COMMUNITY-BASED NATURAL RESOURCE MANAGEMENT: CONNECTING MICRO AND MACRO PROCESSES, AND PEOPLE WITH THEIR ENVIRONMENTS

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TABLE OF CONTENTS

I. WHAT IS COMMUNITY-BASED NATURAL RESOURCE MANAGEMENT?

- A. Some Qualifications
- B. CBNRM Strategy
- C. Reasons for CBNRM

II. WHY IS CBNRM RECEIVING ATTENTION?

III. SECTOR ALTERNATIVES

- A. Options for Natural Resource Management
- B. Strengths and Weaknesses

IV. WORKING AT LOCAL LEVELS

- A. Community
- B. Group
- C. Locality

V. HISTORICAL PERSPECTIVE ON NATURAL RESOURCE MANAGEMENT

VI. VOICES FROM THE COMMUNITIES

VII. WORKSHOP THEMES

- A. Community-Based Groups
- B. Linkages that Transcend Communities
- C. Conflict Management
- D. Enabling Policy and Institutional Environments

VIII. CRITERIA FOR EVALUATION

Interest in community-based natural resource management (CBNRM) derives from a combination of frustration and optimism. The frustration comes from the shortcomings of efforts to preserve vulnerable natural resources that ignored the needs and interests of local communities and that failed to enlist their cooperation and capabilities in managing those resources. At the same time, there are a number of encouraging experiences with community involvement in natural resource management. Some of these have been documented for this workshop.

Over 400 abstracts were submitted for this workshop reporting cases where local interests and talents have been engaged in a variety of initiatives to preserve the natural resource base on which communities and nations depend for future livelihood and life itself. This workshop will assess the potentials and limitations of such approaches, the conditions under which they can be successful, and when and for what objectives of conservation they are likely to be inadequate.

This introductory paper highlights issues and offers some analytical concepts and frameworks that can assist in systematic evaluation of CBNRM as a strategy for serving both conservation and development objectives. It also presents some CBNRM experience from countries in Africa, Asia and Latin America with which I have some personal acquaintance, mostly through the Cornell International Institute for Food, Agriculture and Development (CIIFAD), my personal 'data base.'

I. WHAT IS COMMUNITY-BASED NATURAL RESOURCE MANAGEMENT?

The term 'community-based' distinguishes the emerging approaches from an earlier concept of *community* natural resource management, which refers to communities having full and generally autonomous responsibility for the protection and use of natural resources. This approach has derived from or been modeled after indigenous systems of natural resource management, where local knowledge, norms and institutions have co-evolved over long periods of time with the ecosystem in question. This often makes for well-attuned management regimes as shown by some of the case studies in Berkes (1989) and Clay (1988), though it does not invariably make for a commitment to the conservation of natural resources (1).

There are situations where community NRM is more feasible, and more desirable: where human populations and ecosystems are co-adapted and not under stress, and where communities are not confronted with new conditions or new pressures, e.g., from climate change, rapid population growth (natural or due to in-migration), availability of new technologies, weakening of local institutions, new tastes and demands within communities, or changed legal regulations and policy directions. This listing does not suggest that community NRM is invalidated by such factors but that it is less likely to tenable where such factors are present.

It should be realized that many changes in resource status are not primarily the result of human action or intervention, as seen on the fragile hillsides in Nepal (Blaikie and Brookfield 1987: 37-49) and West African savanna and forest regions (Leach and Mearns 1996). It needs also to be appreciated that how resources are viewed and used is conditioned by political and power relationships, not just by abstract or inexorable trends in biophysical or demographic terms.

> Recent advances in ecological theory suggest ... that many more environments than was previously thought are characterised by high variability in time and space. This has important implications for managing natural resources and environmental risk, and suggests that understanding environmental change involves looking beyond natural-resource depletion or degradation in the aggregate.

> Similarly, local communities may be shown to be dynamic and internally differentiated, and the environmental priorities and natural-resource claims of social actors positioned differently in power relations may be highly contested. These factors point to the importance of diverse institutions operating at multiple scale levels from macro to micro, which influence who has access to and control over what resources, and arbitrate contested resource claims. (Leach et al. 1997: 5-6)

The circumstances that favor purely local and autonomous resource management are becoming more restricted. Local ecosystems are usually linked significantly with larger ecosystems, so one can argue that conserving, as compared to extractive, management requires larger rather than local schemes. Moreover, if the conservation of particular resources is justified not just as a local good but as something that the whole world community has a stake in, then that larger community should be expected to contribute to the cost of maintaining that good.

This means that conserving management is likely to be less supportable or even desirable in isolated areas, even if responsibility for this could be discharged by persons living in close proximity to the resources rather than remotely from them. It is appropriate that beneficiaries who reside far from the resource nevertheless be involved in some way in covering the cost of maintaining the benefit, which is difficult to arrange with autonomous local management systems.

CBNRM as a strategy reflects in social and policy terms the parallel *nestedness* of organisms, species, associations and ecosystems in the natural universe. Biological systems, because they do not exist in isolation, need to be maintained within conceptions that comprehend the connectedness between micro and macro levels. Larger systems are obviously made up of smaller ones and disappear without them; yet at the same time, smaller systems depend on larger ones for their survival. So different levels need each other.

This image coming from an understanding of nature, extrapolated to systems of social organization, justifies a strong concern for the micro. It is from such realities and dynamics, and from their attendant interactions, that ever more encompassing systems emerge which are reasonably stable and productive. For natural resource management, the community broadly conceived is where most of the decisions and actions that directly affect natural resources are made. At the same time it highlights a need to remain cognizant of higher levels of social organization and ecosystem analysis and to relate these clearly to lower levels, a strategic vision expressed by René Dubos' admonition to "think globally, act locally."

A. Some Qualifications

To endorse decision-making at local levels is not to argue that the decisions taken there are necessarily or always the most crucial ones. Certain decisions and actions taken at regional, national or international levels are going to be more determinant. Accordingly, one should not focus exclusively on local arenas for management. The converse of Dubos' advice is also true: think locally, act globally. What appear to be local problems often cannot be solved at local levels.

But local decisions and actions collectively and cumulatively shape the course of ecosystem conservation or degradation in pervasive ways. It is mostly within the purview of communities that forests are cleared, land is cultivated, wild flora and fauna are collected, and water sources are affected by resource management practices. Impetuses for these practices may come from outside communities, but communities are where "the rubber meets the road."

Not all community decisions and actions with regard to natural resources are benign. They can range from resource-degrading to resource-conserving, and sometimes resource-enhancing. This makes it all the more important that local understanding and support for conservation objectives be gained and maintained, since government abilities to enforce decisions favoring natural resource protection are so often limited.

Not all resource-degrading behavior comes from communities. Much stems from 'outsiders.' Focusing only on communities can overlook important threats to the environment. But such threats make enlisting local understanding and support all the more important, as communities can be vigorous defenders of natural resources that they believe they have a stake in, though it is true that they can be stymied or bought off, especially if local structures of decision-making are weak or unaccountable.

A community-based approach recognizes and reinforces the stakeholder role of people living in, on and around vulnerable natural resources, both for these people's sake and for that of future generations, for people living in the immediate area but also in the rest of the country and the rest of the world.

Where local perceptions or interests do not favor resource conservation and where a strong case can be made for preserving particular ecosystems in terms of objectives discussed below, there may be justification for other agencies or organizations to become involved more directly with their management, providing financial and other resources as compensation or incentive to support the preservation of natural resources. But even then, the approach is more likely to succeed if negotiated and linked, with rather than in opposition to local residents.

CBNRM does not parcel out natural resources in self-contained spheres coterminous with existing community domains. Forest, soil, water and biological resources need to be understood and sustained within 'nested' ecosystems, as already suggested, from local microenvironments up to landscape and watershed levels, ultimately to larger systems on regional, national and international scales. These seldom correspond to or respect political and administrative boundaries.

CBNRM faces two particular problems of aggregation. First, communities are not necessarily clearly bounded social or geographic units, nor they likely to be homogeneous entities, with single or agreed interests. Part of the process of CBNRM is to identify what socio-geographic units can function and work out sufficient agreement to undertake management and conservation of the natural resources within their purview on a collective basis.

The units for management may be groups below the community level or localities above this level, aggregating a number of communities or groups within a larger landscape, as discussed below. CBNRM assumes that processes of resource inventory and appraisal, consensus building and conflict management can inform and empower communities to engage in collective action to utilize and sustain natural resource endowments. This will lead to a system of management that is superior to what could be achieved by purely outside decision-making and initiatives.

Second, natural resources themselves are quite heterogeneous. Community management of *harvested* resources such as timber or fish is quite different from community conservation of biodiversity. The former is management of directly utilized resources which produce immediate value to those extracting them from nature, while the latter provides only indirect, delayed or cultural value. Communities may be quite able and motivated to undertake the former in ways that ensure the continued availability of economically-valued resources, while at the same time

having little interest in the preservation of 'extraneous' biological resources (2). These two objectives of natural resource management are not necessarily or always in conflict; they can be or can be made compatible. But the first kind of management tends to be emphasized by persons interested in economic development, while conservation biologists usually have the latter kind in mind when they find fault with CBNRM (e.g., Kramer et al. 1997).

The very concept of natural resources, it should be noted, contains a bias toward evaluating the components of 'nature' in economic terms, assessing their use value more readily than assigning them any intrinsic value (Herring 1998). The term 'natural resources' as used here refers to soil, water, flora and fauna, commonly aggregated in the category of *renewable* natural resources. Use of the term natural resources should not privilege utilization over preservation, however.

In a policy environment where importance is attached to 'sustainability,' everyone should understand that continuing utilization depends on preservation. Exploiting certain resources to the point where they collapse or disappear is not 'wise use.' Sacrificing some part of ecosystems, even a small part, to produce profits for some persons (certainly not for all) puts whole ecosystems at risk, as well as their multiple benefits which accrue ultimately for everyone. Arguments that conservation and preservation are not important depend ultimately on discounting the future to zero. The earth is not a project for which we calculate and assess a finite life.

B. CBNRM Strategy

CBNRM *starts* with communities as a focus and foundation for assessing natural resource uses, potentials, problems, trends and opportunities, and for taking action to deal with adverse practices and dynamics (Little 1994). This is done not in isolation but with cooperation and support from other actors, both from other communities (horizontal linkages) and from higher-level or external entities (vertical linkages). These higher-level actors can be: local or district governments, regional bodies, government agencies, non-governmental organizations (NGOs), universities, or any other institutions that have an interest in resource conservation and management.

CBNRM presumes that local residents can understand and will support larger interests and principles of conservation, factoring these into their economic, social and cultural considerations about how natural resources should best be treated. It should not, however, idealize or romanticize local resource users, who for a variety of reasons – economic, social or cultural – may be more disposed toward resource-degrading behavior (RDB) than resource-conserving behavior (RCB) (Uphoff and Langholz 1998).

Sometimes communities may preserve the resources within their own jurisdiction by diminishing those of neighboring communities, as in the case of the Madan Pokhara panchayat in Nepal (Acharya 1984). Threats to natural resource sustainability can come from any level, from micro to macro, so decisions are not entrusted entirely or exclusively to higher levels or to lower ones. CBNRM is a *system* of natural resource management, especially because there may be need for higher level support for enforcement of local management efforts and restrictions.

The essential feature of CBNRM is *starting* with communities, taking them into confidence and having confidence in them. It engages their ideas, experience, values and capabilities on behalf of resource conservation objectives, at the same time it seeks ways for communities to become better remunerated and better served. It is prepared to accommodate local interests, needs and

norms that are compatible with long-term preservation of ecosystems and their biological resources. There is a burden of proof on outsiders for proceeding contrary to these interests.

C. Reasons for CBNRM

There are two main reasons why CBNRM is of current concern to governments, NGOs and donor agencies like the World Bank. One relates to the objectives of conservation and the other to development. Different weights are attached to each by different interests, but there is usually agreement that both are important considerations.

The first reason concerns the *protection of biodiversity*, maintaining the integrity and viability of particular ecosystems with their unique combinations of species of flora and fauna. This can have development payoffs, possibly more in the long run than the short term. Where it is linked with economic activities such as ecotourism there are more short-run incentives and benefits attached to the conservation of biological resources, especially endangered or threatened species.

The second reason concerns the *maintenance of ecosystems* such as watersheds for their multiple service functions of benefit to communities, regions, nations, and the world. These include: soil conservation and fertility, sustained water accumulation and flow, favorable microclimates, forest growth for both timber and non-timber products, pollination which is critical for agricultural production, maintenance of grasses and other forage, fish and other aquatic species production, and purification of soil, air and water resources. These have definite economic value though not always commensurate with the costs to those persons and communities whose cooperation is needed to preserve those resources.

Where ecosystems yielding timber, fish, crops, livestock and other products on an ongoing basis falter, and possibly collapse, there are adverse consequences for humans, not just for the flora and fauna extinguished. CBNRM is generally more attractive to communities for the second reason than the first, but the two are commonly connected, as noted above. This connection can be explained to and accepted by communities, as seen from examples cited below.

There can be a third reason, *preservation of global cultural diversity* where the identity and values of certain communities are linked to living in and extracting resources from particular ecosystems. Quite often, fragile ecosystems are associated with vulnerable cultures, when groups defined ethnically or linguistically have been marginalized by the dominant culture and rely on certain forest, savanna, desert, mountain, coastal or tundra environments (Chenier 1998; Clay 1988). Such groups need to maintain their own identity and homogeneity if larger societal, indeed global, heterogeneity in terms of languages, belief systems, aesthetics, and social organization is to be preserved. If the ecosystems on which such ways of life depend are lost, so are the associated cultural systems.

Consideration here will focus on situations where the first two reasons predominate, because they are more common, not because they are necessarily more valid. Where cultural preservation is the objective, community NRM is more likely to be a viable alternative because the capabilities and incentives for communities to preserve ecosystems and their attendant resources are greater under such conditions. Presently, the most frequent conflicts regarding NRM come from the first two kinds of situations. Most of the conclusions regarding CBNRM undertaken for biodiversity or ecosystem preservation purposes will apply to similar efforts made for other reasons.

Communities, it should be kept in mind, will have their own reasons for favoring, or opposing, CBNRM such as short-term or long-term effects on livelihoods, and reinforcement of community identity and sustainability. To the extent that these are compatible with external rationale, CBNRM initiatives are more likely to be successful. Part of the process of establishing community-based management should include discussion and comparison of objectives. External and internal aims need to be harmonized, with outside actors contributing to the achievement of local aspirations if community actors are expected to help fulfill external objectives.

II. WHY IS CBNRM RECEIVING ATTENTION?

Thirty years ago, CBNRM was considered likely to be ineffective or, worse, destructive of environmental resources. The arguments that Hardin (1968) made against sustainable use of resources which were held and managed collectively as common property were regarded as conclusive. It was thought to be 'rational' for individuals to overutilize any common resources and ultimately destroy them by pursuing their self-interest in ways deemed normal, or at least predictable behavior. The short-term benefits to individuals from exploiting a resource held in common would be greater than the short-term costs to those same individuals. So this would promote overuse of resources even though the sum of those costs subsequently would exceed total benefits. Excessive use would sabotage the renewability of resources, whether rangelands, forests, fishing banks, or underground water supplies, and lead to its cessation.

Most natural resources are 'common' in many ways, not just when they have the status of common property, so that no individual owns them privately and can dispose of them at will. They are, first of all, a common heritage, not created by individuals, and at least in principle they belong to future generations even more than to ours. There is a Native American saying that we do not inherit the land from our ancestors; rather we hold the land in trust for those who come after us. Second, natural resources produce benefits – and can create costs – beyond the power of individuals to appropriate them or avoid them.

- *Forests* produce timber and other products that can be privately extracted but they also produce widely diffused benefits in terms of climate and atmospheric conditions that are shared by all. Conversely, the reduction of forests alters the composition of the atmosphere in ways that adversely affect weather and temperature patterns in the long run.
- The cycle of *rainfall* – precipitation, runoff flow, percolation, distribution, use and evaporation, leading to subsequent rainfall and use which maintain life on earth – is beyond the control of any person, though it is vulnerable to cumulative adverse activities by people.
- The pool of genes for *flora and fauna* is a biological treasure at least potentially available for everyone, and when it is reduced, through extinctions, everyone is poorer as a result.
- While it is true that *land*, and the *soil* thereon, can be privately owned and exploited, even this eminently ownable resource evades human control when topsoil lost through water or wind erosion aggravated by misuse gets deposited elsewhere according to the influence of gravity and weather patterns which are oblivious to titles and deeds.

The analysis which Hardin proposed suggested that protection and preservation of natural resources such as rangelands, forests, fishing stocks and groundwater required either their *privatization*, so that individuals would see and bear the costs of their extraction, or their

management by state institutions, able to bring instruments of coercion to bear on individuals not accepting restrictions on use that sought to ensure that 'carrying capacities' or sustainable offtake rates were not exceeded. Rather than entrust responsibility for resource management to communities, Hardin advocated regimes of private property, state control, or possibly a combination of the two.

This assessment, however, interpreted 'common property' regimes as 'open access,' when in fact, many if not all are governed by established norms and precedents, often with roles and rules that regulate access to and use of resources (Gibbs and Bromley 1989). Not all of these local mechanisms are effective in deterring abuses of soil, forest, water and biological resources, but then, neither are all market or state institutions effective. Strong arguments have been made against 'the tragedy of the commons' thesis on both logical and empirical grounds (e.g., Jodha 1995; Kimber 1981; Ostrom 1986, 1990). There is now also an emerging literature on 'the tragedy of the anti-commons,' showing how market mechanisms expected to regulate the use of resources can contribute to their degradation (Feeney et al. 1990; Heller 1998).

It is increasingly argued that community institutions, formal or informal, can achieve as good or better results than with state or private management (Baland and Platteau 1996; Berkes 1995; Ghai 1994; Ghai and Vivian 1992). However, successful local management systems are usually not operating in isolation from other institutions and organizations, governmental or non-governmental. The record of community involvement in NRM is not uniformly good. Experience with CBNRM needs to be looked at analytically and critically. This opening presentation seeks to provide concepts and a framework for such an effort at this workshop.

III. SECTOR ALTERNATIVES

Thirty years ago, the institutional alternatives were seen as basically two: either state sector institutions, operating with the authority, expertise and other resources of the state to shape and implement decisions about resource use, or private sector institutions pursuing individual interests and benefits with economic resources being of greatest concern. The past three decades have witnessed the emergence of a third sector standing in between the private and public sectors, as discussed in this section. CBNRM operates mostly in this 'middle sector,' though it works best when there are complementary, supportive public and private sector activities (3). Understanding sectoral differences and strategies helps to situate CBNRM within the institutional landscape.

Middle-sector organizations and institutions have been around for a long time, but they have been fragmented and for the most part have remained small. The middle sector was previously thought of as marginal, ineffective, even atavistic. Preoccupation with 'modernization' made it appear old-fashioned. However, various evaluations over the past 10-15 years have showed this sector to have many advantages (e.g., Esman and Uphoff 1984; Hirschman 1984; Uphoff 1986).

There are some good reasons for not regarding NGOs as constituting or as belonging to this third sector. Rather, they are a part, albeit a very important and quite distinctive part, of the private sector (Uphoff 1996a). NGOs are sometimes called 'private voluntary organizations' (PVOs), though they are often not strictly private, and neither do they rely purely on voluntary efforts. NGOs operating on a *not-for-profit* basis are distinguished from *for-profit* businesses or enterprises that have been the major portion of the private sector. This means that the private

sector has two major subdivisions, one charitable and the other commercial, to characterize them in simple descriptive terms. Neither has *members* to whom they are accountable.

Similarly, within the public sector, a distinction should be made between agencies and actors of the central government, who are accountable to decision-makers at the national level who may or may not be democratically elected and controlled, and *local government* bodies and actors, who are accountable at least in principle more directly to local constituents. Agents of the central government acting at local levels represent local *administration* rather than local government.

CBNRM involves institutions and organizations at local levels which can be part of any of these three sectors, but particularly of the middle sector, such as user groups, community management committees, local councils, or producer cooperatives. If these have the sanction and authority of the state behind them, they are part of or at least attached to the public sector. But otherwise they operate with social more than legal authority, invoking community sanctions such as fines, penalties or ostracism. Local government management of natural resources is one form of CBNRM, and not its only form.

There are an increasing number of instances of private sector CBNRM, both for-profit and not-for-profit. Examples of the first category are the private wildlife reserves being operate in parts of Africa and Central America (Alderman 1994: Langholz 1996); an example of the second is the Loma Quita Espuela Foundation operating the Loma Quita Espuela Scientific Reserve in the Dominican Republic (Gutierrez 1996).

Middle-sector user groups are increasingly common for watershed management in countries like India and Sri Lanka (Krishna 1997; Wijayaratna 1994, 1997), while cooperatives represent a promising institutional mechanism for CBNRM as suggested by forest management experience in Peru and in Mexico (Alatorre and Boege 1998; Hartshom 1992).

Some analytical distinctions can make these considerations and evaluations clearer as they differentiate among the kinds of local institutions or organizations involved in NRM (4). A continuum laying out this continuum of institutions/organizations is presented in Figure 1. The major distinction among the three sectors is the differing relationships that persons have to them *from below*.

A. Options for Natural Resource Management

Natural resource management undertaken by *local administration*, i.e., by units of the central government, would not be considered community-based, though to the extent that such units are interactive with and responsive to local people, incorporating their knowledge and needs into management plans and practices, this approach is closer to CBNRM than conventional top-down management by government. On the other hand, local government bodies that manage forest, coastal or other such resources are engaged in a form of CBNRM, possibly supplemented by user groups, management committees, or cooperatives from the middle sector.

It is possible that private, for-profit enterprises can undertake to manage natural resources with conservation as an objective rather than simply short-term profitability, either because they can get income from activities like ecotourism or in anticipation that the resource will become more valuable in the future, whether for exploitation or for further preservation. Local foundations can undertake to protect endangered natural resources, utilizing laws that give special status or incentives to non-profit operations. The Nature Conservancy is an example of a NGO service

organization that plays such a role. Some traditional institutions should also be considered under this category, such as the local elders or trustees who have responsibility to protect 'sacred groves' or 'sacred forests' on behalf of communities in parts of Asia and Africa (Chandrakanth and Romm 1991; Lebbie and Freudenberger 1996).

Figure 1: Alternative Kinds of Local Institutions for Community-Based Natural Resource Management

Public Sector		Middle Sector		Private Sector	
Authoritative		*Collective Action*		*Autonomous Decision-Making*	
Local admin-istration	Local government	Membership organizations	Cooperatives	Service organizations	Private businesses
Bureaucratic, looking upward	Political, looking downward	Voluntary, interest-advancing	Economic self-help	Charitable, non-profit	Commercial, for profit
People Relate to These Institutions / Organizations as:					
Citizens, taxpayers, and voters	Taxpayers, constituents, and voters	Members	Members	Clients or beneficiaries, contributors, or employees	Customers, investors, or employees

A park, forest, watershed or coastal area could be managed by an agency of the central government, such as the Park Service, Forest Service, Ministry of Agriculture, or Department of Interior; by a local government body; by membership organizations such as user groups or community associations; by a cooperative; by a foundation or charitable organization, possibly a church or mosque association; by a private business; or by some combination of these. While management by a central government agency will not qualify as CBNRM, any of the other organizations or institutions, either respectively or in combination, can undertake CBNRM as this is not the province or prerogative of only one kind of institution or sector.

B. Strengths and Weaknesses

Each of these kinds offers certain advantages, and unfortunately each has certain limitations. *Local government* can exercise or invoke the authority of the state to enforce decisions; it can have personnel who are specialized and trained for such responsibilities. The power to levy taxes as well as prohibit certain behavior strengthens its hand for protecting natural resources. On the other hand, compared to agencies of the central government, local government bodies are often weak, by design or by default, with limited revenues, staff, expertise and even legal authority. Without such resources, its efforts to manage natural resources may invite abuse because there is the appearance of control but not the reality. Also, local government can be dominated by local (or outside) interests that are more concerned with extraction than conservation.

Community organizations, whether membership organizations or their special category of cooperatives, created through a pooling of resources, have greater flexibility than do government organizations. They represent and can act on local interests quite directly. They have most access to the knowledge about natural resources that local residents have. With appropriate roles

and incentives, such as fashioned in the CAMPFIRE program in Zimbabwe (Metcalfe 1997), community members can undertake very detailed management literally at the grassroots. But voluntarism, like flexibility, has a down side as well as an up side. Enthusiasm can wane; conflicts can arise that deadlock local action. The resources that are needed for effective management can fluctuate. Persons with special rather than general interests can subvert or take over the organization. So there may be less predictability and continuity of management as well as less certainty that it will preserve resources in as good or better condition than before.

Service organizations or NGOs can operate quite flexibly, and often exhibit a high degree of commitment to conservation. They are able to provide or access more expertise than other institutions and can often access financial resources that governments and communities cannot. But they too can have internal conflicts that are debilitating, and their financial resource base is seldom assured or steady, so they can default on commitments for a variety of reasons. The government may appreciate that it is spared the expense of services that these organizations undertake to provide, but it can also be jealous and even obstructive of them as competitors. There are sometimes also complaints that these organizations operate in paternalistic or arbitrary ways, not accommodating local needs and interests. Since service organizations can withdraw at their own discretion, so there is no assurance of long-term management. So this option has more limitations than often acknowledged.

Business enterprises if they operate within limits of sustainable use, so as to preserve natural resources, have the advantage of not costing governments or communities anything, at least not directly if they operate successfully. They may be quite innovative and efficient in their operations. Private reserves are gaining ground in South Africa and Costa Rica, for example (Langholz 1996). But their decisions remain profit-driven, and there are no in-built incentives for taking intra- or inter-generational welfare into account. Both the environment and the poor can lose out to considerations of increasing income and wealth in the present for a narrow set of beneficiaries.

There are no perfect institutional solutions for establishing and maintaining CBNRM. As Mao Zedong told us, each solution creates (contains) its own problems. Much depends on *how* institutions are structured, to ensure technical and organizational competence and to have incentives that favor environmental conservation while giving sufficient and appropriate incentives for the various stakeholders and actors involved. Public, private and middle-sector institutions have complementary strengths and offsetting weaknesses, so sharing of responsibility among them provides more overall capacity for managing natural resources most effectively.

For example, local governments can bring some authority to the enforcement of decisions. User groups can monitor and report on changes in resource status. NGOs often have expertise that they can contribute in a responsive manner, and they can make independent critiques of any evident failings. Businesses often undertake certain services more efficiently than other actors.

Along with such arrangements, there can, and probably should, be some kind of *supporting network* that cooperates with and assists the local institutions involved. These higher-level institutions can come from any of the three sectors, from the public sector (an agency of the central government such as the Park Service or Forest Service); from the private sector (either a foundation or conservation NGO, or private enterprises); or from the middle sector. Carroll (1992) gives some examples of the latter from Latin America.

Research institutions and the scientific community at large could be regarded as a fourth sector. Much of the decision-making on NRM is influenced by researchers, either academic or based in other kinds of institutions, and knowledge generation is proving to be an important element in improving or mediating decisions concerning contentious NRM and public policy issues (5). The importance of more and better knowledge for improving natural resource management is increasingly evident. This is true not so much in terms of estimating optimum rates of extraction or delimiting vulnerable ecosystems, as in terms of knowing more about the interests, needs and capabilities of stakeholders who are interacting in natural resource management situations.

Knowledge is not unique to any one sector, and knowledge generation can be undertaken by public, private or middle sector institutions. What *kind* of institution supports the generation of knowledge can affect its quality, credibility and acceptability. CBNRM benefits from a good supply and flow of reliable information that can help parties understand the present and alternative futures. Communities themselves, of course, are an important source of knowledge. All parties can work together with more confidence if they can agree on resource statuses and trends, and for this, universities and other knowledge-generating institutions from the public, private or NGO sectors can be constructive partners with communities in CBNRM.

IV. WORKING AT LOCAL LEVELS

When thinking about CBNRM we need to put 'community' in analytical context because community-based activities are not just undertaken by, or occur only within, communities. Generally speaking, decision-making and action can take place at any or all of *ten different levels* that range from the international level to the individual level:

(1) International;
(2) National;
(3) Regional / provincial;
(4) District;
(5) Sub-district;
(6) *Locality*;
(7) *Community / village*;
(8) *Group (or neighborhood)*;
(9) Household; and,
(10) Individual.

Three of these levels are appropriately considered to be 'local' and thus loci for CBNRM.

A. Community

The community is a *residential* unit which may be small or large, ranging from half a dozen up to several hundred or even several thousand households. Communities may be fairly homogeneous in terms of language, wealth, lineage and other characteristics. More often, as suggested above, they are quite heterogeneous, more than suggested by the stereotyped idea of 'community.' Communities may have tightly clustered, nucleated settlement patterns, or be quite dispersed, possibly linear along a road or a river, or scattered in small hamlets that are connected just by lineage or allegiance to community authorities. Persons join a community by being born into it or by moving into it and being accepted by other residents.

The term 'village' is commonly used interchangeably with 'community.' Village refers to a physical area, while community refers to the people residing within it. This level can be thought of in terms of either territory or population, with limits delineated on a map or by a sociogram. Community can also be understood as a cognitive or cultural construction, analogous to what Anderson (1983) has identified at the national level, where people are joined by a common identity and by mutual perception of interest. In CBNRM, it might be best to speak in terms of a 'community of interest' to avoid making 'community' too geographic.

B. Groups

Groups are usually smaller than whole communities, though they can be larger in number of members and in geographic spread than a community. Groups are based on some shared characteristic of their members, if only a common desire to belong to an association or committee. Usually some trait such as age, gender, occupation or religion distinguishes members from others who are not members or are not eligible to belong to the particular group. Neighborhoods or hamlets are usually segments of larger communities or villages, so they can be considered analytically as operating at the group level, representing a smaller unit of social organization than the community or village. Groups can and often do cross community boundaries, so this analytical category does not follow a strict hierarchical ordering.

User groups or any subset of community members grouped in an association, club, committee or union can engage in CBNRM, but when they do so, they do not normally have the same kind of territorial claim or legitimacy that a community organization would have, because they represent a 'part' rather than a 'whole.' However, because they are usually smaller and more homogeneous than communities, therefore they are also usually more cohesive and able to decide and act, there are advantages in group management of resources. This is done with some reference to and usually approval from the community, so that this is community-based management rather than community NRM.

C. Locality

Above the community, one finds in almost all NRM situations something that can be designated as a *locality*, a set of communities that have some degree of common identity and cooperation based upon proximity, but also deriving from social interaction (e.g., inter-marriage) and economic relationships (e.g., periodic market days when villagers from a number of communities gather at some central location to buy and sell goods), as analyzed by Johnson (1970).

A limitation of community NRM is that it truncates the ecological units which are subject to local management responsibility. Communities seldom have jurisdiction over whole ecosystems, such as watersheds, hillsides, valleys, plains, coasts, rivers or lakes. Multiple communities have certain parts of these under their purview. Effective natural resource management requires some degree of coordination – joint decision-making, implementation, monitoring and enforcement – among communities sharing a larger biophysical unit containing a complex of soil, forest, water and biotic resources.

For CBNRM, communities with responsibilities for resources in their respective areas are encouraged to collaborate with neighboring communities that are co-dependent on a larger landscape (or waterscape), be it a watershed, hillside, valley, plain, coast, river or lake. What incentives and institutional arrangements can best support such cooperation, however, need to be

identified and evaluated in specific contexts. Some examples of this should be seen in the case studies for this workshop.

Accordingly, when thinking about CBNRM, we need to consider not only a variety of institutional or organizational channels as discussed above, but a range of *local levels* of decision-making – group, community, and locality. What happens at these levels depends on and affects the decisions and actions of individuals and of the households they belong to. The important point is that CBNRM does not occur just in and by communities; it can be undertaken also either by smaller or larger social units of decision-making and activity. But for both groups and localities, the community remains a pivotal entity, even when decisions are taken at lower or higher levels than the village. The concept of community-*based* NRM thus bridges *three levels* as well as *three sectors*.

V. HISTORICAL PERSPECTIVE ON NATURAL RESOURCE MANAGEMENT

One can likewise delineate three *stages* in the evolution of NRM, especially that which is oriented toward protection of biodiversity, with respect to the attitude that is taken toward local residents. This periodization, though simplified, points out an important progression in thinking underlying the conceptualization of CBNRM.

When natural resources have been at risk from overuse or abuse – for example, when watershed conservation or endangered species protection has been sought – the first response has usually been governmental, i.e., legal and coercive (Peluso 1992). Certain resource uses were declared illegal, and people were excluded from certain places so that they could not damage the resources of concern. This prohibitive approach regarded local residents in and around protected areas as *adversaries*, to be kept out of designated areas which are given 'protected' status.

This has proved to have limited effectiveness, however, unless the area is quite small and/or the government has considerable administrative and regulatory capacity – ample staff, good transportation facilities, sufficient information to operate with, and a tradition of general compliance with official decisions. These conditions are seldom satisfied in developing countries, especially in the more remote and inaccessible areas where protection is often most needed or still relevant.

A subsequent approach has been to design programs, policies and especially projects that can 'integrate' conservation and development. Rural communities were offered certain incentives to desist from resource-degrading behaviors in return for assistance to improve their agriculture or provide schools and clinics. These were given as a kind of quid pro quo for accepting restrictions on access to natural resources. In this mode, local residents are regarded as beneficiaries, to be bought off by goods and services that will enhance incomes and well-being.

There is a growing literature critiquing integrated conservation and development projects (ICDPs), showing that they have not achieved the changes in behavior sought, at least not on the scale or with the speed that is desired (Barrett and Arcese 1995; Brandon and Wells 1992; Larson et al. 1997; McCoy and Razafindrainibe 1997; Wells et al. 1992; Wells et al. 1997). The ICDP approach has come under heavy attack from conservation biologists who do not think it can and will succeed (Kramer et al. 1997).

One can, however, object to this critique, suggesting that ICDPs should not have been expected to achieve rapid changes when dealing with long-standing and complex social situations, ones that have not been amenable to quick solution by administrative or coercive means either. Moreover, ICDPs have too often been poorly conceived as well as poorly implemented so that they have not been given a fair or full test. They have been more paternalistic than participatory and have not capitalized on what has been learned about development processes and behavioral change (Buck and Uphoff 1997).

To the extent that material incentives are perceived as bribes, they create the problem that people then need to be continuously rewarded with additional benefits to ensure their cooperation with regimes of protection. The implication of such an approach is that resource conservation is something that serves the interests of outsiders rather than the interests of communities. This suggests to villagers that resource-conserving behavior is not something beneficial to them, as Leach (1998) pointed out in her critique of the UNCDF's concept of 'eco-swaps.'

Reflecting dissatisfactions with the first and second approaches as well as broader experience with introducing developmental change, a third approach has been emerging that is more genuinely participatory. In this, local residents are viewed as *partners* in the complex enterprise of resource conservation. They are regarded as persons with whom outside agencies should work and from whom they can learn.

This newer approach, which has led to CBNRM, integrates conservation and development goals by focusing on the needs, interests, knowledge, values and capabilities of local populations. Such factors are considered as starting points in the design and evolution of management regimes. Gaining people's confidence and cooperation is seen as the key to success. As many accommodations are made to local interests and needs, as well as local modes of organization and management, as are compatible with maintaining soil, water and climate resources in need of conservation as well as any flora and fauna in need of protection.

VI. VOICES FROM COMMUNITIES

This approach is looked upon with skepticism by persons who think that the interests of local people, especially those living in poverty, are unavoidably inimical to the needs of environmental conservation. There are instances where the poor have ravaged the environment out of ignorance of the long-term effects of tree felling, swidden burning, hunting, fishing, gathering, plowing on hillsides. But more often these people understand that there are adverse consequences, but feel, however, that there are no real alternatives when household and personal survival are at stake (Rabesahala and Gautier 1995).

I have talked with villagers in a variety of countries and situations where there is a growing realization at the grassroots that conservation practices are not luxuries, serving the interests of city folk and foreigners, but rather are essential to the survival of their communities and of opportunities for the next generation. Just as environmental consciousness is taking root and spreading in most of the industrialized countries, it is growing in non-industrialized ones. Surely it could grow faster, and there is need for stronger appreciation and conviction around the world that we cannot continue to overtax the ecosystems which are our and others' life support systems.

At present, I sense a more rapid growth of concern about environmental degradation in poor and marginal areas of the Third World than in the U.S. and maybe Europe. This is often evoked and

spurred by alterations in weather patterns and by the decline of water availability, more than by concern with the conservation of biodiversity. But villagers in my experience can see the connection between what is happening to their soil and water resources and what is happening to the rest of their natural surroundings, such that biodiversity can also be part of their concern, e.g., protecting plants that have medicinal value. Let me recount in summary form some conversations with villagers living in or near areas having protected status:

Dominican Republic. In October 1994, as part of a practicum on integrated watershed analysis and management which CIIFAD held in the Nizao watershed, a major source of water for irrigation, urban supply and hydroelectricity generation, we talked with members of the La Esperanza coffee growers' cooperative. Its 800 members had been resisting government efforts to regulate land use and restrict tree cutting. It wanted to reduce siltation in the dams that utilize the flow of water coming from the watershed (6).

The Presidential Commission seeking to maintain the forest cover in the Nizao watershed had at first decreed "no tree felling," but there was no way this could be enforced. So a new approach was taken, perhaps learning from the example of a project in Haiti where farmers began planting trees (in large numbers, 60 million over 10 years) once they were given the right to cut these later for household benefit (Murray 1997). At the time we visited, the Commission had not worked out a credible process for farmers to register the trees they had planted so that they would be exempted from the ban on felling.

Farmers told us that they had come to see that continuing to cut down trees in the uplands was not good for the health of the environment or for their own long-term interests. The cooperative had enacted its own rule regarding tree cutting by members: For every *five* trees that a member plants under the government program, only *two* of these can be harvested, and these must be immediately replanted in order to keep the number constant. These Dominican farmers were thus prepared to require of themselves more rigorous reforestation practices than the government expected (Uphoff 1994a: 5).

Indonesia. In October 1995, I visited the village of Sesaot on the island of Lombok. LP3ES, an NGO participating in the action research program of the Nusa Tenggara Upland Development Consortium, was working with community members in a situation where conflict had arisen. The government had unilaterally upgraded the status of an adjoining forest area, putting it off limits from local use to protect its watershed functions serving irrigation systems in the plains below the mountain.

Farmers with the facilitation of LP3ES had organized a committee, Partnership for Forest Protection. This was patrolling the forest and was reporting to authorities any illicit extraction of wood that committee members observed. Over the course of a year, through a process stimulated by LP3ES/CIIFAD action research, the Partnership reached an agreement with the Forest Department to develop a 12-hectare pilot project for community forestry within the protected forest. This area, planted with durian, rambutan, jackfruit and other trees, was judged the most successful reforestation site in the province.

Working relations with the Forest Department had become more constructive by the time of my visit, and a district forest officer joined our discussions in a farmer's home. (Happily, good relations were not disrupted by the fact that some of the persons identified by the committee as illicitly taking wood were forest guards of the Department.) As long as their access to some of the forest area was maintained, farmers were willing to modify their practices and help preserve the forest and its watershed functions. They acknowledged that unrestricted access and unlimited use would in the long run harm them too, not just others downstream (described in Fisher 1998).

Sri Lanka. In March 1996, while reviewing the Shared Control of Natural Resources (SCOR) project, funded by USAID and implemented by the International Irrigation Management Institute (IIMI), I visited several villages in Nilwela watershed, adjoining Singharaja national forest. This project is supporting establishment of resource user groups of many sorts (rice

farmers, tea growers, resin tappers, flower growers, etc.). These are federated within microwatersheds to undertake land use planning and management which can both improve economic productivity and resource conservation (Wijayaratna 1997).

In Dothalugala, villagers under the leadership of the priest at the local Buddhist temple had formed and registered an NGO to protect their environment, Dothalugala Heritage. They observed that with the deforestation of hillsides above the village, either there was now less rainfall or runoff was more rapid. Either way, as one villager told me, after a week without rainfall, streams were drying up as quickly as they used to do after a month without rain. Villagers knew that if this deterioration was not reversed, they would have to leave the area because they could not survive without an adequate water supply.

The villagers' first response was to take vigilante action, burning down at night the huts of any persons encroaching on the forest area. But this was extra-legal action likely to cause conflict. With SCOR project facilitation, villagers worked out an arrangement to take responsibility for the forest area, which was owned by a government tea estate, now being managed on contract by a private firm. This firm was doing nothing to protect the forest from incursion because it had no financial interest in doing so. A SCOR project coordinating committee got the estate to turn the area over on long-term lease to the Forest Department, which in turn 'deputized' village volunteers to patrol the area and prevent any further tree cutting or other abuses (Uphoff 1996b).

Madagascar. In September 1997, with CIIFAD colleagues and Malagasy counterparts, I visited the village of Riambondrona, about a 45-minute walk from the only road going through Ranomafana National Park. The village lay just outside the designated 'peripheral zone' around the Park and thus it had received no assistance or attention under the USAID-funded ICDP that CIIFAD began helping to implement in 1994. Our assignment was to introduce agricultural alternatives to slash-and-burn cultivation that presented a threat to the rich biotic resources being protected within the Park.

The residents of Riambondrona are from the Tanala ethnic group, which has been wedded to a life in and around forest areas from time immemorial. Slash-and-burn agriculture is not only a means of livelihood but an intrinsic part of their culture. We have had considerable success introducing both lowland and upland agricultural improvements within the peripheral zone, thanks in large part to our NGO partner, Tefy Saina, so that there are some good alternatives to shifting cultivation.

The residents of Riambondrona had heard about these practices. They formed a farmers' association with all 14 households in the village, and they set aside two hectares of their scarce productive land to experiment with and demonstrate alternatives to slash-and-burn. They invited CIIFAD and Tefy Saina to help them reduce their reliance on shifting cultivation, recognizing that the reduction in forest was affecting their water supply and the long-term viability of their agricultural practices and, for that matter, their community.

The whole village participated in land use planning and management to move away from an agriculture they no longer regarded as sustainable. They mapped the area around the village, the area between them and the Park forest, and the area between them and the road, listing changes they had observed over the past 5-10 years and problems that are now perceived, leading to solutions that they could suggest themselves to reverse the resource decline (Uphoff 1997; see Annex I for this map and listing).

Ghana. In March 1998, I visited the village of Domi in the Greater Afram Plains, a large semi-arid savanna area to the west of the huge Lake Volta. Three years earlier this village had been classified as "challenging," i.e., not particularly cooperative, by the NGO with which we are working in the area. World Vision/Ghana has been installing village water supplies in the Greater Afram Plains since 1990 under its Ghana Rural Water Project, supported by the Hilton Foundation and World Vision International. Now, I was told, Domi is considered to be "promising," i.e., active and cooperative.

The previous summer, a Ghanaian student doing graduate work at Cornell worked with the chief and villagers in Domi, as well as with two other communities in the Greater Afram Plains, to

initiate a process of community-based land use planning and management. They constructed a map of the village and its resources and assessed resource uses, considering the different information and evaluations that men, women and children had about natural resources. With this base of knowledge, they began taking steps to ensure that there would not be further loss of forest, soil and water resources.

The headwaters of six streams were identified within the Domi domain. The chief banned farming around the sources of these streams and asked villagers to join in reforestation efforts so that the water supply could be improved. Villagers believe that as forest cover has been reduced over the last 20 years, their water supplies have dwindled. They expressed agreement that reforestation will be better if they use a variety of trees, not just a single species, and not just exotic species. They said they know that some plant species are being lost in the area. Some of these plants have medicinal value, the villagers suggested, saying they would be glad to cooperate with researchers who can document and help evaluate these plants and help protect them (Uphoff 1998).

There is much more potential for CBNRM than even a few years ago. Rural people have been exposed to some of the same information about global warming and climate change that reaches us in urban areas. They are necessarily very attentive to shifts and trends in their environment, particularly to changes in rainfall and weather patterns. They also have knowledge of and some attachment to the flora and fauna, because they depend upon these for some or much of their livelihoods. They see value in sustaining biological resources. Suggestions and appeals concerning the environment that would have gone unheeded in the past now have more resonance in conversations with rural residents.

It is very important *how* such conversations occur. Villagers in my experience, when dealing with government agents that are condescending and in their hearts and minds contemptuous, will be either uncooperative or only nominally acquiescent. Either way they continue doing whatever they can get away with. Even well-meaning approaches by outsiders as in Domi may be met at first with indifference or hostility from villagers. There is in most countries a long legacy of unsatisfactory relationships between communities and outside agencies, governmental or non-governmental.

Given problems of estrangement and distrust, often subtle and unspoken from the community side, one cannot expect new cooperative arrangements for resource conservation and utilization to spring up quickly or without some misunderstandings and difficulty. An attitude that local people are enemies or abusers of the environment, when often others richer and more educated are also taking advantage of natural resources for personal profit, sometimes even with government sanction or acquiescence, does not help establish rapport and a basis for cooperation.

CBNRM is not simply devolution of responsibility to communities. It is a result of discussions and negotiation, seeking agreement on terms and conditions that are not unilaterally determined and whose fulfillment is jointly reviewed and assessed. How well can such arrangements serve both conservation and development goals? How widely is CBNRM feasible, and with what costs and what risks of failure? These are questions to be answered empirically.

VII. WORKSHOP THEMES

The organizers of the workshop have identified four main areas in which knowledge needs to be systematically accumulated, evaluated and disseminated:

- The process of establishing an *enabling policy and institutional environment*, at macro and micro levels, fostering the emergence of community-based institutions to manage natural resources locally;
- The participatory process of organizing effective *community-based groups*, both at local levels and scaling up to the regional level (the preceding analysis has showed this to be process to be more complex than stated in the workshop documents);
- Effective *operational linkages*, both horizontal and vertical, among the public sector, the private sector, and community-based groups in the management of natural resources; and,
- Alternative approaches to *conflict management* with regard to the use of natural resources at all levels, local, regional and national.

For considering questions and criteria, it makes sense to start with the second focus – community-based groups – coming back to the first – enabling environment – once it is clearer what kinds of capabilities and networks should be enabled by policies and institutions.

A. Community-Based Groups

- What kinds of *groups* or organizations are involved, or could become involved, in CBNRM? Once we appreciate that there is *not just one local level*, but rather there are *three* local levels, we should ascertain what kind of community-based groups already exist or could be usefully established:

  ⇒ What *groups* if any engage in NRM? What are the common characteristics or interests of their members? How did such groups come into existence? Are they 'traditional' or recently formed? What kinds of sanctions do they have for members and for others outside of the group to enforce certain NRM decisions? What legal status if any do they have?

  ⇒ If *community* organizations take decisions and act on NRM matters on behalf of all the members of a village, what are the boundaries of the organization and its jurisdiction? Is it 'traditional' or recently formed? What kinds of sanctions does it have for members of the village, and what control if any can it exercise over 'outsiders'? What legal status do these have? Is there any link to local government or local administration?

  ⇒ *Locality* organizations may take decisions and act on NRM matters over a larger area, subsuming communities. What are the boundaries of such organizations and their jurisdiction? Are they 'traditional' or recently formed? What kinds of sanctions do they have within the locality, and what control over 'outsiders'?

- For *what resource(s)* do these groups or organizations claim responsibility? Are these resources clearly known and delimited, or are they not well known and determined? Previous analysis suggests that the effectiveness and sustainability of community-based management is affected by whether or not the resource is 'bounded,' as well as whether the resource users are a 'bounded' set. These distinctions are laid out in Figure 2.

Figure 2. Resource Management Situations, According to Nature of the Resource and the User-Managers

Nature of User-Manager	Nature of Natural Resource: Known and predictable	Nature of Natural Resource: Little known and unpredictable
Identifiable and coherent group	Irrigation water management	Coastal fishing by fisherman groups
Lacking group identity and structure	Forest management	Rangeland management

Source: Uphoff (1986: 26)

Protected area management presents a situation where the resource is delimited, at least in principle, though boundaries may indeed be changing or ambiguous, as we have found with the Los Haitises National Park in the Dominican Republic (Geisler et al. 1998). Most users, on the other hand, have little in common except for being located close to the protected area as delineated by officials who make decisions far from the resource itself, and some users, authorized or unauthorized, are indeed 'outsiders' with no relationship to persons living around the protected area. There is no reason why such persons should consider themselves as belonging to 'communities,' and there may be little solidarity within the communities that do exist. The challenge of responding to government decisions and intrusions may give impetus to a common identity and forge some common interest that was not evident before, but this may not be a positive context in which to try to establish cooperative community interests (7).

Watershed management confronts many different situations with greater uncertainty along both axes in Figure 2. A greater variety of resources may be involved, not just biological resources valued for biodiversity's sake, and a resource like water varies from year to year, being fairly unpredictable. The resource users can be grouped, at least analytically, into upstream and downstream areas. But many persons and diverse organizations have access to a watershed, so the 'community of users' is very difficult to delimit.

> The SCOR project in Sri Lanka, discussed above, has been able to link a wide range of resource users, but it is uncommon to have such a heterogeneous set of interests engaging in CBNRM together. It was learned that most households in the Nilwela watershed had members engaged in several different occupational activities (rice, tea, forest extraction). This meant that persons involved in one kind of user group could perceive a stake in supporting other kinds of groups to have sustainable access to certain resources to be maintained within the watershed.
>
> The kind of competition and conflict that was envisioned as likely when the project was designed did not materialize (8). This was partly because households perceived more common interest than we anticipated, due to the diverse interests within and hence multiple connections among households that derived from their heterogeneous survival strategies. Cooperation also emerged because of the efforts of institutional organizers, young persons recruited and trained as catalysts to evoke normative reorientation as well as to reconcile interests.

The 'institutional organizer' role was modeled after a prior catalytic role that helped to improve irrigation water management in Sri Lanka (Uphoff 1996). It was possible to create more cooperative efforts to preserve and manage natural resources within whole watersheds that had been previously expected.

With the help of project staff, sub-watershed residents developed maps identifying current resources and evaluating their uses within the hydrologically-defined area. They then produced a map that projected a vision of more beneficial uses corresponding to a differently managed and sustainable natural resource base in the future. This information was put into a geographic information system (GIS) which then drew attractive computerized maps for communities, along with revised maps updated every six months to show the tree-planting, terracing, changes in farming systems, creation of no-use zones, and other actions that had been taken (see Annex II).

- An important question for community-based groups is how much support and strength can come from existing, often '*traditional*' organizations and culture. A related question is how much positive support for conservation efforts these organizations and culture can derive from 'traditional' symbols and values. In Ghana, for example, we find that land tenure decisions emanate mostly from the local chief and his superior, the paramount chief for the region. But they are actually shaped by the much less visible clan heads, whose voice in all matters pertaining to land and other natural resources is effectively binding, though their authority is seen as subordinate.
- While it is fairly easy to engage the attention and cooperation of communities when their access to sufficient and reliable water supply is at stake, groups and associations can vary considerably in terms of whether they have any similar, related, overlapping or competing interest in *biodiversity*. For some groups, this connection is easy to get accepted, and indeed there may be a positive value already attached to preserving the full range of flora and fauna existing in an area. Alternatively, there may be no interest in biodiversity and even a hostility toward certain plant or animal species, such as animals that harm crops. This makes CBNRM for protecting endangered species and ecosystems problematic. Different strategies will be appropriate if conservation of biodiversity is an urgent need and a top priority where community groups are disinterested or antagonistic toward this.

Other questions can and should be asked of the various cases, but these get at core concerns for evaluating the efficacy and sustainability of community-based groups for conserving the environment.

B. Linkages that Transcend Communities

This thematic focus highlights the need for CBNRM to look beyond the community. Important questions include:

- What kinds of *horizontal* linkage exist, or can be forged, between and among group / community / locality organizations at the same level? This focuses on attention on linkages among actors having similar interests and capabilities. To what extent is CBNRM seen as an isolated activity, or, much better, as a method for mobilizing local leadership and efforts to manage natural resources that is understood and acceptable to similar organizations elsewhere? This speaks to the question of spread effect.
- Along the same lines, what kinds of *vertical* linkage exist, or can be forged, between organizations at the group, community and/or locality levels and higher levels? This focuses on linkages with district, regional, national and even international actors. To what extent is CBNRM limited in its outreach and upreach, not having influence beyond its local domain and not having access to 'outside' resources (authority and expertise as well as funds and personnel). This speaks to the question of effectiveness. Autonomous local institutions if isolated and unlinked may be impotent rather than empowered.

- To what extent is work at group/community/locality levels associated with broad *coalitions* of actors that represent different sectors and levels, bringing multiple perspectives and capabilities to the enterprise of CBNRM? Here are some examples of such networks which I know about from Asia, Africa and Latin America:

  Indonesia. The Nusa Tenggara Area Community Development Consortium was launched in 1990 with support from the Ford Foundation office in Jakarta and from World Neighbors, an international NGO. The Consortium brings together NGO, university, government and community actors in, or with an interest in, the southeastern part of the Indonesian archipelago (see Fisher et al. 1998). The consortium addresses a wide range of development and conservation problems in Eastern Indonesia. Its working group on conservation of natural resources deals with CBNRM issues at eight sites in Lombok, Sumba and Timor through action research, community organizing, coalition building, and joint fact-finding, with a variety of innovative strategies for convening stakeholders. Community-level experiments to deal with conflicts over natural resources are going on in Gunung Mutis Nature Reserve and Wanggameti Conservation Area, among other places.

  Philippines. In 1993, a similar set of universities, NGOs, government agencies and international agricultural research centers formed the Conservation Farming in the Tropical Uplands (CFTU) consortium. Having started with upland farming systems evaluation and improvement, joint activities now include watershed protection (around Cebu City) and protected area management (Rajasikatuna National Park on Bohol).

  Ghana. The Natural Resource Management and Sustainable Agriculture Partnership (NARMSAP) was launched in 1994 by World Vision International/Ghana and CIIFAD, joined by faculty from two universities, the Ministry of Food and Agriculture's Extension Service, and representatives from communities in the Greater Afram Plains (GAP). At a second planning conference held a year later, there was broader institutional and local government participation and more than three dozen community representatives this time. When it appeared that launching field activities would be delayed pending mobilization of donor support, the community and district representatives urged the NGO, university and government partners to start with whatever resources would be available, pledging to make some contributions from their own sources to this venture.

  A program of farmer-centered research and extension to develop technologies and practices that could conserve natural resources while improving people's livelihoods was formulated with suggestions from farmer workshops held in each district. There are two protected areas within the GAP (Digyae National Park and Kogyae Strict Nature Reserve), so it is not surprising that NARMSAP has become engaged in protected area management and conflict resolution. This has brought the Department of Wildlife in as a stakeholder, and members from the media have become involved, not just in reporting events but in helping to better understand and resolve conflicts.

  Honduras. Starting in 1995, a diverse group of NGO, university and other partners formed the National Association for the Promotion of Ecological Agriculture, known as ANAFAE for its Spanish acronym. This loose association of 18 independent organizations sharing the common goal of promoting sustainable agriculture has, like NARMSAP in Ghana, become quite involved with protected area management issues and with conflict resolution. Besides the members, 13 other organizations or programs participated in some way in ANAFAE activities during 1996-97. Cerro Azul-Meambar National Park and the Yeguare Valley watershed were initial focuses of research. Conflict management efforts are now centered in the Copan Valley to the west (9).

These are examples of the kinds of broad coalition building that is going on in support of CBNRM around the world (see partnership listings in Figure 3). They are grounded in community-level activities and initiatives but have a larger view and strategy, both in terms of geographic area and in terms of diverse partnerships. They purposefully support actions at local

and national levels and beyond. An excellent analysis of such processes transcending national borders in Central America is offered by Edelman (1998). The Association of Central American Peasant Organizations for Cooperation and Development (ASCODE) formed in 1991 has pledged to "promote conservation of Central America's ecological systems" (ibid., p. 233).

Figure 3. Consortium of Partners in Community-Based Natural Resource Management

	Indonesia	Philippines	Ghana	Honduras
	Nusa Tenggara Area Community Development Consortium	Conservation Farming in the Tropical Uplands (CFTU)	The Natural Resource and Sustainable Agriculture Partnership (NARMSAP)	National Association for the Promotion of Ecological Agriculture (ANAFAE)
Government	Ministry of Forestry; Ministry of Agriculture; Bureau of Land Registration	Department of Environment and Natural Resources; Department of Agriculture, Soil Conservation Bureau	Ministry of Food and Agriculture (Extension Service); Council for Scientific and Industrial Research (CSIR)	
	Representatives of provincial, district, and sub-district government bodies	District VIII and IX offices of DENR and DA	District Assemblies of five districts in the Greater Afram Plains	
NGOs: International	World Wide Fund for Nature; Wildlife Conservation Society; Birdlife International; World Neighbors; Ford Foundation	International Institute for Rural Reconstruction; World Neighbors	World Vision / International; Techno-Serve	World Neighbors; Save the Children Association of Honduras; International Cover Crop Clearing House (CIDICCO)
NGOs: National	LP3ES; Yayasan Tananua; Yayasan Sanusa	Mag-Uugmad Foundation; Philippine Partnership for the Development of Human Resources in Rural Areas (PhilDDHRA); Aboitiz Development Studies Center, Cebu	World Vision / Ghana	Committee for the Defence and Development of the Flora and Fauna of the Golf of Fonseca; National Campesino Union; Caritas; and 11 other religious and developmental NGOs
Universities and Colleges	University of Indonesia; University of Mataram; Agricutlural Polytechnic, Kupang; Cornell (CIIFAD and	Visayas State College (FARMI); University of the Philippines, College of Agriculture; Los Babos (Agroforestry); Bohol Agricultural	University of Ghana; University of Science and Technology; Cornell (CIIFAD)	Panamerican School of Agriculture at Zamorano, Dept. of Plant Protection; Cornell (CIIFAD)

	CPECM); East-West Center, University of Hawaii	College; Waikato University; New Zealand; Cornell (CIIFAD)		
Communities	Representatives from forest-margin communities throughout Nusa Tenggara	Barangays in Leyte, Cebu and Bohol	Zonal (sub-district) and Unit (locality) Committees and farmer groups at village level carrying out experiments for sustainable agriculture and NRM	Community representatives where these partners are working at grassroots in Honduras
International Agricultural Research Centers		International Center for Agroforestry Research (ICRAF); International Rice Research Institute (IRRI)		

With such strategies, each participating organization contributes according to its comparative advantage and organizational objectives. These coalitions represent conjunctions of public, private and middle sector activity, though the private sector involvement is mostly from non-profit rather than the for-profit organizations. The role and involvement of state institutions is often informal, not committing or compromising public authority. Rather state institutions harmonize their exercise of authority with what 'civil society' institutions and community representatives think will be most beneficial. In this way, CBNRM may be evolving interesting new forms and exercises of public authority.

- With regard to operational linkages, one should consider not just management but also *planning* which sets directions and priorities in light of problems and trends that are identified. Reference has been made above to efforts to promote 'community-based land use planning and management' in a number of countries. Planning invariably requires the involvement of multiple actors at various levels, as we are seeing in our initiatives along these lines in Ghana, Madagascar, Indonesia, Philippines and the Dominican Republic. To what extent are local institutions cooperating in creating a vision of more desirable futures, compared with visions of what are likely future conditions if present forces and trends persist? This *visioning process* is important for creating impetus and incentives for management, so we should look specifically at this.

C. Conflict Management

This is emerging as a subject of much concern and importance because conflicts of interest are ubiquitous in natural resource management, but also because there is a growing body of techniques and methods available for trying to deal with disputes and differences of approach to NRM. Conflict management is relevant to the subject of planning, just discussed, as much as to management.

Terminology and concepts are still evolving in this area. For example, conflict management is probably a more realistic term than conflict resolution in many cases since conflicts are often not really resolved, only mitigated. The idea of 'multi-party collaborative problem-solving' is gaining ground as a more comprehensive and inclusive approach. It recognizes that the concept of 'conflict' is not always accepted or freely understood in many cultures.

An explicit focus on conflict runs the risk of reifying it, perhaps putting people into opposing camps when they could be considering themselves on the same side and working together for outcomes that are agreeable to all. The case studies prepared by Fisher et al. (1998) from Indonesia and by Chenier (1998) from Honduras give more detail on learning about conflict management that I have been following through collaborating institutions. The Ghana case discussed above has had some very instructive experience with conflict resolution:

> Just two months before my visit to Domi village, there was impending conflict between villagers there and in 17 other communities located around Kogyae Strict Nature Reserve in the middle of the Greater Afram Plains. The reserve had recently been expanded by the government without any consultation with villagers, who were suddenly told by armed guards from the Wildlife Department that they would have to stop cultivating in the area and would have to move out. There were plans afoot, which we only learned about subsequently, to kidnap those guards and expel them from the area by force.
>
> World Vision and CIIFAD had gotten word of the likelihood of violence and were able to organize a 'workshop' bringing the various stakeholders together in mid-January. This was a very successful event, even though it got off to a shaky start with the Wildlife Guards staying away ("fearing for their lives"). A series of discussions, alternating between group work and plenary sessions, and starting with people in homogeneous groups (villagers, chiefs, Wildlife guards, local government officials, NGOs, media) and then moving to heterogeneous groups (constituted at random), defused tensions and created a sense of common interest countervailing separate and conflicting interests.
>
> The techniques used included each group listing expectations for the workshop, a 'time line' making visual everybody's relationship to the protected area, analysis of the ways that English terms like forest and reserve had been translated into Twi, the local language (creating some misunderstandings) (10), an inventory of resources, uses and trends, and visioning of the future likely with alternative suggested scenarios (remove all guards, remove all communities around the reserve, invest in conservation agriculture, etc.)
>
> By the end of the workshop, there was agreement from the community representatives that the guards should remain in the area and that slash-and-burn agriculture should be prohibited in and around the reserve, and agreement from the government side that the area into which the reserve had been expanded should be a buffer zone rather than strict reserve, with restricted but continuing and non-degrading human uses allowed. The villagers and their chiefs agreed to help protect the ecosystem within the reserve (Deshler and Edmonds 1998). The Domi residents with whom I spoke in March expressed support for adopting practices of 'conservation agriculture,' for their own sake as well as for that of the environment.

As this area of conflict management is still fairly new, the search is on for various and alternative methods for resolving conflicts.

- The cases considered in this workshop should be assessed for whatever *innovations* they offer from which others involved in CBNRM could learn. We should not be tied to or constrained by the concept of 'conflict' and rather should consider what it takes to forge and maintain agreements on the uses and practices which sustain soil, water, forest and other biological resources.

- *Information and knowledge* generated through research, and especially participatory action research, cannot eliminate preexisting conflicts of interest. But they can modify and realign interests, so that issues which threatened to evoke conflict, even violence, get redefined in ways which permit all parties to change behaviors and proceed in some kind of compatible manner.

- *Cultural differences* need to be considered, as we in CIIFAD have seen from involvement with conflict management efforts in a range of countries.

  Conflict resolution efforts that we have facilitated in the buffer zone around Los Haitises National Park in the Dominican Republic have found useful a procedure referred to as the 'moral contract.' After all parties have reached some consensus, each person tells the group what he or she intends to do to help carry out what has been agreed on. When they meet again, they begin with a discussion of what has been accomplished, and what not. Where intentions could not be realized, others help to figure out how obstacles could be removed.

  Such a procedure, however, seems more suited to a Latin American cultural setting than to situations in Madagascar and Indonesia, for example. In countries with quite different cultural sensibilities, this 'moral contract' is unlikely to build commitment. Individuals in Madagascar and Indonesia avoid making public and individual commitments, preferring instead to associate themselves with a group consensus that is articulated by respected figures who speak for the group rather than for themselves. There are ways of working in both kinds of cultural settings, but techniques surely need to be different.

D. Enabling Policy and Institutional Environments

What kinds of policies and institutions are required to make community-based groups, linkages, and conflict management for CBNRM more effective? Which are most important to start with? These are questions we will seek answers to from the case studies, recognizing that all situations are different. The structure of each situation is different, with different sets of actors and different configurations of interest. Timing is an important consideration as the political climate may be more receptive or more closed in one period compared to another. The objectives also will differ, with specific aspects of conservation and development highlighted compared to others.

The constant in these situations is the need for *community capacity* to participate in CBNRM, assuming that intention or motivation will be always a variable, shaped by the way problems and opportunities are presented.

- One issue is whether *existing organizations*, formal or informal, at local levels will be able and willing to undertake CBNRM responsibilities. If the answer is no, a priority policy and institutional concern will be to support new – or strengthen old – capacities.

- Another question is whether CBNRM institutions should be linked with – or can operate separately from – institutions of '*civil society*.' Some would argue that CBNRM must be connected to larger efforts to ensure democratization and accountability, whereas others see these issues as contentious and divisive, so that CBNRM is best kept at arm's length from what will invariably be seen as partisan and political activities.

- The current disposition shaping most policy making these days, emanating from 'the Washington consensus' and accepted by or pressed upon governments in developing countries, emphasizes *market forces and incentives*, with their reliance on individual self-

interest and material motivations. It is not clear how compatible this emphasis is with CBNRM, and indeed with natural resource conservation, over the long run. If essentially selfish motives are endorsed, even encouraged, the disposition to forego any personal advantage that could be gained from exploiting natural resources is diminished.

The economic logic of heavily discounting future benefits compared to costs devalues the needs and interests of future generations. Quite possibly, the policy signals which support CBNRM could be undermined by other signals that stress the pursuit of individual and material advantage, downplaying social and non-material benefits. This is a complex issue which may or may not be assessed from the case studies. But it is one which everyone concerned with natural resource conservation should consider.

We are seeing interesting evolutions of the policy and institutional environment regarding CBNRM in a number of countries around the world:

Indonesia. Although the government has generally been reluctant to grant much scope for NGO activity, the Nusa Tenggara Area Community Development Consortium working in the eastern part of the country has found officials at provincial, district and lower levels amenable to more experimentation and improvisation that would have been expected from central pronouncements. Reasons for this include: (1) decentralization policies and more local autonomy in decision-making and management; (2) strong links established with local government, mitigating line-agency bias toward national policies; (3) improved relations among stakeholders through a range of formal and informal activities; and (4) research and analysis which has provided new and accurate information on the condition of forest ecosystems and forest-margin communities.

Although the national policy environment in Indonesia has become more favorable in recent years, the activities of the consortium have helped to gain more understanding and supportive interpretations and implementation of policy at middle to lower levels of government. This has occurred even within a system regarded as quite centralized, which suggests that getting a more favorable policy and institutional environment may not depend entirely on top-down initiatives. Rather, the environment can, at least to some extent, be improved by creative actions at middle and local levels. Whether the Minister of Forestry in the newly appointed government will be as well-disposed toward community-based approaches as his predecessor remains to be seen. Possibly the consortium partners will have build up good enough working relations with provincial, district and lower-level officials that present cooperation can be mostly maintained.

Madagascar. The government has been actively involved with NGOs and donor agencies to formulate a national environmental action plan (the first in Africa) and to revise it in light of experience. The second phase of this plan (1997-2001) has made CBNRM a principal pillar of policy. The policy presented under the acronym GELOSE seeks to create security for natural resources by giving communities a large voice in their management, through indigenous institutions and roles rather than forcing communities to work through the unfamiliar and somewhat remote structure of local government. The Mahajanga declaration (November 1994) stated that community institutions, and not just government agencies, should be relied on to protect water, forest and endangered biological resources. Soil conservation and protected area management have been made the responsibility of state-sponsored NGOs (ANAE and ANGAP) that can work more flexibly with other NGOs and with communities than can existing bureaucratic agencies.

Dominican Republic. This country now has about 30 percent of its area under protected status. The creation of parks and reserves was done rather unilaterally, however. From time to time when human incursions on forest or marine resources became too obvious and an issue, the government would use force to evict transgressors. Sometimes this was wealthy interests, as in the case of logging or grazing large herds of cattle in forest areas. But often the brunt of exclusion fell

on poor and marginal rural households. The government is quite reluctant to be giving up any authority to regulate access to and the use of natural resources. But in recent years, resulting at least in part from NGO and university activity, government decision-makers have begun accepting more consultative modes of NRM, including some experiments with community participation.

An overall institutional issue is whether the state will seek to maintain its *dominant position* within the institutional landscape with regard to NRM, perhaps permitting community involvement on a pragmatic basis but moving toward CBNRM in a limited way, or will accept the private sector, both non-profit and for-profit parts, and the middle sector as active and full partners, if not yet equal partners.

VIII. CRITERIA FOR EVALUATION

Various criteria could be proposed for assessing the cases presented for consideration in this workshop. The following are suggested as starting points for consideration:

(1) *Preservation and protection of natural resources*, especially maintaining the renewability of those which are renewable, particularly flora and fauna that are endangered within vulnerable ecosystems;

(2) *Improvement in the income, security and well-being of communities* that are associated with and to some extent dependent on those natural resources. This consideration can include the preservation of the *cultural identity and integrity* of populations which are distinct from majority cultures;

(3) *Sustainability of the management system*, including ability to evolve and adapt in response to changing conditions;

(4) *Modest cost* for operating the system, considering all costs, those borne by communities as well as by the government and other organizations;

(5) *Acceptable equity* in the distribution of benefits from the system of management. This includes consideration of benefits relative to costs distributed by *gender*; and,

(6) Extent and range of *participation and empowerment* of local residents. If this conflicts with any of the above objectives, there needs to be some redesign of CBNRM, itself involving local residents to reach agreement on goals and on means which can advance these goals as a set.

It should not be assumed that these goals are all naturally compatible. There needs to be considerable deliberation involving communities and their representatives in envisioning the future and seeking ways to make the preferred futures more likely. Rural residents have aspirations for the next generation that are more concrete and compelling than the abstract goals that policy-makers debate and the quantified targets that they set.

This is the main reason why I am hopeful that CBNRM can become an effective approach to natural resource conservation and management. For this to succeed, rural populations need more information and channels for expressing their interests, hopes and ideas regarding how to give their children and their children's children a chance to enjoy life as abundant as nature's resources and human skills, knowledge, talents and cooperation can provide, and to live in environments that maintain the diversity, integrity and productivity that have permitted human societies to advance this far.

Endnotes

(1) Reflecting on her observations during fieldwork in Western India, Baviskar (1995: 173) comments: "While reverence for nature is evident in the myths and many ceremonies which attempt to secure nature's cooperation, that ideology does not [necessarily] translate into a conservationist ethic or a set of ecologically sustainable practices."

(2) John Schelhas in a personal communication has estimated that perhaps 80 to 90 percent of biodiversity conservation in the world is 'incidental,' a by-product of other activities that are more intrinsically rewarding, such as growing shade-grown coffee which harbors high bird and insect diversity, or maintaining riparian forests that protect watersheds but also provide habitat and migration corridors for wildlife species. Many traditional farming systems that rely on polycropping and nutrient cycling contribute to the maintenance of biodiversity, as do parks and protected areas set aside for recreational or scenic values. These objectives are enhanced by having greater biodiversity, but this benefit is more incidental than planned

(3) Various designations have been given to the middle sector: the participatory sector, the voluntary sector, the membership sector, the collective action sector, the self-help sector (Uphoff 1993). For simplicity's sake, this sector is here referred to as 'the middle sector.' Along with this, there has arisen something referred to as the NGO (non-governmental organization) sector (Carroll 1992; Clark 1991; Edwards and Hulme 1992; Farrington and Bebbington 1993; Fisher 1993). I would include NGOs as a part of the private sector, as explained below.

(4) No systematic distinction is made here between institutions and organizations, but understanding this is important for a deeper appreciation of CBNRM options. This distinction is analyzed in Uphoff (1986: 8-10; and 1994).

(5) This is suggested by Larry Fisher, based in part on his work with colleagues in Indonesia (Fisher et al. 1998).

(6) Research using radioisotope analysis to trace the sources of soil and silt accumulation in the Nizao reservoirs showed that erosion associated with hillside cultivation was a negligible contributing factor compared to the disturbance of soil that resulted from road building and reservoir construction (Nagle 1997). So efforts directed at changing or stopping certain farming practices to slow the loss of reservoir capacity were largely misdirected, since the government itself was responsible for more demonstrable environmental disruption than were farmers.

(7) Also, some protected areas depend on habitat connections to areas outside their boundaries, which is why conservation biologists so often argue for expanded areas of protection with jurisdictions that extend into private lands. So sometimes the boundaries of 'protected areas' are not that evident, and even the resources within them (water, wildlife, forests, and forest products) may be somewhat ambiguous because of their variety and uncertain value (suggestion from John Schelhas).

(8) In 1992, I participated in the design of this project, along with Gil Levine, also from Cornell, and a large number of Sri Lankan colleagues.

(9) The case study by Jackie Chenier on CBNRM efforts in Copan valley reports on activities of the Honduran Network for Collaborative Natural Resource Management, which grew out of the ANAFAE collaboration.

(10) Government officials thought they were being culturally sensitive (and clever) to use the Twi word for 'sacred forest' to translate the word 'reserve,' but this created confusion because there was no resemblance in local people's minds between the already somewhat depleted Kogyae area and a 'sacred forest.'

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