

Monetary Valuation for Ecosystem Accounting

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Major issues for valuation

1. Principles for valuation, consistent with SNA:
 - marginal vs average value (i.e., treatment of consumer surplus)
 - distinguish intermediate from final ecosystem flows
2. Assessment of available valuation techniques— which are appropriate for accounting
3. Set priorities for valuation of ecosystem services in terms of scientific agreement and ability to implement
4. Review emerging financial mechanisms for ecosystem services and suitability as indicators of value

Four papers

DEFRA—overview of monetary valuation, flows and assets

3 papers that go into depth on specific aspects

P. Nunes (CIESM) describes valuation approaches in greater detail, with particular emphasis on valuing ES that are intermediate inputs

D. Simpson (US EPA) discusses critical issues for valuing ecosystems

M. Eijeraam et al discuss a particular kind of financial mechanisms for ecosystem services in Australia

DEFRA-Comprehensive Overview of Valuation

Links environmental economics framework—Total Economic Value (TEV) to MA classification of services

Reviews the approaches to valuation

- market-based and hypothetical
- Benefits/damage averted basis vs Cost basis (replacement, mitigation, etc)

Problem: few comprehensive national level valuations, many case studies

EPA, CIESM stress the need for spatially explicit values—the challenge then is scaling up
Cannot easily use ‘benefits/value transfer’

UK's NEAb

Hierarchy of techniques

Market values

- Market prices (provisioning services)
- Surrogate markets (production functions)

Stated preference only where markets not available
(non-use values of biodiversity)

Carbon costs applied two approaches:

- Marginal damage costs (a benefit approach)
- Cost of abatement--to meet targets

The cost-based approach as considered preferable in this case, given uncertainties about damages

UK's NEA experience

UK's NEA focused on Marginal Changes to ES flows under alternative scenarios rather than valuing entire stock

Measuring and valuing flows or marginal changes in flows is difficult, but valuing the entire stock raises even greater challenges because of very large uncertainties

Uncertainties:

- Non-linearities, thresholds of service provision by ecosystems
- EPA stresses that we don't have methods for changes that may be low probability but potentially catastrophic
- Levels of stock in the future, future scarcity and substitutability between different stocks
- Discounting and uncertainty about evolving preferences



Victoria, Australia

Valuing ecosystem goods & services

Reverse auction for ecosystem services paid for by govt

- Govt determines land mgmt plan for farmers that will result in (increased) provision of ES
- Farmers then bid to provide these services (i.e., they will implement the mgmt plan)

Supply-side approach—

supply of services (supply curve) facing a budget constraint/lower bound on demand

Summing up

Many issues related to lack of knowledge about biophysical properties/processes of assets

e.g., prioritize the scale at which an ES may be produced, 'ecosystem' defined is relatively small vs very large, trans-boundary...

Valuation techniques

- must stay within the SNA concept of value, market-based/marginal values
- Cost-based, remediation is a 'third-best' approach

Monetary accounts do not convey information about serious non-linearities and thresholds

→ Essential to link with physical stock accounts

Should we focus on flows, marginal changes, asset values or are the uncertainties/difficulties too great to overcome?

What are the priorities for research?

- Treatment of low probability/catastrophic changes
- Where do we get started, priorities for valuation?



WAVES