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ANALYSIS

Post-normal science in practice: A Q study of the potential for sustainable forestry in Washington State, USA☆

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Abstract

Some ecological economists have advocated participatory decision methods, in which people act as citizens rather than consumers, as an epistemologically preferable alternative to a price-based valuation approach for determining the disposition of ecosystems. Q method is a research technique advocated by proponents of discursive democracy to assess the self described attitudes of participants in discourse around a particular topic. Techniques that attempt to discern public values around ecological systems without imposing contrived (e.g. only monetary) or unintentionally biased frameworks can be seen as advancing ecological economics as a post-normal science. Understanding the attitudes of groups involved in conflict over ecosystem use is crucial for designing policies that have a chance of being implemented, as well as being equitable and sustainable. Thus, the use of Q method is an essential step for supporting successful public participation in decisions affecting ecosystem sustainability. This paper reports the results of a Q study designed to ascertain: (1) the potential to find a common basis for cooperation among groups with a long history of conflict over forest management issues in the Pacific Northwest of the United States; and (2) the extent to which current science pertaining to sustainable forest ecosystem management is commonly understood among these same actors. Participants were asked to rank 64 statements about forest management in the region, including definitions of sustainable forestry, on a scale of +4 (strongly agree) to −4 (strongly disagree). Thirty people with a wide variety of backgrounds and experience with forest issues performed this "Q sort" and then were interviewed to provide context for their answers. The individual Q sorts were correlated and factor analyzed to derive ideal discourse types. Three distinct discourses about sustainable forestry emerged from the factor analysis. Results indicate a strong desire across stakeholder groups to engage in participatory decision-making with people from all sides of the issues. There also appears to be a lack of consensus about the exact meaning of sustainable forestry and a lack of familiarity with scientific concepts of ecosystem resilience among some groups. Recommendations for additional ways in which Q method can be applied by ecological economists as a practical means of advancing the field as a post-normal science are described in the concluding section.

Keywords: Post-normal science; Q method; Sustainable forestry

☆ Any views expressed or construed from this paper are those of the author alone and not necessarily those of the Washington Department of Fish and Wildlife.

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1. Introduction

Various authors writing in *Ecological Economics* have proposed a post-normal science framework for addressing social conflict surrounding sustainability issues (e.g., Funtowicz and Ravetz, 1994; Martinez-Alier et al., 1998; Muller, 2003). Such a framework recognizes that uncertainty is inherent in complex ecological and social systems, the quality of decision processes is a crucial consideration, and that values around ecological systems take many dimensions and can be incommensurable. Given these understandings, iterative, public, and inclusive processes are likely the best means of accessing and understanding those values as a foundation for formulating policy that leads to sustainable outcomes which are acceptable to all social actors involved. Post-normal science also includes a different way of viewing the role of scientists: as a set of actors who participate in the public dialogue and decision-making processes alongside members of the general public rather than as technocratic advisors to a closed decision process among policy elites (O'Conner et al., 1996). Such a shift is important because the risks and uncertainties involved with altering complex ecological systems for economic development require broad, informed social discussion as a basis for decisions regarding the trade-offs involved with potentially irreversible alteration of ecosystems (Faucheux and Froger, 1995; Martinez-Alier, 2002).

Post-normal science proponents advocate a combination of institutional analysis and iterative public dialogue using multi-criteria decision analysis as a tool to understand the structure of conflict and potential for conflict resolution (O'Conner et al., 1996; Munda, 2000). Multi-criteria decision aid (MCDA), however, requires that all participants' views are well understood in order to construct policy or management scenarios that reflect the positions of all relevant stakeholders. Once this is achieved, multi-criteria decision techniques appear to have promise in facilitating public understanding of the decision problems at hand (Munda, 1995; De Marchi et al., 2000; Strassert and Prato, 2002). However, without significant interactions with those whom any alternative would affect, it would be difficult for a researcher to construct an authentic set of alternatives that would be meaningful and potentially acceptable to those communities.

The work of Habermas (1984, 1987, 1998) suggests that understanding the linguistic structure of discussion is important for setting up situations in which the potential for fair, non-coerced discourse can be reached—a situation called communicative rationality. Further work by Dryzek (1990, 1997) describes the practical political translation of communicative rationality into discursively democracy—public decision-making structures based on fair, non-coerced discussion. Ecological economists have described the use of discourse-based techniques for understanding how the public values ecological systems as being necessary to achieving fair outcomes (Wilson and Howarth, 2002). Political discourse analysis is one such discourse-based technique, and is an important tool for researchers wanting to make a contribution to the furtherance of discursive democracy because of its potential to illuminate different values held among people while imposing minimum researcher bias. Discursive analysis grounded in the theory of communicative rationality (Habermas, 1984) has thus been advocated as a means of furthering the goals of ecological economics in a manner that is equitable to all parties concerned and that is consistent with a post-normal science approach (O'Hara, 1996). However, O'Hara (1996) did not describe specific research techniques that could be used to link the intent to use discursive ethics as a means of improving the quality of research designed to understand how people value ecosystems.

The structure of discourse around any particular topic can be analyzed using Q method, developed by psychologist and quantum physicist William Stephenson in the 1930s (Stephenson, 1935, 1953). The main distinguishing feature of Q method from traditional survey methods is that it views subjects as self-referent and thus allows them to define the discourses and categories themselves rather than having the researcher define categories for analysis. In addition, the researcher herself or himself can be considered as a subject by participating in a Q study, along with the respondents, thus there is not the structural power imbalance inherent in the subject/object duality of survey research (Dryzek, 1990). Q method is therefore epistemologically consistent with the intent for researchers to contribute to high quality decision processes with fair outcomes in conflict over sustainable ecosystem management and with the role of scientists as participants in