*Essays*

# Rethinking Community-Based Conservation

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**Abstract:** *Community-based conservation (CBC) is based on the idea that if conservation and development could be simultaneously achieved, then the interests of both could be served. It has been controversial because community development objectives are not necessarily consistent with conservation objectives in a given case. I examined CBC from two angles. First, CBC can be seen in the context of paradigm shifts in ecology and applied ecology. I identified three conceptual shifts—toward a systems view, toward the inclusion of humans in the ecosystem, and toward participatory approaches to ecosystem management—that are interrelated and pertain to an understanding of ecosystems as complex adaptive systems in which humans are an integral part. Second, I investigated the feasibility of CBC, as informed by a number of emerging interdisciplinary fields that have been pursuing various aspects of coupled systems of humans and nature. These fields—common property, traditional ecological knowledge, environmental ethics, political ecology, and environmental history—provide insights for CBC. They may contribute to the development of an interdisciplinary conservation science with a more sophisticated understanding of social-ecological interactions. The lessons from these fields include the importance of cross-scale conservation, adaptive comanagement, the question of incentives and multiple stakeholders, the use of traditional ecological knowledge, and development of a cross-cultural conservation ethic.*

**Key Words:** adaptive management, comanagement, common property, community-based conservation, participation, scale, social-ecological systems, traditional ecological knowledge

Repensando la Conservación Basada en Comunidades

**Resumen:** *La conservación basada en comunidades (CBC) se fundamenta en la idea de que si la conservación y el desarrollo se pueden alcanzar simultáneamente, entonces se pueden servir los intereses de ambos. Ha sido controversial porque los objetivos de desarrollo comunitario no siempre coinciden con los de la conservación en un caso determinado. Examiné la CBC desde dos ángulos. En primer lugar, la CBC puede verse en el contexto de cambios en paradigmas en ecología y ecología aplicada. Identifiqué tres cambios conceptuales (la visión de sistemas, la inclusión de humanos en el ecosistema y los métodos participativos para la gestión de ecosistemas) que están interrelacionados y que corresponden a una concepción de los ecosistemas como sistemas adaptativos complejos en los que los humanos son una parte integral. En segundo lugar, investigué la factibilidad de la CBC, usando información proveniente de campos interdisciplinarios emergentes que han estado analizando varios aspectos de los sistemas acoplados de humanos y naturaleza. Estos campos (propiedad común, conocimiento ecológico tradicional, ética ambiental, ecología política e historia ambiental) proporcionan nuevas percepciones para la CBC. Pueden contribuir al desarrollo de una ciencia de conservación interdisciplinaria con un entendimiento más sofisticado de las interacciones socio-ecológicas. Las lecciones de estos campos incluyen la importancia de la conservación trans-escala; la cogestión adaptativa; el tema de incentivos e intereses múltiples; el uso del conocimiento ecológico tradicional y el desarrollo de una ética de conservación trans-cultural.*

**Palabras Clave:** cogestión, conocimiento ecológico tradicional, conservación basada en comunidades, escala, manejo adaptativo, participación, propiedad común, sistemas socio-ecológicos

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## Introduction

What are the prospects for community-based conservation? The question is of concern to a broad range of conservationists, social scientists, and resource management professionals. On one hand, there have been increasingly greater efforts and investment in community-based conservation. On the other hand, there has been increasingly greater concern that community-based conservation is not working and that the emphasis on "community" and "participation" is diluting the conservation agenda.

More inclusive, people-oriented and community-based approaches to conservation are in part a reaction to the failures of exclusionary conservation, in a world in which social and economic factors are increasingly seen as key to conservation success (Ghimire & Pimbert 1997). Community emphasis is motivated by the idea that "if conservation and development could be simultaneously achieved, the interests of both could be served. Thus the old narrative of 'fortress conservation' was largely displaced by the counter-narrative of development through community conservation and sustainable use" (Murphree 2002:2). Such is the popularity of the concept that it soon may "be difficult to find a rural conservation project that does not define itself as community-based" (Hackel 1999:730).

However, the results of community-based conservation experiments have been mixed at best, and the performance of many has been well below expectations (Kellert et al. 2000; Barrett et al. 2001). This has led to various debates in the conservation literature over the merits of community-based conservation (Agrawal & Gibson 1999) and to critical evaluation from a number of different perspectives (Redford & Sanderson 2000; Brosius & Russell 2003). Two positions have been emerging. One holds that the failure of community conservation is not due to the weakness or impracticality of the concept, but rather to its improper implementation, especially with regard to the devolution of authority and responsibility (Songorwa 1999; Murphree 2002). The second holds that the conservation and development objectives, both important in their own right, should be delinked because the mixed objective does not serve either objective well (Redford & Sanderson 2000).

This dilemma is part of the larger debate of preservation versus sustainable use and the participation of rural populations in decisions that affect their lives. The debate has its counterparts in other environmental fields such as resource management and development, with respect to the merits (or lack thereof) of centralized resource management (Holling & Meffe 1996), participatory development planning (Chambers 1983), and the significance of local perspectives and knowledge in environmental management in general (Berkes & Folke 1998).

I approached the question of community-based conservation from two different vantage points. First, community-based conservation can be seen in the context of larger, historical conceptual shifts (paradigm shifts) that have been occurring in ecology and applied ecology. These changes are not specific to conservation ecology but have implications for it; they provide context and benchmarks for all areas of applied ecology. Second, in light of this "bigger picture," I examined community-based conservation with an eye to lessons from emerging new interdisciplinary fields that deal with coupled systems of humans and nature. Researchers in several fields, such as common property and traditional ecological knowledge, have been pursuing various aspects of social-ecological system relationships. These interdisciplinary fields provide insights into the community-based conservation debate and may contribute to the development of a fuller understanding of social-ecological interactions, providing firmer ground for a truly interdisciplinary conservation science.

## Conceptual Shifts in Ecology

Community-based conservation has emerged at a time when the science of ecology and the various fields of applied ecology seem to be in the midst of three conceptual shifts: a shift from reductionism to a systems view of the world, a shift to include humans in the ecosystem, and a shift from an expert-based approach to participatory conservation and management (Levin 1999; Bradshaw & Bekoff 2001; Ludwig 2001). I expand on each.

### Systems View of the Environment

A complex adaptive system often has a number of attributes not observed in simple systems, including nonlinearity, uncertainty, emergence, scale, and self-organization (Levin 1999; Gunderson & Holling 2002). These characteristics of complex systems have a number of important implications for conservation and environmental management, as can be seen from a consideration of nonlinearity and scale.

The issue of nonlinearity comes up with respect to management institutions. The older, conventional emphasis on centralized institutions and command-and-control resource management is based on linear cause-effect thinking and mechanistic views of nature. It aims to reduce natural variation in an effort to make the ecosystem more productive, predictable, and controllable. But the reduction of the range of natural variation is the very process that may lead to a loss of resilience in a system, leaving it more susceptible to crises (Holling & Meffe 1996). Nonlinearity is also an issue with respect to specific relationships and processes. Nonlinear effects have been documented in conservation biology—for example, in the interactions of elephants and people. The two coexist up to a certain threshold of human population density, beyond which elephants disappear (Hoare & du Toit 1999).

The issue of scale has implications for the match between institutions and ecosystems and for perspectives that may be held by different agents. Take the question of match. Can a given conservation problem be managed by a centralized agency or are there more appropriate structures of governance in which the scale of management institution is matched to the scale of the ecosystem? Often, one-size-fits-all kinds of management ignore scale issues. Such mismatches of scale may be one of the key reasons for the failure of environmental management regimes (Folke et al. 2002).

One of the insights from complexity thinking is that a multiplicity of scales prevents there being one "correct" perspective in a complex system. Phenomena at each level of the scale tend to have their own emergent properties. The system must be analyzed simultaneously at different scales. In biodiversity conservation, for example, different groups of conservationists focus on different levels of biological organization: they may use different research approaches and principles at the genetic, species, and landscape levels. All these levels are the "correct" level to consider at the same time. Similarly, a number of agents or actors may hold different but equally valid perspectives on a conservation problem. Redford and Sanderson (2000:1364) allude to this phenomenon: "they [forest peoples] may speak for *their* version of a forest, but they do not speak for the forest *we* want to conserve" (emphasis added).

### Including Humans in the Ecosystem: Social-Ecological Systems

There is general agreement that we can ill afford to consider humans separately from nature, especially in today's heavily human-dominated world (Kates et al. 2001; Gunderson & Holling 2002). It has become increasingly important to incorporate the dynamic interactions between societies and natural systems, rather than viewing people merely as "managers" or "stressors." There is little agreement, however, on how this can be accomplished, conceptually or methodologically.

In our work, we use the term *social-ecological system* to refer to the integrated concept of humans in nature (Berkes & Folke 1998; Berkes et al. 2003). A number of different terms are in use to denote the idea of humans as part of ecosystems. One of them is the dwelling perspective of Ingold (2000), which refers to the "... practical engagement of humans with others of the dwelt-in ecosystem." This practical engagement, building knowledge and ecological relationships, is the basis for putting humans back into the ecosystem. It involves the "skills, sensitivities and orientations that have developed through long experience of conducting one's life in a particular environment" (Ingold 2000:25).

The social-ecological system has many levels. The links between social and environmental systems are different at the level of the community than they are at the level of the nation state. For example, Gibson's 1999 book, *Politicians and Poachers*, deals with the political economy of conservation in four African countries. It shows that the forces operating at the level of the nation state (many of them related to the peculiarities of postcolonial governments) are quite different from those at the levels of region and community.

Putting humans back into the ecosystem requires using all possible sources of ecological knowledge and understanding as may be available. Using knowledge and perspectives from the community level can help build a more complete information base than may be available from scientific studies alone (Berkes et al. 2000). The partnership of local communities with scientists is not an unusual phenomenon. Details of such research collaboration, and its positive outcomes for ecosystem management, have been documented, for example, by Olsson and Folke (2001), from Sweden and by Blann et al. (2003) from Minnesota (U.S.A.).

A word of caution is appropriate here. The term *community* in community-based conservation is gloss for a complex phenomenon because social systems are multiscale and the term *community* hides a great deal of complexity. Idealized "images of coherent, long-standing, localized sources of authority tied to what are assumed to be intrinsically sustainable resource management regimes" (Brosius et al. 1998:165) are just that—idealized. As many conservationists know, it is often difficult to find a cohesive social group to work with in the field. Communities are elusive and constantly changing. A community is not a static, isolated group of people. Rather, it is more useful to think of communities as multidimensional, cross-scale, social-political units or networks changing through time (Carlsson 2000).

Hence, it is more productive to focus not on communities but on institutions, defined as the set of rules actually used, the working rules, or rules-in-use (Ostrom 1990). Institutions are humanly devised constraints that structure human interaction, made up of formal constraints (rules, laws, constitutions), informal constraints (norms of behavior, conventions, and self-imposed codes of conduct), and their enforcement characteristics. I have specifically examined those institutions that mediate between social and ecological systems (Berkes & Folke 1998) and have focused on the dynamics of these institutions: their renewal and reorganization, learning and adaptation, and ability to deal with change (Berkes et al. 2003).

### End of Management by the Expert-Based Approach?

Many of our environmental problems, including those related to conservation, do not lend themselves to analysis by the conventional, rational approach of defining the problem, collecting data, analyzing data, and making decisions based on the results. There is too much uncertainty;

targets keep shifting, and the issues must often be redefined (Kates et al. 2001).

These make a class of problems that Ludwig (2001) and others have called "wicked problems," those with "no definitive formulation, no stopping rule, and no test for a solution," problems that cannot be separated from issues of values, equity, and social justice. Ludwig (2001) argues that where there are no clearly defined objectives and where there are diverse, mutually contradictory approaches, the notion of an objective, disinterested expert no longer makes sense. Hence, a new kind of approach to science and management must be created through a process by which researchers and stakeholders interact to define important questions, objectives of study, relevant evidence, and convincing forms of argument. This kind of research, referred to by Kates et al. (2001) as sustainability science, requires place-based models because understanding the dynamic interaction between nature and society requires case studies situated in particular places.

To deal with the implications of complex systems, working partnerships can be built between managers and resource users. This is done, for example, in adaptive management, which recognizes, as a starting point, that information will never be perfect (Holling 2001). The use of imperfect information for management necessitates a close cooperation and risk-sharing between the management agency and local people. Such a process requires collaboration, transparency, and accountability so that a learning environment can be created and practice can build on experience. This approach, bringing the community actively into the management process, is fundamentally different from the command-and-control style.

These three conceptual shifts in ecology—toward a systems view, inclusion of humans in the ecosystem, and management by participatory approaches—are related. They all pertain to an emerging understanding of ecosystems as complex adaptive systems in which human societies are necessarily an integral part. We can abandon Enlightenment assumptions of predictability and control; we should at least be very skeptical of them. We need to recognize the limits of expertise and the advantages of participatory conservation and management. Along with the conventional biological science of conservation, there is an emerging social science of conservation that may provide a more nuanced understanding of social systems. To move toward an interdisciplinary science of conservation, we need to learn from the lessons emerging from several new interdisciplinary fields.

## Toward an Interdisciplinary Conservation

Asking whether community-based conservation works is the wrong question. Sometimes it does, sometimes it does not. Rather, it is more important to learn about the conditions under which it does or does not work. A number of interdisciplinary subfields have in fact been pursuing elements of this question and have contributions to make to the conservation dilemma. These include common property, traditional ecological knowledge, environmental ethics, political ecology, environmental history, and ecological economics (Table 1).

These subfields have a number of characteristics in common. All are recent, dating largely from the 1970s and 1980s. All are "bridging" fields, spanning different combinations of natural- and social-science thinking. Each of them developed in response to needs or gaps in understanding the linkages between social systems and ecological systems. All provide insights relevant to the conservation dilemma.

For example, one of the first questions to ask in the common-property approach to conservation is who controls a given area or resource. In the winter of 2000, I was heading out to Misali Island Conservation Area in Zanzibar, East Africa, with a group from the Ford Foundation and the Zanzibar Department of Natural Resources. On the way, we ran into a make-shift processing plant in

**Table 1. Integrative subfields that explore new approaches to social-ecological systems (summarized from Berkes et al. 2003).**

| *Field* | *Area of Interest* |
|---|---|
| Common property | Examines the links between resource management and social organization; analyzes how institutions and property-rights systems can deal with the "tragedy of the commons." |
| Traditional ecological knowledge | Refers to a local or traditional knowledge base built not by experts but by resource users. Questions expert science and argues for diverse kinds of knowledge. |
| Environmental ethics | Recognizes a wide diversity of spiritual and ethical traditions in the world that offer alternatives to current Western views of the place of humans in the ecosystem. |
| Political ecology | Analyzes power relationships among actors in the way decisions are made and benefits shared; interprets events with reference to the behavior of actors in pursuit of their own political agendas. |
| Environmental history | Interprets landscapes in terms of their history and analyzes their dynamics, making ecological sense of resource-use practices that have created these landscapes. |
| Ecological economics | Promotes an integrated view of economics within the ecosystem, viewing the economic system as a subset of the ecological system; concerned with a wider range of values and a longer time horizon. |

which a worker was boiling some marine product in a large vat. The worker explained that he was processing sea cucumbers for Japanese buyers (and probably for Chinese markets). We were witnessing, on an outlying island in Zanzibar, in the middle of nowhere (by our standards), an example of global market integration, with local divers responding to East Asian market demands.

For all we knew, these sea cucumber species were not locally used resources and did not come under local controls or common property institutions. Hence they were prime candidates for open-access exploitation and depletion, as common property theory tells us (Ostrom 1990). By contrast, locally used resources are rarely open-access or freely available to all; rather, there are often local rules about how resources should be used. These sets of "rules-in-use," or institutions, as common property researchers often use the term, may facilitate or constrain conservation (Becker & Ostrom 1995). If local common property institutions are consistent with conservation objectives, as in the case of traditional sacred areas (Ramakrishnan et al. 1998), that is an ideal situation. Then the conservation task is to strengthen these institutions and not to undermine or replace them (Brosius & Russell 2003).

More commonly, however, local rules are about use, allocation, and conflict management and not about preservation per se. Conservation planning becomes considerably more difficult when local institutions are not in line with conservation goals (Becker 1999). The choice of action follows the lines of our conservation dilemma. Either we pursue conservation independently of local resource use and livelihood needs (Redford & Stearman 1993) or we deal with local resource users as potential conservation allies and look for common objectives that would serve conservation while producing community benefits (Alcorn 1993).

In many cases, local common property systems do not exist or are not adequate for the conservation task. If resource users lack rights or incentives to design and enforce rules that control the use of a resource, and government rules are not enforced, open-access exploitation may ensue (Becker & Ostrom 1995). In other cases, local institutions may exist, but the scope of the resource or conservation problem may be beyond the ability of local institutions to deal with effectively (Ostrom et al. 1999). This brings us back to the question of complexity and scale.

Barrett et al. (2001) observed that the current fashion for community-based conservation overemphasizes the role of local communities, much as the previous command-and-control, government-driven model underemphasized it. In discussing tropical biodiversity conservation, they noted that local, community-based institutions are only one level in a complex system, one that is often ill-equipped to deal with the issues. Government agencies in many of these countries also tend to be weak, leaving biodiversity conservation in an environment of weak institutions. What is the alternative? Barrett et al. (2001:497) suggest that the best management designs may "involve distributing authority across multiple institutions, rather than concentrating it in just one," not an easy task, given the weakness of existing institutions at all levels.

Where institution building is needed, institutions may be "crafted" using the elements of rule-making and self-organization, or institutional capital, that exist in any group or society (Ostrom 1990). The literature on the fields of common property and participatory development suggests that institution building at the community level may take on the order of 10 years for simple, local-level institutions. In the case of institutions that span the scale from local to regional and national levels, as in various comanagement regimes, there is relatively little data on which to base conclusions. This is a current area of research in the common-property field, and preliminary indications are that a decade is certainly not an overestimate for the time required to develop effective cross-scale institutions (Berkes 2002).

The literature on common property and some of the other fields highlighted in Table 1 provides a number of lessons and insights. A full discussion of these insights is beyond the scope of this paper, but I focus on five conceptual themes: the importance of cross-scale conservation, adaptive comanagement, the question of incentives and multiple stakeholders, the use of traditional ecological knowledge, and development of a cross-cultural conservation ethic.

## Cross-Scale Conservation: Grappling with Complexity

A major change in the science of the last few decades is the recognition that nature is complex (Levin 1999). Natural processes are seldom linear and predictable. Ecosystems and social systems tend to be organized hierarchically. Each level in the hierarchy is independent, to some degree, of the levels above and below, and each level operates under somewhat different principles. Hierarchies make sense to conservation biologists, for example, because they know that one can work at the genetic, species, and landscape levels of biodiversity. Each level is partially dependent on the levels above and below; each level shares some of the same principles with other levels but also follows principles that are specific to itself.

Exploring the scale issue further in community-based conservation, centralized management is a poor fit for complex systems: it works neither at the level of the central government nor at that of the community—and it creates mismatches in scale (Folke et al. 2002). If conservation issues are complex-systems problems, they have to be addressed simultaneously at various scales. That is, a cross-scale approach to conservation is necessary, addressing governance and "community" at the

various scales appropriate for the conservation problem in question.

The cross-scale interplay of institutions involves horizontal and vertical linkages (Ostrom et al. 2002; Young 2002). Hence, cross-scale conservation requires linking institutions horizontally (across space) and vertically (across levels of organization). Horizontal linkages may include, for example, networks of communities involved in community-based wildlife conservation initiatives, comparing experiences and learning from one another. Such linkages may include multistakeholder bodies and networks of nongovernmental organizations (NGOs), learning networks, and various kinds of civil science networks (Gadgil et al. 2000; Olsson & Folke 2001; Blann et al. 2003). They may include networks of government agencies dealing with problems that cut across their mandates or international networks focusing on a shared problem, as in the case of epistemic communities (Haas 1990) and policy networks (Carlsson 2000).

Linkages across levels of organization can take a number of different forms. Comanagement involves vertical linkages; in some cases, so do multistakeholder bodies, development organizations, citizen science organizations, policy communities, and social movement networks (Berkes 2002). There is growing interest in different arrangements of institutional interplay (Young 2002) and in special groups that can enhance vertical links between local and global levels, called boundary organizations (Cash & Moser 2000).

Even though linkages are key, the community level is still singularly important because long-term conservation objectives are easier to achieve with the cooperation of local people than without (Ghimire & Pimbert 1997; Brown 2002). Cross-scale conservation has to be planned bottom-up, rather than top-down, because it makes sense to start solutions at the lowest organizational level possible. The relevant principle, sometimes called the *subsidiarity principle*, may be phrased thus: the goal should be as much local solution as possible and only so much government regulation as necessary.

### Adaptive Comanagement: Dealing with Dynamics

The term *comanagement*, or the sharing of management power and responsibility, usually refers to a two-link partnership between community and government. But this conception of comanagement does not fully capture the complexities of cross-scale interaction that may include multiple horizontal and vertical linkages. Judging by the conservation-development cases compiled by the Equator Initiative (2002) for the Johannesburg Summit, a typical conservation case may involve (1) three levels of organization, community, regional or national, and international; (2) a number of local groups at the intra-community level; (3) a variety of NGOs and government agencies; and (4) one or more international groups. Hence, comanagement in practice is often a linkage of multiple parties, involving both horizontal and vertical dimensions.

Detailed and long-term studies of comanagement reveal that there is another dimension to be considered. Comanagement is an evolutionary process requiring mutual learning and trust-building. The term *adaptive comanagement* may be used to denote a concept that combines the vertical linkage characteristic of comanagement with the dynamic learning characteristic of adaptive management.

Folke et al. (2002:20) define adaptive comanagement as a process by which institutional arrangements and ecological knowledge are tested and revised in an ongoing process of trial–and-error. Ruitenbeek and Cartier (2001:8) define it as a long-term management structure that permits stakeholders to share management responsibility and to learn from their actions. These definitions are useful because they highlight two key processes: (1) sharing of management power and responsibility through multiple institutional linkages that may involve government agencies, NGOs, and other communities and (2) feedback learning and building of mutual trust among the partners.

Ruitenbeek and Cartier (2001) advance the interesting notion that adaptive comanagement may be an emergent property of a complex system of management; that is, it can evolve over time from simple systems through feedback learning. This can happen with little or no external intervention; conversely, policy intervention to introduce adaptive comanagement could lead to system failure. Contrast this with the emphasis on deliberate institution building in the work of Ostrom and colleagues (Ostrom 1990; Ostrom et al. 1999; Barrett et al. 2001).

Paradoxically, both arguments may be partially correct. Community-based management systems have spontaneously emerged through self-organization in various parts of the world (Berkes et al. 2003), and management systems do evolve over time (Olsson & Folke 2001; Blann et al. 2003). Although adaptive comanagement cannot be imposed from the top down, its emergence can be assisted by creating a favorable environment through such measures as enabling legislation to recognize local rights over land and resources. Not only can local institutions be assisted by capacity building, but appropriate government institutions also need to be developed and put into place.

### Questions of Incentives and Multiple Stakeholders

The logic of the original integrated conservation-development projects (ICDPs), and community conservation in general, was to create a stake for the local community in conserving a particular resource (Brown 2002). There is little debate on the question of whether incentives

for conservation are important—they are. The parallel finding in the commons literature is that incentives for management through the creation of property rights are important for the management of commons (Ostrom et al. 1999).

In the case of community-based conservation, there has often been a mismatch between what conservationists have thought of as community benefits (e.g., the sharing of financial benefits from ecotourism) and what multiple stakeholders in communities may have considered benefits (Songorwa 1999; Brown 2002). One of the conclusions emerging from this literature is that the conception of local incentives purely in terms of community economic benefits is too narrow, too simplistic, and potentially counterproductive. There are two reasons for this.

First, just as "the community" is complex and elusive, the distribution of benefits from any conservation or management project is also complex and elusive. Kellert et al. (2000) used six social and environmental indicators to study cases of community resource management and found that these projects rarely resulted in the more equitable distribution of power and economic benefits. It is a well-known phenomenon that local elites tend to capture the benefits from development interventions, so a conservation-development project that starts with the aim to provide community benefits often ends up resulting in a less equitable distribution of power and assets.

Second, rural communities in the developing world rarely equate benefits with simple monetary rewards. Various kinds of social and political benefits are also likely to be important. Key considerations include equity—fairness in the distribution of benefits—and empowerment, defined by Chambers (1983:11) as "the process through which people, and especially poorer people, are enabled to take more control over their own lives, and secure a better livelihood, with ownership of productive assets as one key element." Because many rural livelihoods are based on mixed strategies of wage employment and resource use, what people value is going to vary from case to case. Access to resources is almost always important; hence, any conservation measure that closes access to an area or a resource is likely to be opposed, at least by some members of the community.

Community-based conservation projects need to pay more attention to questions of equity and empowerment. They can start by asking some of the questions political ecologists ask: What is the distribution of benefits and costs? How do different actors relate to the resource in question? How do power relations at the local level derive from differences of class, ethnicity, and gender? (Brosius et al. 1998; Brosius & Russell 2003). If equity and empowerment issues can be addressed, livelihoods can drive conservation rather than simply being compatible with it (Brown 2002).

### Use of Local and Traditional Ecological Knowledge

Different actors define knowledge, ecological relations, and resources in different ways and at different geographic scales. For example, a forest-dwelling indigenous group may see the value of the forest (source of fruit, medicinal plants, game) quite differently from a forest company or a conservation agency. Their forest knowledge and ecological relations may also be defined quite differently. In some cases, the objectives of the indigenous group and a conservation agency may be consistent, even though their environmental perceptions and world views may be quite different, as in the case of sacred areas (Ramakrishnan 1998). In other cases, however, such as the management of protected areas in New Zealand, both objectives and world views may be different (Roberts et al. 1995).

*Indigenous knowledge* may be used as a generic term to refer to knowledge systems of indigenous peoples, and *traditional ecological knowledge* may be defined as "a cumulative body of knowledge, practice and belief, evolving by adaptive processes and handed down through generations by cultural transmission" (Berkes 1999:8). As a complex of knowledge, practice, and belief, traditional knowledge tends to be experiential and closely related to a way of life. It is multigenerational and is passed on orally, rather than through book learning. Hence, it is different from scientific knowledge in a number of substantial ways. Although many community-based conservation projects attempt to use local and traditional ecological knowledge, the relationship between scientific knowledge and local knowledge is not always comfortable.

The use of traditional knowledge in the last decade or so indicates that indigenous peoples and local communities have become more guarded about their knowledge and have started to use it politically and strategically for territorial claims. Numerous cases in North America, Central America, South and Southeast Asia, and Oceania indicate that this is the case (Berkes 1999; Ford & Martinez 2000). The trend is toward research projects based on traditional ecological knowledge that are participatory in nature, with the community becoming a partner in the cooperative process of knowledge creation and sharing, as opposed to being the object of research (Berkes 1999).

Research based on participatory approaches is important for civil society because it helps empower indigenous peoples and community groups. It also provides place-based case studies for the interaction of researchers and stakeholders, who can define research questions and assess evidence through these case studies (Kates et al. 2001). Science and local knowledge can interact to improve the understanding of both parties of the need to conserve, as in the case of Ecuadorian *garua* forests (Becker 1999). Collaborative research projects that involve local people from the outset generate possibilities

for complementary use of scientific and traditional knowledge (Berkes & Folke 1998; Berkes et al. 2000).

### Developing a Cross-Cultural Conservation Ethic

Conservation programs often need to encompass a broader view of the livelihood needs of local people and their knowledge and interests. Further, they may need to consider broader definitions of conservation. Our definitions of conservation have perhaps been too simplistic and too Western. Local support for conservation remains weak in many countries because conservation is often regarded as a concern of elites who are insensitive to rural people and their livelihood needs. We need to diversify the base of people who speak for the earth and build constituencies for conservation (Brosius & Russell 2003).

To do so may involve linking conservationists with indigenous groups and local associations. Experience from the Amazon area, for example, shows that the expulsion of local communities from protected areas may result in their replacement by powerful economic groups and large-scale resource developers. The activities of communities of small-scale farmers, fishers, and forest users may not fit well with the narrower definitions of conservation (Redford & Stearman 1993), but in many cases they are the best natural allies for conservationists (Alcorn 1993).

Brosius and Russell (2003:55) call for "a social definition of conservation that validates and encourages small-scale local conservation efforts, that links conservation with issues such as soil fertility degradation and loss of traditional food crop varieties, and that entails a new kind of relationship between grassroots groups and international organizations." Examples of such socially defined conservation include shade-grown coffee, which conserves some components of biodiversity, and a host of environmentally friendly local-level development projects documented in the Equator Initiative (2002) and elsewhere. Such practical examples of local conservation are easy to support and appreciate, but developing a cross-cultural philosophy of conservation is much more difficult.

For example, New Zealand's Conservation Act of 1987 directs the Department of Conservation to establish co-management arrangements with the Maori, in accordance with the principles of the Treaty of Waitangi. The problem is that the conservation ethic adopted by the act involves "the preservation and protection of . . . resources for the purpose of maintaining their intrinsic values . . . ." This conservation ethic is at odds with the Maori conceptualization of humans "as part of a personified, spiritually imbued 'environmental family' . . . . Earth's bounty is considered to be a gift, necessitating reciprocity on the part of human users in order to maintain sustainability" (Roberts et al. 1995:14). Sustainability requires maintaining stewardship (kaitiaki) over land and resources. Hence, the imposition of the Western concept of a dichotomy between humans and nature and the setting aside of land for preservation serve to alienate Maori from their stewardship responsibilities (Roberts et al. 1995).

The attitude that "we respect the land because we use it" is common in North and South American aboriginal traditions and in many other parts of the world. This stewardship ethic does not fit well with the conventional Western conservation ethic. Accommodating a diversity of perspectives and developing a pluralistic cross-cultural conservation ethic remains a challenge.

## Conclusions

I have focused on community-based conservation, but perhaps the larger issue is not whether or not communities conserve. The larger issue is rethinking conservation at a time when there is a historical shift in ecology and applied ecology toward a systems view of the environment, a perspective that sees humans as part of the ecosystem, and an emerging practice of participatory management. Many leading ecologists, such as Levin (1999) and Holling (2001), see ecosystems as complex adaptive systems characterized by historical dependency, complex dynamics, inherent uncertainty, multiple scales, and multiple equilibria. Such integrated complex systems do not divide along disciplinary lines; they are integrated social-ecological systems.

Conservation has become participatory for two reasons. First, there has been a rise of stakeholders and civil society in general throughout the world. Some would say this is an inevitable development of the postmodern age, like globalization. Second, participatory approaches have come to dominate management because the very nature of complex environmental problems requires a different, participatory approach; as Ludwig (2001) puts it, the age of management is over.

It is useful to consider this larger picture in rethinking community-based conservation. As conservation scientists, we need to come to grips with these new realities. "Community-based conservation," as a fad (Hackel 1999), has not been very helpful. After all, "communities" do not conserve or despoil; at least, they do not act as simple, isolated agents. Rather, they are embedded in larger systems, and they respond to pressures and incentives. It may be more useful to rethink community-based conservation as shorthand for environmental governance and conservation action that starts from the ground up but deals with cross-scale relations. To ground conservation effort, we need a more nuanced understanding of the nature of people, communities, institutions, and their interrelations at various levels.

There is little evidence that community-based conservation has benefited from the last two decades of findings from fields, such as common property, that investigate integrated social-ecological systems. There have

been many lessons and insights, of which I address a selected few. They go a long way toward conceptualizing an interdisciplinary science of conservation and include the following.

(1) The cross-scale approach to conservation alerts us to the notion that the scale at which we view a complex system affects what we see (Levin 1999). Matching the scale of management to the scale of the system to be managed and implementing solutions at the local level first are both important principles to follow.
(2) Adaptive comanagement captures two key elements to making community-based conservation work: sharing of management power and responsibility—as opposed to token consultation and passive participation—and creating a context that encourages learning and stewardship and builds mutual trust.
(3) Incentives are multidimensional. Equity and empowerment are often more important than monetary incentives for community-based conservation. A workable conservation project helps implement decision making processes that are legitimate, accountable, and inclusive and that take into account multiple stakeholders and interests (Agrawal & Gibson 1999).
(4) Knowledge is power, and the use of local and traditional ecological knowledge is a mechanism for comanagement and empowerment. Traditional knowledge is not another resource to be mined by outsiders. Rather, traditional knowledge projects can be partnerships for the cooperative process of creating and sharing knowledge.
(5) Our definition of conservation is Western-centric. Is this the right time to start looking seriously at some time-tested traditions of resource use and to develop a cross-cultural pluralistic definition of conservation? This may be an important question to ask if the challenge is to broaden the base and build more inclusive, robust constituencies for conservation.

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