

Valuation methods: examples from freshwater studies in Scotland

Julia Martin-Ortega, Klaus Glenk (SRUC),
Kirsty Holstead, Anja Byg



The James
Hutton
Institute



EAWG5: Ecosystem Services Research: Update
on valuations and values
11th of June, Edinburgh

The predominant approach

- Conventional economics associates human well-being with human welfare measured in **monetary terms**
- The value of ecosystems and natural resources is measured through individual's **willingness to pay** to maintain or increase the goods & services they provide
 - The **social value** is then the addition of individual values across the whole population
- Monetary valuation doesn't mean putting a 'price' on natural resources, but using monetary units to measure **the change in welfare** associated with changes in their quality/quantity

The predominant approach

We use WTP as an indicator of the satisfaction (utility) that people obtain



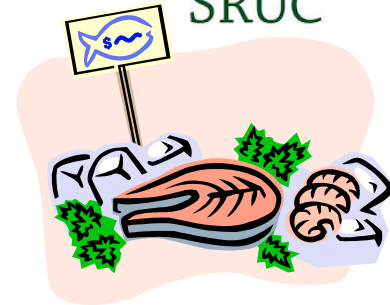
Monetary valuation methods (I)

- WTP for some goods or services can be 'easily' valued since they are traded in markets (market price as reflect of WTP)– **direct market price methods** (& contribution to GDP)
- Other form of market-based valuation method is the **replacement cost method**

Example: the value of water for hydropower production

Comparison of how much would it cost to produce the same amount of energy with the next best alternative. The difference in costs can be considered a lower bound of the social value of water for hydropower

McLeod et al (2005): £13.2m (2.5p/kWh) based on comparison with combined cycle gas turbines as alternative energy source



Monetary valuation methods (II)

- Other ecosystem services are not (directly) traded in markets and their value is more difficult to measure
- Their value may be measured through market prices of *other goods* for which there is a market– **avoided costs methods**

Example: the value of flood mitigation

Avoided costs to property damage can be used to estimate a lower limit to the value of mitigating flood risk

Werritty et al. (2002): £1.8 – £2.4 million based on current average annual property damage of 26,000 houses in seven catchments in Scotland



Monetary valuation (III)

- Recreation is another example of value that can be measured through market prices of other goods and services – **travel cost method**

Example: the value of hillwalking

Can be inferred from people's behaviour when they go hillwalking and how much they are WTP for other associated goods and services that they consume on the way (e.g. petrol consumption to get to the site, parking costs, costs of time, subsistence and accommodation costs, etc.)

Hanely et al. (1998). Value of hillwalking in the Queen Elisabeth Forest Park: £1.70 per trip or £160,744 per annum for the total amount of visitors



Monetary valuation (III)

- There are other services which cannot be associated with any other market goods and services, mainly because they include **non-use** values, such as existence, symbolic and natural heritage
- Environmental economics has developed **stated preference methods**
 - Contingent Valuation
 - Choice Experiments

Monetary valuation (III)

Example: the value of the good ecological status of lochs

The improvement in water quality to ensure ecological conditions that provide (non-use) services appreciated by people (e.g. support for wildlife, biodiversity, natural heritage, ecosystem's good health, etc.)

can be measured by asking a representative sample of the public **in a survey** about their WTP for getting those services

Glenk et al. (2011): mean value of £1,500 per hectare of loch improved to the GES. Reaching the GES in 73% of Scottish lochs surface area produces a benefit of £5.7m per year



Challenges to the dominant approach

- Using the monetary metric is the predominant way to value natural resources. It has the advantage of being able to compare benefits of interventions with costs (CBA)
- Many criticise this approach because:
 - Human well-being is more complex than utility and 'rational' satisfaction only
 - There are elements of human well-being that cannot be measured in monetary terms
 - There are elements of human well-being that should not be traded because of their moral status (e.g. basic human right of access to drinking water)
 - Monetary valuation risks reducing nature to a tradable commodity (morally wrong?)

Non-monetary valuation

- There exist alternative non-monetary valuation frameworks and tools that try to quantitatively or qualitatively measure the value of ecosystem services
- Questionnaires, in-depths interviews and deliberative methods (e.g. focus groups, citizen juries) aimed at:
 - Eliciting public **attitudes** and behaviour towards the environment
 - Understanding and measuring effects on well-being, length and quality of life
- Using alternative quantitative indicators (comparisons and rankings):
 - Presence/absence/number of **features that are associated with values** (e.g. presence of water courses, presence of historic buildings, visual indicators of aesthetic values, etc.)
 - Human use or activities (e.g. number of visitors to a national park)
- Participatory maps to identify where the value is and its magnitude (e.g. number of people who identify a certain area as valuable)

Non-monetary valuation

Example: the value of Etrick Valley Floodplain restoration project

Citizen's jury consist of a small group of people representing the general public. 'Witnesses' provide evidence to the 'jury' who come to decision through discussion and deliberation

Kenyon et al. (1999). The jury in the Ettrick Valley project identified several positive benefits: getting back to nature, community involvement, flood control, preservation of indigenous life forms and education, which reflect the value of the restored ecosystem

Alternative decision-making frameworks

- Non-monetary valuation does not easily fit into CBA but it can accompany it
- Other decision-making framework exists (e.g. multi-criteria decision making, cost-effectiveness analysis, impact assessment and life cycle analysis)
- Whether to do monetary or non-monetary valuation depends on the decision-making framework and what the values are used for
- Specific method depends on type of value and what they are used for

- But there is more to it!
- Valuation is about **efficient allocation** of resources, but we also look at:
 - Equitable allocation:
 - ▶ Whose values: collective or individual values? What to do in case of conflicting values? What about silent groups?
 - ▶ Distribution of costs and benefits? Cost bearers Vs. beneficiaries?
 - Scales and boundaries: how far/where to value? (Klaus Glenk's ppt)
 - ...and more!

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