COMMUNITY-BASED NATURAL RESOURCE MANAGEMENT

Concern with community-based natural resource management (CBNRM) has emerged as a critical and integrative theme from most of our geographically-focused programs.

We are not looking just at community management, i.e., management by communities alone, but rather at management where communities play the central role, interacting with and supported by actors at various levels, from the household up to national and international levels, and from various sectors.

Previous CIIFAD efforts in this area have been undertaken under the headings of "protected area management" (PAM) and "community-based land use planning and management" (CBLUPM). Both interests continue, but we have opted this past year for a more inclusive rubric which subsumes both PAM and CBLUPM. A common theme across all of these approaches is greater participation and responsibility for people living in communities.

These approaches share a premise that the long-term sustainability of natural resources and the ecosystems they are part of will be greater to the extent that people in communities, in smaller groups, and in sets of contiguous communities become more engaged in explicit processes of natural resource assessment and management. This involves utilizing local knowledge, exercising judgment, and giving effect to shared values.

Where the impetus for such participation comes from is not important. Initiative for local management may come from communities or from groups of persons, or from outside agencies. What is important is that all parties to the process take time and make efforts to become knowledgeable about the resources in question and about each other, so that more effective and equitable systems of resource management can be devised.

We are seeing evidence of CBNRM in practically all the countries where CIIFAD has collaborative programs as well as in our cross-cutting thematic initiatives.

CBNRM issues go back many years. Almost 40 years ago a distinguished agricultural economist wrote an article in the journal of *Land Economics* entitled: "Can People Be Trusted with Natural Resources?" The author answered this question with a resounding "no." He foresaw what Garrett Harden characterized subsequently as "the tragedy of the commons," fearing that greed, ignorance, and a lack of stewardship among people who have less and less sense of community in the modern world would overwhelm efforts to conserve resources for the future.

This made J.W. Milliman a foe of local control in land use planning, which he viewed as noble rhetoric cloaking less-than-noble intentions to undo resource protection. Echoes of this perspective can be found, in more sophisticated forms, in books and articles appearing lately which challenge the

feasibility and desirability of CBNRM.* So it is significant that we are discovering or are able to facilitate authentic instances of CBNRM in a variety of countries around the world.

In last year's annual report, we noted that the tasks of CBNRM are twofold: sustainable resource use and conservation, as well as poverty remediation. It is well recognized that there are commonly trade-offs between these goals. We also know that progress on either or both of these fronts cannot be conclusively determined within a few years. This is where research and evaluation become important.

Institutions such as CIIFAD and its partners including community organizations are designing ways to monitor the progress and performance of CBNRM. This is occurring directly, as students and faculty undertake CBNRM research, and indirectly, as they work with stakeholders on conflict resolution, adaptive co-management, indigenous soil surveys, grassroots ecotourism, green micro-enterprise development, bottom-up planning, interactive distance learning, community transects, local watershed management, and many other topics relevant to local social and biological welfare.

The faculty and students working on CBNRM come from various disciplines: Crop and Soil Sciences; Government; Natural Resources; Regional Planning; and Rural Sociology, to name those most involved so far (see list of participants in the CBNRM group are listed on page 142).

In this section, we report on some of the current experiences from CIIFAD programs. All counter Milliman's skeptical dismissal of the power of conscientious local interests seeking to utilize better and more permanently their natural resource base—typically through some conservation activities—without costs to local welfare. In other sections there are also discussions of initiatives to support and evaluate CBNRM, such as in China.

Finding and optimizing means to support both conservation and development requires local solutions to which there is both local commitment and local empowerment. The latter is needed to enforce rules and restrictions, both for local residents and for outside actors who have no stake in the sustainability of ecosystems and opportunities for local people.

Not all balances can best be struck by purely local efforts. There are extra-local interests that have legitimate stakes in resource management and conservation and should have a voice. Also some negative extra-local interests can only be dealt with adequately by national or international efforts. What we are seeing is that interest groups seeking what is best for both the environment and for people can gain enough public support to ensure that ecosystems are maintained intact or allowed to evolve in ways that are suited to multiple needs, ecological as well as human.

Managing Mountain Resources

Communities in upland and mountainous regions around the world present some special challenges for managing their natural resources. With support from the Ford Foundation, CIIFAD is examining environment and development experiences in selected mountainous regions in South and Southeast Asia and comparatively in the United States. E. Walter Coward, Jr. is leading this activity, with assistance from Frederick Addison, a PhD student in Regional Planning who has been working on community-based natural resource management in Ghana on behalf of CIIFAD and its partner, World Vision / Ghana.

Though typically on the periphery of larger political and socioeconomic systems, upland and mountain communities have always been affected by these centers of power, while often maintaining unique ethnic identities and resource management institutions. Ongoing research on mon-

* Writings referred to here are J. W. Milliman (1962), "Can People Be Trusted with Natural Resources?" *Land Economics*, 38, pp. 199-218; Garrett Harden (1969), "The Tragedy of the Commons," *Science*, 68, pp. 1243-1248; and as a recent example of critiques of CBNRM, R. Kramer, et al. (1997), *Last Stand: Protected Areas and the Defense of Tropical Biodiversity*, New York: Oxford University Press.

The Landcare Approach to Conservation Farming in Mindanao

Soil erosion in upland areas is one of the major environmental hazards associated with agricultural production. In the locality of Claveria, located in Misamis Oriental Province of the Philippines, rapid population growth and economic needs push farmers to cultivate steeper and more fragile lands, contributing to erosion of 50 to 300 tons of topsoil per hectare annually. The loss in soil fertility reduces productivity and income levels of farming households, eventually affecting the nutritional status of vulnerable children.

The use of contour hedgerow systems on hillsides is widely recognized as an important technical option for reducing soil erosion. In the mid-1980s, the Department of Agriculture introduced the "sloping agriculture land technology" (SALT) in Claveria, but its adoption by farmers up to the early 1990s was limited.

This challenged the International Centre for Research in Agroforestry (ICRAF) to study the dynamics of this dismal response and to seek means to effectively promote and disseminate appropriate agroforestry technologies. A decade of research efforts in Claveria has led ICRAF to draw a number of conclusions for better land use planning and management at the grassroots. These lessons deal with technical, institutional, and interorganizational relationships.

Technical Innovation: ***Farmers adopt more readily simple and low-cost technologies that emerge from their own technical innovations.*** ICRAF has concluded that hedgerow systems of leguminous trees that the SALT system recommended can increase maize yields by 20-30 percent. However, since profit margins with this system are usually low, farmers abandon the tree hedgerow systems after several years of trial. However, ICRAF noticed some farmers experimenting to modify the contour hedgerow concept by placing crop residues along contour lines serving as filter strips. Native species of weeds grew in these unplanted strips, in due time forming stable natural barriers to soil erosion. These uncultivated areas along hillside contours evolved into a technology now known as natural vegetative strips (NVS). Research has shown that these are equally effective in controlling soil erosion compared to hedgerow technology.

Farmers tested and found NVS suiting their varying needs, resources and preferences. They thus took over conservation efforts through a technology that they themselves discovered.* By 1995, NVS had already been adopted by 100 farmers. The technology began spreading on its own without official extension support.

ICRAF studied this process and found an opportunity to become involved in extension. But it was constrained organizationally by its research mandate. This limitation led to the formation of a three-member contour hedgerow extension team (CHET), composed of a farmer innovator, an agriculture technician from the local government (municipality), and a researcher from ICRAF. The CHET provided support to other farmers willing to adopt the NVS technology. This scheme institutionalized the practice of teamwork, and it integrated extension work with the traditional research role of ICRAF. By this past summer, about 3,000 farmers in the municipality, about one-third of the total number, had adopted some version of NVS.

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* This technology has been developed autonomously elsewhere. See a report on NVS in Africa by M. Osunade and C. Reij (1996), 'Back to the Grass Strips': A history of soil conservation policies in Swaziland. In C. Reij, et al., *Sustaining the Soil: Indigenous Soil and Water Conservation in Africa*, pp. 151-155. London: Earthscan Publications.

Institutional Innovation: ***People's organizations assume crucial roles in the shift to a demand-driven extension system.*** In 1996, a gathering of farmers trained on NVS from six barangays (villages) decided to form a group, the Claveria Landcare Association (CLCA). Its name captures the concern with "care for the land," and members use the organization as a mechanism for horizontal information dissemination, sharing, and learning. It also provides a venue for addressing issues and solving problems that farmers encounter. It further became an arena for articulating needs and mobilizing resources from the local government and other support agencies. There are now about 250 Landcare groups in Claveria and other municipalities of northern and central Mindanao. They occupy the "driver's seat" to steer the wheel of extension and learning in directions that farmers choose.

ED SABIO

Members of the Claveria Landcare Association meet to share information and discuss priority needs.

Organizational Relationships: ***A three-way collaboration of people's organizations, local government units, and technology facilitators offers a mechanism for effective partnership toward creation of social capital.*** The CHET institutionalized teamwork among farmers, the municipal agriculture office, and ICRAF. This was subsequently reflected in the triangular relationship among the CLCA, local government units (LGUs), and technology facilitators. ICRAF appreciates that the success of Landcare as an approach to conservation farming depends on how these three partners interact and work together. The exponential increase in number of farmer adopters in Claveria is attributable to the effective partnership among these stakeholders.

The collaboration among partners in the Landcare triangle is based on non-duplicating and complementary roles. The Landcare groups adopt or adapt technologies suggested by ICRAF, and municipal agriculture technologists combat soil depletion and erosion. The LGUs support this convergence of intention by extending financial, policy and moral support to the community-based groups, which in turn generate internal responsibility and accountability to monitor and supervise the projects and activities of LGUs as well as improvements in technology. The latter oversee the whole operation, documenting the success of soil and conservation work to justify the continuing provision of public resources.

The gains and losses of all the respective stakeholders become shared indicators of performance. Mutual expectations and obligations emerge from the interaction. The relationship is like a "triangle in a balance," where if one party does not perform its role adequately, the triangle will tilt to one side, affecting everybody. The efforts of all three stakeholders are therefore geared toward attaining a certain degree of balance in their performance. A balanced triangle depicts a partnership that is working harmoniously with reciprocity in actions and outcomes.

—Eduardo A. Sabio, Education
(on leave from International Institute for Rural Reconstruction),
Dennis P. Garrity, and Agustin R. Mercado, Jr., ICRAF

tane regions in Southeast Asia and Yunnan Province of China, for example, is uncovering the important role that valley-based political systems have had in shaping natural resource management in the adjacent highlands. Coward as well as other Cornell faculty and staff participated in an international conference on ecology and culture in mountain regions held in Kunming, Yunnan, in July 2000.

In many upland and mountainous communities there are two large trends. One is increased involvement by the state through its polices and technical agencies. The other is increased linkage with markets, including engagement with the tourism sector. CIIFAD research is examining these changes in widely different contexts, including the western Himalayas, montane Southeast Asia, and the southern Appalachians. Both of these trends have large effects—usually difficult to predict—on how natural resources are used locally and by whom.

Each of these forces—policies and prices—also creates new demands on existing community arrangements for managing the natural resource base in ways that support rural livelihoods and conserve the habitat for the long run. This CIIFAD activity is reviewing a number of government and NGO-supported programs that are working to assist communities to transform inherited arrangements or establish new community-led institutions for natural resource management.

Looking Ahead

We think it is important to share and evaluate experience in a variety of ecological, social and institutional settings, including the U.S., since problems are often very similar, or instructively different, between Third World and First World contexts. Through the efforts of our faculty, students and staff, we hope to contribute to a growing base of knowledge and practice that can inform and motivate local efforts to manage natural resources in more productive and sustainable ways.

Community Participation in Natural Resource Management in Madagascar

Preserving the varied but vulnerable ecosystems of Madagascar will require community support and active participation. The Landscape Development Interventions (LDI) project has had good response from village groups and various partners in three sites where CIIFAD is working in the Moramanga region.

GEORGE RAKOTONDRABE

Villagers in Lake Alaotra Strategic Zone draw a resource map of their *terroir* (area) in a local primary school. Children, young people and elders were involved. They used local materials like stones, leaves, and blades of grass to represent different themes.

The first focus of effort is the zone around Lake Alaotra, which contains several endangered endemic species, including the small lemur *Hapalemur griseus alaotriensis*. Pressures from the surrounding human population threaten many kinds of birds and fish, by hunting and fishing and by burning of the marshes around the lake, which destroys natural habitat.

Five communities residing around the lake are taking a hand in managing the marshes. Traditional decrees (*dinas*) have been promulgated to protect the resources, and plans are being made to reduce siltation within the lake with the assistance of qualified engineers. The next stages will include: drafting the specifications and formulating a contract for community management; working with the National Forestry Commission and the Fishing Service to establish sustainable levels of resource exploitation; and formalizing community responsibilities for management.

Around Brickaville near the eastern coast of Madagascar, LDI is working with peasant groups and entrepreneurial processors of essential oils. Planting cinnamon trees can improve the standard of living of rural households and prevent destructive bush fires. Connecting peasant producers with processors, and these in turn with external markets, creates incentives for conservation. About 50 households managing 50 hectares of cinnamon are already working with Phael Flor, a local processing company, with expansion projected for 500 hectares in the area. If shown to be profitable for all concerned, there could be further expansion.

A third site of intervention is around Ambatovy, a village located near Moramanga with nickel and cobalt reserves nearby. The question is how planned mining investments can contribute to the agricultural development of the region and to economic and social improvements for the population. The communities in the zone are now organized to articulate their interests and contribute to sustainable development activities and suitable management for the nearby forest.

The populations around Lake Alaotra are the most energized. They feel the urgency of undertaking actions to slow the rapid and devastating trends currently diminishing the lake and its marshy resources, and understand the irreversible consequences of further losses.

—George Rakotondrabe,
CIIFAD/LDI Moramanga