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SPECIAL ISSUE: The Dynamics and Value of Ecosystem Services: Integrating Economic and Ecological Perspectives

Discourse-based valuation of ecosystem services: establishing fair outcomes through group deliberation

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Abstract

Discourse-based methods involving small groups of citizens have yet to be thoroughly engaged in the practice of ecosystem valuation. This remains true despite the fact that many ecosystem goods and services—such as clean air, biodiversity, and unpolluted lakes and rivers—are considered to be public goods. The conventional application of ecosystem valuation relies heavily on methodologies such as contingent valuation, in which individuals are asked to express the value they attach to ecosystem goods and services in social isolation. The difference between the public nature of ecosystem services and their valuation through individual expression has thus recently led to calls for more deliberative forms of environmental valuation. Because the allocation of ecosystem services directly affects many people and raises normative questions about social equity, it is argued that carefully designed discursive methods will help ensure the achievement of social equity goals. In this paper, we examine the theoretical and normative assumptions that rest beneath the proposed turn towards discourse-based methods, and identify procedures for testing their application in the field.

Keywords: Ecosystem services; Discourse-based valuation; Small groups

1. Introduction

Ecological economics identifies the importance of three normative concepts—economic efficiency, ecological sustainability, and social equity—in managing the links between ecological and economic systems (Costanza and Folke, 1997). To date, the literature has generated rigorous and lively debates concerning the theoretical foundations and practical applications of efficiency and sustainability as guides to ecological conservation (Bingham et al., 1995; Daily, 1997; Gatto and De Leon, 2000). In contrast, the concept of social equity presents an unresolved challenge. While the asymmetric distribution of natural resources among different social groups has been widely discussed (Martinez-Alier and O'Connor, 1996), ecological economists have been

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somewhat slow to embrace explicit principles of equity in the assessment of ecosystem service values (Perkins, 2001).

From a social equity perspective, the crucial question is how ecosystem goods and services should be evaluated in a manner that involves the fair treatment of competing social groups. One answer that has recently gained prominence in the field of ecological economics is discourse-based valuation (Coote and Lenaghan, 1997; Jacobs, 1997; Blamey and James, 1999; Perkins, 2001). Derived from a convergence of arguments from economics, social psychology, decision science, and political theory, this emergent set of techniques is founded on the assumption that the valuation of public goods should result not from the aggregation of separately measured individual preferences, but from a process of free and open public debate (Habermas, 1984; Dryzek, 1987, 1990; Fishkin, 1991).

The basic idea is that small groups of citizen-stakeholders can be brought together to deliberate on the economic value of a public good, and that the values derived in this forum can then be used to guide environmental policy (Jacobs, 1997; Perkins, 2001). By implementing a fair and openly structured procedure for deliberation, it is assumed that small groups of citizens can render informed judgements about public goods not simply in terms of their own personal utility, but also in terms of widely held social values. Implicit in this argument is the notion of a small group, comprised of citizen-stakeholders, as the social decision maker (Keeney et al., 1990; McDaniels and Roessler, 1998). The role of the discursive process is, therefore, to help this social unit structure, learn about, and articulate preferences for alternative ecosystem goods and services. The group is not meant to negotiate, but rather to engage in a deliberative process for making consensus-based judgements.

Because the process of deliberation requires citizens to go beyond private self-interest, it is further believed that the outcome will increase the social equity and political legitimacy of outcomes (Holcombe, 1983; Elster, 1997). In this manner, the process of discourse itself is taken to provide a 'corrective function' for situations where individual citizens alone possess incomplete information. Acting together, groups can piece together a more complete, and socially just, assessment of ecosystem goods and services.

The purpose of this paper is to address the question of whether and how ecosystem valuation methods can be designed to address issues of social equity. To answer this question, we first examine the theoretical and normative assumptions that undergird the recent turn towards discourse-based valuation. Based on this review, we then discuss the potential for testing and evaluating discursive applications in the field.

2. Social equity and ecosystem services

Ecosystem goods and services are, by definition, inherently public in nature, containing all 'the conditions and processes through which natural ecosystems and the species that make them up, sustain and fulfil human life' (Daily, 1997). Defined thus, ecosystem goods and services provide benefits to society as a whole, over and above the benefits they provide to individuals. As Jacobs (1997) puts it: ''society is better off for having them, even if the number of people who privately benefit from their existence is very small''. In this sense, ecosystem goods and services are inherently objects of ethical and normative concern—what is done to them can be discussed, not simply in terms of individual costs and benefits but in terms of social rights and wrongs (Sagoff, 1988). Because ethical concerns and issues of social equity are a matter of argument, and argumentation itself requires a public arena in which to occur, it thus seems appropriate to search for procedures that will bring ecosystem valuation into the public arena.

In this paper, we define social equity as a normative concept that emphasizes the ex ante freedom and equality of all persons, both across and within generations (Kant, 1965; Rawls, 1971; Baynes, 1992). Our notion of equity begins with the idea that where common goals are necessary they should be worked out in a situation where each person is fairly represented. While laudable as a principle, the obvious challenge is that in

reality, people often hold unequal social positions and possess differential strengths in political bargaining because of their different natural abilities and/or access to power—contingencies that often distort the process of collective decisions about the worth of ecosystem goods and services.

The ideal of designing deliberative value-articulating institutions to promote social equity is a familiar theme in political theory (Dryzek, 1990; Cohen, 1997). In his classic philosophical treatise on justice as fairness, for example, Rawls (1971) introduced the ideal of the 'original position'. In this ideal state, fair social decisions are defined as those that would be unanimously agreed upon by individuals conceived as free and equal moral persons. According to Rawls (1971, p. 141):

> In order to define the original position as fair, we imagine that everyone is deprived of certain morally irrelevant information. They do not know their place in society, their class position, or social status, their place in the distribution of natural assets and abilities, their deeper aims and interests, or their particular psychological makeup…no one is advantaged or disadvantaged by natural chance or social contingencies. Since all are in this sense similarly situated and no one knows how to frame principles that favor his particular condition, each will reason in the same way. Any agreement reached is unanimous and there is no need to vote.

Rawls presents readers with a picture of what social equity would look like if every person had an equal right to the most extensive scheme of basic liberties, and could articulate their genuine interests on an equal footing with all others (Baynes, 1992). The challenge posed by Rawls is thus to incorporate into the basic structures of public decision-making an effective 'procedure' that would mirror the fair representation of people achieved by this original position. Thus, while the concept of original position itself is somewhat unrealistic—a standard to aspire to—it provides an idealized image of social equity in a world where issues of social status and power were set aside in free and open debate. As such, Rawls' framework provides a useful model of what we should strive to mirror in value-articulating institutions.

The concept of equity is important when assessing the value of ecosystem services because difficult social decisions must ultimately be made to achieve a sustainable ecological future (Martinez-Alier, 1995). As emphasized by the Brundtland Report (World Commission on Environment and Development, 1987), sustainability is a principle of intergenerational fairness that entails the management of economy–environment interactions to ensure that the life opportunities enjoyed by future generations are (on balance) no worse than those available today (Solow, 1986; Howarth, 1997; Faucheux et al., 1998). As Martinez-Alier and O'Connor (1996) emphasize, however, sociopolitical and spatial asymmetries or inequalities that exist cross-sectionally at any given time play a key role in forming the patterns of access to benefits obtained from ecosystem services.[2] The achievement of intragenerational fairness is, therefore, a necessary condition for the achievement of economic and ecological sustainability over intergenerational time scales.

Viewed from this perspective, we see that societies must often choose between competing uses of the natural environment and the goods and services provided by healthy, functioning ecosystems: Should an old-growth forest be opened to intensive forestry, or should it be maintained in its current state to serve as a biodiversity reservoir? Should a river be dammed to provide more electricity or should it be allowed to remain free flowing for the enjoyment of this and future generations?

To equitably choose from among these competing alternatives, it is important to know not only what ecosystem goods and services will be affected but also what those services are worth to

[2] In the tropics, for example, recent empirical research has shown that unequal land distribution, coupled with pressure to export agricultural goods from limited land resources, can readily lead to agricultural extensification on unsuitable and ecologically sensitive terrain, thereby accentuating the inequalities of economic and ecological distribution that lead to long-term environmental degradation (Barrett, 1996).

different members of society. When choosing between ecosystem goods and services, we cannot escape the need for addressing social equity: whenever one service or good is chosen over another, that choice indicates which service or good is worth more than the other and who will benefit from it. This suggests that when ecosystem goods and services are at issue, the most appropriate value-articulating methodology will be one that most closely mirrors Rawls's 'original position'—a procedurally based public forum in which people are brought together to debate before making value judgments. That is, to achieve the ideal of social equity, economic valuation should not focus exclusively on the aggregation of separately measured individual preferences, but should instead proceed through public argument and reasoning among free and equal citizens.

3. Failure of conventional valuation methods to account for social equity

The issue of social equity is often sidestepped in conventional economic analyses of ecosystem goods and services. For example, the most widely employed approach to nonmarket valuation involves techniques like contingent valuation, hedonic pricing, and the travel cost method (Mitchell and Carson, 1989; Hanley and Spash, 1993). These conventional valuation techniques begin with the assumption that outcomes generated by free and competitive markets set the appropriate standard for general welfare improvements through efficient resource allocation. The underlying assumption is that individuals act to satisfy their own preferences within budget and production constraints (O'Connell, 1982). When this standard economic model is extended to ecosystem goods and services, a concurrent focus on utility maximization and methodological individualism tends to follow (Ableson, 1979; Hanley and Spash, 1993; van den Bergh et al., 2000).

Conventionally, economists have approached questions of environmental valuation using the familiar language of individual consumer preferences and production relationships (Baumol, 1982). For example, working under the general rubric of fairness theory (Varian, 1974), several authors have grappled with ecological valuation under the neoclassical framework of individual utility maximization (Chavas, 1994; Barrett, 1996). In this literature, fairness is conceptualized as the 'absence of envy', where envy itself is defined as an individual's 'willingness to exchange circumstances with another, holding natural endowments constant' (Barrett, 1996). Thus, a 'fair' outcome is one which involves no envy by any individual of another (Holcombe, 1983). As we see it, this welfare theoretic approach to social equity is limited in two critical ways: (1) it remains axiomatically individualistic; and (2) it eschews interpersonal welfare comparisons in favor of intrapersonal comparisons.

A well-recognized problem in economics is that most ecosystem goods and services are not private goods (Samuelson, 1954). Things like 'global biodiversity' and 'climate regulation' have no explicitly identifiable private property rights because individuals cannot be excluded from enjoying them and no one can effectively 'own' them (Freeman, 1993). Economists have long recognized that if public goods are to be allocated efficiently, non-market mechanisms of valuation will be necessary (Krutilla, 1967; Anderson and Bishop, 1986).

The problem with conventional valuation techniques is not with their goal of improving environmental accounts. The measurement of shadow prices provides a useful evidentiary basis for social and political accountability; putting a 'price' on the environment provides a useful mechanism for making ecological problems visible and gives us evidence connecting powerful social actors to their environmental responsibilities. The problem is that due to its focus on utility maximization and a heavy reliance on individual preferences, the social equity of ecosystem goods and services tends to be effectively excluded from the results of non-market valuation (Jacobs, 1997).

Under conventional valuation techniques, social equity and normative judgment tends to be represented in terms of the fixed preferences of presumably sovereign individuals (Norton et al. 1998; Dryzek, 1990; van den Bergh et al., 2000). Consumers of ecosystem services may hold an

altruistic concern for other people, for future generations, for social justice and for the intrinsic value of nature when they are asked to 'put a price' on the environment, but these motivational concerns are axiomatically taken to exist within the locus of the individual (Freeman, 1993). In this manner, any 'commodity'—public or private—is deemed valuable only to the extent that it contributes to the goal of an individual's satisfaction.

4. Procedural fairness and discourse-based valuation

Thus far, we have argued that the valuation of ecosystem goods and services raises pervasive questions of social equity that are poorly addressed by conventional techniques. One obvious solution to this problem would be to adopt an explicit social welfare function that encompassed the goals of economic efficiency and social equity. Since the work of Arrow (1951), however, social choice theorists have discovered deep problems with the notion that social decisions can (or should) seek to maximize some index defined in terms of the utility achieved by each member of society (Arrow, 1951; Sen, 1979, 1995).

Alternatively, authors such as Rawls (1971) and Habermas (1984) have argued that social equity should be understood in terms of procedural norms in which notions of unforced agreement between free and equal moral persons play a central role (Rawls, 1971; Habermas, 1984). Here, social fairness is defined in terms of a deliberative forum that: (a) protects participants from uncompensated harms; and (b) ensures that participants have a common set of rights or capabilities. A key point is that basing valuation on individual preferences and utility maximization alone, as is done in conventional economic analysis, does not ensure the achievement of social equity goals. As Sen (1995) notes:

> Many of the more exacting problems of the contemporary world—ranging from famine prevention to environmental preservation—actually call for value formation through public discussion.

Following this logic, one approach to ecosystem service valuation that has gained increasing popularity involves the design of methodologies to ensure free and open group deliberation about the value of ecosystem goods and services (Coote and Lenaghan, 1997; Jacobs, 1997; Blamey and James, 1999). In this manner, meaningful ecosystem service values are meant to result, not from the aggregation of separately measured individual preferences, but from the consensus achieved through public debate; a notion rooted in the intuitive ideal of a democratic association through which the elucidation of social value proceeds through public argument among free and equal citizens (Cohen, 1997).

The reasoning behind the deliberative approach to valuation involves a relatively straightforward extension of social equity as procedural fairness (Holcombe, 1983; Habermas, 1998). Building on the insights of Rawls (1971) and Habermas (1984, 1998), the notion is that a fair outcome is one that results from a fair process. According to this view, fairness and reason do not reside in an abstraction of universal rights or the ethical substance of a particular community, but 'in the rules of discourse and forms of argumentation that borrow their normative content from the validity basis of action oriented to reaching understanding' (Habermas, 1998).

Hence, the goal is to ensure a free and fair system of discourse in which social power, deception and ideology do not influence decisions about economic value (Habermas, 1990). The basic requirements for such a system include equal access to debate, the absence of a powerful agenda setter, unrestrained access to raise and object to amendments, and the freedom of all participants to express their own attitudes, wishes and needs (van Mill, 1996). In this manner, ultimate success depends not on unanimity or collective action among all citizens, but on the formalization of procedures and conditions for achieving free and fair deliberation between them.

The conventional practice of welfare economics has come under criticism on both technical and political grounds precisely because of its failure to achieve these basic requirements (Sagoff, 1988;

Foster, 1997; Jacobs, 1997; Blamey and James, 1999). As Jacobs (1997) summarizes:

> If the deliberative model of value-formation on public issues is accepted, this suggests that public values towards environmental goods should not be gathered through private processes in which respondents are asked their choices in isolation. The value articulating institution should be 'public' and deliberative in character.

The purpose of discourse-based methods is, therefore, to reach agreement on what should be valued by or on behalf of society as a whole (Dryzek, 1987; Fishkin, 1991; Lafferty and Meadowcroft, 1996). By exposing participants' initial preferences to one another through 'reasoned debate', the logic goes, preferences may change and in this way, be brought closer together (Habermas, 1984). While this may not result in a complete convergence of values, compromise will still be achieved through a dialogue between competing judgments of the best interests of society as a whole, not a simple aggregation of individual preferences.

So, what would a discourse-based valuation methodology using small groups of citizen stakeholders actually look like? First, one of the defining features of the discursive approach is its reliance on the small group, rather than the individual, as the primary unit of analysis. A small group is generally defined in the social psychological literature as more than two individuals, and no more than twenty, whose dynamic interrelation with one another and common purpose leads to the shared perception by participants and outsiders alike, that this collective of individuals is a social unit (Kerr et al., 2000). The idea of a common purpose—particularly as it involves coordinated task activity—is the essential feature that distinguishes the small group from other types of social units.

Second, while there are no prima facie rules limiting the agenda of discussion or the sociopolitical makeup of the participants, it is clear that certain procedural rules would need to be followed to make the outcome fair:

1. each participant would be allowed to participate in discourse.
2. Each participant would be allowed to place issues on the agenda.
3. Each would be allowed to introduce his or her own assessment of an ecosystem good or service.
4. Each would be allowed to express their own attitudes, needs and preferences for an ecosystem good or service.
5. No speaker would be hindered by external compulsion or pressure.
6. The goal of discourse would be to reach a consensus value among the participants.

When properly conducted, then, discourse-based methods of ecosystem service valuation would provide a forum of manifest equality among a small group of citizen-stakeholders and involve open deliberation focused on the task of reaching consensus about the social value of an ecosystem good or service. In a well-ordered deliberative forum, debate would be organized around the acceptance of alternative conceptions of the common good. Participants would thus be encouraged not to take a narrow or group-interested standpoint and the parties would be reminded to be responsive to demands that are argued for openly in reference to a conception of the common good for society.

Ultimately, discourse-based valuation aims to elicit meaningful consensus-based value statements that are persuasive to all who are committed to the results of a free and reasoned assessment among citizens. While not limited to economic values, we nevertheless believe that value statements derived using discursive methods may be quite meaningfully reported in terms of dollars because these can then be used to complement and compare with results from more traditional valuation methods used in cost–benefit analysis (i.e. contingent valuation). In this sense, discursive techniques can be considered as providing a forum for discussing social value; one that serves as a constructive approach for eliciting economic value judgments for complex environmental issues (Gregory et al., 1993; McDaniels and Roessler, 1998).

The economic values derived using deliberative methods would be discussed in terms of social willingness to pay rather than in terms of individual willingness to pay (see Gregory and Wellman, 2001). For example, following the procedural rules outlined above, an intensive small group could render a judgment regarding the appropriate use of society's scarce financial resources (i.e. state or federal taxes) in order to achieve a specified provision of ecosystem services. Like a traditional CV exercise (Mitchell and Carson, 1989), this group of respondents would be presented with alternative policy scenarios, each representing different amounts of the desired ecosystem good or service (i.e. acres of forest habitat). Faced with this tradeoff, the group would then be asked whether they were willing to have society pay a specified amount of additional money in tax revenue (i.e. US $1 million or US $2 million) to provide for the specified amount of ecosystem goods or services provided in each scenario (i.e. 200 or 400 additional acres of habitat). In this manner, the group would provide values not in terms of each member's willingness to pay, but rather in terms of the group's willingness to have society pay.[3] The results would thus yield important information about social tradeoffs between policy options as well as dollar estimates for the social value of ecosystem goods and services.

5. Examples from the literature

Applications of discursive valuation methods have yet to fully emerge in ecological economics (Perkins, 2001). Most examples that do exist involve 'focus groups' (Morgan and Spanish, 1984; Johnston et al., 1995), 'in-depth' group discussions conducted on environmental issues (Burgess et al., 1988; Press, 1994; Gundersen, 1995) and 'citizen juries' (Coote and Lenaghan, 1997; Blamey and James, 1999). For these investigations, the research goal has generally not been to wind up with explicit economic values for ecosystem goods and services, but rather to explore the group processes surrounding environmental decision-making. Published results are, therefore, often rich in qualitative data that help us to understand the process of group-level environmental decision-making, but because they fail to generate value estimates in a dollar metric, there is no direct means of comparing them with conventional methods of environmental valuation.

For example, in a recent comparison of focus group and personal interview techniques in Mexico's Yucatan Peninsula, Kaplowitz and Hoehn (2001) show that small groups and individuals yield significantly different information about ecosystem services, but the authors stop short of eliciting economic value estimates from the two methods. After conducting a series of 12 focus groups and 19 individual interviews with residents from two villages near the Gulf of Mexico, the authors conclude that that 'focus groups and individual interviews are not substitutes' (p. 3), and further suggest that the methods are complementary (Kaplowitz and Hoehn, 2001). Interestingly, small discussion groups were found to yield significantly more ecosystem services than individuals, but individuals appeared to be more comfortable volunteering controversial information during private interviews. The key message of this study is not that one method is better than the other, but rather that the two approaches are complementary.

Multiattribute decision analysis (MDA) has also recently been adapted as a group-based approach for evaluating and selecting land and water resource management systems (McDaniels and Roessler, 1998; Prato, 1999). Here, as with conventional MDA (Keeney and Raiffa, 1976), the basic idea is that a given land area can be decomposed into an array of multiple attributes, each valued in its own metric (monetary or otherwise), which are then re-arranged into alternative scenarios between which 'social' decision makers are asked to make tradeoffs. Among other strengths noted in this recent literature, group-based MDA need not limit itself to assigning monetary values

[3] It must be remembered, however, that even under ideal conditions, there is no promise a consensus value will be forthcoming (Cohen, 1997). If not, then deliberation about among policy tradeoffs would need to conclude with voting, subject to some form of majority rule (Habermas, 1994; van Mill, 1996).

to ecological services. Moreover, the approach circumvents the classical utilitarian view of optimality by avoiding several assumptions employed in conventional environmental accounting (Keeney and Raiffa, 1976).

Another approach that has been proposed is the openly deliberative, or small 'group' contingent valuation exercise (Jacobs, 1997; Sagoff, 1998). While there is a long tradition of group research in CV, the goal of such research has generally been to increase the validity of elicitation procedures (Mitchell and Carson, 1989). With a group CV, on the other hand, the explicit goal would be to derive a group-consensus value for the ecological good or service in question. The valuation exercise would be conducted in a manner similar to a conventional CV survey—using hypothetical scenarios and tradeoffs between realistic payment vehicles—but not through private questioning. The group CV treats deliberation not as a diagnostic tool, but as a mechanism for social value elicitation.

Gregory and Wellman (2001) recently used a structured group process to elicit estimates of social willingness to pay for alternative management strategies in Tillamook Bay, Oregon, USA. This approach has its conceptual basis in the theory of multiattribute utility analysis (MAUT) and the techniques of decision analysis (Keeney and Raiffa, 1976; Von Witerfeldt and Edwards, 1986). Drawing from a random sample of utility ratepayers in the Tillamook Bay region, five group workshops were held ($n = 89$ participants) and respondents were asked to select among alternative policy actions to protect and restore tidal wetlands for salmon habitat, each of which was associated with a specific cost or benefit to society for additional land purchases. After selecting the most desirable policy option, groups were then asked if they would be 'willing to have society pay' additional money (US$ millions) in added taxes to implement the policy option (Gregory and Wellman 2001). In this manner, the authors were able to place a lower-bound (US$ 3000) and an upper bound (US$ 5000) on the social value for each additional acre of protected salmon habitat. The data were then used by Tillamook Bay National Estuary Project managers to decide whether or not it was worthwhile to purchase marginal farmland at US$ 3000–5000 per acre to attempt to restore the full range of ecological services. These results show strong support for adapting a structured group decision process to both clarify tradeoffs among different policy objectives and derive meaningful estimates of the social economic value of ecosystem goods and services.

Taken together, the results from recent studies in the literature suggest that there are some good reasons to believe that the valuation of ecosystem goods and services may be well suited to discourse-based methods. First, as we have seen, most ecosystem goods and services are public goods, and the social issues that surround them often tend to have multiple loci of social interest (Coates and Munger, 1995; Dryzek, 1996). Second, ecosystem goods and services tend to affect many people and groups in society, they raise ethical questions that are inherently public in character, and they play an integral role in defining a sustainable future (Lafferty and Meadowcroft, 1996; Daily, 1997). Finally, the process of forming preferences towards these goods and services may necessitate a more constructive approach to value elicitation (Gregory et al., 1993). A constructive approach assumes that people do not have well-ordered preferences for unfamiliar objects like ecosystem goods and services and that the elicitation process itself can help people form and express preferences in terms suited to the decision problem. To put a meaningful economic value on global biodiversity or ozone depletion may require discussion in order to understand and grapple with other interests and values, thereby testing one's own knowledge, value judgments and political arguments in open debate (Jacobs 1997).

6. Small group research: challenges and opportunities

The use of groups rather than individuals in the context of environmental decision-making is commonly justified on the grounds that small groups should bring more intellectual resources to bear

and, hence, increase the probability that more information about an ecosystem service will be generated and a higher quality valuation will result (Larson et al., 1994; Kaplowitz and Hoehn, 2001). Due to differences in training, background, and life experience, group members frequently will have different information about a given alternative under consideration. Hence, the logic goes, if group members effectively pool their unique, 'unshared' information with other members of the group, the group has a high probability of making a more informed choice than would otherwise be the case if the decision were left to any single individual (Winquist and Larson, 1998).

Empirical evidence from social psychology, however, suggests that small groups may not be very efficient at pooling unshared information, thereby leading to sub-optimal results. Perhaps the most dramatic example of small groups failing to achieve their full decision-making potential is provided by a series of social psychological experiments conducted by Stasser and colleagues with small decision-making groups (Stasser and Titus, 1985; Stasser et al., 1989; Stasser and Stewart, 1992; Stasser et al., 1995). Under this experimental tradition, information pertaining to various choice alternatives is distributed among all participating group members prior to discussion. However, some information is made available to every group member (shared), while some is available to only one group member or another (unshared). The finding has been that in general, groups will tend to discuss much more of the information that they initially shared in common than the information that was unshared (Larson et al., 1994; Schittekatte, 1996; Winquist and Larson, 1998). These results suggest that groups may forgo the potential benefits of pooling their members' unique knowledge and expertise, leading to less complete and more inaccurate decisions than would be the case if information pooling were to take place.

Viewed in the context of group valuation for difficult-to-define ecosystem goods like 'climate regulation' or 'refugia functions', we might assume that groups would indeed be better off discussing more of their unshared information (particularly in the presence of experts) because doing so would add to their collective knowledge base, whereas discussing already shared information does not. In general, one might reasonably hypothesize that the common pool of socially available information on biodiversity or global climate conditions is less accurate than specific domains of knowledge held by experts and involved stakeholders. Consider, for example, what would happen if a small group's shared information favored one climate change scenario, whereas their unshared information favored another (i.e. some individual members held information that was not 'brought out' in discussion). If members were to discuss only shared information, the resulting pattern of support would not be socially inclusive. This would not be the case if the process of group valuation explicitly provided mechanisms for members to reveal and discuss their unshared information.

Therefore, while discourse-based methods offer a novel and compelling approach to ecosystem service valuation and appear to satisfy many of the conditions for achieving social equity in the valuation of ecosystem services, several assumptions remain untested:

1. Socially fair outcomes are guaranteed by employing a fair procedure of deliberation. By employing rules of discourse that seek to minimize power relations among participants, consensual agreement will evolve from a fair procedure.
2. The provision of a forum for debate will encourage individual participants to engage in collective thinking about the common good. Individuals will not stop at stating their own preferences, but will go on to re-shape those preferences in terms of consensus values for ecosystem goods and services.
3. Deliberative techniques will expose participants to a wider range of points of view than would be possible if individuals were left to private contemplation, and this exposure will encourage a shift from a personal point of view to a wider, socially-inclusive perspective.
4. The act of deliberation and debate among participants leads to better decisions. If group members pool their information with other members of the group, the group will have a higher probability of making a more informed

choice than would be the case if the decision were left to a single group member.

As we have seen, recent developments in the ecological economics literature provide encouraging news for the examination of these fundamental assumptions. Now, the challenge is to identify and implement new procedures for testing their application in the field. While the completion of this task is beyond the scope of this paper, we can nevertheless suggest some basic guidelines.

First, a crucial design concern will involve the choice of a consistent metric for comparing values derived from discourse-based methods and other valuation techniques. In this case, we argue that information may be meaningfully reported in terms of assigned dollar values. While important qualitative and quantitative data about group processes and tradeoffs may ultimately be derived from discourse-based techniques, it will nevertheless be essential that results be articulated in a metric that is comparable with conventional ecosystem service valuation techniques such as the contingent valuation method.

Second, we believe that comparative, split-sample experimental designs would be helpful so that researchers could examine and isolate meaningful differences between discourse-based methods and conventional valuation techniques (Kerr et al., 2000). An example experiment might involve a baseline CV survey and a series of deliberative group experiments with respondents drawn from the same sample pool. The ecosystem goods and services assessed in both the baseline CV survey and structured group processes would be held constant and presented in the form of policy alternatives. The only difference would be in terms of the elicited expression of willingness to pay: for the small group, a social willingness to pay would be elicited ('how much is the group willing to have society pay for X?') and for the CV survey, individual willingness to pay estimates would be elicited ('how much are you willing to pay for X?'). Using this experimental design, important conclusions about the similarities and differences between discourse-based and conventional valuation methods might be drawn.

Third, discourse-based methods should be designed with a wide variety of citizen-stakeholder groups and facilitator/moderators to test the assumption that social deliberation exposes participants to a wider range of points of view and that small discursive groups bring more diverse resources to bear on an environmental valuation task. By testing alternative procedural conditions that aid or hinder groups in the process of generating social willingness to pay estimates, researchers might thus examine the factors that actually limit group discussion: information that members share in common (Stasser and Titus, 1985), individual members prediscussion preferences (Moscovici, 1985). Here, important technical considerations will involve examining the role of the group facilitator/moderator and the prediscussion background of group members.

Finally, the issue of social status and power differences that exist between different group members will need to be explicitly confronted (Shaw, 1981). The potential for interpersonal conflict in any small group setting is a very real one and cannot be readily ignored. Here, the research challenge will be to examine the role of pre-discussion social biases and power differences between group members and their impact on the outcome of discourse. For example, a variety of citizen-stakeholder group combinations could be examined while holding the object of valuation constant. Such a research design would yield comparable valuation results under different experimental conditions, thereby providing meaningful information on the impact of social status and power on the process of valuation.

By thus exploring and describing the dynamics of small group discourse in an environmental valuation context it should be possible to conclude whether or not small group valuation processes do indeed lead to meaningful economic values and 'socially fair' outcomes.

7. Conclusions

Discourse-based methods involving small groups of citizens have yet to be thoroughly engaged in the practice of ecosystem service valuation. This is true despite the fact that many ecosystem goods and services that come under

scrutiny in the public domain are considered to be public goods in the sense that they are collectively consumed and indivisible among individuals. Things like global climate regulation, biodiversity and freshwater services tend to be shared collectively by social groups; individuals do not own them outright. Yet, as we have noted, the conventional application of ecosystem service valuation relies heavily on methodologies like the contingent valuation method whereby individual citizens are asked to express their values of ecosystem goods and services in social isolation.

The paradox between the public nature of ecosystem services and the measurement of their economic value through individual expression has led to calls for more deliberative forms of environmental valuation to provide an alternative to standard valuation methods. Because the allocation of public goods affects other people, raises normative and ethical questions, and directly affects social well-being, we too have put forth the argument that discursive groups may provide an appropriate forum for fair and equitable environmental value formation. The most appropriate value-articulating institution may not involve the traditional measurement of economic values measured in social isolation, but instead, values derived in a forum of free and open discourse.

The key message of this paper is not that discourse-based valuation methods are better than conventional methods or that they should supplant such; rather, we see the two methodologies as complementary. Thus, ecosystem service valuation research should be cautious of relying upon information generated solely by conventional approaches before more research is done. The goal should now be to move the principle of social equity to the foreground of ecological economic research by focusing attention on ecosystem service valuation using discourse-based methods. By explicitly embracing the normative concept of equity within the methodology of ecosystem service valuation, new techniques for measuring economic values and understand fairness dilemmas over ecosystem services will be revealed.

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