Global Environmental Change 21 (2011) 505–521

Contents lists available at ScienceDirect

Global Environmental Change

journal homepage: www.elsevier.com/locate/gloenvcha

The importance of deliberation in valuing ecosystem services in developing countries—Evidence from the Solomon Islands

Jasper O. Kenter [a,1], Tony Hyde [a], Michael Christie [a], Ioan Fazey [b,*]

[a] Institute of Biological, Environmental and Rural Sciences, Aberystwyth University, Llanbadarn Campus, Aberystwyth, Ceredigion, SY23 3AL, Wales, UK
[b] School of Geography and Geosciences, University of St Andrews, Irvine Building, North St, St Andrews, Fife, KY16 9AL, Scotland, UK

ARTICLE INFO

Article history:
Received 4 May 2010
Received in revised form 28 December 2010
Accepted 5 January 2011
Available online 11 February 2011

Keywords:
Ecosystem services
Participatory approaches
Environmental values
Developing countries
Solomon Islands
Social choice experiments
Deliberative valuation

ABSTRACT

Monetary valuation of ecosystem services enables more accurate accounting of the environmental costs and benefits of policies, but this has rarely been applied in developing countries. In such contexts, there are particular methodological and epistemological challenges that require novel valuation methodologies. This paper introduces a new participatory, deliberative choice experiment approach conducted in the Solomon Islands. The research aimed to determine the value people placed on ecosystem services and whether participatory interventions to elicit deeper held values influenced the preferences expressed. Results found that the initial willingness to pay for a number of tropical forest ecosystem services amounted to 30% of household income. Following deliberative intervention exercises, key ecosystem services effectively became priceless as participants were unwilling to trade them off in the choice experiment scenarios, regardless of financial cost. The group based deliberative approach, combined with participatory interventions, also resulted in significant learning for participants. This included a more sophisticated view of ecological-cultural linkages, greater recognition of deeper held values, and greater awareness of the consequences of human actions for the environment. The use of a group-based participatory approach instead of a conventional individual survey helped to overcome many of the practical difficulties associated with valuation in developing countries. Given the impact of learning on valuation outcomes, participation and deliberation should be integrated into valuation of any complex good, both in developing and developed economies. However, such a methodology raises questions about how valuation can deal with unwillingness to trade-off key ecosystem services, which results in the breakdown of monetary valuation methods. Evaluation of the appropriateness of valuation processes and methodologies for assessing deeper held values and use of mixed-method approaches will be essential to ensure policies take into account the extent to which human life is dependent on ecosystem services.

1. Introduction

There are increasing calls to estimate the value of ecosystem services in monetary terms (Carpenter et al., 2006, 2009; Sutherland et al., 2009; TEEB, 2010). However, research on the valuation of environmental goods and services is limited in developing countries, where much of the worlds biodiversity is located (Abaza and Rietbergen-McCracken, 1998; Christie et al., 2008; Fazey et al., 2005; Georgiou et al., 2006). This paper introduces a novel, participatory and deliberative approach to ecosystem service valuation in a developing country context, and discusses how deliberation may impact on the way environmental values are expressed.

Ecosystem services are the ecological processes and mechanisms that result in the conditions that fulfil and sustain human life (Daily, 1997). They can be categorised as provisioning services (e.g. food, fuel and fibre); regulating services (e.g. water purification, climate regulation); supporting services (e.g. photosynthesis); and cultural services (which provide spiritual, aesthetic, educational and recreational benefits) (Millennium Ecosystem Assessment, 2005). The contribution of ecosystem services to human wellbeing is enormous (Costanza et al., 1997; TEEB, 2010), but many ecosystem services are rarely traded directly or taken into consideration by economic markets. This has led to a lack of appreciation in policy-making of the critical role of ecosystem services in maintaining livelihoods and wellbeing.

* Corresponding author. Tel.: +44 0 1334 463937; fax: +44 0 1334 453949.
E-mail addresses: jasper.kenter@abdn.ac.uk (J.O. Kenter), ath@aber.ac.uk (T. Hyde), mec@aber.ac.uk (M. Christie), ioan.fazey@st-andrews.ac.uk (I. Fazey).
[1] Current address: Oceanlab, Institute of Biological and Environmental Sciences, University of Aberdeen, Newburgh, Aberdeenshire, AB41 6AA, Scotland, UK.

0959-3780/$ – see front matter © 2011 Elsevier Ltd. All rights reserved.
doi:10.1016/j.gloenvcha.2011.01.001

Over the last 10 years, there has been increasing interest in methods that can estimate the monetary value of ecosystem services so that the environmental costs and benefits of policies and land use change can be accounted for (Carpenter et al., 2006, 2009; Costanza et al., 1997; Sutherland et al., 2009; TEEB, 2010). In developing countries, the number of Payment for Ecosystem Services schemes is increasing, for example where water users pay to protect upstream water resources or farmers are paid to prevent erosion through afforestation. Such projects, if implemented as community-based schemes, have the potential to both conserve nature and improve the welfare of rural people (Tallis et al., 2008). However, relatively few environmental valuations have been conducted in countries with the least developed economies (Abaza and Rietbergen-McCracken, 1998; Christie et al., 2008; Fazey et al., 2005; Georgiou et al., 2006), despite such countries harbouring the majority of the world's biodiversity and the high dependence of people on those services for their survival and livelihoods (Christie et al., 2008).

There are many different tools for monetary valuation of ecosystem services. These include market-based, revealed preference and stated preference methods. An example of a market-based approach is replacement-cost analysis, where the cost of replacing certain ecosystem services by technology is calculated, e.g. replacing flood protection by mangroves with coastal defence works (Gunawardena and Rowan, 2005; Winpenny, 1991). However, the reliability of such methods is frequently undermined by limited or incomplete knowledge of ecological systems (Gunawardena and Rowan, 2005; McCauley and Mendes, 2006). Also, they fail to capture the total value of such environmental goods because many services, such as nutrient cycling (supporting service) or aesthetic values of ecosystems (cultural service) are not easily replaced by technology.

Another approach is to use revealed preference methods, where some kind of marketed good that has a monetary value, such as house prices or travel cost, is used as a proxy to reveal the value of a non-marketed good. It is nonetheless difficult to establish meaningful relationships between the price of a marketed good and all but a few ecosystem services. This is particularly the case where markets such as property and transport are underdeveloped, as in many rural areas of developing countries (Christie et al., 2008).

The third approach is to use stated preference methods, which do not rely on existing markets. Instead, respondents are asked for their willingness to pay for environmental goods in a number of hypothetical scenarios. For example, participants may be asked for their willingness to pay for conservation programmes which improve biodiversity or a number of ecosystem services such as erosion protection, water availability or even 'ecosystem health' (Barkmann et al., 2007). Because a hypothetical market is simulated, there is the advantage that practically any good can be valued, including more subtle benefits of the environment such as those provided by cultural ecosystem services. Stated preference techniques are therefore likely to be the most suitable approach for monetary valuation of many ecosystem services in developing countries.

Nonetheless, a number of theoretical, methodological and epistemological challenges remain. These include low literacy rates and language barriers, especially as the techniques often rely on questionnaires (Christie et al., 2008; Whittington, 1998); difficulties in explaining hypothetical scenarios (Whittington, 1998); lack of local research capacity for implementing complex techniques (Alam, 2006; Christie et al., 2008; Whittington, 1998, 2002); and assumptions by researchers that participants have similar ways of thinking as they do (Alam, 2006; Christie et al., 2008; Lu et al., 1996).

Another challenge are the utilitarian assumptions associated with welfare-economic theory that form the basis of monetary valuation (Hanemann, 1984). These state that individuals seek to maximise their benefit and minimise their cost, that preferences are stable and transitive, and that utility curves are comparable between individuals (Kahneman, 1986; Urama and Hodge, 2006). Further, values may be lexicographic (meaning that they will not be traded-off), or individuals may express multiple values (Spash, 1998; Urama and Hodge, 2006). These issues can be challenging in any context. In many developing countries, however, people can have limited experience of market mechanisms if they rely on subsistence livelihoods. It is also not clear whether the assumptions underlying monetary valuation are upheld in these circumstances.

A key issue specific to stated preference methods is that they require respondents to take income constraints into account when stating preferences (Arrow et al., 1993). But when incomes are low and when people heavily rely on biodiversity for their livelihoods, the values expressed may not properly reflect the true value of an environmental good or service to their wellbeing (Abaza and Rietbergen-McCracken, 1998; Hearne, 1996). For example, for those dependent on subsistence farming, livelihoods will rely heavily on nutrient cycling services. However, their monetary income could be very low relative to what they believe is the actual value of nutrient cycling for maintaining wellbeing. If participants take their income restraints into account when asked what they would be willing to pay for this service, the full value of the services to them is not reflected. If they don't take income constraints into account, the assumption that people make choices as if they would actually have to pay the amount asked for in a hypothetical scenario, is violated.

A further, more general issue with stated preference techniques is the assumption that preferences are pre-formed. This has encouraged methods that use individual preference surveys. However, values are not pre-formed but 'constructed' through deliberation, and conventional methodological individualism fails both to capture collective values and to make use of dialogue in order to encourage reflection of what a persons' values truly are (Spash, 2008b).

Communal discussion for decision-making is particularly important for many indigenous societies, such as those with customary tenure systems, where land management and decision-making on environmental goods is decided upon at the clan or extended family level. Dialogue and deliberation that promote reflection are also a key component of participatory and action research methods, which are receiving increasing attention as research funders recognise the need to find new mechanisms for knowledge exchange and the co-production of knowledge (Armitage et al., 2008; Fazey et al., 2010; Folke et al., 2005; Pahl-Wostl, 2009). Such processes are important for enhancing learning at a range of scales, promoting adaptive capacity for responding to complex social and ecological issues, and for promoting more equitable decision-making (Armitage et al., 2008; Fazey et al., 2010; Folke et al., 2005; Pahl-Wostl, 2009).

Not surprisingly, introducing communal discussion and providing time for participants to think in valuation has been shown to improve the quality of decisions (Urama and Hodge, 2006; Whittington et al., 1992). This is particularly the case when research is conducted with those who have had poor access to education (Urama and Hodge, 2006). It has also been suggested that group dynamics draw out greater attention to less obvious values of the environment (Kaplowitz, 2001; Kaplowitz and Hoehn, 2001), which is important for indigenous societies that may have strong but subtle ties to the natural capital upon which they depend.

While there is certainly potential for integrating group discussion with stated preference techniques, it is not clear whether these methods and their underlying assumptions can be