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# Informing biodiversity policy: The role of economic valuation, deliberative institutions and deliberative monetary valuation

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## ABSTRACT

In the past years, monetary valuation of changes to biodiversity and ecosystem services has received increased attention in the scientific community and in the policy arena. Regardless of the abundance of valuation methods, there seems to be a particular interest in obtaining monetary estimates via stated preference methods. While some experts regard these methods as useful means to recognise, demonstrate and integrate biodiversity concerns in policy design, others voice severe criticism and advocate the use of deliberative approaches to biodiversity valuation. In view of these debates, this paper outlines the rationale and characteristics of three valuation avenues: stated preference methods, deliberative institutions, and deliberative monetary valuation. We develop criteria that guide the selection of an appropriate valuation approach in different decision contexts and discuss the advantages and drawbacks of each approach against these criteria. The aim of the paper is to illuminate the portfolio of valuation methods available to guide policy design and to improve the applicability of these methods in practical biodiversity policies.

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## 1. Introduction

In the course of the past 10 years the importance of considering biodiversity and ecosystem services in environmental practice and policy assessment has gained considerable attention (MEA, 2005; TEEB, 2010). A trend can be observed among policy-makers and various stakeholders to assess the monetary value of these environmental public goods in order to facilitate their recognition in decision-making. For example, in its Biodiversity Strategy the EU has set itself the target to map ecosystems and their services, as well as to assess their economic value for inclusion in national accounting systems by 2020 (European Commission, 2013).

Monetary economic valuation is relatively straightforward for ecosystem services and biodiversity aspects that are traded in markets or that can be related to markets, because market prices are available, which signal the scarcity of these environmental goods and can be used as a proxy for their value. A disadvantage of market-price and cost-based methods is that they focus on private costs and benefits associated with changes in ecosystems and neglect the costs and benefits of these changes to the public (Hansjürgens et al., 2012). For example, the water purification properties of forests are not only valuable to water supply companies that would benefit from avoided costs of using more complex water treatment methods, but also to

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the public that might value high water quality for recreational activities in adjacent streams or the existence of healthy aquatic life. Thus, in order to grasp the full extent of the values of ecosystems and their biodiversity additional methods, namely revealed and stated preference techniques, need to be applied. For purely public environmental goods that cannot be related to markets at all, stated preference methods (SP) are the only available means to assess their value (see [Box 1](#), [OECD, 2005](#)).

### Box 1. Main characteristics of stated preference methods

Stated preference methods elicit people's preferences and thus the utility or disutility they derive from a change in the state of an ecosystem in a survey. The two main methods are Contingent Valuation and Choice Experiments.

#### Contingent valuation

Contingent valuation (CV) is a survey-based method that elicits people's preferences directly by using one of the following measures: willingness to pay (WTP) to obtain an environmental improvement or to avoid an environmental deterioration, or willingness to accept (WTA) compensation for relinquishing an environmental deterioration or to forgo an environmental improvement. The method bypasses the need of a market for environmental assets by presenting individuals with a hypothetical market in which they have the opportunity to buy (WTP) or sell (WTA) the environmental good in question. People's actions are *contingent* on the hypothetical situation described to them, and elicited WTP and WTA bids are close to the value that would be revealed if an actual market existed.

CV surveys contain of three parts: Firstly, a detailed description of the environmental asset or change being valued and the hypothetical market. Secondly, questions that elicit respondents' WTP and/or WTA amounts. Thirdly, questions about respondents' socio-economic characteristics and their attitudes towards the environment for validity testing. Once WTP/WTA bids have been obtained, the total value estimate of the environmental good or change is derived by the calculation of mean WTP/WTA and its aggregation to the total population. The last stage of a CV study involves a validity assessment of WTP/WTA estimates.

#### Choice experiments

Choice Experiments are similar to CV with the main difference that respondents do not express their WTP or WTA for a certain environmental change directly. Instead, they are presented with alternative policy options from which they have to choose the one they prefer most. The policy options have shared attributes of the environmental goods at stake, but with different attribute levels. One of the attributes is the cost that respondents would have to pay for an enhancement in the state of the ecosystem in question or the compensation people would receive for the deterioration from that state.

Source: [Garrod and Willis \(1999\)](#).

Since SP methods are the only methods capable of quantifying the economic value of changes to non-market environmental goods or services they are regarded by many researchers as indispensable ([Arrow et al., 1993](#); [Pascual et al., 2010](#)). There is a general belief that monetary values of non-market ecosystem services and biodiversity aspects are a suitable means to facilitate their recognition, demonstration and consideration in decision-making. Accordingly, many practitioners are interested in monetary values of non-market biodiversity and ecosystem services benefits associated with environmental protection or management measures so as to justify the costs of such measures ([Carpenter et al., 2009](#)). Examples that substantiate this perceived trend towards non-market monetary valuation are the EU Biodiversity Strategy envisaging the mapping of biodiversity and all ecosystem services values in monetary terms ([European Commission, 2013](#)), and planners that promote accounting and monetary valuation as a means to highlight the potential contributions of biodiversity and ecosystem services to regional development ([von Haaren and Albert, 2011](#)).<sup>1</sup>

In view of this trend, it is important to reflect on the concerns related to SP methods and to be aware of potential alternatives (for an overview, see [Spash, 2007](#); [Vatn, 2009](#)). The SP criticism can be clustered into two broad categories: psychological issues and ethical/political concerns.

Psychological concerns regarding the usage of SP methods have mostly to do with the formation of preferences: standard economic theory assumes that preferences are predefined ([Pearce and Turner, 1990](#)). Psychologists have serious reservations towards this assumption that "preferences are pre-existing, stable, and complete across all choice sets, and can therefore merely be called upon" ([Spash, 2007](#), 693). In their view people might have general attitudes towards something, but they do not have clearly defined preferences in their mind ([Kahneman et al., 1999](#)). Particularly in the environmental context, it is likely that goods and services provided by the environment exhibit high levels of unfamiliarity and complexity, which makes preference formation a difficult task ([Brouwer et al., 1999](#)). Hence, when asked to state their preferences for an unfamiliar environmental good in a SP survey, respondents are unlikely to hold preferences *ex ante* and are therefore influenced by decision heuristics and framing effects that are theoretically inconsistent and lead to results that are far from showing how much individuals really value the ecosystem at stake ([Tversky and Kahneman, 1974](#)). Since SP surveys are commonly implemented in the form of telephone or face-to-face interviews, mail or web-based surveys, respondents have little room and time to learn about the ecosystem at stake, let alone to form preferences for them and translate these preferences into monetary units ([Shapansky et al., 2003](#); [Bateman et al., 2008](#); [Tversky and Kahneman, 1974](#)). According to [Harris et al. \(1989\)](#), in forming preferences people often rely on

<sup>1</sup> In addition, the authors have observed an increased interest in non-market monetary valuation expertise in the preparation of project proposals (mainly from natural scientists who are interested in the economic value of ecosystems), an increased number of presentations on non-market monetary valuation studies on conferences, and a rise in publications and PhD projects in the field.

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