



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](mailto:seea@un.org)

Name:	Jan-Erik Petersen
Organization & country:	European Environment Agency

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](mailto:seea@un.org).

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

In case you have any questions or have issues with accessing the documents, please contact us at [seea@un.org](mailto:seea@un.org)

## General comments

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

The EEA considers the final draft of the SEEA EA generally to be a very convincing document and congratulates the entire team working on it for the progress that has been made. Following the conclusions of the recent extraordinary UN-CEEA meeting we are of the view that the chapters 1-7 of the SEEA EA could be presented as a statistical standard to the 52<sup>nd</sup> Session of the United Nations Statistical Commission. We also consider, however, that the valuation chapters have not (yet) reached the level of a statistical standard and propose to present the valuation chapters with a clear recognition of their provisional status and appropriate cautionary language.

Notwithstanding the general approach taken not to overload the SEEA EA with references (corresponding to its status as a statistical handbook rather than an academic paper) we support comments made by colleagues working in the EU INCA project that conceptual and empirical contributions of the INCA project could be more explicitly recognised. This relates particularly to work of staff of the European Commission's Joint Research Centre, who have flagged relevant sections and include references in separate comments. EEA supports many of these comments, in particular those relating to:

- the role of ES potential (i.e. the ecosystem's ability to generate services irrespective of the demand) and the ES demand in generating the ES actual flow
- the proposal to make a clearer distinction between ES where exceeding the regeneration and absorption rates cause overuse of the service and the other ES. Regeneration and absorption rates only apply to part of "source" and "sink" services, not to all ES (as described in La Notte et al., 2019). These services require that a sustainability threshold is set to calculate a "potential" or "sustainable" flow. All the other ES do not need sustainability thresholds

A further general comment relates to the context and purpose of the document. While there is strong methodological progress, and ecosystem accounts can play a major role in environmental management, the specific goal of the SEEA EA is still not fully defined, which means its purpose and capabilities could be overstated. In relation to this we consider that:

- Users of the SEEA EA should have an understanding of the role of environmental-economics in decision-making before being introduced to the SEEA-EA. Figure 6.1, and the accompanying Section 6.3 of the supplementary valuation guidelines, are vital context material. We suggest they should be part of the introduction or a summary of the purpose of the SEEA EA. Welfare valuation and wealth accounting methods are equally important parts of decision-processes for the environment. In this context, it should be stated that the SEEA EA should aim to standardise, but never reduce, the types of information provided to decision-makers. Alternate methods should be presented as complementary and any implication that they are competing methods should be avoided. Different methods are appropriate in different contexts, and it is important for users to understand this.
- The opening paragraph (1.1) talks about mainstreaming biodiversity and ecosystems in decision-making processes. However, the standard's reliance on exchange values means that this will not be sufficient alone, rather other approaches will also be required to achieve this goal (including ones that make

use of welfare values). This is not a problem in itself, but could be counterproductive if the ecosystem accounts are expected to do more than they actually can (see para A1.8: “neither the SEEA Central Framework nor the SEEA EA provide a complete set of information for analysing the environmental-economic relationship but that when combined a rich data set can be envisaged.” – this should have more prominence). In not accounting for some material (welfare) implications of biodiversity loss and ecosystem change, the SEEA EA must make clear that other forms of measurement are more suitable for some decision-making processes, in particular welfare valuation approaches that inform policy appraisal. Guidance on the decision context and appropriate tools / value frameworks would be a valuable addition to SEEA EA.

The individual chapters generally reflect the different views on available methods and approaches well. However, the introduction and summary material could benefit from some additional caveats to reflect this rich discussion, clarifying the role of the SEEA EA outputs in relation to policy appraisal and business decision-making. Accounting should be presented as an important component of the suite of economic tools for mainstreaming environmental value.

An additional point to add to the material (e.g. in 11.6) is that exchange values are ambiguous as to how ecosystem service flows have changed, so need to be presented with accompanying physical data. This is a very important point that deserves further treatment.

We also consider the concept of reference conditions as defined in the document to be problematic and requiring further work.

We do not agree with the way the global climate regulation service is described in section 6.4.3 which argues that the relevant service is the carbon stock (carbon retention). This text is very theoretical, ignores the measurement challenges for carbon stock and does not give sufficient attention to the policy demand which focuses on carbon sequestration.

Finally, it would be useful to be clearer what the SEEA EA document principally is (a statistical standard), and what it is only at the margin (a guidance document). To increase use of the SEEA EA and integration with related activities it would be useful to develop a guidance document for Ecosystem Accounting.

### Comments by sets of chapters

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

We are generally happy with these chapters which provide a good introduction to the SEEA EA overall. However, the following options for improvement should be considered:

The specific goal of the SEEA EA could still be better defined. We would draw attention to the goal of the TEEB initiative to ‘make nature visible in decision-making’ as a relevant purpose that could be adopted.

(1.23) should encourage the combined use of physical and monetary benefits.

(1.30) This is true up to the point that current institutional structures and reliance on exchange values allow. The underlying problem is that current institutional structures often ignore many inputs from ecosystems to production, and this should be highlighted.

(1.49, 1<sup>st</sup> bullet): Misleading. A wide range does not guarantee comprehensiveness. It is comprehensive because all ecosystem services and assets are in scope.

(2.25) Resilience may also change as the nature of the shocks an ecosystem is exposed to change.

(2.34) An important conclusion is that that no one perspective can give a complete view.

(2.39) Figure 2.2 – the logic of the figure is quite clear; however, the hexagons presenting different SEEA EA components are too small and disappear against the background hexagon; we recommend to increase their size relative to the background.

(2.41) We do not agree that distance to a reference condition should be highlighted here; the main purpose of the condition account in our view is to describe and track trends in ecosystem condition, in particular with re to potential supply of ecosystem services.

(2.56) and below: We appreciate the discussion of different types of values and think that their representation in a two-matrix is well-chosen. While links and commonalities between the different value concepts are worth highlighting, conceptually they are actually very distinct from, if not even opposing, each other. We think this should be recognised as such in 2.58 – they represent different views of our relationship with nature but in practice all do aim for its recognition.

(2.59) The concept of intrinsic value has also been very stable over many decades now..

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

We think that overall these chapters provide a good conceptual and methodological overview of the issues they deal with. While we have only some smaller suggestions for improvement for chapters 3 and 4 we have significant concerns regarding some key points presented in chapter 5.

The following points for potential improvement should be considered for chapters 3 + 4:

(3.11) Pelagic (marine) ecosystems should be distinguished by at least sea floor - water column - surface/near surface.

(3.19) Is 'boundary' perhaps better than 'footprint'? 'Footprint' is usually used for other types of ideas.

(3.31) Shouldn't the concept of ecosystem type be used here? It is used in 3.3.2.

(3.39) In our experience it is preferable if all data can be presented in a regular spatial grid (e.g. 100m<sup>2</sup>); however, data at coarser spatial scale can still be represented in such a grid (e.g. by giving all 100m cells within a larger spatial unit the same data value). However, we agree that the units represented in an ecosystem *extent* account should

ideally be recorded only where their spatial extent is above a common minimum size threshold.

(3.55) Above it says subterranean is excluded? Can you clarify?

(3.60) We strongly support the point made in this para that the Biome T.7 contains substantial ecological variation and needs to be described in appropriate sub-ecosystem types, using ecological as well as land use data.

(3.61) EUNIS, MAES etc need writing out in text or in a footnote.

(3.63) Why 'ecosystem assets will involve..' and not 'may' in this case ?

(3.70) Land use data are useful to the extent that data relating to ecological or environmental variables are not available.

(3.80) "relevant for accounting for ecosystem condition and estimating flows of ecosystem services" add: "and their values and policy implications..."

(3.83) This brief mention of a National Spatial Data Infrastructure is clearly an insufficient discussion of the importance of spatial data organisation as key pillar of making ecosystem accounting operational in our view! We understand if this aspect cannot be elaborated in the time available for final revision but it needs to be highlighted as an important issue that will be taken up in forthcoming SEEA EA application guidance. Some relevant material is available in the following briefing by the EEA : [Land cover accounts – an approach to geospatial environmental accounting – European Environment Agency \(europa.eu\)](#) as well as an accompanying technical report: [ETC/ULS Report 02/2020 Land and ecosystem accounts for Europe. Towards geospatial environmental accounting – Eionet Portal \(europa.eu\)](#)

Finally, we noticed that annexes 3.1 and 3.2 have a lot of relevant material, but not all of it is referenced in the main text.

(4.3) Yes, but to communicate 'with relevant caveats'...

(4.14) Rather than use 'managed' (many environmental changes are random/ illegal/ unmanaged) better say "human driven"? Or add an explanation of what "managed" means in this place.

(4.22) The set of ecosystem services may be the same (or largely so) but the level of flow of different ES is likely to vary much more strongly.

(4.28) We do not agree with the emphasis in the opening sentence on comparing to a natural condition. This is of interest to certain sub-fields of ecology or history but not the most relevant or important application of ecosystem accounting in our view. As it should be informing current policy decisions to inform better ecosystem management rather than track historic environmental change brought about by humans. One could say 'Another relevant application of ecosystem accounting is..'

4.3.8 'Information linking ecosystem extent to economic units **is** of particular..' Is establishing that connection not a key purpose of SEEA? And in our experience

information on type of land use / owner is critical for being able to influence management of any given ecosystem unit via a better designed policy framework or other measures.

As stated above we have significant concerns regarding some aspects of chapter 5 (even if we consider that it puts forward lots of very useful methodological and conceptual points). We explicitly support the key arguments put forward in comments by Eurostat on this chapter.

We copy below the EEA comments made in an earlier consultation round which we still consider valid. Some additional key considerations are presented immediately below:

- a) Ecosystem extent accounts are a very good tool to document the destructive impact that humankind has had on natural ecosystems if one wishes to focus on that, and far easier to construct (model). Using ecosystem condition accounts for that purpose is therefore neither a necessary or suitable (often) tool. See also para 5.107 ..
- b) When (all) ecosystems where in a 'natural reference condition' humankind was living in small hunter-gatherer bands – how can that be relevant to utilising ecosystem accounting for analysing and improving environment-economy links in modern society ?!
- c) We understand the theoretical interest in analysing distance to natural reference condition, but that is clearly not the only useful or valid reference condition. And the related sections are better placed in an annex to the chapter or the guidance document.
- d) (5.16) and elsewhere: we understood that stages one and two of ecosystem condition accounts were to be recommended and the last step of producing an index optional. This distinction needs to be made clearer at the beginning of section 5.1.3 and in this para. And we do not support the phrasing 'to be used in an integrated way' step three needs to build on 1 and 2, but 1 and 2 can exist and be very useful without step 3.
- e) (5.20) the optional third stage..
- f) We understand the interest in re-scaling in section 5.3 to ensure that direction of change is not too easily mis-interpreted. However, that can also be achieved via other type of presentations and it disconnects the condition account too much from support for ES accounts (which require specific physical values for calculation rather than one point on a scale from 0 – 1). See para 5.117
- g) (5.111) 'Measures of ecosystem condition will be more *comprehensive* and integrative than measures of capacity..' ? What do you mean by 'general' ?

We maintain the positive comments on this chapter from our feedback of 20 May; we also would like to give recognition to the fact that several of the points made in our comments on condition accounts then have been integrated in the current text in one way or the other. Below is a copy of our original comments (some of which are now redundant).

May 2020: Overall we think that the three-stage approach to accounting for ecosystem condition is quite clear and structured. We have concerns, however, regarding the recommendation to develop ecosystem condition indexes as presented in this chapter – see below. Furthermore, this chapter takes a more prescriptive approach than others it seems, on a subject that is actually particularly complex and less researched. We are not

confident that this is appropriate and recommend in particular to look at options for presenting choices more clearly, in particular with regard to necessary differences in approach between more natural landscapes and those which are more strongly modified by human land use or influences.

Sections 5.2.5 and 5.3.4: Our main point of concern here is that the quantitative way of developing an index for the level III condition account can potentially hide critical declines in certain condition variables as these are potentially cancelled out by positive trends in other variables. So we think there should be a discussion on combining this with clear thresholds related to ecosystem resilience or planetary boundaries and/or red flags for strong declines etc. This issue was discussed already some years ago at the EU-level and it is documented in the attached document (published on the 'Natural Capital Accounting library' of the EEA). Please look at p 8 in particular as it discusses other means of developing a summary index (counting the number of positive and negative trends, for example). We consider that adding a para on the potential pitfalls of straight arithmetic or geometric averages to develop a condition index would be an important complement to the current text, eg. after para 5.68.

So while the fundamental issues in accounting for ecosystem condition are well described we would propose to better highlight the risk of including trade-offs in the aggregated condition index, which would then be hidden, e.g. soil carbon levels and species richness can be negatively correlated. The point is implicit e.g. at the beginning of Annex 5.3 where it is stated

- Defining the scope and the purpose of the study (ecosystem, accounting goals...),
- Identifying key characteristics (ecosystem components and processes),
- Selecting the best indicators for the selected characteristics.

but it would be important to highlight the risk of including trade-offs in the aggregation process.

Reference condition: some of the text in section 5.2.4 (e.g. para 5.31) retains emphasis on comparing to a 'natural reference condition' (even if that is not so easy to identify in many places as humans have influenced ecosystems or at least selected species populations for tens of thousands of years, across all continents, minus Antarctica). We understand the interest in showing the impact of human activity on the decline of natural habitats but ecosystem accounting is primarily an analytical tool which looks at the interest of maintaining ecosystems for their benefit to human society and not one which aims to record biodiversity decline primarily (which is done through other complementary and very important exercises / international processes). So our preference is for presenting it as one of the options (as it is actually done in annex 5.5). This view is informed by our assessment that ecosystem accounting will have a particularly important roles in landscapes that are already modified as that is where interactions with ecosystems primarily take place, both in terms of further pressure and modifications but also in terms of ecosystem management and restoration and benefits for human societies.

*Additional comments by Markus Erhard (EEA MAES coordinator):*

Section 5.39 The link between statement (change because of human intervention) and example (effect of temperature increase on plant growth) seems not to be very logical as human interventions usually don't induce direct temperature changes. For

the plant growth example the word respiration would help to explain why plant growth can be impacted by increasing temperatures....

5.64 concerning the "Non-natural reference conditions" an example would be very useful - practically I have no idea what a reference condition for agricultural land (mainly cropland) or urban could look like...

section 5.3.4 Ecosystem condition indicator accounts (page 94 ff)

How is it secured that no trade-offs are included? E.g. increase in productivity vs. biodiversity loss if productivity is achieved by reducing no. of tree species and structural diversity in a forest stand?

section 5.3.5 Aggregated measures of ecosystem condition:

This approach would amplify the problem of ignoring potential trade-offs

5.77 forest birds and deadwood are synergistic but what will higher productivity increase - this can have positive effect (synergy) but also a trade-off e.g. by introducing alien tree species?

Table 5.7 Functional state use of "dry matter productivity" in many ecosystems

Think this needs some careful interpretation to avoid trade-offs, for example with species richness) and therefore it should be combined with respective pressure indicators (fertilizer use, livestock density but also alien species in forests etc.

As example, increase in biodiversity can also be triggered by invasive alien species etc.

Section 5.5.3 The use of data on environmental pressures

5.9.7 I don't agree: livestock per hectare or fertilizer use are crucial to understand (ie root causes of) increases in productivity (table 5.7) and should therefore not be only optional

So important to guard against simplifying assumptions and interpretation by combining condition accounting with pressure accounting, which should be anchored in section 5.6 application guidance.

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

EEA considers that these chapters have progressed very much and provide a good introduction to the issues discussed. However, we have the following technical and conceptual comments which should be considered:

6.2.5 We recognize the effort to distinguish between ecosystem services and abiotic flows (a distinction we support); we also think that has generally succeeded but a figure to illustrate the differences on the basis of concrete landscape example could be useful.

We also advise to clearly state that ES are reliant on functioning/healthy ecosystems, abiotic flows not. See your the biodiversity section for relevant arguments. The special case is where the usefulness of the abiotic flow depends on functioning ecosystems. This is the case for water where flow moderation by ecosystems, depollution by wetlands



and the like impact both the flow and the quality of the water. This should be made clearer.

Table 6.1 Para 6.32 states that abiotic flows can also have a cultural dimension – this could be illustrated by an example in this table, for example on the basis of a high mountain landscape?

6.33 say [...] *analysis of pressures (or environmental trends) per spatial area* ?

6.43 and Table 6.3. As the SEEA EA focus is on final services it would seem appropriate to limit the reference list to final services, some of which can also be recorded as intermediate services. This would imply that the only options in the use column of table 6.3 would be 'final' and 'final or intermediate' with the suggested main use underlined of the two. We consider that all services listed can be considered final under certain situations, so do not think any would need to be deleted.

Another option could be deletion of the last column in table 6.3, that deals with the possibility that a service is final or intermediate. We would prefer clarification, however, as the concept of intermediate is not always easy to grasp.

Finally, we have not reviewed the list of services listed again but it appears fairly complete.

6.3.5\_The concept of a disservice is really problematic, and in using the term the document simply perpetuates the confusion in our view. There are negative flows from ecosystems (e.g. disease) but these are not services (if services are defined as the contributions to well-being; note para 6.111 which states that compilers should focus on the "...core definition of ecosystem services and ensure that the focus of measurement is on the ecosystem contribution to benefits."). Thus, ecosystem services are the contributions that ecosystem makes to mediating the negative flows (both biotic and abiotic) that sometimes arise. Thus for clarity and consistency with their own definition of ES, this section should state that (a) the term disservices is sometimes used to refer to negative flows; and, (b) the SEEA-EA will not use it – but instead refer to 'negative flows' to be consistent with the idea that services are positive contributions to well-being (we realise that disservices is used elsewhere in the text and that needs to be considered in final editing). The other issue that is lost in this section is that in part whether something is regarded as a positive or negative contribution or not, is a valuation problem (the shade example does acknowledge this, para 6.62, but the text uses the term 'perspectives' which makes this rather obscure). Anyway, the suggestion here is to rename the section 'Negative flows from ecosystems' and change the terminology so that use of the term 'disservice' is not perpetuated. Paras 6.65 and 6.66 point in a similar direction but this needs to come out more clearly.

6.69 We acknowledge the argument later connected to SEEA-CF in para 6.81 (last bullet) that felling residues etc should be considered part of ES flow. However, this is somewhat in contradiction with the concept of use identifying a final service. This should be discussed and clarified here.

6.71 'timber plantations' are very modified or artificially established production-focused forest stands in European language usage; please check Wikipedia or other technical

sources here. Our proposal would be 'lightly managed native forests'.

6.72 to 6.76 We generally agree with the discussion of the challenge of measuring ecosystem contribution in a cultivated provisioning context, and support the pragmatic solution being proposed in 6.74 – though we suggest to say 'adequate' rather than 'suitable'. Furthermore, we think that the text should leave more space to more sophisticated solutions for identifying ecosystem contribution as pioneered by the JRC. And we think that 6.75 does not clearly present the option of using organic or 'extensive' production systems as options for setting a production level baseline which could be used as a potentially stronger proxy for identifying ecosystem contribution in intensive systems.

6.79 We suggest [...] some *intensive* forms of chicken .. and (e.g. via *soymeal*, pellets etc.)

6.80 Carp production in ponds has been practiced in Europe for over 1000 years and involves a clear ecosystem contribution in traditional and more intensive forms; fish co-rearing in rice systems in Asia could be another example that shows boundaries are not so clear-cut here. Please revise.

6.81 last sentences: should this not specify that one share of recreational fishing would be allocated to provisioning and the other to cultural services? Or can they both be recorded for a single event of recreational fishing? Please make clear.

Section 6.4.2 We support the discussion of the treatment of water supply presented here.

Section 6.4.3 The text gives strong preference to the carbon stock (carbon retention) being the relevant service. We think is not appropriate and state our disagreement again here. The central figure of interest for policy is the carbon sequestration and the text should give this more weight and clarify that this is equally useful rather than dismissing this approach as "an acceptable proxy is some circumstances". This is not enough. Policy demand is in the sequestration and not in the storage. Accounting for storage may only be a useful complement in that perspective, and trends in carbon stocks can already be inferred from a combination of ecosystem extent and condition (and loss of carbon stock would become a 'negative flow' in this context).

6.98 and 6.99 It is not correct that biomass harvesting (even if very complete) leads to loss of carbon sequestration and hence of climate regulation service. As vegetation re-grows immediately in nearly all circumstances and younger tree stands (for example) often actually have higher sequestration rates than old stands (this fact underpins the entire concept of BCCS – biomass carbon capture and storage). And as ES flows are meant to be measured on an annual basis anyway there may be a local dip in one location but not across the entire forest system (even if over-harvested in terms of regular supply of mature timber..).

Issue combined with 6.114: We strongly think that a time limit needs to be applied to flow of provisioning services from organic material as ES are connected to living systems and abiotic flows are not. This is particularly relevant for organic stocks which can be fossil oil reserves or layers of peat – both are the product of historic living processes. And peat bogs can also be 5000 yrs old, the border gets fluid.. So we recommend a time limit of 30 or

100 years which would be the depth of peat which could be considered an active ES flow (in Europe 1mm growth per year, ie 3 or 10 cm corresponds to the ES flow).

6.120 We appreciate the concept of spatial functions that has been introduced here and elsewhere and fully support it.

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

No comments on these chapters as we did not manage to review them in sufficient detail.

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

No specific comments on these chapters as we did not manage to review them in sufficient detail. However, we express our support for the discussion of thematic accounts in chapter 13, in particular the role of biodiversity accounts and ocean accounts.