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Community Natural Resource Management: Promise, Rhetoric, and Reality

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Community natural resource management (CNRM) has been extensively promoted in recent years as an approach for pursuing biological conservation and socioeconomic objectives. The rationale for CNRM is often compelling and convincing. Relatively little data exists, however, regarding its implementation, particularly the reconciliation of social and environmental goals. This article summarizes empirical evidence regarding the implementation of CNRM, based on five case studies in Nepal, the U.S. states of Alaska and Washington, and Kenya. Six social and environmental indicators are used to evaluate and compare these cases, including equity, empowerment, conflict resolution, knowledge and awareness, biodiversity protection, and sustainable resource utilization. The results of this analysis indicate that, despite sincere attempts and some success, serious deficiencies are widely evident. In especially Nepal and Kenya, CNRM rarely resulted in more equitable distribution of power and economic benefits, reduced conflict, increased consideration of traditional or modern environmental knowledge, protection of biological diversity, or sustainable resource use. By contrast, CNRM in the North American cases was more successful. Institutional, environmental, and organizational factors help explain the observed differences.

Keywords biodiversity, community resource management, Kenya, Nepal, sustainability, USA

Variations of what can be collectively termed community natural resource management (CNRM) have exerted significant impact on the organization of natural resource management during the past decade and more. Various expressions of CNRM include social and community forestry, community wildlife management, cooperative or comanagement, buffer zone management, participatory multipurpose community projects,

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communal area management for indigenous resources, and others (Western and Wright 1994). Despite often important differences, all these expressions of CNRM share certain characteristics, including:

- A commitment to involve community members and local institutions in the management and conservation of natural resources.
- An interest in devolving power and authority from central and/or state government to more local and often indigenous institutions and peoples.
- A desire to link and reconcile the objectives of socioeconomic development and environmental conservation and protection.
- A tendency to defend and legitimize local and/or indigenous resource and property rights.
- A belief in the desirability of including traditional values and ecological knowledge in modern resource management.

This mixture of political, organizational, socioeconomic, epistemological, and institutional features of CNRM has been rationalized and promoted in various ways (IIED 1994; Western and Wright 1994; Lynch and Talbott 1995; Kothari *et al.* 1997; Uphoff 1998). CNRM has been advanced as a way of improving the social and economic standards of local and rural peoples (Wells and Brandon 1992). An emphasis on power, participation, and property rights of frequently marginalized peoples also represents a prominent objective (Gilmour and Fisher 1991; Little 1994; Lynch and Alcorn 1994; Strum 1994; Sarin 1995). An additionally compelling aspect of CNRM is its stress on achieving conservation goals through economic and social incentives, and by incorporating the traditional knowledge and wisdom of local peoples accumulated over generations of intimate participation with the natural environment (Berkas *et al.* 1994; Kleymeyer 1994).

Rather than being new, CNRM can be viewed as a modern attempt to revive often quite established and traditional local and indigenous cultural and institutional mechanisms for managing and conserving the natural environment (Croll and Parkin 1992; Berkas *et al.* 1998). The reality for much of the world, however, is that many traditional practices for regulating nature have eroded as a consequence of expanding markets, industrialization, urbanization, state power, economic globalization, and profound alterations in property rights, life-styles, and consumption patterns (Burch 1986; Goodland *et al.* 1990; Miller *et al.* 1991; Worster 1993). The desire to revive, at least in modified form, traditional resource management practices often originates in the belief that it may better achieve and reconcile two persistent and rarely attained objectives: the alleviation of rural poverty and the conservation of biological diversity (Parker 1997; Butler 1998; Mehta and Kellert 1998; Wainwright and Wehrmeyer 1998).

CNRM initially gained attention during the early 1970s when many became disenchanted with the results of large-scale, capital-intensive, and centrally planned conservation and development projects (Horowitz and Painter 1986). Interest particularly developed in agriculture, water management, and forestry, centering on promoting the participation and enhancement of the power and decision-making role of local communities (Little 1994). Community approaches further developed in national park and protected area management, with many believing the combined effects of ecological insularization and chronic conflict with local peoples jeopardized the long-term sustainability of protected areas (Dasmann 1984; Machlis and Tichnell 1985; MacKinnon *et al.* 1986; West and Brechin 1991; Nepal and Weber 1995; Stevens 1997; and others).

In these and other cases, the arguments for CNRM were both powerful and convincing. Yet promise and rhetoric represent one reality, and the implementation

and delivery on optimistic aspirations and pronouncements quite another. Achieving the goals of CNRM has been complicated and organizationally challenging. Effectively implementing CNRM necessitates a careful and difficult blending of local, national, and sometimes international interests and institutions, as well as reconciling multiple and sometimes conflicting objectives. By contrast, state management of natural resources, although fraught with myriad difficulties and little evidence of broad-based success, is often less complicated and difficult.

This article examines the experience of CNRM in three countries, namely Nepal, Kenya, and the United States. It cites factors associated with the success, shortfall, and failure of CNRM. Data were obtained in a series of case studies conducted during the period 1993–1998. The complexity and variability of CNRM make comparative evaluations difficult. To facilitate comparisons, we selected six variables covering economic, social, and environmental objectives of CNRM. These six variables and brief attributes of each include:

- *Equity*—the distribution and allocation of socioeconomic benefits and resources.
- *Empowerment*—the distribution of power and status, particularly among local peoples, including authority devolved from central and state governments to local peoples and institutions; as well as participation in decision making, sharing of control, and/or democratization.
- *Conflict resolution*—the handling and resolving of conflicts and disputes over resources among local peoples and among local, state, and national entities and interests.
- *Knowledge and awareness*—the consideration, incorporation, and production of traditional and modern ecological knowledge in managing natural resources.
- *Biodiversity protection*—the conservation and protection of biological diversity and associated habitats, including the preservation and recovery of rare, imperiled, or flagship species, or imperiled populations or stocks of species.
- *Sustainable utilization*—the consumptive and nonconsumptive utilization of natural resources in ways intended to maintain the long-term availability of these resources in a nondiminished manner for present and future generations.

Study Approach

A detailed account of the social and ecological contexts and methods employed in each of the case studies is not possible because of space constraints, but these are described elsewhere (Ebbin 1998; Mehta and Kellert 1998; Heinen and Mehta 1999; Mehta et al., submitted). A brief description of the study areas and our methods is presented instead.

Study Areas

Nepal

The assessment of CNRM in Nepal involved case studies in the Annapurna Conservation Area (ACA) and Makalu-Barun Conservation Area (MBCA). Both areas are located in the Himalayas and have a diverse fauna and flora. Varying ethnic, cultural, and linguistic groups reside within these areas. The great majority of these people rely on subsistence agriculture and pastoralism for their livelihoods, although incomes are often supplemented by soldiering, seasonal labor, and trade. Tourism is also an important source of income for people in these areas. ACA is managed by a national, nongovernmental organization (NGO), while the management of MBCA is a joint undertaking of the Nepal wildlife agency and an international NGO (the United States-based The Mountain Institute). Both areas receive external financial support to

implement conservation and development programs. Formal, community-based institutions have been organized in each area with legal authority to use and manage community forests and other natural resources.

Kenya

The Kenya case focused on the Kimana Community Wildlife Sanctuary (KCWS), located in southern Kenya. KCWS was developed as a consequence of a growing realization that wildlife conservation in the region needed to reach beyond the boundaries of protected areas and include community involvement to achieve its conservation goals (Ndung'u et al., 1996). The KCWS includes several important ecological habitats (see Irgia 1995), and serves as a wildlife corridor between Amboseli and Tsavo West national parks. Resident people are predominantly Maasai. Pastoralism is the main occupation of the majority of the people, although many have turned to settled agriculture. Tourism also contributes to the local economy. KCWS is managed by a board of local community members. The Kenya Wildlife Service, a parastatal agency, financially and technically supports the conservation and development programs of KCWS. Local communities have legal rights and authority to use and manage the natural resources of KCWS.

United States

The North American case studies involved cooperative management of North American Pacific salmon (*Oncorhynchus* spp.) in the states of Washington and Alaska. The Washington case study occurred in the Puget Sound region, with comanagement involving 20 native tribes possessing legal fishing rights working jointly with the Washington State Department of Fish and Wildlife. The Alaska case study occurred in the Kuskokwim River watershed area, where management of the salmon resource was the focus of a working group of 12 members including fishing organizations and interests, local commercial and subsistence users (mostly tribes), fish processors, and the Alaska Department of Fish and Game (ADFG). All members were involved in deliberations and decision making, although final management authority resided with ADFG.

Methods

Diverse methods were employed in the five case studies, including quantitative and qualitative data collection from both primary and secondary sources. The Nepal case studies occurred from 1996 to 1998. Four hundred randomly selected persons residing in each of the two conservation areas were surveyed, structured interviews were conducted with field staff and senior government officials, and more informal and open-ended interviews were conducted with community leaders.

The Kenyan case study occurred in 1996–1997, and in the summer 1998. Data collection methods included semistructured interviews with a sample of 50 local people, participant observation of meetings and daily activities of KCWS management, and review of official records and other relevant literature.

Data for the U.S. case studies were collected during 1993–1995. Three methods were principally employed: (1) participant observation at meetings and fishing activities; (2) review of management documents and fisheries data; and (3) semistructured interviews with a sample of 228 persons, including Puget Sound and Kuskokwim members and fishermen, past and present comanagers, and other persons involved in salmon management.

Study Findings

Limited space necessitates only a summary of the findings, although more detailed results can be found elsewhere (Ebbin 1998; Mehta and Kellert 1998; Heinen and Mehta 1999; Mehta et al., submitted). The overall implementation of CNRM varied greatly, with some programs marked by relative effectiveness and success, and others burdened by mismanagement and failure. Based on these analyses, our general conclusion is that the problems and deficiencies of implementing CNRM were more evident than expressions of efficiency and effectiveness. Moreover, most of the success encountered involved socioeconomic objectives, while most of the failures focused on conservation and biodiversity protection goals. As noted, six variables representing socioeconomic and environmental objectives of CNRM guided our analysis, and a summary of the results is presented next.

Equity

CNRM occasionally resulted in more equitable distribution of benefits and decision-making responsibility among local, often subsistence, and indigenous peoples. The shift from state to more community-based management of natural resources sometimes assisted marginalized and neglected groups in obtaining a greater role and stake in the allocation and proprietary control of local natural resources. Despite this occasional success, we frequently encountered—especially in Kenya and Nepal, although far less in North America—a highly uneven distribution of benefits. Certain individuals, communities, and interests materially and politically benefited to a far greater extent than others. For example, local communities living in remote areas of ACA and MBCA in Nepal received substantially less development benefits than their counterparts residing in closer proximity to the CNRM headquarters. In Kenya, only a small minority of community members received monetary benefit from KCWS, and a general consensus existed that revenues were misappropriated by board members and used for personal gain.

Empowerment

The various case studies revealed a conscious attempt at devolving authority from national and state to more local and often indigenous peoples and institutions. Yet the actual extent and effectiveness of this devolution was uneven and often questionably effective. Local communities were frequently only marginally more empowered than prior to the implementation of CNRM, with considerable control still residing in national and state authorities. Moreover, devolution often resulted in power being concentrated in particular groups and sectors in the local communities.

This situation was especially evident in Kenya and Nepal, where certain groups unduly appropriated and often misused their increased authority to advance personal interests and agendas. For example, in both Nepal and Kenya, traditionally powerless groups such as women and minorities were rarely empowered by the shift to CNRM. In ACA and MBCA, women and low-caste people were highly underrepresented in executive committees responsible for managing local resources. In Kenya, devolution of authority typically resulted in power being concentrated in particular community groups and members, with others routinely excluded. Moreover, in both Nepal and Kenya, the entitlement of community forests and wildlife remained largely with the state, and government officials often intervened if local institutions did not perform within the parameters of approved management plans.

The major exception, as indicated, was in North America, where a substantial and significant shift in power from state to local and indigenous peoples occurred under CNRM. In the Puget Sound case study, comanagement especially empowered participating tribes, often providing indigenous groups with the status of partners in fisheries management. Native participation in Kuskokwim comanagement decision making was limited, however, by not having sufficient legal rights and authority to manage local fisheries. The North American cases suggest the importance of possessing a clearly articulated judicial and legislative mandate as a basis for significant and sustained transfer and redistribution of power and authority.

Conflict Resolution

Latent and at times overt conflict was frequently encountered in the cases examined, although it was often difficult to determine if this contention was more extensive than prior to the implementation of CNRM. What seemed clear was that CNRM did not dampen or diminish the extent or frequency of resource disputes. Moreover, CNRM at times fostered conflict by unrealistically expanding individual and group expectations, unduly increasing conservation and development objectives, and diffusing decision-making authority among a wide array of interest groups and stakeholders.

Tension and conflict were most evident in Nepal and Kenya and least present in the North American cases. In Nepal, conflicts occurred both within and between institutions. For example, local elites often held key institutional posts, sometimes resulting in power struggles among members and between members and users. In some instances, power struggles occurred between local institutions due to overlapping jurisdictions and mandates (Heinen and Mehta 1999). In Kenya, wildlife depredation conflict was especially prominent and often rarely resolved, in part due to little or no compensation being provided for damage inflicted. Conflicts also occurred among KCWS board members and the public over allegations of power abuse and embezzlement, as well as occasional disputes with neighboring group ranches over boundary delineations. In the U.S. cases, evidence occurred of increased intertribal allocation conflicts in the Puget Sound region and upriver-downriver disputes in the Kuskokwim watershed, although these conflicts were often settled at the local or regional level.

In general, CNRM occasionally offered a more effective institutional basis for expressing and resolving disputes. Moreover, the experience of conflict can be a creative and productive process, and this situation sometimes prevailed. A frequently encountered problem, however, was conflict fostered by inflated expectations, especially where anticipations were either frustrated or associated with unrealistic assumptions regarding what CNRM could accomplish.

Knowledge and Awareness

CNRM is often promoted as a way to better connect traditional with modern ecological knowledge, as well as more effectively utilize local understanding developed over generations of extended environmental relationship. Our case studies indicated the implementation of this goal was elusive and difficult to sustain. Relatively few instances were encountered, except in North America, of systematic attempts at incorporating traditional ecological knowledge, or rendering modern scientific understandings and methods more meaningful and accessible to local peoples.

This pattern of deficiency was most evident in Nepal and Kenya. For example, in MBCA in Nepal, despite a policy of consulting local herders in developing strategies

for reducing wildlife depredations (Shrestha et al. 1990), little or no concrete effort was observed. In ACA, attempts were made to strengthen traditional practices of diversified and mixed farming by introducing new technologies for increasing crop yields (Adhikari and Lama 1997), but the long-term effectiveness of this effort remains highly uncertain. In Kenya, the historical system of Masai livestock grazing and knowledge of wildlife movements was not considered, nor was any noticeable exchange of information on conservation and development matters observed between local and indigenous peoples and government officials.

The outcome in North America was more ambiguous, although comanagement generally resulted in a more effective mixing of modern and traditional knowledge. We also observed greater access to modern knowledge among local peoples, although little attempt occurred at systematically incorporating indigenous environmental understandings. Comanagement in Alaska did expand the reporting of traditional and experiential knowledge, as well as observations and opinions of members, fishermen, and other stakeholders. In Washington state, tribes and state biologists jointly shared responsibility for collecting management information and producing analyses, as well as distributing, reviewing, and critiquing this data by both state and tribal biologists.

Biodiversity Protection

CNRM is frequently advanced as a means for achieving more effective wildlife and biodiversity protection by appropriately considering human socioeconomic needs and aspirations. This "philosophy of conservation for development" is compelling, and one conservationists have difficulty opposing. In the cases examined, however, especially in Nepal and Kenya and to a lesser degree in North America, we found the socioeconomic goals of CNRM typically assumed a much higher priority, at times compromising and subverting biodiversity conservation objectives.

In Kenya and Nepal, the conservation of biological resources was not consistently or strongly supported by CNRM organizations and institutions. Interviews with field staff in both ACA and MBCA revealed most of the work focused on community development and local institution building, with relatively little time devoted to monitoring and protecting biological diversity. Moreover, both conservation areas tended to pursue a wildlife conservation approach of "benign neglect" rather than "active management." Basic data were lacking on wildlife population dynamics and habitats for the majority of species, and although routine biological inventories were conducted (KMTNC 1995; Shrestha et al. 1990), ecological studies of threatened and endangered species and related conservation problems remained rare. In Kenya, little scientific data on wildlife populations and habitats was collected. Encroachment on wildlife habitat in parts of the KCWS also remained unchecked, and patrols of game scouts were highly sporadic.

In both Nepal and Kenya, local attention largely focused on community development and social welfare objectives, with most residents viewing CNRM as a means for pursuing social and economic advancement and rarely as a device for promoting biodiversity protection. Moreover, a frequent stress on resource utilization in the absence of clear biodiversity protection goals and local support frequently encouraged legal and illegal overexploitation of biological resources. CNRM rarely functioned as a more effective alternative to state controlled protected area management or traditional wildlife conservation. In general, biodiversity protection goals under CNRM were often diluted, undermined, and compromised.

The North American situation was less problematic and, in the case of Puget Sound, appeared to advance biological resource protection. Ecological information on various

salmon stocks improved, and coordination of conservation efforts was enhanced among diverse stakeholders including state agencies, fishing groups, commercial interests, and tribes. The survival of the salmon also emerged as a critical concern among the public, regulators, and politicians. This more effective focus on biodiversity conservation goals may have stemmed from an emphasis on a single flagship species, the salmon. Additionally, strong legal mandates and relatively more evolved and financially supported management regimes contributed to better connecting conservation with development objectives. Still, societal forces inimical to conservation and beyond the control of CNRM, as well as an emphasis on economic and political objectives, occasionally subordinated biodiversity protection goals.

Sustainable Utilization

The objective of sustainable utilization is closely associated with biodiversity protection, although focusing more on managing species with a clear economic benefit. In most of the cases examined, sustainable utilization goals tended to be underemphasized and the victim of mismanagement. CNRM also occasionally increased the pressure to exploit natural resources by unduly fueling expectations and increasing access. This situation especially prevailed in Nepal and Kenya.

In Nepal, a review of local community forestry management plans in both conservation areas revealed a focus more on procedural issues (e.g., duties and responsibilities of local committee members, rules regarding cooperation and forest product extraction, punitive measures) than on basic technical matters such as silvicultural practices and strategies, stand dynamics, and forest regeneration. Moreover, local institutions and communities often set harvesting quotas for forest products with little consideration of whether these levels were sustainable over the long term. Decisions regarding extraction of forest products tended to be influenced more by external commercial interests, with local institutions often allowing timber harvesting of community forests in response to higher prices (Euroconsult 1996; M. K. Thakali, personal communication 1997). Monitoring of community forests and other natural resources to determine sustainability over the long-term was rarely a major priority in either conservation area.

An analogous situation prevailed in Kenya, where grazing pressures and nonconsumptive wildlife utilization remained unchecked under CNRM, with relatively little effort devoted to short- or long-term mechanisms for achieving sustainability. Interviews with KCWS staff revealed no baseline data on how much cattle grazing the sanctuary could sustain before adversely effecting the habitats of resident wildlife. KCWS also failed to negotiate with neighboring communities' reductions in irrigation diversions to protect wildlife-rich wetlands areas.

A better situation existed in Alaska and Washington. For example, inventory and monitoring of various salmon stocks was a regular management tool employed in both the Puget Sound and Kuskokwim areas. Interviews with state and tribal fisheries managers revealed some salmon stocks were maintained and a few restored. Comanagers, nonetheless, tended to believe they had not been successful in arresting the decline of many salmon stocks, especially in the Puget Sound region, although limited success occurred in preventing future diminution. As previously suggested, more effective resource utilization in North America may have stemmed from an emphasis on a single species, and the ability to institutionalize rational procedures, both modern and traditional, for sustaining the targeted resource.

Conclusions and Recommendations

The arguments for CNRM are important and relevant. Yet the evidence accumulated in the five case studies examined in three countries on three continents suggests the reality often falls far short of the rhetoric and promise of CNRM. The complexity of goals, interests, and organizational features of CNRM renders its implementation exceedingly difficult. A major and consistent obstacle was the inability to control and guide the behavior of complex organizations, particularly bureaucratic and local institutions. Effectively managing organizations is difficult and alien terrain for most government sponsored programs. The eventual success of CNRM may depend, however, as much on institution building and organizational reform as on socioeconomic development and scientific considerations.

A problem of CNRM was the difficulty of reconciling and harmonizing the objectives of socioeconomic development, biodiversity protection, and sustainable resource utilization. We encountered a far greater emphasis and record of success in the area of human development. CNRM at times empowered elements of local communities and generated a somewhat more equitable allocation of resources. Effectively resolving conflicts and incorporating traditional ecological knowledge were less frequently achieved goals, but noteworthy efforts and some improvement occasionally occurred. Sustainable resource utilization and especially biodiversity protection objectives were, however, rarely achieved. Even more ominously, these conservation goals were often subordinated and undermined by an inordinate emphasis on social and economic development. Overall, the findings seriously question whether CNRM can effectively integrate and reconcile the goals of socioeconomic development and environmental protection.

CNRM in North America was generally more successful, partly as a consequence of an emphasis on a single resource. Additionally, strong legal support, and a relatively more organizationally developed and financially supported infrastructure, resulted in greater success.

We would recommend far more emphasis on institution building and public education. Developing viable local institutions and generating public understanding and support for both economic development and environmental conservation constitute a formidable challenge. Resource managers and environmental scientists must assume positions of status and responsibility equal to those of development-oriented professionals.

The effective implementation of CNRM is extraordinarily complex and difficult. We believe its success will be more likely to occur if the challenge of implementation is explicitly acknowledged. A number of relatively naive assumptions generally prevail regarding the implementation of CNRM, and we would suggest the following instead be generally assumed:

- Interest group and stakeholder conflict will be a normative rather than exceptional condition.
- Heterogeneous interests and demographic differences should be expected.
- Extensive institution building will be necessary before CNRM can be effectively implemented.
- Significant disparities will exist between the needs of local peoples and ecosystems and species with large territorial requirements.
- Educational efforts will be necessary, particularly the social and environmental benefits of CNRM.

CNRM is relatively new, and judgments regarding its eventual effectiveness remain tentative and preliminary at this time. More extensive evaluation will be necessary

before confident conclusions can be offered regarding its eventual impact. Our analysis suggests significant and serious concern regarding its current implementation. The rhetoric and promise of CNRM remains powerful and persuasive, but this should not be substituted for rigorous and objective evaluation. The dual objectives of biological conservation and social development may invite frustration and sometimes failure. It may become necessary to consider the possibility that the importance of each goal is better served by establishing independent, although perhaps parallel methodologies and infrastructures.

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