

Institutions matter: the need to address the institutional challenges of ecosystem management

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Abstract

As management philosophy focused on sustainability, ecosystem management calls for a reassessment of how we approach nature, science and politics. Implementation of ecosystem management will require changes in society's institutions. However, the exact requirements for institutional change are unclear. Therefore, in order to move toward implementing ecosystem management, a better understanding of the relationships between institutions and natural resource management will be required. The purpose of this paper is to examine institutional barriers and incentives to ecosystem management and to encourage a dialogue on this subject among resource managers, the public, and researchers. To this end, the paper identifies five problem areas where additional understanding of the institutional requirements for implementing ecosystem management is needed. © 1998 Elsevier Science B.V.

Keywords: Ecosystem management; Natural resource policy; Institutions; Policy

1. Introduction

As management philosophy focused on sustainability, ecosystem management calls for changes in how we approach nature, science, and politics. It requires that we ask ourselves what kind of society, and correspondingly, what kind of relationship with nature we want. To answer these questions, and perhaps more importantly, to put these ideas into action, requires an examination of society's institutions. Indeed, if we are to change the way we manage resources, we must understand how much of our lives are lived in and through institutions, and that better institutions are essential if we are to lead

better lives (Bellah et al., 1991). Specifically, we must survey our present institutions and discern what is healthy in them, and what is not, as well as what needs to be altered (Bellah et al., 1991). The purpose of this paper is to examine institutional barriers and incentives to ecosystem management and to encourage a dialogue on this subject among resource managers, the public and researchers (See the work of Cortner et al., 1996 for an in-depth treatment).

This paper is a companion to the document, 'Social aspects of new perspectives in forestry: a problem analysis,' by Stankey and Clark (1992). The Stankey and Clark document focused on the relationship between social values and new approaches to land management. They identified six general topics needing research, including: integration of social values; understanding public values for resources; public acceptability of management approaches; public

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participation mechanisms; the structure, procedures and values of natural resource organizations; and forums for deliberating over the issues. Social values and institutions are closely linked together. Values of the past created the institutions of the present, while changing social values will affect the institutions of the future. Thus, it is important for institutional research regarding ecosystem management to build upon research and understanding of current values and how these values can be integrated into management strategies. Moreover, we need to understand how approaches to natural resource management help create the foundations of social institutions.

This paper provides some directions for how to begin this admittedly complex and even daunting prospect of examining institutional questions in light of the move toward ecosystem management. First, the concepts of ecosystem management and institutions will be addressed. Next, five institutional problem areas, where additional study and research are needed to link changes in management with institutions, are identified and discussed.

2. Ecosystem management—what is it?

Ecosystem management has been defined in a variety of ways. In general, however, there is agreement that a goal of ecosystem management is to sustain ecosystem health, integrity, diversity and resilience to disturbances (Aplet et al., 1993; Iverson, D., 1993. Framework for a shared approach to ecosystem management. Unpublished manuscript. On file at the Water Resources Research Center, University of Arizona, Tucson, AZ). This is achieved through the maintenance of productivity, biodiversity, landscape patterns, and an array of ecological functions and processes (Society of American Foresters, 1992; Slocombe, 1993; Grumbine, 1994). It also requires the integration of social, economic, and ecological considerations at broad spatial and temporal scales (Salwasser, 1994; Moote et al., 1994). Ecosystem management's focus on sustainable systems contrasts with traditional natural resource management's focus on sustained yields of resource outputs (Gordon, 1994). A literature review, conducted in 1993, of writings in the areas of conservation biology, ecosystem management, integrated environ-

mental management and adaptive management, revealed five recurrent principles of ecosystem management (Moote et al., 1994). These principles include:

- socially defined goals and management objectives;
- integrated, holistic science;
- broad spatial and temporal scales;
- collaborative decision building; and
- adaptable institutions.

Not all researchers embrace all principles. Moreover, there is little consensus about the new terminology and classifications being used to discuss ecosystem management (Shannon and Robinson, 1994). Ecosystem management is an evolving concept which will be further defined as attempts are made to turn philosophy and theory into policy and on-the-ground management practices.

3. Institutions—what are they?

While grounded in the ecological sciences, ecosystem management has a large social component; it is as much a social endeavor as it is a scientific endeavor (FEMAT, 1993). Moreover, it is a very political process (Cortner and Moote, 1992). Orr (1992) has called politics the process through which we define the terms of our collective existence. Institutions are the expressions of the terms of collective human experience. Institutions reflect the ways people interact with one another and the ways they interact with their environment. Further, they are the means people use to solve social problems. The term institution has been defined in various ways; however, the broadest definitions include both formal institutions, such as administrative structures, and also informal institutions, such as customs and practices.

Recent trends indicate increasing dissatisfaction with many of society's institutions, including those that manage natural resources. For example, over the past 20 years, increasing numbers of administrative and judicial appeals of public land plans and management decisions have been filed. Similarly, hostile standoffs between the public and agencies indicate that the values society places on natural resources are in conflict with the institutions that direct re-

source management. These institutions have been characterized as insular, hierarchial, output oriented, and protective of turf, attributes which are now being contested and criticized.

An ecosystem approach will require changes in institutions (Sirmon et al., 1993; Cortner and Moote, 1994). Laws which seemed sensible in a time when resources were believed to be inexhaustible are now outmoded. It may be that some institutions that served us well in the past have outlived their intended missions and objectives, and in some cases, their usefulness (Wilkinson, 1992). The basic structure of many current institutions reflects a fundamentally different view of land, natural resources, and people than proposed under ecosystem management with its themes of holism, dynamism, complexity, and uncertainty (Kessler, 1994). An ecosystem approach suggests institutions should be complex and adaptive, rather than hierarchical and rigid. Indeed, our institutions for natural resource management, research, policy, and education may well be the most significant barriers to the adoption of ecosystem management (Kessler, 1992; Slocombe, 1993; Grumbine, 1994; Kessler, 1994).

However, the exact requirements for institutional change are unclear. In part, this is because of the complexity of the subject. But it is also because we have failed to recognize the linkages between the way people relate to nature and each other and the character of our institutions. For efforts to implement ecosystem management to succeed, a much better understanding is needed of the relationships between this change in philosophy for resource management and society's institutions.

4. Institutional problem areas

This paper identifies five problem areas where improved understanding of the institutional issues associated with ecosystem management is needed. These problems are not intended to be a comprehensive classification of issues, nor is any priority given to the order they are presented. They are intended to encourage a dialogue between resource managers, the public, decision-makers, and researchers and to initiate research that will provide information for the implementation of ecosystem management.

4.1. Problem one: the extent to which existing laws, policies, and regulations may constrain or aid the development and implementation of ecosystem management policies, programs, and practices is unknown. The economic dimensions of ecosystem management are also unknown

While existing laws may contain fragments of ecosystem management concepts, there are still significant barriers to be confronted (Keiter, 1994). For instance, laws dealing with natural resource management and environmental quality tend to divide ecosystems by arbitrary political boundaries that bear no relationship to ecological structures or functions. Further, most laws separate natural resource management and production into single resource categories, such as timber or endangered species. Federal anti-trust and private property laws as well as the potential impact of the Federal Advisory Committee Act (FACA) must be considered when managing resources cooperatively and across jurisdictions. If ecosystem management is to connote more than 'another layer of standards and guidelines' (p. 4 of AFPA, 1993), there is a need to assess the applicability of these laws and regulations to ecosystem management.

The role of the judicial system in resource management also needs to be examined in the context of ecosystem management. Particularly since World War II, the courts have played an important role in defining and enforcing environmental standards and planning procedures. Similarly, federal budgetary processes have been criticized for not giving local decision-makers flexibility in tailoring their resource allocation and land use decisions to site-specific and landscape conditions (Sample, 1994a). Current budgetary allocations are also contingent on commodity outputs, and do not provide long-term support for maintaining and monitoring ecosystem health.

Finally, the economic dimensions of ecosystem management must be better addressed and understood. While recognizing that it is difficult to place economic values on ecosystem functions, the costs of both adopting and not adopting an ecosystem approach need to be defined. Further, an analysis of the role that economic institutions, specifically the market, play in promoting the adoption of ecosystem management on both public and private lands is

needed (Ewing, 1994). Ultimately, there is a need to clarify the relationship between economic growth and ecosystem sustainability.

4.2. Problem two: institutional mechanisms for managing across jurisdictions under an ecosystem approach are largely unknown and have uncertain effects

Ecosystems cross political and jurisdictional boundaries; it is rare to find an ecosystem wholly contained on a single owner's land. An ecosystem is often a patchwork quilt of federal, state, tribal, corporate, municipal, private and other types of land. The multiple scales of ecosystem management requires cooperation among a broad range of interests as well as improved interorganizational coordination (Sample, 1994b). A significant challenge is to design institutions and cooperative approaches to management that cross these jurisdictional boundaries. Efforts to manage land uses divorced from ownership realities are ineffectual (Geisler and Kittel, 1994). Most significant is the fact that efforts to implement ecosystem management will fail unless they include private landowners.

Responsibility for the management of federal and state lands is divided among a myriad of agencies. These agencies typically have overlapping jurisdictions and differing mandates often leaving them working at cross-purposes which may impede efforts to adopt ecosystem management (Keiter, 1989). As Clark et al. (1991) note, the "fragmentation of authority and overlapping agency authorities can result in cooperation or mutual obstruction" (p. 415). There is a need to identify what incentives and resources will be necessary for cross-coordinated land management among agencies, industries, and private landowners.

Additionally, it needs to be recognized that property tenure systems in today's society are dynamic and diverse. Too often, public debate, policy, and research focus on a dichotomy of private vs. public property, a dichotomy that misses the complexity and richness of the hybrid forms of land ownership that already exist (Geisler and Kittel, 1994). Property itself is a social construction which is undergoing continual modification through court rulings, new philosophical and ethical currents, and changing so-

cial values toward labor and capital (Geisler and Kittel, 1994). Changes in the institutions of property warrant deeper understanding as they relate to ecosystem management.

4.3. Problem three: the adoption of ecosystem management as a management philosophy may require internal organizational change, and new arrangements among resource management agencies and the public. Further, the level of public support for ecosystem management is unknown

Organizational change, especially changes in administrative structure and procedures, and changes in the relationships among land management agencies and the public, are crucial aspects of ecosystem management. Because of the complexity and uncertainty of moving to this approach, as well as the need to develop better relationships with the public, institutions will be required to improve decision-making flexibility and openness, and to develop new models of leadership and coordination (Lee and Stankey, 1992; Boyle et al., 1994). Current institutional norms and procedures will have a significant impact on the development of these organizational contexts and may produce both opportunities and barriers to implementing an ecosystem management approach. For example, agency culture may present a substantial barrier to ecosystem management; "the federal agencies may be incapable of looking beyond their own traditions, values, and management problems to translate... ecosystem management goals... into meaningful policies and practices" (p. 418 of Clark et al., 1991). These norms and procedures are found not only within the natural resource agencies, but also within other organizations such as interest groups, universities, and professional societies.

The relationship between the public and the agencies' roles in resource decision-making is another issue that will affect the adoption of ecosystem management. Presently, there is a lack of mutual trust among resource agencies, other organizations, and the public. Restoring trust between the public and governmental agencies will require a more flexible and open decision-making process and a shift away from a linear step-by-step model of public participation to one which encourages a rich public discourse (Cortner and Shannon, 1993). If ecosystem

management is to succeed, it will require widespread public support; support which must be generated through democratic processes. Therefore, a key responsibility for agencies will be to provide forums where public deliberation can occur (Stanley, 1983; Force and Williams, 1989; Stanley, 1990). Instead of relying on technical experts to set management goals, ecosystem management—when seen as a process where goals are socially defined—will require that decisions be made by a wide variety of people. Thus, the role of the land manager may include educator, technician, mediator, conflict manager, public relations specialist, scientist, or a combination of these roles.

4.4. Problem four: ecosystem management requires the examination of the theories which guide resource management

To fully understand the implications of alternative resource policies such as ecosystem management, there must be an examination of the theoretical principles upon which resource policies are founded. Too often, the links between theory and the development of policy are overlooked. Questions of political theory, whether implicit or explicit, underlie every policy (Stillman, 1976; Sandel, 1988). Reich notes that beneath the activities of elected officials, administrators, and the public exists a “set of first principles that suggest what good policy-making is all about” (p. 1 of Reich, 1988).

Examining the existing theoretical base can lead to new ways of thinking about relationships between humans and nature, humans and government, and among humans themselves. For example, in the past, theoretical principles underlying natural resource management in the US have emphasized the mastery of nature by humans (Wallace et al., 1996). Nature has historically been viewed as separate and apart from humans and traditional science has reflected this world view. Further, American political traditions and institutions emphasize the rights of the individual over the interests of the community (Stegner, 1992; Christensen and Richardson, 1994). Policies in the past have been forged with little awareness of the larger community, or of the actual landscape. However, by embedding human society in nature, ecosystem management implies a concern for both community and place.

Important questions about the forms of government are also implicit in an ecosystem approach. Some have argued that the threat to ecosystem health is of such a magnitude that more centralized government authority and power will be necessary to protect and manage ecosystems for the future (Ophuls, 1976). Others counter that a more decentralized approach to resource administration is needed so that resource management can be tailored to local ecosystem conditions (Rodman, 1980; Behan, 1988). Alternative ways of looking at the role of government and ecosystem management must be addressed.

Similar shifts in thinking may be needed regarding science and how we approach knowledge. In traditional resource management, shortcomings in knowledge are attributed to a lack of theoretical, methodological or technical rigor, or inadequate budgets (Stankey, 1994). Under an ecosystem approach, knowledge is a much more fluid concept. Knowledge is recognized as having a social character; science and knowledge are viewed as shaped by society as a whole (Bird, 1987; Wheatley, 1992). Under an ecosystem approach, experts work in concert with society, not alone as is traditionally done, to understand social and ecological problems.

4.5. Problem five: current methodological approaches for researching institutional questions are insufficient to address the goals of ecosystem management

Ecosystem management will require new methods of scientific inquiry, including different approaches to knowledge and research methods. Our understandings of the world and consequently, our research needs are changing (Christensen and Richardson, 1994). We cannot simply ask the same research questions or use the same methods we have in the past either from the biophysical or the social science perspective. Institutional studies for ecosystem management will require integrating traditionally distinct schools of thought in the social and natural sciences and among disciplines. Separateness within the sciences is a barrier and is contradictory to the idea of holism embedded in ecosystem management.

Attention by researchers and resource managers must also focus on questions concerning how to measure policy successes and failures. In the past, methods used in policy analysis and evaluation have

been narrow in scope, focusing on whether specified objectives have been met; economic indicators most often served as the predominant evaluative criteria (Wallace et al., 1995). Ecosystem management will require the development of new approaches that can recognize unintended consequences, which may vary quite dramatically from stated goals or objectives. A project that is deemed a ‘failure’ from the standpoint of stated objectives may still have yielded tangible benefits such as a decrease in conflict, the establishment of communication, or lessons for application at another place or time.

Better methods must be developed to integrate economic analysis into broader social and political research. Under an ecosystem approach, there is an increasing range of values whose importance and worth are not captured by the economic marketplace (Stankey, 1994). For example, forest uses for aesthetic and spiritual purposes and the importance of biological and structural diversity are difficult to measure by economic valuation methods. There is a need to understand how (or if) these values can be represented in a way that permits incorporation of those elements which are generally not viewed in economic terms (Krutilla and Fisher, 1985).

Better methods must also be developed to understand the relationship between scientific data and uncertainty. Natural resource issues are often characterized by high levels of complexity and low levels of knowledge, leading to high levels of ambiguity in decision-making (Stankey, 1994). To identify relevant issues, agency personnel and scientists must develop better ways of communicating with the public. Broad conceptual terms such as ecosystem management, sustainability, and forest health pose particular barriers to communication, given that people have very different views of the meanings of such terms (Christensen and Richardson, 1994). Finally, researchers need to reduce jargon and to speak plainly so that resource managers and the public can understand them.

5. Conclusion

Ecosystem management suggests alternative organizational structures, cooperation across institutional

and land boundaries, large scales and broad focuses for management and research, and the need to learn while acting. Barriers may be found in current laws, in the organizational relationships among levels and branches of government and between private and public interests, in the theories underlying resource management, and in scientific methods. However, incentives and avenues for change are also present. Instead of ‘recipes’ from manuals, textbooks, current policies/status quo, or traditions, management actions may be viewed as an ‘improvisory art’ where “we combine familiar and unfamiliar components in response to new situations” (p. 3 of Bateson, 1989). Such an approach is in contrast to the goal-centered, rational, linear approach of most of today’s natural resource-related institutions (Force, 1994).

Ecosystem management thus, provides a framework for reassessment of natural resource management and institutions in society (Manfred Stanley, 1994, personal communication). It is “an opportunity to invite professionals and citizens alike backstage behind community and social institutions, so that they may discover the ropes and pulleys, scripts, and stage directions which generate the social dramas of institutional life” (Stanley, 1994). How society is organized, and what kind of institutions we have, both formal and informal, matter. Because ecosystem management calls for fundamental alteration in the institutional structures and processes that govern resource management, it is bound to engender controversy. Managers will need to work with the public and with scientists to recognize the intended and unintended consequences that implementation of ecosystem management will entail. Action will be needed to resolve the inevitable institutional issues. Collaboration among managers, scientists and the public to address the institutional barriers and incentives to ecosystem management presents an opportunity to explore from many facets and perspectives what institutional questions matter.

Acknowledgements

This paper was prepared in part with funding from the USDA Forest Service, Pacific Northwest Research Station, Portland, OR.

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