



Department
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Food & Rural Affairs

SEEA EEA Revision

Ecosystem asset valuation and accounting entries

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Ecosystem asset valuation and accounting entries

Chapter 10

Covers asset valuation and the balance sheet accounting entries of ecosystem enhancement, ecosystem degradation and ecosystem conversions

- **What factors need to be considered in applying the concepts of NPV in an ecosystem accounting context?**
- **In distinguishing the changes in value due to ecosystem enhancement, degradation and conversion, is the approach described in Annex 10.1 appropriate?**

Ecosystem asset valuation

- NPV of future flow of services is the best way of estimating ecosystem asset values
- NPV requires a best estimate of the future or expected pattern of services flows (ideally in both volume and unit price terms) over a specified length of time
- Discounted with an appropriate discount rate
- Each calculation ideally requires consistent assumptions
 - For each service
 - For each ecosystem type

Projections of services - factors to take into account

Three broad determinants of future flow values:

- Factors which affect the supply of services in physical terms
 - E.g. changes in extent
- Factors which affect the 'demand' for services in physical terms
 - E.g. Population growth
- Factors which affect unit values
 - E.g. Institutional arrangements affecting carbon prices

NB these factors aren't necessarily independent. This has implications for the decomposition

Would a full list help? What are the key factors?

In practice only a few factors can be readily taken into account

- Where official projections are available
 - E.g. carbon sequestration flows, population growth
- Can we assume Government policies come into effect?
 - Are they actually funded policies or actually backed up by enacted legislation?
- Should specific 'scenarios' be modelled? If so, which ones?

NB Modelling of service flows often needs to be undertaken at a detailed spatial level, but official projections are often only available at national level

Accounting entries

Monetary values, constant prices

| | Ecosystem Type 1 | Ecosystem Type 2 etc. |
|---|------------------|-----------------------|
| Opening stock | | |
| Additions to stock – Ecosystem enhancement | | |
| - Other additions to stock | | |
| Reductions in stock – Ecosystem degradation | | |
| - Catastrophic losses | | |
| - Other reductions in stock | | |
| Ecosystem conversions – Additions | | |
| - Reductions | | |
| Revaluation | | |
| Net change in value of stock | | |
| Closing Stock | | |

Accounting entries for ecosystem asset values

Requires “**decomposition**” of the changes in value over the accounting period

As the asset value is based on the NPV of the future flow of services, decomposition is carried out on a **service by service** basis

Key elements of the calculation are:

- The separation of **volume changes** from **price changes** (revaluation)
- The estimation of the effects of extent changes during the accounting period (**conversions**)
- The identification of changes in value resulting from condition changes during the accounting period (**degradation and enhancement**)

Decomposition of price changes (revaluation): Changes in unit values for each service

- Requires assessment of the change between the opening and closing stock calculations, in average unit prices over the entire period of future flows, for each service (in real terms)

NB Discount rate changes (where not treated as revisions and past estimates reworked) are treated as price changes

This means that changes in estimates of future prices, as well as changes in prices within the accounting period, are treated as revaluation rather than reappraisals

Decomposition of volume changes Extent changes (Conversions)

Current extent changes are taken out of the opening and closing balances and treated separately

- A reduction is shown against the ecosystem type lost from the opening stock
- An increase is shown against the ecosystem type gaining from the conversion

NB Changes in expected future extent changes (e.g. those resulting from expected future increases in population) are classed as reappraisals

Does this work OK? What are the challenges of interpretation?

Condition changes (Enhancement and degradation)

Annex 10.1 sets out a proposal for accounting for degradation

Table 10.5: Attributing volume effects based on cause

| volume | condition | demand | |
|---------------|------------------|---------------|----------------------|
| up | up | up | enhancement |
| up | up | down | enhancement |
| up | down | up | upward reappraisal |
| up | down | down | not possible |
| down | up | up | not possible |
| down | up | down | downward reappraisal |
| down | down | up | degradation |
| down | down | down | degradation |

Assumptions

1. The change in condition is established as positive or negative in the condition account
2. Revaluation effects and conversions have already been accounted for – this table relates only to the residual volume changes
3. Implicitly assumes the assessment of demand changes is carried out at an individual service level but can be related to changes in overall condition

Questions for discussion

1. What factors should be taken into account in determining the asset values?

- Slide 4 listed 3 categories of determinants (supply, demand and unit prices).
 - Is this distinction helpful?
 - Are there other factors we should consider?
 - Which are the key factors?

2. Do the proposals for accounting for conversions, enhancement and degradation set out in Annex 10.1 work?

- Will they produce meaningful results?
- How can they be interpreted?
- Are there other options that should be considered?