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 3: Spatial units for Ecosystem Accounting

Chapter 4: Accounting for Ecosystem Extent

Chapter 5: Accounting for Ecosystem Condition

Comments Form

Deadline for responses: 30 April 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 nine 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

Question 1: Do you have any comments on the definition and description of ecosystem assets and ecosystem accounting areas and the associated measurement boundaries and treatments?

The methodology described in Chapters 3 to 5 is a robust and well-debated proposal, which we agree with in general terms. In particular, we would like to stress that we fully support the ecologically-based concept and the operational definition of EAs and their explicit link to the definition of 'ecosystem' in the CBD, as well as the principles applicable to their delineation, which should be based on the set of particular ecological characteristics of each ecosystem type.

Defining a reference classification of ecosystem types (ET) is a really challenging task, as it will be discussed in Question 2. In any case, we fully support that classifications of ETs must be based on an ecosystem process-based approach for all ecosystems.

In addition, we have further comments regarding linear features and subterranean aquifers which were discussed in the following paragraphs of chapter 3:

3.27: The small rivers or river transects with a Strahler stream order of 1-4 have the consideration linear features within broader ecosystem types. These orders may involve important rivers in the Mediterranean Region, and not considering them as EAs could underestimate very valuable ecosystem services in some cases. It is difficult to imagine these ecosystems without their associated riparian vegetation, which is strongly functionally connected. Considering riparian vegetation would provide the 2D dimension and minimum area to become a single ecosystem asset represented at least by one basic spatial unit (BSU).

3.33: As mentioned in this paragraph, it is reasonable to include relevant ecosystems like large parks as proper ecosystem assets within "Complex mosaics" like urban areas.

3.37: Attention must be paid to subterranean aquifers, which have a tremendous ecological importance and are tightly linked to superficial vegetation, and such important ecosystems as endorheic lakes (overexploitation of these aquifers may threat these endorheic systems). Of course they are difficult to map, but when necessary they should be included as attributes in related EAs.

As a general comment, no much advice is given on how to deal with ecotones and transition areas among ecosystems. Nor how the vertical component will be treated like in the case of pelagic habitats and groundwater (will these features be included as attributes or additional data to each EA? And, when appropriate, will these attributes be shared among the different EA that are spatially delimited but commonly influenced by them?)

On the other hand, ET of industrial areas is missing (not just urban/residential, nor agriculture…). We find this important as the extent of all EAs must correspond to the whole EAA which will include many industrialised areas. If these are included, indicators of better condition should aim towards more sustainable exploitations.

Question 2. Do you have any comments on the use of the IUCN Global Ecosystem Typology as the SEEA Ecosystem Type Reference Classification?

While we understand the need for a Global Ecosystem Typology, such as the IUCN one, as an overall reference at global level, we consider that the classification of EAs used for ecosystem accounting should be primarily based, as much as possible, on existing national ecosystem classification systems used for national monitoring and surveillance, in order to avoid duplicities and to maximize the availability of data and information. These duplicities resulted from the existence of different classifications may discourage countries from applying this methodology and can finally hinder international cooperation. As we also understand the need of a reference Typology for coordination purposes, we suggest that the Typology selected will take into account the most widely used classifications of ecosystems (or other related ones that are compatible with the ecosystem process-based approach).

According to paragraph 3.41 (chapter 3) "For the purposes of international reporting and comparison, the SEEA Ecosystem type reference classification should be applied" (3.48 At biome level: level 2). Also, other classifications of ecosystems can be used for classification of EAs (according to paragraph 3.40). For example, the evaluation of ecosystems services in the European Union is being developed by the MAES project, which adopted the CICES classification.

In order to facilitate international cooperation and comparison, it would be highly valuable to coordinate efforts and provide the correspondence across all levels of ecosystem types of different classifications, e.g. SEEA, CICES but also EUNIS, LULUCF (from IPCC and the United Nations Framework Convention on Climate Change) or Corine Land Cover. Even if they are not strictly ecosystems classifications, they are widely used and establishing these correspondences would facilitate EAs classification.

Coordinating all this classification is fundamental. For example, agricultural areas (either intensive or extensive) and urban areas are classified within the same biome (which is the reporting level expected at the international level). This classification is in disagreement with IPCC. Agricultural and urban areas are totally different ecosystem types, with widely different ecosystem services, recovery rates or conversion possibilities towards more natural ecosystems. Therefore, we consider the need to separate them into different biomes, as it has been done in other classifications, like LULUCF.

Question 3. Do you have any comments on the recording of changes in ecosystem extent and ecosystem condition, including the recording of ecosystem conversions, as described in chapters 4 and 5?

These two Chapters highlight the importance of considering both changes in ecosystem extent and ecosystem condition for the assessment of ecosystem changes.
Assessing changes in ecosystem extents allows identifying forms of ecosystem changes like e.g. deforestation, desertification, agricultural conversion, urbanization.
Under chapter 4 (page 5), it is recommended that both additions and exclusions to extent should, where possible, be separated into managed expansion/regression and natural expansion/regression. While we do not oppose to this idea, we would like to stress that communication of this type of information should be very carefully managed, because there is a risk that "natural expansion" and "natural regression" are perceived as a positive trend, while they can refer, for example, to undesirable situations for biodiversity such as desertification induced by human activities or regression of coral reefs linked to the effects of climate change.

Table 4.1 shows the structure of ecosystem extent account. For each ecosystem type (ET), increments or reductions in their area are shown for a period of time including the cause of these changes: natural, managed or due to reinterpretation or updated information (reappraisal). This table reflects aggregation of individual EAs of the same ET. Similarly, the ET change matrix set out in table 4.2 reflects as well as aggregation of individual EAs of the same ET and shows extent exchanges between ET pairs. It would be interesting to have also change matrixes for natural and managed changes separately.
In addition to these tables, we consider that mapping ecosystem extent should be regarded as equally important, due to the fact that it is very useful to reveal patterns of changing fragmentation of EAs (4.19) and to locate changes in ET.

Question 4. Do you have any comments on the three-stage approach to accounting for ecosystem condition, including the aggregation of condition variables and indicators?

A three-stage approach is used in the SEEA for the compilation of ecosystem condition accounts (5.8):

- In stage 1, key characteristics are selected and data on relevant variables are collated
- In stage 2, a general reference condition is determined and for each variable a corresponding reference level is established that allows a condition indicator to be derived
- In stage 3, condition indicators are normalized to support aggregation and the derivation of ecosystem condition indexes.

Regarding Stage 1: It will be not very feasible to measure some variable for each EA (like species richness, pollutants..). Instead, it could be more interesting to group EAs e.g. from the same region. This is outlined in paragraph 5.47, but not enough detail is provided on how to deal with it. This possibility, also considered in paragraph 5.43, should be evaluated when choosing variables for the EA condition assessment. While biodiversity data is crucial and will be probably included as variable in most of ET, it cannot always be measured. Therefore, if the same values would be extrapolated to various EAs this could introduce artifacts in the evaluation. On this regard, we would like to stress the importance but also the risk of choosing few variables (6 maxima would be ok according to Chapter 5).

Furthermore, it is not explained how to deal with missing values when collecting variables data for each EA when the information of all indicators is aggregated.

Regarding Stage 2:
According to paragraph 5.55 "The simplest transformation to rescale variables to indicators demands two reference levels (a 'favourable' and an 'unfavourable' reference level). The indicator is calculated by a linear transformation:
I = (V – Vu) / (Vf – Vu)"
Thus, two reference values are needed: a favourable one (Chapter 5 give some examples) and an unfavourable one (not explanation on how to choose it is provided in Chapter 5). Maybe, the unfavourable reference value is the most similar value to the threshold levels mentioned in paragraph 5.28, but a large range of values can be chosen depending on what are considered to be the "unfavourable conditions". We agree on the need to rescale variables but more comments, evaluations and examples on how to choose unfavourable reference values should be included in Chapter 5. Together with the decision of which variables include for the ecosystem condition assessment, this is a critical point to allow proper comparisons across ETs and also countries.

Stage 3: Some variables may be more important than others at the time of determining ecosystem condition, and thus weighting averages may be needed for the evaluation of all the rescaled variables. This is recorded in table 5.5. Against what Chapter 5 states, we think that sub-index values could be weighted when aggregated into ET index (as some properties may be more critical than others in certain ecosystems, e.g. chemical composition in water). Alternatively, before calculating the index, if any indicator or subindex at the Ecosystem Condition Typology (ETC, see table 5.1) level is beyond a certain threshold, this could directly indicate poor condition.

According to paragraph 5.70 "This information also suggests an alternative approach to presenting aggregate measures of ecosystem condition by recording the area of each ET that is covered by various ranges of ecosystem condition relative to the reference condition". We think that the option presented in paragraph 5.70 is a more interesting option, rather than show an average condition for ET

Regarding the aggregation of the data, another level of spatial resolution should be in and out Natural Protected Areas. This would be very informative for policy decision making.

Question 5. Do you have any comments on the description and application of the concept of reference condition and the use of both natural and anthropogenic reference conditions in accounting for ecosystem condition?

See answer to question 4.

We see the weakness: each country may choose different reference conditions…the final evaluation of ecosystem condition is highly dependent on the reference conditions chosen. If they are not chosen in base of same criteria, this could risk comparisons across countries or even across ET.

When establishing reference conditions for each variable, climate changes should be considered.

Question 6. Do you have any comments on Ecosystem Condition Typology for organising characteristics, data and indicators about ecosystem condition?

According to Chapter 5 "*The ecosystem condition account provides insight about the characteristics and quality of EAs and how they have changed (5.1). Quality is assessed with respect to ecosystem structure, function and composition (5.2). Ecosystem assets are multi-functional, adaptable and resilient. Ecosystem integrity is defined as the system's capacity to maintain structure and autonomous functioning.*
The accounting structure provides the basis for organizing the data, aggregating across both EAs of the same ecosystem type (ET) and across ETs within an EAA, and measuring change over time between the opening and closing points of accounting periods (5.6). Each ET type has distinct characteristics/indicators (5.7). In contrast to characteristics to define ET types, the focus in assessing condition will be on dynamic and changing characteristics (5.12)". The SEEA Ecosystem Condition Typology (Table 5.1) is a useful guide for the selection of these characteristics. As a suggestion: The Chapter could include definition of indicators common to all ET. In addition, we miss that no clear index for resilience is included. As resilience is challenging to define and measure, some more detailed definitions and guidance would be valuable.

According to paragraph 5.20 "At least one variable is selected for each of the six ECT classes. This rule of thumb aims to ensure a minimum level of comprehensiveness in the full set of condition variables". However, this is not overly ambitious, as we consider that at least one variable indicative of structure, functionality, composition, and resilience should be included.

We agree that some of the ancillary data for ecosystem condition measurement (Annex 5.4) like e.g. species population phenology (seasonality), may not be good indicators of changes in ecosystems condition, but still their record is important because the aim of these evaluation includes time series analysis. Recording these auxiliary data may be fundamental in the future to understand and investigate the causes of change or ecosystem degradation that are recorded. If we want to get the chance to create an ambitious spatial information structure, these variables should also be included when possible.

Question 7. Do you have any other comments on Chapter 3?

The basic spatial unit (BSU) structure proposed will likely provide considerable computational advantages (paragraph 3.68). In addition, BSU would enhance compatibility among national reports. On this regard, we consider that there should be more agreement on the BSU to be used (so far, they can be minimum cell sizes, but also other polygons; paragraph 3.52).

As explained in Chapter 3, the terms vegetation and ecosystems are often used interchangeably (e.g., Tropical Rainforest), but vegetation is rather a biotic element of an ecosystem. However, level 2 of SEEA Ecosystem type reference classification (used for international reporting) will mainly relay on vegetation possibly neglecting other fluxes and functions providing key services. Scaling the data from national (and more detailed) level to international level, will bring different results if scaling services evaluation or EAs at level 2. EAs at level 2 may underestimated some of the ecosystem services that will be reported at the international level.

As a general comment, when using GIS data is important to promote the use of international standards in order to guarantee the interoperability and compatibility of data (e.g. INSPIRE directive of the European Union)

Recognition is made in this chapter (paragraph 50 and following) to the high resource costs involved in ground assessments. We therefore fully support the need to recognize the possibility of using effective and efficient tools for delineating and monitoring EAs, including GIS tools but also probably largely relying in the future in other upcoming tools like satellite image and others. These tools will probably become more and more useful in the near future, and may hopefully allow for a simplification and reduction of costs of monitoring tasks. The SEEA system should therefore be flexible enough to allow for a certain evolution and adaptation to novel techniques as they become available.

Question 8. Do you have any other comments on Chapter 4?

We consider that more indications are needed regarding how to analyze extent changes that produce important changes in ecosystem condition of EA and ET. The size of an EA beyond a certain threshold could mean severe fragmentation, and thus, the variable “area” could also be considered as a variable for the assessment of ecosystem condition.

Question 9. Do you have any other comments on Chapter 5?

According to paragraph 5.4 "Ecosystem condition accounts complement environmental monitoring systems by using data from different monitoring systems, for example concerning biodiversity, water quality and soil properties. The intention of the ecosystem condition account is therefore to build upon rather than replace existing monitoring systems".

We fully support the idea that the ecosystem condition account should build upon rather than replace existing monitoring systems. The system should therefore be flexible enough to rely as much as possible on any existing ecological knowledge and monitoring systems.

Paragraph 5.23 states that Ecosystem condition indicators are rescaled versions of the ecosystem condition variables, which are transformed to a common dimensionless normative scale. This transformation is done when condition variables are set against reference levels for each ET. According to paragraph 5.31 "For many ecosystem types, it is considered best practice to use the natural state of those ecosystems as the reference condition".

This can be challenging for semi-natural ecosystems, e.g. *dehesas*, traditional pasture with oak ecosystems, one of the temperate ecosystems with higher biodiversity. Establishing anthropogenic reference conditions (as proposed in 5.33) and defining stable ecological conditions imply including permanent anthropogenic non intensive use. This is equivalent to reference condition 7 of annex 5.5, and no example of reference condition is provided.

As a final minor remark, the list of references is missing in Chapter 5.