DEPARTMENT OF ECONOMIC AND SOCIAL AFFAIRS
STATISTICS DIVISION
UNITED NATIONS

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?

Overall in agreement with the way everything is presented. There is some potential for confusion regarding property rights/management and who the "user" is considered to be. Para 6.3: "linked to the different users who receive the services"; para 6.8: "flows of ecosystem services as defined in ecosystem accounting … requires a connection to be made to users". Who receives/who is the user for the service of water filtration, for example – the water utility company downflow, or the polluting farms upflow? Related to distinction in 6.15 based on question of ownership/management. This might also be noted in 6.20 where the supply company is identified as the user of the service, and all the subsequent water users as beneficiaries, but there is no mention of upstream polluters. See also 6.30 "the service of air filtration requires that there is some release of air pollutants and some level of atmospheric pollutant concentrations" (on a separate point, worth noting that the "release" does not need to be from human activity, could also be air pollutants arising naturally).

Then in the section on abiotic flows, "Where residuals are actively mediated, broken down or otherwise processed by ecological processes, examples in this case include air filtration, water purification and solid waste remediation. In this case, the ecosystem contribution is considered an ecosystem service equivalent to the quantity of residual that is processed. This seems to suggest that the biotic treatment of residuals is to be considered as a service. The issue is cleared up in 6.89 which states "The convention in ecosystem accounting is to assign the use of ecosystem services to those economic units who subsequently use the ecosystem and hence benefits arising from clean water, air and soil."

Here, it would be very helpful to state this clearly from the start. Secondly, however, there seems to be a risk with this approach of overlooking, or at least not sufficiently emphasising, the values of ecosystems as receivers of waste products from human activities? There is some consideration of this via the logic chains, as "factors determining supply", but that stops well short of directly ascribing value to this role.

It seems clear that we can have only either the upstream or the downstream unit as the user and it seems more natural (and should be more clearly stated) to have the downstream unit as user as the convention (as in 6.89). However, at least it should be said explicitly that alternative views can also be taken (making it clear at the same time that the upstream unit user is an alternative view).

The definitions of SNA and non-SNA benefits are not symmetrical. Compare 6.14 with 6.11. While 6.11 explicitly refers to the current production boundary, 6.14 simply states "by economic units". This is probably incorrect. For both definitions the qualifier should be "within the production boundary as currently defined". Please also correct the glossary for these items.

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

Comments on the selected ecosystem services are:
"Rainfall pattern regulation services are the ecosystem contributions of vegetation at the sub-continental scale, in particular forests, in maintaining rainfall patterns through evapotranspiration. It is a final ecosystem service." It is not very clear what is to be treated as the service here. If this includes rain as input to agriculture and water supply, is there not a risk of double counting? Also, it is not totally clear why this service is labelled "final". This service will probably overlap significantly with others such as provisioning services, water supply etc.

Soil erosion control - "It is generally an intermediate service (contributing to biomass provisioning services) but it can also be a final ecosystem service (preventing damaging effects to houses and buildings from mass movement of soil)" – no mention here of (intermediate?) impacts on water supply/energy – reduced treatment costs, reduced silting up of dams. This is noted later in 6.81, although as "retaining sediment" and it's not clear if that is intended to be recorded as a service different from erosion control.

"Ecosystem and species appreciation services are the ecosystem contributions, in particular through the biophysical characteristics and qualities of ecosystems, that people seek to preserve because of their non-utilitarian qualities. They are final ecosystem services." – is this intended to represent non-use values: existence, bequest, altruism? If so, "non-utilitarian" is not an appropriate term, because it invites possible confusion regarding the total economic value framework, which is based on the utility concept and its manifestation via willingness to pay. The point about non-use values is not that there is no utility involved, but rather that there is no personal use of the resource associated with the utility (the satisfaction of knowing the resource is protected or whatever); the concept of non-use values is still entirely grounded in a utilitarian, anthropocentric framework. And indeed there can be exchange values associated with non-use value (for example, some part of donations to conservation NGOs).

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?

The treatment of biomass services has greatly improved from the discussion papers 3.1/3.2. One issue that may be worth considering again is 6.59, that is the equivalence drawn between aquaculture and intensive pig/chicken production. The situations are a little different in that the latter takes place in buildings more or less totally cut off from ecosystems, whereas aquaculture pens are still located in a natural system and depend on the flow of water and other interactions as well as on added feeds.

In 6.52, "The activities of economic units in this joint production process can be separated into those concerning the growth of the biomass (e.g., the application of fertilizers and pesticides) and those concerning the harvest of the biomass. The contribution of the ecosystem is evident up to the point of harvest." - it is not clear what is to be understood from the text underlined there. Perhaps you mean "….contribution occurs continuously

up until harvest…"? The point that should be made clear is that, for consistency with the non-cultivated case in which the gross biomass is recorded as ecosystem service, the determination of the ecosystem/human contributions in the cultivated case should be based only on the "growth of biomass" aspects, ignoring the "harvest" aspects. And/or this might also be noted in 6.60, where it is argued that ecosystem accounting should use gross terms.

On carbon, the argument is to a degree valid: the service is not being measured as flows to/from the stock, but rather that the total stock is a proxy for the service, which is in effect the benefit of that carbon not currently being in the atmosphere. Then, as 6.64 states "For a single ecosystem, the minimum service that can be supplied is zero when the stock of carbon is zero." It is worth noting however that valuing this service is likely to be quite a challenge compared to the relatively simple issue of valuing emissions/sequestration (e.g. via carbon prices). 6.66 notes that sub-soil fossil fuel deposits are not part of the ecosystem service – in principle, the processes of creating new subsoil deposits from current ecosystems should be an additional ecosystem service, but probably too slow to have any practical consequences here.

However, deciding to select the carbon stock is also a very massive temporal allocation decision and it is not clear it is a wise one as it probably reduces the policy relevance. E.g. a drained peatland is a net emitter (as organic matter decomposes and carbon is released). If keeping the stock is the service and the drained peatland sheds 2% of the stock per year, the difference between a drained and a natural peatland in terms of service flow is tiny. The service from the former is nearly as big and only slowly declining over time. Furthermore, observed prices will typically not be for storage but for sequestration. On balance we suggest you reconsider!

6.74 suggests that outdoor workers may receive "recreation-like" benefits. This is probably true (though there could be disbenefits e.g. in poor weather) but in theory that should be reflected via lower wages (ceteris paribus – if outdoor work also riskier, would expect higher wages, and so on). In principle hedonic wage studies might pick this up, though we are not aware of any relevant studies. But worth noting that in principle any benefit gained "on the job" is already internalised via the employment market.

The treatment of water services seems a bit ambiguous in offering different approaches and although that may be appropriate, some more guidance may be required. The ES reference list includes several related services:

- Water supply services reflect the combined ecosystem contributions of water purification and water regulation … It is a final ecosystem service.
- Rainfall pattern regulation services …. It is a final ecosystem service
- Water purification services … can be a final or intermediate ecosystem service
- Water regulation services … concerning baseline flows may be final or intermediate.

It would helpful to include some more guidance in section 6.4.4 regarding how these options fit together and how to select the most appropriate one. Or at least make clear that the correct approach is to measure where it is best (low costs and high quality) and

NOT to measure all flows! Para 7.32 already hints how to avoid double counting. Please make clear that the most important issue is to avoid double counting and if a final flow cannot be measured due to the lack of data for example, then a flow intermediate to that flow could be included as a proxy. And as noted below, chapter 7 does not clear these issues up.

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

6.75 “Where payments are made by people to economic units who manage ecosystems...The appropriate recording of these flows is described in Chapter 7.” There is at present little on this in chapter 7. It is touched on in 7.45-7.47, but as noted below a worked example would help clarity here. More may be expected in 7.50, but that is not yet written. 6.79 “"under the first approach the measurement of water regulation of base flows and water purification services as they pertain to water supply may not provide a complete measurement of the ecosystem contribution of these services. Further discussion on the appropriate recording of these combinations of flows is presented in Chapter 7." – this seems primarily to refer to 7.32, but that is not conclusive, rather leaving the appropriate treatment quite open (“it may be appropriate to record flows of related ecosystem services such as water regulation of base flows and water purification as intermediate services. Alternatively, these input services may be treated as final ecosystem services and water supply treated as an abiotic flow”). It would be helpful to give some guidance on how to determine the appropriate method. In the table in Annex 6.1, please also clarify for the recreation services if they are SNA or non-SNA or both!

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?

Some comments for specific paragraphs/topics:

- 7.2 "**All flows of ecosystem services** in the reference list (see Chapter 6) can be measured in physical or quantitative terms" – this is not very clear in several cases. Genetic material services? Rainfall pattern regulation services? Amenity services? Spiritual services? Even the mitigation and attenuation services – in many cases, it might be possible to construct some kind of indicator or proxy that relates to some aspect or part of the service, but there are not many that could be considered 'perfect' measurements. And actually that's ok, both data and method limitations call for simple units for provision and use (as explained in 7.7 and 7.8), but need to be clear that the measurements are imperfect indicators – saying the services "can be measured" risks being misleading.
- 7.9: "In practice, it is expected that countries will apply a national or **regionally applicable classification of ecosystem types**." It is not further discussed what consequences a regional application has regarding accounting at national level/how aggregation then can be done; in addition, what are the consequences of this for aggregation (e.g. EU level) and/or comparison among countries? (Alternatively, please clarify if you mean UN regions, subnational regions or broad zones such as "tropical" here.)
- 7.20: "While measurement of the **potential or sustainable level of supply that could be delivered by an ecosystem asset is highly relevant, this is not the focus** of recording in the supply and use accounts": reference to the specific chapters (and not only a general reference) to the corresponding concepts of ecosystem capacity and potential supply would be useful here. It's also worth considering that, while the accounting rationale for supply and use having to match is clear, in practice this might not reflect reality very well. The example of melons and pollination used later may be such a case: "number of visits" is the suggested measure. That corresponds very well to the supply side. However on the use side, it's quite possible that adequate pollination could be achieved with a fraction of that – each flower might be visited several times, but one or two visits might be all that's needed to ensure pollination. At the least, we'd expect the relationship to be highly nonlinear above a certain level of provision. This could show in the accounts via a disconnect between physical and monetary values – the physical "number of visits" could vary over a large range for which the monetary value of pollination services was essentially constant.
- 7.31: "By ensuring that a sequence of supply and use entries are recorded for each type of ecosystem service, the **overall contribution of each ecosystem can be determined"** – this works for the simple case presented here, but say "farmland" is also producing "biomass (potatoes)" and grassland is also providing "pest control services" then the links from specific intermediate services to specific final services will not be obvious just from looking at the tables. This is not necessarily a problem (7.33 explains that "It is not the ambition in ecosystem accounting to provide a full documentation of all ecological processes or connections") but the text in 7.31 should

not give the impression that the contributions can be determined easily/completely from the accounts/tables.

- 7.33: "Potentially, quite complex interlinkages between different ecosystems can be recorded within a supply and use accounting structure. However, the focus of ecosystem accounting should remain on recording final ecosystem services and entries for intermediate services should concern only those flows that can be clearly connected to a final ecosystem service – as in the example above. **It is not the ambition in ecosystem accounting to provide a full documentation of all ecological processes or connections**." While this is the case under the current understanding of accounting, what are the consequences of this regarding the provision of appropriate support to policy making? What additional tools exist that can and should be used then in parallel to accounting in order to close this gap – and how this is then connected to accounting? In particular, please clarify that sometimes intermediate services are highly policy relevant, especially inter-ecosystem ones, as they underline dependencies.
- 7.46/7.47: this would be much clearer with a worked example, as in tables 7.2-7.4.
- 7.50: the clarification/addition pending here will be very useful.

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

Overall, in agreement with the content and presentation of the chapter.

Some additional specific comments:

- 7.1: "Physical quantification commonly focuses on measurement of ecosystem structures, processes and functions; i.e., the supply side of ecosystem service flows **but quantification of ecosystem contributions can also take place through a focus on the use of ecosystem services**, for example the number of visits to a national park": It is not clear (esp. to a reader who is new to the overall issue) what consequences these different ways of quantification have and how to deal with them. If one uses different approaches for the physical quantification, how does everything then "come together" at the end? What needs to then be considered in order to have consistency/ avoiding double-counting etc.?
- 7.52 "can in turn would support" needs to be edited
- 7.57 and 7.58 deal with very important issue of the **spatial allocation of supply and use of ES**, basically saying that this is likely to be in practice "**of considerable power**". While a reference is given to the very relevant ES mapping, more detail should be provided on how and with what consequences this can and should be done. Linked to this (in para 7.71), it is stated that the SEEA Central Framework does not consider spatial connections, but that it describes accounting at national scale. While this is correct, the consequences of this are not fully elaborated, e.g. how to then "upscale" analysis/pilots done at local/landscape level: what needs to be considered and how?