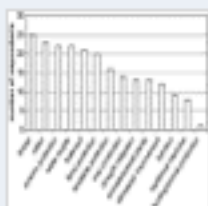
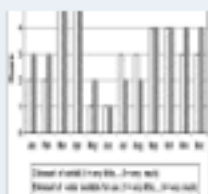


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4.2.2. Administration and analysis of the choice experiment

Table 2

4.2.3. Validity tests and influence of respondent comprehension

Table 3

4.3. Results

4.3.1. Base model, validity tests

Table 4

4.3.2. Willingness-to-pay calculation

Table 5

5. Discussion

5.1. Unfamiliarity aspects

5.2. Data and modeling aspects

6. Conclusion

Acknowledgements

References

Abstract

Ecosystem functions are a central topic of environmental valuation research. Lay respondents are usually unfamiliar with the implications of scientific descriptions of ecosystem functioning. Thus, the applicability of stated preference methods for the valuation of ecosystem functions is a matter of debate. In the general discourse on the economic valuation of ecosystem functions, it was suggested to value ecosystem functions via the ecosystem services they provide. In this contribution, we argue that the recognition of this principle is the key also for the applicability of stated preference methods to the valuation of ecosystem functions. Successful application requires a precise differentiation between the descriptive realm of ecosystem functions and the evaluative realm of ecosystem services. On this basis, an ecosystem service approach for the economic valuation of ecosystem functions is introduced.

We illustrate the ecosystem service approach by the valuation of a hydrological ecosystem function in rural Indonesia. Identification and representation of the ecosystem services were based on extensive investigations of respondent perception of hydrological phenomena. The availability of irrigation water during the dry season turned out to be a locally decisive ecosystem service. Within the case study, willingness-to-pay (WTP) values were estimated for changes in the availability of irrigation water, rattan, shading in cacao plantations, and in the population of an endemic mammal by Nested Logit (NL) analysis of choice experiment data. Only few respondents lacked sufficient familiarity of the environmental goods to be valued. WTP for a reduction in water scarcity by one month was ~ 39–40,000 Indonesian Rupiah/household/year. A rating of respondent comprehension correlates with preferences for water availability. For respondents with above average comprehension (rated 4 versus mean of 3.12 at a 5-point scale), NL analysis predicts a 14.1% increase in WTP. Interactions of attitudinal constructs support the notion that the WTP estimate is an expression of underlying values and risk perceptions.

The ecosystem service approach comes at a cost. Because ecosystem services relevant to local respondents are valued rather than scientifically described ecosystem functions, typical 'basic science' models that represent ecosystem functioning cannot be used for the analysis of valuation scenarios with direct policy relevance. Engineering-type models that embody technical and, in our case study, agronomic knowledge are necessary to bridge the gap between ecosystem functioning and their practical implications. A lack of this kind of information also hinders a meaningful application of alternative valuation approaches.

Keywords

Ecosystem services; Ecosystem functions; Willingness-to-pay; Stated preference methods; Information and misspecification bias; Data requirements