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 2019 SEEA EEA Revision Expert Consultation on Spatial Unit recommended "*to avoid reinventing the wheel*" during the technical consultation. The recommendation could be also interpreted as the need to be careful in not duplicating ecological well-established concepts and language.

For example, the ecosystem accounting practices mentioned at the point 3.2, "*the approach used in the SEEA to define, classify and delineate spatial units*", fully lie on the Landscape Ecology statistics and methods which already own a terminology, concepts, definitions and classification.

As well as at point 3.8 the definition of the assets according to which "*Environmental assets are the naturally occurring living and non-living components of the Earth, together constituting the biophysical environment, which may provide benefits to humanity the assets together constituting the biophysical environment*" could be interpreted as a misleading duplication with respect to the well-established ecological definition of the *physical environment* of the ecosystem: "*Any unit that includes all of the organisms in a given area interacting with the physical environment so that a flow of energy leads to clearly defined trophic structure, biotic diversity, and material cycles within the system is an ecological system or ecosystem*"[1] and it's even more troubling that "*establish the economic ownership of ecosystem assets is required for the integration of ecosystem accounting data with economic accounts".*

From the definition at the point 3.8, the environment is reducible to a collection of ecosystem assets (EA) useful to mankind and it doesn't encompass the nature of the interactions and the characteristics that contribute to and derive from the interactions of the components of the ecosystem, nor the central and controlling role that the energy flow plays in the definition of other ecosystem characteristics.

A clear boundary criteria for accounting EAs is needed hence: if EAs will include the interactions and the energy flow contribution, then they can be considered attributable to the well-established ecosystem components in which case they cannot be evaluated in economic terms; conversely, if EAs will not include the interactions and the energy flow, then, even if spatially located inside an ecosystem typology (ET), they should be considered different by the ecosystem components and in that case they should be accounted separately from the related landscape ecological statistics (i.e. ecosystem condition).

The interaction and energy (and genetic) flows are also considered in the ecological analysis at a landscape scale trough the assessment of the connectivity index of the eco-mosaic. The connectivity is essential for the animal and vegetal genomic displacement among functionally homogeneous elements and the useful shapes to highlight the degree of connectivity are the lines and the nodes within the unit system.

Therefore, unlike point 3.30, the linear element *such as ditches or hedgerows in a pasture landscape* should be separately identified as they are essential for the evaluation

1 E. P. Odum- Fundamentals of Ecology (1971)

of the connectivity and the ecological networks and absolutely not, as written at the point 3.30, be attributed to the ET of the surrounding ecosystem.
Conversely, a high diversity of landscape can be linked to a high rate of fragmentation of patch, also due to the anthropogenic linear elements as highways, so it is important also to detect these barriers since they represent a loss of the eco-mosaic's biodiversity.

Concluding, breaking points are still detected between the SEEA EEA's constraint of to be developed within an ecological spatial framework and the SEEA EEA's final ambition which to be implemented requires a transposition above natural constraints (i.e. EAs have been transposed with respect to the environmental components). A further strengthening of the dialogue between the expertise could be useful to reduce these distances.

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

Considering the inconsistencies between the coarse thematic definition of ecosystems and the fine spatial resolution of field arising from the applications used to model functional traits, to assess conditions and threats and to evaluate ecosystem services[2]. and considering that research on mapping ES has grown substantially in the past decade and many initiatives are being established[3] and also taking into account the tight deadlines of the post-2020, it is advisable to look for links and synergies with the more consolidated processes it is advisable to seek as many links and synergies as possible with more established processes which have already achieved some reliable result at a more advanced experimental stage (i.e. carbon accounting).

In this regard, acknowledging the Policy context and the ambition of the IUCN Global Ecosystem Typology (GET), it is suggested to integrate the GET classification with the land use categories, providing a correspondence between Corine Land Cover classes and ecosystem types.

In EU, the national identification and mapping of ecosystems is mainly based on CORINE Land Cover (CLC) and it is also used in EU agricultural policy monitoring and land and ecosystem accounting, as well as the MAES process at the continental level have been considered and mapped at the scale of land cover-related units combined with the EUNIS (European Nature Information System).

Moreover, CLC is used in Land Use and Land Use Change and Forestry (LULUCF) in the framework of the UNFCCC; the CLC+[4]is expected to support the LULUCF reporting obligations (obligatory from 2021 onwards). In this direction it would be most advantageous if the SEEA EEA fostered synergy and cooperation with the carbon accounting that is also closely related to ecosystem conditions and carbon sequestration services.

Finally, the adoption of the same methodologies about the classification of landscape area and land use units would favour the overlap of the ecosystem accounting with LULUCF also to promote the mainstreaming of Natural Capital and biodiversity into climate and carbon accounting, as under the auspices of the CBD.

2 C. Blasi et al. Environmental Science and Policy 78 (2017) 173–184
3 J. Maes et al. Ecosystem Services 1 (2012) 31–39
4 the upcoming version of CLC using the Copernicus Land Monitoring Service

**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?**

About the recording of changes, as already mentioned in the previous comment, the land use changes accounting are regularly monitored under the Land Use and Land Use Change and Forestry (LULUCF) and in addition it is to be considered that with the adoption of the LULUCF EU Regulation 2018/841, the greenhouse gas emissions and carbon dioxide absorption from land use have become part of the 2030 climate and energy targets, intensifying the monitoring of land use change.

The LULUCF EU Regulation requires a 'net no debit' in all land use accounting categories during the period 2021-2030 and a land-based accounting framework has been already established so that it would be synergic maintaining a link with the carbon accounting data trough a correspondence table[5] between CLC and IUCN Global Ecosystem Typology (GET) for sharing data and methods widely agreed within the scientific community.

**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?**

While the SEEA EEA 2012 clearly distinguished between ecosystem characteristics and metrics, the three-stage approach puts together ecological data and indicators as two hierarchical levels, to become a science-policy interface tool that is handier for decision maker.

It is a kind of approach that leaves a broad operating space to countries *as appropriate* and *as much as possible* (points 5.20 and 5.21). For example, the point 5.16 affirms that the "*data on the ecosystem characteristics may be of particular interest from scientific or policy perspectives*" and that "*in some situations may be considered appropriate proxies for the measurement of condition*" but no unique parameters are provided to assess appropriateness on a case by case basis.

The decisional field is left almost open (the only stakes are the principles and criteria for the selection of variables outlined in section 5.2), so that whatever national initiative can fall under the umbrella SEEA EEA if it complies the three-stage approach to accounting for ecosystem condition. All that thanks to *the nested hierarchical structure of the SEEA ecosystem condition accounts that offers the possibility to perform thematic aggregation in several ways (e.g. across indicators, ECT classes, or ETs)* (point 5.38).

One of the reasons raised for the variables (point 5.20) is that *the most appropriate breadth and detail of variables selected to characterize ecosystem condition is difficult to standardize given the range of ET and differences across countries*. This statement is not entirely accurate since an attempt at standardization can instead be made by creating the link to the land use classification CLC which, at least up to level 3, is homogeneous for all countries (see comment above) and also incorporating point 5.74, it should be borne in mind that each land use category corresponds to one set of anthropogenic pressures.

5 https://biodiversity.europa.eu/maes/correspondence-between-corine-land-cover-classes-and-ecosystem-types

The three-stage approach responds to the requirement of evaluating the ecosystem condition to deal the post-2020 process but it remains confined to a national scale because probably the adopted selection will not be comparable and maybe not yet consolidated.

Concluding, if on the one hand the three-stage approach will foster the evaluations at national level which could represent an excellent tool for policy makers and stakeholders, on the other it does not help to support the process at a global level, especially on the assumption of the adoption at the CBD - COP 15 of a legally binding commitment including the protection of Natural Capital and Ecosystem Services (EU draft position[6]).

**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?**

The Annex 5.5 lists the Options for establishing natural reference conditions and anthropocentric reference conditions.

While the natural reference options are convincing, the anthropogenic options may not be reliable considering that since the time of the conversion of the most of the ancient populations from nomadic to sedentary because of agriculture, the impressive anthropic action of modifying ecosystems has never stopped.

In the case of natural options that develop only when the anthropic pressure becomes lessened, a single reference variable can be approximate to many others about the health of the ecosystem.

For example, the potential natural vegetation (PNV), cited at point 3 of the Annex 5.5, represents the vegetation that would be expected given environmental constraints (climate, geomorphology, geology) without human intervention or a hazard event.
Hence PNV includes more information as climatic, geological, geomorphological, soil and bioclimatic characteristics as well as presence/absence of human activities.

A possible methodological approach aimed at achieving a detailed spatial representation of ecosystem types has been proposed by a group of researchers and agreed with the Italian Ministry of Environment: it is based on the rationale that current and potential vegetation cover are valuable operational proxies for outlining ecosystems at a given scale[7].

This approach, which focuses on the spatial and successional relationship between current land cover and potential natural vegetation (as for the European Environment Agency Technical Report 1/2014), was recently adopted in Italy but may be applied to any national context. Indeed, the map obtained is currently being used in Italy as a basic

6 https://www.europarl.europa.eu/doceo/document/B-9-2020-0035_EN.pdf
7 C. Blasi et al. Environmental Science and Policy 78 (2017) 173–184.
https://www.researchgate.net/publication/320895619_Ecosystem_mapping_for_the_implementation_of_the_European_Biodiversity_Strategy_at_the_national_level_The_case_of_Italy

source of information to assess ecosystem conservation status (both in the whole country and in each administrative region) and to evaluate significant ecosystems services[8].

Moreover, it represents the starting point for the development of different national programs such as the Red List of Ecosystems, the implementation of the EU Strategy on Green Infrastructure and the setting-up of a natural capital accounting system[9].

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

See Question 5.

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

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

8 C. Blasi et al. Environmental Science and Policy 78 (2017) 173–184
9 INCC (Italian Natural Capital Committee), 2017. 1st Report on the State of Natural Capital in Italy. Synthesis. (Available from).
http://www.minambiente.it/sites/default/files/archivio/allegati/sviluppo_sostenibile/sintesi_raccomandazioni_primo_rapporto_capitale_naturale_english_version.pdf.

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

Some further comments on:

- Table 5.1 cites among the "physical" type abiotic factors the soil structure which is a "geological" abiotic factor (physical factors are e.g. light, temperature, air pressure, gravity. Chemical factors are e.g. water, air and mineral substances. Geological factors are e.g. type of rocks, soil and the morphology of the territory).

- Point 5.33 states that "*for those ecosystems in which humans have been influencing the environment for long periods a 'natural' state will no longer represent a meaningful reference for condition accounts";* instead these areas are representative in terms of productive land loss and land degradation and consumption (e.g. UNCCD reference) and therefore, compared with the high reference level, this reference level and its Ecosystem Services will be close to zero.

- Point 5.83 states that "*Ecosystem conversions occur when part or all of an ecosystem asset changes from one ET to another between the beginning and end of an accounting period. Examples of ecosystem conversions include clearing a natural forest for use by grazing animals; converting a natural grassland to cropland; urban sprawl into agricultural land; wetland restoration through in a conservation program; creation of a new hydropower reservoir; natural encroachment following permafrost melt; or the potential future flooding of coastal areas due to sea level rise*". The para and the examples are confused by putting on the same level hierarchically different ecological topics such as the ecological successions and the anthropogenic soil sealing.

- Point 5.84 states "*other examples have less clear thresholds and hence it may be more difficult to define a distinct change in ecosystem type. For example, a change in canopy cover below a certain threshold (but not zero) could result in conversion from an ecosystem type of 'forest' to 'woodland' but this may be due to land use change that removed trees or due to the partial loss of leaves during drought which is reversible*" . The para puts on the same level two different measures, the canopy cover is a function of the Leaf Area Index (LAI) in m2/m2, while another thing is the density of trees which is expressed in number of trees/hectare.

In conclusion:
- Point 5.73 states "*as noted above, in practice, it is important that local ecologists and related specialists are involved in the process of variable selection, as well as in the determination of reference conditions and levels*". The ecologists and related specialists might be extremely useful in many other issues.