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Value Transfer in the SEEA - EA

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Monetary accounts in the SEEA EA
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Online webinar

MAIA
Mapping and Assessment for Integrated ecosystem Accounting

Structure of presentation

1. Introduction of method (also under ecosystem accounting context and SEEA framework)
2. Guidelines/adjusting guidelines
3. Method in practice
4. Use of method in ecosystem accounting
5. Future developments
6. Take home messages

Introduction

- Commonly used in cases where there is no time or resources to conduct primary valuation
- Use of research results from pre-existing studies at one or more sites of policy contexts to predict value estimates for other sites/ policy contexts
- Recognized in the early 90s by the U.S EPA for regulatory impact assessments
- In environmental economics, this approach is known as Benefit Transfer-BT; commonly used in large-scale environmental benefit-cost analysis.

The method in the SEEA framework

- Progress in ecosystem accounting is rather slow; Limited sources and lack of data (*monetary valuation)
- One solution is to transfer values from existing studies; Transfer of values refers to both physical as well as monetary metrics
- In SEEA EEA benefit/value transfer was not among the eligible methods; usually is not based on the accounting-compatible exchange value concept
- Use of 'Value Transfer' term to reflect value generalization
- Current developments under **SEEA EA revision**: '*9.5.1 Spatial variation and value generalization for the purpose of ecosystem accounting*'

Transfer approaches

Two main approaches are provided with two variations within each

- **1. Unit value transfer**:
  - 1.1. Simple, single unadjusted value transfer;
  - 1.2. Adjusted unit value transfer in order to account for factors such as currency or income differences.
- **2. Function value transfer**:
  - 2.1 Single-site function transfer, which employs an estimated function from a single primary study;
  - 2.2 Meta-analysis value transfer which gathers information from a set of prior studies

Past applications for diverse purposes

- Unit value transfer has been applied in global valuation of ecosystem services and change in the values (Costanza et al., 1997; Costanza et al., 2014)
- Unit value transfer has been applied to conduct Cost-Benefit Analysis for the EU Marine Strategy Programme of Measures to Achieve Good Environmental Status (Börger et al, 2016)
- Meta-analysis value transfer has been applied for thematic assessments of ecosystem services:
    - wetlands (Ghermandi et al., 2010),
    - forests (Chiabai et al., 2011; Grammatikopoulou and Vačkářová, 2021),
    - mangroves (Brander et al., 2012)
    - lakes (Reynaud and Lanzanova, 2017)

Guidelines

Certain implementation steps for conducting transfers have been suggested in literature (**Johnston et al., 2015; Boyle and Parameter 2017**)

Preparation: Steps 1 to 4

- Define the valuation policy context
- Establish the need for a value transfer
- Define the *good* to be valued and the affected population
- Specify the baseline and current conditions of the good to be valued

Implementation: Steps 5 to 9

- Gather and evaluate valuation data/evidence
- Select the value transfer approach
- Implement the transfer
- Aggregate values over population, areas and time periods
- Conduct sensitivity analysis and test reliability

Reporting

- Report results

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Adjusting the guidelines

- Defining the policy context (what is the purpose of accounting?)
- What is it valued (ecosystem, a certain ES)?
- What is the scope and scale of changes (in quantities and in prices)
- What type of VT?
- How primary studies are selected and how is the database compiled?
- How do we measure accuracy and what is the accepted range?
- How can values be reproduced (what are the requirements of accounts' periodicity)?

Contexts and purposes of ecosystem accounting

USERS:

International agencies

National governments

Finance sector

Industry bodies

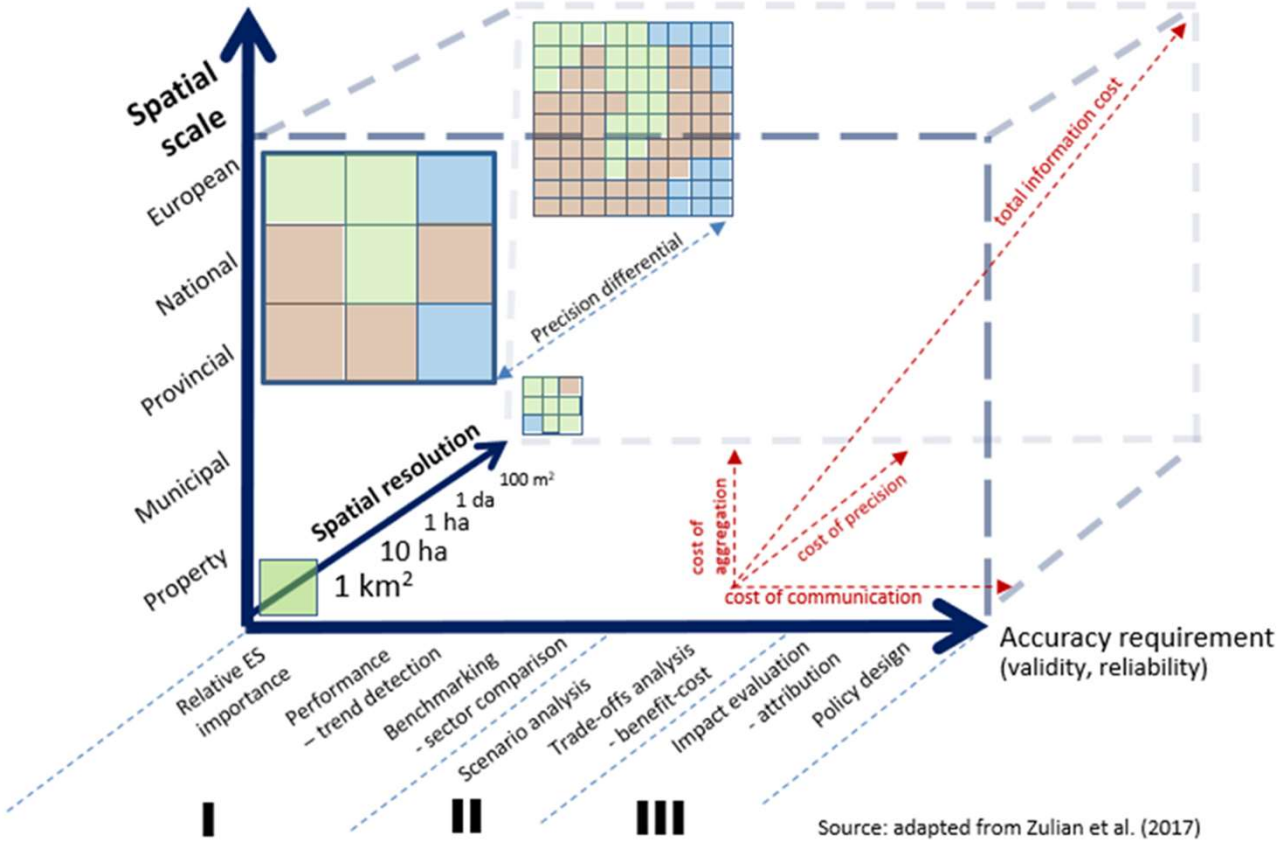
Land & water authorities

Local governments

Primary producers

NGOs

Landowners



PURPOSES:

Source: adapted from Zulian et al. (2017)

Overview of challenges

(*Grammatikopoulou et al., 2020)

1. Relating biophysical and monetary metrics
2. Monetary metrics: exchange vs welfare measures
3. Accounting for spatial factors and spatial and temporal variation

Challenges during VT preparation

4. Selection of studies and database compilation
5. Criteria for accuracy: (validity and reliability, generalization errors)
6. Periodic updating of accounts

Challenges of VT implementation

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In practice: where to find values

- There are open access datasets that report the economic value of ES for various ecosystems and which can provide data for VT applications
  - Ecosystem Service Valuation Database (ESVD) (de Groot et al. 2012)
  - Environmental Valuation Reference Inventory (EVRI) database

In practice: how to select studies

- A review of selected studies is required
- Systematic Review (SR) is a step-wise methodology that aims to collect, assess and synthesise existing research data.
    - Review scoping (keyword selection)
    - Abstract and title screening
    - Full text screening (inclusion criteria)
    - Data extraction (template) and reliability assessment (quality criteria)
- An example: A SR following Environmental Evidence guidelines has been conducted to collect data based on the use of monetary valuation methods to support marine management (Håkansson et al., 2020)

In practice: how to organize information

- There is a great variation in the information provided by primary studies
- Clarity in definitions and classifications is important

Sections	No	Definition of data inputs	Type of input: e.g. original data as reported in primary study or implied data from primary study or supplementary data from other datasets, o transformed data	Description of transformations
Study info				
Site and country specifics				
Biome and Ecosystem Services details				
Valuation details				
Study objectives				
Quality				
Other				

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In practice: how to apply a meta-analysis VT

- **Model specification and analysis**

Linear specification

$$y_i = a + X_{\mathrm{si}} b_s + X_{sti} b_{st} + X_{esi} b_{es} + \varepsilon_i$$

Where:

variable (y) is a vector of values in US$ per hectare per year in year x

site and socio-economic characteristics (X_{si})

study characteristics (X_{st})

biome and ES valuation characteristics (X_{es})

- **Transfer errors:**

$$TE = \frac{Value_{transf} - Value_{obs}}{Value_{obs}}$$

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Why use VT in ecosystem accounting?

- Transfer of values and value generalization are already common in ecosystem accounting, e.g. look up table approach/ unit value transfer
- VT is a cost effective method (good tool for countries that show slow progress in a ecosystem accounting applications).
- VT can accommodate both exchange and welfare value concepts, extending hence application of accounts beyond SEEA approach .
- VT could allow periodic and consistent update of ecosystem accounts

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Future developments

Use of VT as a second best approach before the transition towards mainstreaming of periodic (local-specific) surveys applying valuation methods

1. Adjusting VT method for accounting purposes
2. Standardized procedures for primary studies and review process
3. Recommendations for acceptable transfer errors
4. Spatial explicit VT applications
5. Simulated Exchange Values method and VT
6. Replicable VT estimates (meta-analysis functions)

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Take home messages

- VT could accelerate empirical applications especially at the national scale; Why?
  - Already in use
  - Low-cost solution
  - Based on SNA compatible (i.e. exchange-based) values
  - Transparent approach for periodic accounts
- Less reliable than primary surveys
- Certain challenges remain and should be acknowledged in current applications
- Need for collaboration among *experts in the two disciplines (most VT experts do not work in ecosystem accounting and vice versa).*

References

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Thank you for your attention

For further questions you may contact me here

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Looking for speakers!

Next ESP conference in Tartu (hybrid event- 7 to 10 June 2021- @ESPartnership)

Thematic session "From assessment to accounting: how countries experience the development of NCA. Insights from applications"

https://www.espconference.org/europe2020/wiki/486607/call-for-abstracts