its content, and we **congratulate Carl and his colleagues for the huge effort is summarizing the massive materials, (never ending) discussions and issues in such an efficient way.**

However as reported in the previous comments, we would like to remark that some issues, that are still under discussion, here seems to be somehow “settled”, such as the **allocation of sink services** to polluters (that is an active issue and is still being debated) and the **ownership issue on ecosystems**, whose discussion that has only just begun.

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?

We agree with the recording approach for ES supply and use table.

However, we would suggest only few paragraphs to be rephrased. Specifically:

7.14 – “mapping is not essential”. This does not apply to all ecosystem services. For services such as flood control and water purification **mapping is essential**: without the spatial connection between catchments it would not be possible to assess those services.

It is not a matter of scale or data availability: it is the way the ecological process work that require spatial elements.

7.15 – “top-down methods” does not sound like the appropriate criterion. Methods can be mainly distinguished by **level of complexity** (fast-track versus modelling approaches), and by **conceptual approaches** (use available datasets as ES actual flow versus calculating ES actual flow as the interaction between ES potential and ES demand).

7.16 – the current message sounds like “at the end of the day, in the SUT does not matter to where (geographically) these assessment belong to”; in our opinion it should sound more like “**the more sophisticated the approach you apply, the larger the range of information for policy uses**”. In fact, to be able to spatially locate larger/smaller amount of service flows together with matches and mis-matches between ES potential and demand does make a difference for planning and analysis.

7.43 – to consider the number of visits is only one way, and indeed not a good one for the accounts of nature-based recreation. Larger flows of visits do not necessarily imply a better ES. More nature-based sites (ES potential) implies a better service (in an ecological perspective). An increase in the ES demand not supported by an equally increase in ES potential may eventually lead to congestion of natural sites. It is thus important that the ecosystem contribution is always there, rather than considering the number of visits as a suitable proxy. Large amount of visits could also be explained by more touristic services (bars, restaurants...) not explained by the ES potential.

This echoes the problem with 6.69 and 6.70 about the passive use of recreational areas – looking pictures or videos has not value. In this sense the hedonic price should record no value for ES as potentially I might buy a nicely located house to see from my window without 0 visits!

Other issues:

7.11 brings in the distribution in term of incomes, can we include here the ownership element as a characteristics of beneficiaries?

7.20 sustainability element seems to be overlooked. Maybe this could be a good place to set the “hook” with the issues of overuse and degradation that will be raised with the “capacity” section/chapter.

7.29 – the government in the SNA is treated as sector not as “society”. The overlapping of these

two different roles may create confusion and misunderstanding. Could the alternative of adding the satellite sector “**Global Society**” be an option? First of all this would not mix the government sector with the society which includes everything (economic units, government and households) and the fact that is “global” would overcome the national boundaries, fact that is needed for services such as GHG regulation.

Table 7.4 – if a fast-track approach (that includes intermediate services) is used, it will not be possible to compile the IS row. If the individual flows of services are modelled and assessed separately then they would be final services (ES #). Although we understand that it would be interesting to record an intermediate “transaction” between ecosystems to track their mutual dependency, operationally we cannot see how and what can be compiled as IS.

On the other hand, it might also be important to record the inter-ecosystem flow (even if the transaction between different ecosystems does not take place) to undertake correlation analyses with ecosystem condition and the flow amount of other services.

7.32 - Water supply and water purification are two different services, meant to serve different purposes (provide water, clean water) and measured in with different units (cbm of water and tons of N removed). The intermediate service for water supply is water regulation (baseline flow maintenance) not water purification, that instead is meant to clean water since (in many countries) there is a regulation that acknowledges that excess of nitrogen is a direct and indirect damage for public health. This comment also applies to 7.74.

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

We believe it is important in this chapter to pass the message that there can be many ways to assess ecosystem services: **spatial explicitness, ability to map, quality of ecological information depend on the method that practitioners decide to apply.**

The consequences of this choice lies not only in the quality of the numbers but also in the range of uses, that may be (i) very limited with reassembled statistics, (ii) very large with modelling techniques that separately assess ecosystem potential and demand before calculating the actual flow that will enter the SUT as presented in this chapter. Between these two extremes there are other possibilities.

Further minor remarks:

- 7.60 is also true for some regulating ES (the ones of the “sink” type).
- 7.61 introduces negative impacts, but why here and not in chapter 6?