

**Accounting for ecosystem
services in physical terms
Some issues for discussion**

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Issue 1 – Definition of ecosystem service

- *Ecosystem services are the biophysical contribution of material and non-material benefits for enterprises households and governments (para 2.12)*
- *Ecosystem services are the biophysical contributions of the ecosystem to economic activities of enterprises households and governments (para 3.1)*
- **Production is central to the concept of ecosystem services**
- **Should humanity be the recipient of ecosystem services/benefits or should we restrict to economy?**

Production central in the definition of the ES

All use of material and non-material benefits must be produced as part of economic activity (para 3.7)

- What about natural resources? Is clean air and clean water in the environment produced or is it simply a service flowing from natural capital – a flow from the asset?

Issue 2 – Ecosystem services versus benefits? What do we want to measure (in physical terms)?

Provisioning services

Ecosystem	ES	Benefit
Agricultural land	Water, nutrients etc.	Crops
Rangeland	Grass	Animals, milk
Forest	Wood	Logged timber
Lake, river	Fish caught	Fish landing
Aquaculture	Fish shrimp	Fish, shrimp
Water	Untreated water	Drinking water

- SNA production boundary
 - Are benefits = output?
 - Are ecosystem services = natural inputs?
- Some inconsistencies
 - Agricultural land, rangeland, forest,
 - ES = natural input, Benefit = output
 - Aquaculture
 - ES = benefit = fish
 - Water
 - ES seems to be water purification rather than provisioning

Issue 3 - Cultivated vs. non-cultivated

- Do we need to maintain the same boundary as in the central framework?
- Can we see agriculture, plantation forest and aquaculture as within the environment rather than within the economy?

Issue 2 – Ecosystem services versus benefits?

What do we want to measure (Cont'ed)?

Regulating services

Ecosystem	ES	Benefit
Forest	Capture of CO ₂	Reduced impacts from carbon
Forest	Capture of pollutants	Reduced exposure
Forest	Dissipation of wave energy	Reduced damages from high water

- Benefits seems to be equated to impacts and mixed up with the valuation
- Shouldn't the benefits be
 - Carbon captured
 - Clean air
 - Protected areas for flood

Issue 4 – Presentations using the egg diagram

- Is the presentation by individual services by ecosystem giving the right message? Or does it dilute the holistic characteristic of ecosystems and trade off between services?
- Could the egg diagram maybe transformed into a flower type of diagram showing different petals providing different services?

Issue 5 – Extension of SNA production boundary

- Is it needed?
- Are we simply making explicit things that should be accounted already in the SNA but are not included because not measured?
- Can we look at the added services that are used without being produced (e.g. clean air, flood protection, etc.) as part of the asset boundary?

Issue 6 – Relationship with SEEA Central Framework

- Should we see the ecosystem services as an extension of the SEEA Central Framework?
- Should CICES be an extension of the classification of natural inputs ? with addition for regulating and cultural services and provision for cultivated biological resources inputs

Issue 7 - Tables

- 3 tables -
 - Ecosystem services flows by statistical unit
 - By services and not benefit, or benefits since observed?
 - Ecosystem service flows by statistical unit and generating economic unit
 - Seems reasonable although demanding
 - Ecosystem service flows by statistical unit and benefit recipient (3)
 - Impossible to know where the benefit comes from. Can know total benefit but not the origin by statistical unit
- Could we look at the tables as an extension of the SEEA Central framework tables?

Issue 8 - Biodiversity

- Is biodiversity an ecosystem services?
- Should it be included in Chapter 3 or Chapter 4 as part of the capacity of ecosystems?
- If in Chapter 3 needs rationale

Issue 9 - CICES

- Supporting services: Exclude from CICES
- Flows from underground natural resources (primarily mineral and energy resources , potentially deep aquifers): Exclude from CICES
- Flows from solar, wind etc Exclude from CICES
- Provision of space: Exclude from CICES
- Conservation and existence of ecosystems: Include
- Amenity services: Suggestion to exclude from CICES
- Bequest and existence values.
- Treatment of environmental disservices (e.g. pests, disease)
- Cleaning up terminology
- Classification of products or activity?

Summary of issue

1. Definition of ecosystem service
 - Production central in the definition of the ES
2. Ecosystem services versus benefits?
 - Provisioning
 - Regulating services
3. Cultivated vs. non-cultivated
4. Presentation of egg diagram
5. Extension of SNA production boundary
6. Relationship with SEEA Central Framework
7. Tables
8. Biodiversity
9. CICES