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FOCUS: Community Forestry and the Environment

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Cover photo: A Villa Santa cooperative member carefully monitors the pine sap he has collected as it is poured into the village barrel for shipment to a processing plant. (See article page 26.) *Photo by Miguel Sayago.*
Opposite: Many participants in the 1992 UNCED conference believe environmentally sound rural development depends on active participation by women. Here villagers attend a training session on organic gardening at a model farm near Tegucigalpa, Honduras. (See article page 36.) *Photo by Patrick Breslin.*

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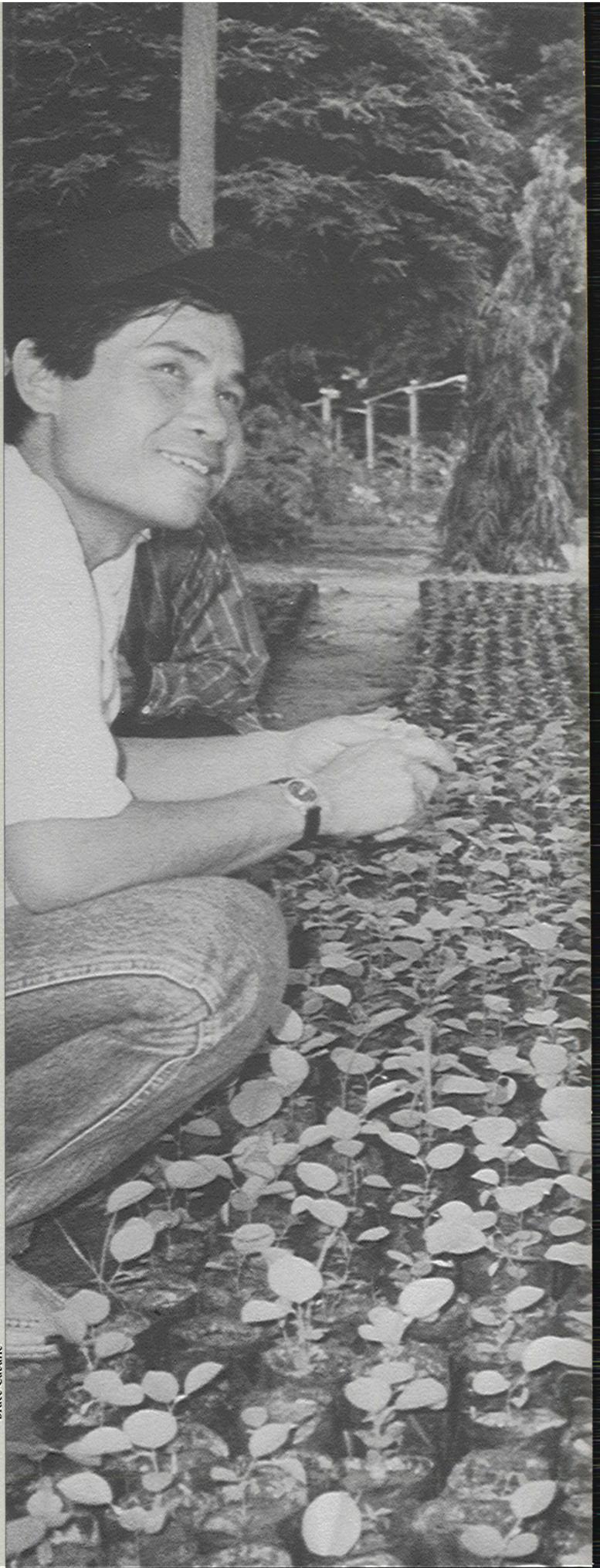
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FOCUS FOCUS FOCUS

A rallying cry of efforts to protect the world's resource base urges people to "Think Globally and Act Locally." This issue of the IAF journal explores how development and environmental projects must become interchangeable to be sustainable, focusing on the potential of community forestry to benefit the rural poor while conserving endangered woodlands. Bruce J. Cabarle opens with a global overview of community forestry and suggests how grassroots resourcefulness can become the basis for informed public and donor policy. David Barton Bray follows by examining how Mexican communities are reclaiming timberland from outsiders, but now face the challenge of organizing environmentally sound businesses to save the forest for their children. Denise Stanley then questions whether policies to correct the failures of government-led social forestry may mistakenly throttle Honduran resin-tappers' efforts at community forestry. Barbara Annis moves beyond the concept of "extractive forest reserves" administered by grassroots groups to look at how the forthcoming UNCED gathering in Rio de Janeiro is challenging governments, multilateral donors, and NGOs alike to rethink the linkages between the environment and development. Herman E. Daly concludes, in the Forum, by arguing that sustainability requires a shift from the economics of "more is better" to an understanding of how "different can be better."

Bruce Cabarle



COMMUNITY FORESTRY

and the Social Ecology of Development

Bruce J. Cabarle

Tropical forests are often the single most important resource available to rural communities, providing them with food, shelter, and spiritual sustenance. However, millions of forest-dependent people often lack legal access to these resources and have no voice in the national policies that will dictate their future and the fate of the forest itself. This has unintended consequences since prudent management of woodlands is vital to the long-term economic development of many tropical countries.

Yet, tropical forests are disappearing by the tens of thousands of square kilometers each year. During the past decade, the rate of deforestation increased by 80 percent. The present decade will likely see accelerating loss from slash-and-burn agriculture by the burgeoning numbers of displaced, landless poor, and from mining activities, road construction, and rampant logging. As the forest shrinks, tropical countries lose—irreversibly in most cases—some of their most valuable natural endowments, eroding the

Community members participate in a state-run eucalyptus tree nursery in Thailand. With NGO help, local groups persuaded officials that mulberry trees would be a sounder reforestation investment. Mulberry leaves can be fed to worms for producing silk that boosts family incomes.



potential for social and economic development. Beyond the direct loss of goods and services, habitat destruction is also driving countless plant and animal species to extinction, and threatens the world climate with potentially catastrophic change.

Fortunately, the assault on tropical forests and its implications for the global environment are now prodding governments into new approaches to manage what remains, and to reincorporate trees into degraded agricultural landscapes.

At the forefront of that movement is the attempt by both governments and international development agencies to improve the livelihood of rural peoples through the rational use of forests. One of the more exciting alternatives to emerge is the revival and expansion of community forestry.

The roots of community forestry are millennia old, predating the emergence of agricultural society. Swidden agriculture—the practice of clearing small forest glades for crops—is perhaps the oldest form still being practiced in Latin America (Clay 1990). But community forestry has diversified to encompass activities as varied as using trees to improve agricultural productivity and conserving pristine reserves by legalizing the customary claims of the indigenous peoples who live there.

The particular form community forestry takes is integral to how particular groups of rural people have learned to coexist with their environment. While their perceptions of the forest and its uses often center around economic need, they may also reflect cultural, spiritual, moral, or ethical

concerned with the human and socio-cultural aspects of “self-help” or “self-reliance” in development (Cabarle 1991). To work, it requires informed participation by local user groups to diagnose problems, propose solutions, and form alliances with outside interests to sustainably manage forest resources. In this process, securing effective local control overshadows technical prowess. Anything less is not community forestry, and would be better described by one of the terms found below. Before proceeding, it is useful to distinguish the several distinct approaches to involving local people in forestry activities from those that are locally initiated and controlled.

LOCATING COMMUNITY FORESTRY AMONG THE TREES

Community forestry gained acceptance in the mid-1970s as one component of integrated rural development (Arnold 1991). It is often used interchangeably, and often incorrectly, with “social forestry” or “farm forestry.” It also has been referred to as “agroforestry” in state-sponsored land allocation schemes, such as the well-known *taungya* system—in which farmers are allowed to cultivate government lands for a specified period in return for planting and tending trees. More recently in Latin America, “extractive reserves” have emerged as a new form of community forestry. What these approaches share is a deliberate effort to foster participation among and provide direct benefits to local peoples through

fuelwood among the rural poor. The schemes employed included planting trees along fence lines, roads, railways, and canals, and in village woodlots, and rehabilitating degraded public lands. Early activities linked agricultural production, soil fertility, and trees in an effort to assist the poor and landless.

Farm forestry describes two separate systems (for an in-depth look, see Foley and Bernard 1984). The first, household forestry, is geared towards subsistence needs and includes the use of trees as live fences, as a food source in home gardens, and as a method of fixing nitrogen in soils by interplanting among agricultural crops. The second promotes trees as a cash crop grown by farmers on private lands for individual profit. Popular among governments and donors, this has become a model for most national reforestation programs, and benefits from state subsidies, including tax breaks. Not surprisingly, such programs tend to favor wealthier farmers and are most successful where individual land rights have been granted or well-defined holdings exist within common property holdings, and where activities occur near established markets (a rarity for most intact areas of tropical forest).

Most social forestry and farm forestry activities, then, occur outside of forest zones, within the agricultural landscape, and offer less local control. Community-based management systems that occur in or around forests, especially those with long-term residents, often afford greater opportunities for local control because of their remoteness from centralized state bureaucracies. These largely home-grown varieties are also proving to be harder than the conventional forestry models imported from abroad or designed in capital cities.

National parks to preserve representative samples of fragile ecosystems often are understaffed or exist only on paper, and restrict the access of forest dependent peoples. Exclusive timber concessions over large tracts by private industrial producers, many of them foreign based, have dwarfed public regulatory capacity, leading to clearcutting and other short-sighted practices that have degraded forests and left few local benefits behind. This is further exacerbated by the large windfall profits

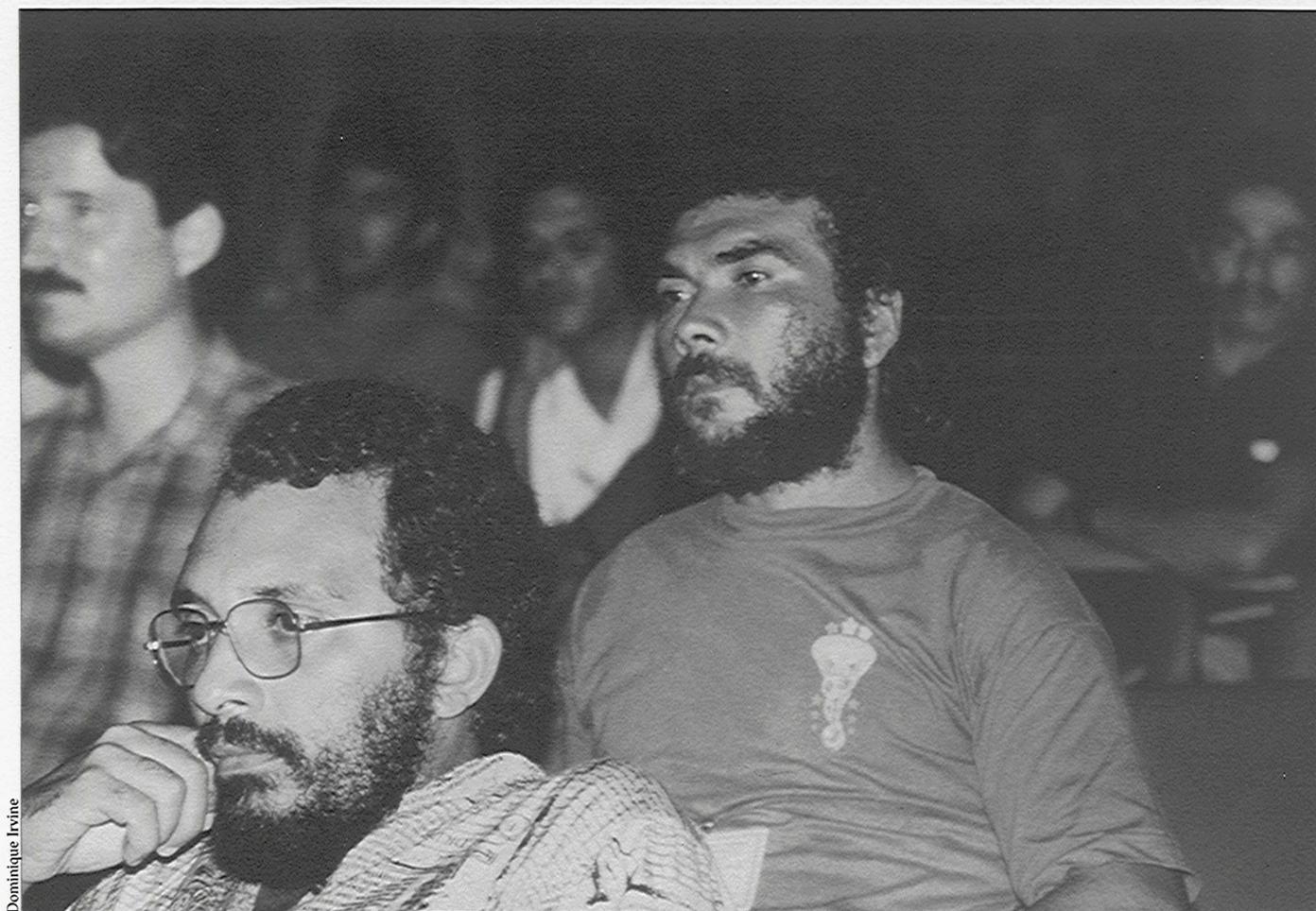
Community forestry implies collective management for the common good, but works best when individuals gain.

values. Community forestry can serve as a political tool to secure access to, and control over, natural resources critical to meeting these needs. While community forestry implies collective management for the common good, it works best when individuals gain, especially the poorest among the poor.

As Chayan Vadhanabhuti of Chiang Mai University indicates, community forestry is more than villagers growing trees. It is primarily

tree-growing, forest management, or forest conservation activities.

In the United States, social forestry was institutionalized during the Great Depression of the 1930s by the Civilian Conservation Corps. By the late 1970s, it became a key lending area for the World Bank (Gregersen, et al. 1989). This policy marked a shift from promoting large-scale, industrial wood production by private or public agencies toward increasing scarce



Dominique Irvine

Participants at a recent seminar on "extractive reserves" in Rio Branco, Brazil. This evolving form of community forestry allows rainforest residents to selectively harvest and market native nuts, fruits, and plants without destroying habitat.

generated by chronic undervaluation and the inefficient collection systems of government oversight agencies.

National reforestation and afforestation programs are foundering due to overreliance on exotic nonindigenous species ill-matched to local conditions, the concentration of benefits among a small elite, and the failure to consider customary land-use patterns. Constrained by shrinking budgets and forced austerity, governments are increasingly receptive to the experiments local people are making in community forestry.

Recent surveys have identified a number of the most promising initiatives in natural forest management that are community-based and -controlled (Johnson, et al. 1991; Perl, et al. 1991). The advantages of community control include better policing and husbanding of local forest resources and more equitable distribution of benefits. Closely knit commu-

nities deeply rooted to land that is their own are often committed to principles of sustainability, and display remarkable resilience in the face of fluctuating markets and sociopolitical change. Programs to encourage community forestry generally cost less than government management of public lands and are often more effective environmental stewards.

Yet community forestry is not a panacea. Not all communities are equipped politically, financially, and technically to manage expansive tracts. Sites are often remote, making it difficult to reach markets and obtain services. Local land claims are often unrecognized by governments and disregarded by outsiders. State forestry agencies and donors are unable or unwilling to provide the long-term (but frequently smaller) investment necessary to develop local capacity. Investors often prefer highly technical and capital-intensive forest op-

erations that yield a quick return but tend to be beyond the reach or interest of community groups. Perhaps most important, national economic and development policies—especially in agriculture, energy, trade, and finance—are often dictated by global market forces that encourage short-term profit taking, promoting land-use practices that endanger forests (WRI 1991).

If community forestry is to have real impact as a method of improving the prospects of the rural poor while protecting the environment, three interrelated issues must be addressed: land and resource tenure, the development of organizational cohesion and management skills, and the blending of local knowledge with technical assistance to promote sustainable production. These factors are not unique to community forestry endeavors, but they are crucial to their success (Rodríguez, et al. 1990).

LAND AND RESOURCE TENURE

The Bray and Stanley articles that follow in this issue of *Grassroots Development* clearly demonstrate that secure tenure—to the forest as well as to its trees—underpins all successful community forestry projects. Securing tenure sometimes is a by-product of dramatic popular movements in which local interests converge to demand guaranteed access to critical natural resources and to organize common-property management schemes for controlling their use. In Bolivia, 800 Indians from 5 tribes marched 35 days from the city of Trinidad to the capital of La Paz in a peaceful demonstration for land and self-determination, and won legal rights to ancestral claims in the Chimanae Forest. In southern Mexico, several Sierra Juárez communities staged a production strike and asserted their claims over a large tract previously administered as an industrial timber concession, securing access in a precedent-setting victory that led to reforms in the national forestry law.

Other, less dramatic, methods are also available to secure tenure. Along the northwestern coast of Ecuador, a farming community of African descent organized as a commune and ushered its claim to 60,000 hectares of ancestral land through government bureaucracies. The commune's reserve was declared a national forest patrimony site, effectively removing it from colonization by outsiders. In Guatemala, landless peasants joined an agroforestry program run by an international nongovernmental organization (NGO) collaborating with the national government and automatically received access to land.

Unfortunately, the latter experiences remain the exception rather than the rule. National laws and policies often deny rights to local inhabitants while promoting the wholesale liquidation of forest resources. Most land-use legislation either "pushes" people into the forest through colonization programs or "pulls" them with the lure of get-rich-quick agroindustrial ventures, cattle ranching, or nontraditional agricultural production. Speculative schemes are subsidized through easy and below-market credit, free services, tax holi-

days, and other incentives. The "pushing" and "pulling" is further facilitated by the legal concept of *tierras baldías*, which holds that land is open and uninhabited until it has been claimed and tamed on a first-come, first-served basis. Furthermore, legal title frequently does not include above- and below-ground resources. For example, throughout the Andes land tenure does not mandate mineral rights or timber rights, which are retained by the state for "national development."

Government policies and bureaucratic procedures for communities to gain legal recognition, often a prerequisite to owning or managing public land, are frequently vague and subject to cross-interpretation by various ministries. To secure forest tenure in Ecuador, a community must first legally constitute itself according to either the agrarian reform law, the cooperative and farmer organizations' law, or the law of communes; register its lands as national patrimony (the case cited earlier took two years); and develop a management plan, which requires the approval of three distinct government agencies.

The management options under the forestry law are limited to either no human activity, logging, or agricultural conversion. Alternatives such as agroforestry, preferred by local communities, are sanctioned only as ministerial decrees. These weak administrative instruments are frequently overruled by more-powerful ministries or nullified by competing national laws, especially those governing mining and petroleum exploration. Since 80 percent of woodlands in Latin America are state property, or "public forests," bureaucratic entanglements are a major impediment to expanding community forestry. When communities negotiate these external barriers, they often confront a series of internal obstacles to success as well.

ORGANIZATIONAL CAPACITY AND MANAGEMENT SKILLS

Community forestry projects face five organizational challenges to success. The first of these—leadership—emerges at the very beginning. Strong and catalytic leaders are central to the securing and demarcation of commu-

nity lands—either existing forests or newly planted areas. Their ability to articulate a vision and motivate people to action is crucial wherever communities must organize themselves to overcome external threats to vital local resources, or when local people decide to organize and collectively manage common property resources.

Leaders may be charismatic, democratically elected, or self-appointed, building their authority through popular appeal, consensus, or even intimidation. While critical to forming organizations, dominant leaders may be horrible managers, becoming a liability once the group moves away from confrontation to the day-to-day labor of consolidating their achievements. Once a nascent grassroots organization obtains secure tenure and enters the maze of donor proposals, project planning and administration, and market competition, managerial qualities become paramount.

This second stage requires grassroots organizations that have been born out of the imperative need to defend members' territorial claims and self-dignity to shift away from "crisis" management and its ad hoc, short-term actions. This transition is not easy since the constant threat of emergency that groups face at this early stage affords little luxury for the long-range planning necessary to establish the administrative, monitoring, and evaluation guidelines which governments require for securing tenure and donors demand as a precondition for grants or loans. Intermediary organizations, also known as grassroots support organizations (GSOs), play a critical role in helping rural groups develop this capacity.

Once basic administrative capacity is established, the distribution of project benefits must be seen as fair and impartial if there is to be organizational unity. Projects that fail to achieve this "transparency" may lose their coherence and eventually divide the community. Meeting the challenge of this third phase does not mean that each community member receives an equal share, but that members perceive benefits to be commensurate with individual input. For example, the case of Comaltepec, cited in Bray's article later in this issue, demonstrates how the failure to generate mutual benefits aggravated conflict between local bioreserve and



Michaëlle Cozzi

Seedlings from the Plan Cordillera tree nursery in the Dominican Republic are readied for planting. Small farmers from 43 communities are reforesting to reclaim barren slopes and diversify agricultural production.

sawmill proponents and stalled both initiatives. On the other hand, the forest communities of the Unión de Comunidades y Ejidales Forestales de Oaxaca (UCEFO) were able to broaden and deepen popular support by providing sufficient jobs for members and reinvesting some of their forestry enterprise profits to spin-off benefits for everyone in the form of roads, schools, and a widows' pension fund. This internal consensus is key for negotiating favorable terms of reference with outsiders to promote the local agenda.

The fourth challenge of negotiating effective outside support while main-

taining internal consensus is ongoing since community forestry usually must function within an indifferent if not hostile policy environment. Once agreement on tenure is reached, local communities and state agencies often see the same forest quite differently. Deciding which combinations of land uses (intact forests, annual crop production, or agroforestry schemes) fulfill legal requirements once land title has been issued often marks the start of the negotiation process between local communities and the government agencies responsible for resource management. For example, laws throughout Latin America require

that a fixed percentage of land be placed in "productive use" within a given time frame—largely via commercial logging or agroindustrial production. In the case of noncompliance, usufructure is forfeited and the land reverts to the public domain.

However, national laws can be interpreted to recognize customary land-use practices if local groups are skilled negotiators. For example, rural communities in northeast Thailand participating in the national wastelands rehabilitation program and supported by a large NGO, the Population and Development Association, convinced government officials to accept mulberry tree plantations over eucalyptus to restore degraded lands. The mulberry leaves are collected by groups of women and fed to worms which, in turn, produce silk, a major income generator for the region.

Finally, community forestry projects require sound fiscal management to achieve sustainability. Many fail because savings are not accrued and reinvested productively. In several instances, community forestry projects have oversubsidized roads, schools, medical clinics, and other social services, sapping funds for regular maintenance, necessary upgrades, and capital improvements to boost earnings. This situation is commonplace where value-added processing equipment is dropped into communities with limited advance planning, and generates sudden cash windfalls. The U.N. Food and Agriculture Organization/Holland project "Participatory Forestry Development in the Andes" cited this problem as the critical factor undermining the Cuzco community sawmill in Peru. Conversely, the ability to manage savings and reinvest in diversified activities lays a foundation for success. The Unión de Organizaciones Campesinas de Salinas agricultural cooperative in Ecuador created a community development fund that provided seed capital for business ventures in furniture making, tree plantations, and mushroom growing.

ADAPTING TECHNOLOGY FOR SUSTAINABLE PRODUCTION

If community-based forest enterprises are to endure, they must employ techniques attuned to local ecological



This small, government-run sawmill already relies on local farmers' machinery. The government is now working to transfer forest management to the community in order to lower costs and preserve the resource base.

limitations. Careless community forestry projects can deplete the resource base as quickly as conventional timber concessions. A number of innovative projects are showing how that can be avoided.

Two projects attempting to design environmentally sound harvesting techniques are the Cooperativa Forestal Yanesha in eastern Peru and the forestry *ejidos* in Quintana Roo, Mexico. The Yanesha project employs a strip shelterwood technique that promotes natural regeneration by mimicking natural forest disturbances. The Quintana Roo project relies on a selective-harvesting technique to promote natural regeneration, supplemented by "enrichment" plantings of preferred tree species that had been overexploited before the *ejidos* took charge of forestry operations. In an effort to reconstitute the composition and structure of the forest, the *ejidos* have required buyers of preferred timber species to also purchase less used species. In the rainy season, *ejidal* members place a moratorium on logging and switch to tapping resin from chicle trees, thus integrating nonwood timber products

into their forest management scheme.

Central to these successes has been the ability to merge local knowledge with technical expertise. In the case of the Yanesha project, Amuesha Indians successfully worked with technicians from the ministry of agriculture and the Centro Científico Trópico, a Costa Rican NGO, to design the forest harvesting technique mentioned above. They also decided to employ draft animals to extract felled timber and minimize damage to the surrounding forest.

Also in eastern Peru, the land reclamation project Proyecto Huerto Integral Familiar Comunal (HIFCO) of the Indian federation Asociación Interétnica de Desarrollo de la Selva Peruana (AIDSESP) merges traditional crops with imported farming techniques in a raised-bed, infiltration-ditch production system modeled after swidden agricultural plots. Over 42 annual and perennial crops are interplanted with nitrogen-fixing trees to enrich the soil and with aromatic flowers to repel insects. They are surrounded by a mixed-species tree plantation that provides leaf litter for sorely needed organic

matter (Cabarle 1990). By merging these techniques, AIDSESP has reclaimed abandoned pastures, converting them into productive farms that yield crops even during the traditional dry season.

WHAT IS TO BE DONE?

Conventional public and private approaches to managing tropical forests have failed to meet the urgent emerging needs of both the local and global communities. Community forestry offers a way to help sustain tropical forests by mobilizing the energies of the people who inhabit them. However, given the obstacles discussed in this article, it should not be promoted as a panacea for saving all tropical forests. It has inherent limitations where large-scale industrial wood production or preservation of fragile ecosystems are of primary concern.

Community forestry will be more successful where local institutions have a tradition of coordination and there are established rules for managing common property resources. In such cases, every effort should be made to strengthen the existing infra-

structure for natural resource management. Community forestry will benefit from organization building and networking that enables local peoples—whether long-term forest dwellers or recent migrants—to define and direct income-generating activities to meet their needs. International NGOs and donor agencies can lend critical support to ensure adequate political space for local groups to function, generate an internal consensus, and articulate their needs. In the process, the responsibilities of different user groups with a stake in the outcome of local forestry activities must be clearly defined and fairly represented. The growing number of participatory mechanisms for project planning, implementation, monitoring, and evaluation (for example, the Rapid Rural Appraisal and Participatory Rural Appraisal methodologies) should be disseminated and employed as warranted.

The existence of long-standing, forest-dependent communities offers a unique opportunity for conserving a shrinking resource. Special effort should be made to transfer control of forest resources to these communities, including the recovery, demarcation, and legal titling of ancestral claims. NGOs and donors should support efforts to identify, document, and transfer environmentally sound, economically viable, and socially acceptable models of forest resource management practiced by such communities. The merger of traditional knowledge and technical expertise should be fostered to design hybrid management practices to improve existing systems and establish appropriate systems where they are absent.

Conventional concessions to private interest groups to exploit timber and other natural resources should be avoided where possibilities exist for community management, unless they have the informed consent of local communities and agreed-upon safeguards are in place. This will require new or revamped legal mechanisms to ensure the communities remain in charge. Current procedures in most countries are too cumbersome and time consuming for local communities to obtain necessary signatures, gain legal status, obtain resource titles, and develop management plans. At the least, in cases where long-term management has been demonstrated,

provisional titles should be quickly authorized to guarantee access rights during the formal application process.

To anchor those rights, governments must begin to recognize that forests are more than the sum of their timber. The various goods and services provided by woodland ecologies—especially the fibers, food, dyes, and medicines important to local communities—should be legally protected as potentially important assets for the regional and national economy. Appropriate schemes proposed by local communities to manage these various goods and services should be officially sanctioned as legitimate land use.

Land-use planning in and around areas targeted for community forestry are essential if such initiatives are to succeed. As a first step, credits, subsidies, trade status, and other incentives that drive deforestation need to be eliminated. A shift from models of resource “mining” toward models that treat forest resources as renewable requires dispelling the premise, deeply rooted in national land-use legislation and development policies, that forests are unproductive unless converted to farmland.

One increasingly understood stimulus for such change would include forest resources in national income accounting. Forest depletion would then register as capital depreciation, thereby lowering GNP, and corrective actions would follow as a matter of national priority. Additional steps would reform royalty systems for managing production of lumber by removing the huge windfall profits from clearcutting and other wasteful practices that act as magnets pulling entrepreneurs into the forest, and often into direct conflict with the communities who wish to continue living there.

As the following articles demonstrate, community forestry blends sociology with ecology. Yet its success is much less a matter of local organizational development and silviculture than of public policies. The political economy of community forestry, and development in general, requires basic changes if local initiatives are to become more than brave but futile attempts to save the tropical forests on which we all ultimately depend. ♦

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The IAF Experience

Finding the "Community" in Forestry



Sergio Solano

Members of a community tree nursery in Talamanca, Costa Rica, one of many started through ANAI, an IAF grantee that helps farmers in tropical forests intercrop to raise incomes and become environmental stewards.

Forests stand at the epicenter of today's global ecology debate. The most visible and shocking environmental threat confronts tropical forests, which are disappearing faster than any other natural habitat. The stakes are enormous: These forests are (or have been) home to approximately half of the world's plant and animal species, and are more densely inhabited by man than temperate and northern zone woodlands. For the rural poor

who live there, tropical forests provide critical survival resources; for the rest of us, they provide a shield against global warming, and a vast untapped bounty of medical and other resources. With roughly 60 percent of remaining tropical forests found in Latin America, many people believe that its peasantry holds the planet's future health and survival in its hands.

The attitudes and actions of the poor toward the environment are lit-

tle understood and seldom integrated into development programs, even though it is increasingly recognized that full participation by local people is fundamental to project success. In Honduras, for example, efforts to protect the vital watershed surrounding the capital city of Tegucigalpa failed miserably until an IAF grant helped a local ecology association plan development programs in concert with the many small peasant communities that lived in the affected zone (see World Wildlife Fund, *Views from the Forest*, March 1991).

The Inter-American Foundation sees the environmental scene through the eyes of grassroots groups and civic organizations working with the poor throughout the hemisphere. In the process, it has learned that promoting development and conserving the environment are not separate challenges, but an inexorably linked socioeconomic process. To better understand how the rural poor meet this twin challenge, two years ago a group of Foundation staff organized a committee called the Sustainable Agriculture Group (SAG). Although SAG draws on the experience of IAF grantees, it also seeks to share information with other concerned public and private development agencies.

Because IAF rural beneficiaries are poor, their projects usually focus on immediate economic needs. For them, development means *agriculture* (subsistence and cash crops that diversify family diets and boost income) that is *sustainable* (production techniques that maximize use of low-cost, local inputs; enrich soils; and protect the resource base). Although natural resource protection is usually a secondary objective, long-term ecological concern increasingly makes better short-term sense.

For example, a decade ago, at the height of the Green Revolution, most agricultural programs recom-

mended laboratory-developed seed strains, mechanization, and intensive use of chemical fertilizers and pesticides to boost productivity. Although initial yields increased, input costs rose faster than income, and natural soil fertility steadily declined. Today's peasant-directed projects also emphasize increased productivity, but they more often try to achieve it through natural tillage, intercropping, and hardy local strains that are pest resistant. Mayan farmers assisted by the IAF in highland Guatemala, and others elsewhere, have shown that simple organic techniques attuned to local ecologies can produce yields that compete with those of high-cost agrochemical inputs, but are more profitable today and leave the land more productive tomorrow.

Yesterday's mistakes that produced a vicious cycle of exhausted soils, reduced water supplies, and intensified pest-control problems have also heightened the awareness among many campesinos of how deforestation aggravates all three and threatens nature's ability to regenerate itself.

Although macroeconomic factors lie largely beyond their control, a growing number of poor communities are taking creative steps to stop the ecological damage. Their actions blend enlightened forestry with sustainable agriculture. For example, a Honduran federation of 6,000 highland peasant families who earn their living by extracting pine sap from local forests sought to improve sapping technology to increase incomes. Gradually they realized that long-term stability required a broader economic base, which meant strengthening agricultural production by gaining access to better land and learning new skills. Assisted by the IAF, the federation is helping to relocate and train people and to develop agricultural supply and marketing systems.

In its 20-year history, the IAF has made grants totaling nearly \$20 million to 150 ecology-related projects carried out by more than 110 NGOs and peasant organizations. More than half have sought environmen-

tally sound methods of increasing family food supplies and incomes; one-third include environmental education programs; and 10 percent establish resource conservation activities. Because most projects are less than a decade old and many are still ongoing, it is too early to predict general outcomes.

Yet one can speak confidently of a new sensibility that is emerging as the organized poor and support NGOs work together to tackle environmental problems. Their grassroots projects tend to be innovatively diverse and geared to individual needs and opportunities. The strategies vary—from establishing an ecotourism park to generate community income, to setting up community enterprises to manage natural resource use, to introducing ecology into municipal school curricula. Reforestation, organic agronomy, and integrated farm systems characterize an increasing number of programs, blending new scientific knowledge with time-



Patrick Breslin

Ana Rivera takes her pupils on a field trip in Calinas, Honduras, to see how deforestation endangers watersheds. Adding ecology to the curriculum has sparked communities in the region to reforest, and switch to low-cost, high-yield organic farming techniques.

proven, traditional production practices to refine both.

All of these projects confront the general limitations of underdevelopment: limited access to land, infrastructure, capital, and political clout. Perhaps the biggest limitation threatening community-run ecology projects is their exclusion from the national political and economic decision-making process that creates incentives for national resource exploitation.

That is unfortunate since it is clear that previous policies have failed to promote development and conserve natural resources at the same time. It is also clear that environmental conservation will not succeed if development fails. What the IAF has learned from its close association with grassroots groups in Latin America is that people, even the disadvantaged poor, possess an energy, intelligence, and creativity that can throw new perspective on seemingly intractable problems, if they are allowed to act. Repeatedly, communities have mobilized their resources to take advantage of timely outside aid and to produce lasting change.

For example, a group in one Central American community whose mountains were being denuded decided recently to reverse the trend not by protesting or by replanting trees, but by revising school curricula. Soon, the children were informing their parents about the crisis, and motivated teachers began to lead community action campaigns in neighborhoods throughout the region. Citizens of all ages and from all walks of life joined in projects to replant forests, limit the hunting of endangered wildlife, replace "extensive" with "intensive" agriculture, and protect watersheds. Not only is the habitat being revived, but community spirit is soaring.

When they get the chance, the poor of Latin America are showing themselves to be responsible stewards, slowly and deliberately crafting a better way for themselves and the planet. ♦

—J. VAN ORMAN
Foundation Representative
and Co-chairman of SAG



THE STRUGGLE FOR THE FOREST

Conservation and Development in the Sierra Juárez

Sustainable forest management challenges communities to renew themselves.

In the southern Mexican state of Oaxaca, Ricardo López Luna is talking about ecotourism. As a truck-mounted winch lifts massive pine logs to be hauled from the steeply sloped forest, he also discourses on logging, butterfly farming, and bioreserves.

Neither ecologist nor forester nor "green" travel agent, López Luna is a small coffee farmer who serves as treasurer of the oversight committee of the Chinantec Indian community of Santiago Comaltepec. His ancient community, clustered around an eighteenth-century Dominican church, occupies over 18,000 hectares of Papaloapan River watershed high in the pine and oak forests of the Sierra Juárez mountains. The winch and the pines, not to mention the butterflies, belong to the community's own forestry enterprise, the Unidad de Aprovechamiento Forestal Cerro Comal.

López Luna's conversation reflects the arguments and practices that have divided Comaltepec for decades, intensifying in recent years. During this time, Comaltepec has seen its forests depleted by a pulp mill and has waged a vigorous struggle to regain control of its woodland resources. Now the community finds itself involved in protracted internal debates over how to use its remaining forest. Sawmills and bioreserves, conserva-

David Barton Bray

tion and development—issues inevitably steeped in personalities—have become the currency of local as well as global politics. Comaltepec may have found some answers, in part because the community is large enough to lend itself to a variety of uses, but also because of its ten years of accumulated experience in managing its stands of oak and pine.

The forests of Comaltepec, like those in all of Mexico, are part of a kaleidoscope of environmental drama in which Ricardo López Luna and his fellow *comuneros* debate conservation and development with visiting Japanese lepidopterists, representatives of Mexican and U.S. environmental and development organizations, and administrators of a parastatal pulp mill. Just as in the Pacific Northwest of the United States where battle lines are drawn over spotted owls and loggers' paychecks, competing groups in Comaltepec struggle over Pleistocene refuges versus better incomes in a poor mountain community that has sent over 400 of its best and brightest to work in southern California.

Some Mexican and U.S. environmentalists would like to see vast untouched nature reserves preserved for geological time. Other environmentalists, as well as promoters of community-managed forestry, argue

that the forests of Mexico have been used by man for centuries. These advocates cite recent research indicating that even the Lacandon rain forest of southern Chiapas is a "secondary growth" forest, once fully recovered from Mayan depredations centuries before and now being destroyed again. Governments, traditionally less interested in ecology, prefer to use the forests' natural resources to generate foreign exchange and supply domestic industries, giving local autonomy little or no priority. Although reconciling such divergent interests may be an impossible task, the struggle for solutions continues in Comaltepec, in Mexico City, and in Washington, D.C.

In exploring community forestry in southern Mexico, this article first focuses on the broader canvas of events in the Sierra Juárez, where one finds a historical pattern of outside exploitation of local resources. Here, too, is found a pattern of resistance to such exploitation, resistance that gradually sees its gains exceed its losses and eventually leads to community control over local resources. The events in Santiago Comaltepec are then presented as a microcosm of conservation and development in the Sierra, where highly politicized struggles appear finally to be leading to what *New Scientist* magazine calls "the optimistic premise that there need be no con-

flict between prudent exploitation and the conservation of forests."

THE SIERRA JUAREZ: POVERTY AND ABUNDANCE

Part of the Sierra Madre Oriental, the Sierra Juárez mountain range of northern Oaxaca is 186 miles long and 47 miles wide, with average altitudes of 8,202 feet and peaks above 9,842 feet. Cool temperatures and high rainfall have allowed great biological vigor. A World Wildlife Fund report on the Sierra's ecological richness catalogued cloud forest, pine, mixed pine-oak forest, moist and dry montane tropical ecosystems, the "richest oak forests in the world in terms of species diversity," and remnant populations of rare flowering plants and butterflies.

One part of the Sierra, within the boundaries of Santiago Comaltepec, constitutes a "Pleistocene refuge": fauna and flora "safehouses" formed during the last Ice Age, whose highly diverse gene pools have vital implications for future evolution.

The Sierra's biological richness is in striking contrast to the poverty of its people. Oaxaca is the poorest state in Mexico: Its incomes are less than half the national average, with 40 percent of its population lacking access to

United States, and some residents of the Sierra are now as familiar with the streets of Santa Monica, California, as they are with the trails to their own corn fields.

MINING THE FOREST

Until the 1950s, forest exploitation in the Sierra Juárez was light, as a gold mine in the mountain hamlet of Natividad was for decades the only timber consumer of any note. However, as part of the 1950s national development policies, 261,000 hectares of Sierra Juárez forests came under a 25-year concession to the foreign-owned (but nationalized in 1965) Fábricas de Papel Tuxtepec (FAPATUX) to produce paper and news pulp. Although born out of the demand for national economic development, FAPATUX brought a profound paternalism to its relations with the communities that nominally owned the forest resources. It claimed to provide for a "rational and integral use of the forests, while promoting social development and creating permanent and productive sources of work, [thus preventing] the possessors of this resource, in a zeal to satisfy their vital necessities and because of . . . uncontrollable demographic pressure, from destroying the forest, using the soil inappropriately, demol-

of its proximity to the pulp mill and argues that FAPATUX did no real forest management or reforestation during the concession period. She contends that the total forest area in the Sierra was reduced by one-third during FAPATUX's concession, with significant degradation of the rest of the forest. She also feels that the communities' "zeal to satisfy their vital necessities" is manifested in an intense interest in forest conservation.

During the 1970s, FAPATUX also invested heavily in pine plantations in the Mixe Baja region of Oaxaca, which may have reduced its interest in assuring sustainability in the Sierra Juárez. An additional part of the problem lay in the fact that FAPATUX employed the standard harvesting technique of the period, the "Mexican Method." This method, also termed "high-grading," is likely to take out the best timber and damage the rest, leading to genetic impoverishment. Because pine forests tend to be evenly aged, this system produced stands of smaller trees of poor genetic quality and permitted scrub oaks—marketable only as lower-value charcoal—to invade the open spaces in a natural forest succession, squeezing out pine regeneration.

FORGING LOCAL RESISTANCE

Its concession failed to give FAPATUX absolute access to community forests, requiring the company to negotiate yearly contracts with the communities. In these negotiations, however, FAPATUX clearly had the upper hand, frequently with the collaboration of the secretary of agrarian reform, using its legal standing as concessionaire to suppress the communities' attempts to assert their rights. Communities were denied the right to sell their timber to other buyers, for example, and one community that wanted to set up a woodworking shop was told it would have to buy

"We will no longer permit our natural resources to be wasted since they are the patrimony of our children."

health facilities and primary education and 80 percent to potable water.

Forestry and mining have historically generated some employment; agriculture has provided less since the soils and climate of the Sierra yield a poor harvest. The shortage of jobs in Oaxaca has led to heavy migration to other parts of Mexico and to the

ishing habitats, [and] creating erosion and aridity."

Yolanda Lara Padilla, a member of Estudios Rurales y Asesoría (ERA), a Oaxaca-based, community-forestry nongovernmental organization (NGO), notes that, in reality, the Sierra Juárez region was far more heavily "mined" than others because



Photo on page 12: Workers roll logs outside the Santiago Comaltepec communal sawmill forward for planing. Above: Mexico has more pine species than any other nation. The forests of Oaxaca's Sierra Juárez contain a lush blend of flora and fauna, including rare butterflies and mammals, plant associations dating back to the Pleistocene Age, pine, moist and dry montane tropical ecosystems, and the world's richest variety of oaks.

back its own pine from FAPATUX.

The first significant rebellion against such practices broke out in 1968, when the community of San Pablo Macuilianguis organized 14 other communities into the Unión de Pueblos Abastecedores de Materia Prima a FAPATUX. Their actions led to a five-year boycott of FAPATUX that eventually forced the factory to close for 40 days in 1972 (although during most of the boycott FAPATUX was able to supply itself from communities elsewhere in Oaxaca).

When they first organized themselves, the communities' primary objective was to receive more economic benefits; sustainability of the resource was not yet an issue. Their demands included higher wages for community loggers, a larger stumpage fee, scholarships for workers' children, protective equipment, and more roads. Eventually, FAPATUX made some bargaining concessions and even formed an intercommunity enterprise, the Unidad Forestal Ixtlan-

Calpulápan-Xiacui-Trinidad (IXCAJIT), which included four communities. The bargaining concessions forestalled further efforts at local economic initiative during most of the 1970s. But as October 1981 and the end of FAPATUX's 25-year concession approached, a new surge of grassroots initiatives developed.

On March 9, 1980, 13 of the communities assembled in the mountain hamlet of Guelatao to create the Organización en Defensa de los Recursos Naturales y Desarrollo Social de la Sierra de Juárez (ODRENASIJ). Its primary goal was to prevent a renewal of the concession and thereby guarantee communities the right to manage their own forests. The organization quickly established a newspaper, *Tequio*, whose first edition presented a vision that encompassed both development and conservation: "We will no longer permit our natural resources to be wasted, since they are the patrimony of our children. The forest resources

should be in the hands of our communities, and we will struggle for [greater education that will permit rational exploitation]."

ODRENASIJ launched a whirlwind of activities: publishing *Tequio*, visiting other forest community organizations in Mexico, organizing the first national conference of forest community organizations in May 1981, and lobbying with state and federal government officials to promote its cause. Working with sympathetic students and young professionals, ODRENASIJ began to define its issues, realizing that merely to prevent the concession's renewal was insufficient; the communities also needed technical training in wood processing, forest management, and small business management.

GAINING COMMUNITY CONTROL

In late 1981, the government tried to reinstitute the concession not just for

The Forests of Mexico: Moving From Concessions to Communities

Mexico has the third largest forested area in Latin America, about 70 percent of it in upland temperate zone forests in the massive complex of mountain ranges that dominate the national geography. The rest are tropical-lowland hardwood forests, mostly in southern Oaxaca, Chiapas, and the Yucatán Peninsula.

In the nineteenth and first half of the twentieth centuries, Mexican forests were "mined" through huge concessions to private companies, with no attention paid to conservation. The lumber from these forests was turned into ties for the railroad tracks that linked Mexican agricultural and natural resources to the world economy, fine European furniture (from the mahogany of southern tropical forests), and dwellings to house an expanding population.

In the 1950s, a more systematic attempt was made to harness Mexico's forests to national economic growth, again using the concession system. Forests all over the country, many of them formally owned by local communities, were given in exclusive exploitation concessions to private and parastatal sawmills and paper factories. These concessions assumed that the indigenous communities and *ejidos* (a communal land tenure arrangement established by Mexican agrarian reform laws) had no ability to manage their own forests or the revenues they produced. The stumpage fee called for in these concessions represented but a fraction of the timber's market value.

Concessions such as these, cattle ranching, and the colonizing of lowland forests brought about the ravages of deforestation that have occurred over the last several decades. The World Resources Institute esti-

mates Mexico's annual losses to agriculture and lumbering at nearly 600,000 hectares. The most publicized losses have been in the Lacandon rain forest of Chiapas, but steady losses and degradation of forest lands are occurring all over the country. However, in Mexico the unrelievedly grim recital of deforestation statistics is balanced by some of the most advanced experiences in community control and exploitation of forest resources anywhere in Latin America.

These community forestry experiences, relatively new and still poorly documented, have taken root in a variety of ecological settings, both highland temperate and lowland tropical. Making Mexico particularly promising for community-based forest management systems is the 70 percent of total forest lands securely held by indigenous communities or *ejidos*. Although these communities have had to struggle for control over the resources on their land, ownership of the land itself has never been in question. (In contrast, the Food and Agriculture Organization of the United Nations estimates that 80 percent of forest area worldwide is on public land.)

An increasing number of forest communities in states such as Oaxaca, Guerrero, Durango, Chihuahua, and Quintana Roo are slowly learning to become effective stewards of their own forests. However, attempts to introduce community forestry into Chiapas, a major reservoir of lowland rain forest, were halted by the 1987 decision of the state government to refuse almost all new logging permits.

The accompanying article describes in detail the community forestry experience in Oaxaca, only one of many efforts that have emerged in Mexico over the last decade. Other compelling experiences have occurred in the lowland forests of Quintana Roo and in the highland pine and oak forests of Chihuahua.

In Quintana Roo, the Plan Piloto was a community forestry effort stimulated in 1983 by the end of a 29-year, half-million-hectare concession to a private enterprise. Community mobilizations against concession

renewal combined with the interests of enlightened politicians and forest technicians to forge a new direction for forestry in the state. Training and organizing in sustainable forestry began in the southern town of Chetumal in 1983, and expanded into a Yucatec Mayan zone near Felipe Carillo Puerto in 1985. The plan evolved into a concerted effort on the part of young forestry specialists, backed by the state government, to turn the full economic and ecological management of the forest over to its owners.

From general community assemblies emerged the ecodevelopment strategy that braked the exploitation of the most precious tropical woods, such as mahogany and cedar. Despite this strategy, however, the company holding the concession—which had been authorized to cut particular quantities of precious tropical hardwoods as well as lesser known species—proceeded to harvest over 99 percent of the authorized precious timbers and a mere 4 percent of the less profitable common woods. Taking immediate steps to reverse this pattern, the communities also set aside a permanent forest extractive reserve to be administered in 25-year harvest cycles. In the meantime, technical teams began intensively training *ejido* members in all aspects of forest management and lumbering, and instituted computerized forest inventories.

In a few short years, communities have vastly increased their forest incomes and have mastered basic technical aspects of forest management. Two organizations of *ejidos*, the Sociedad de Ejidos Forestales de Quintana Roo in Chetumal and the Organización de Productores Forestales de la Zona Maya in Felipe Carillo Puerto, are now regarded as Mexico's foremost examples of the economic and ecological viability of managing lowland tropical forests with sustained-yield forestry techniques. The Plan Piloto, renamed Plan Estatal, is currently organizing two other groups of *ejidos* and small producers with a vision of eventually putting nearly a half-million hectares, stretching between bioreserves in Quintana Roo and



Campeche, under sustainable forest management systems.

Significant problems remain, of course. The more advanced Sociedad de Ejidos Forestales in Chetumal urgently needs to develop new markets for the lesser known species of tropical hardwoods in order to reduce the pressure on precious timbers. In the Mayan zone, the major product is still the traditional one—railroad ties—with the national railroad company as the sole buyer. Its leverage as sole buyer allows the company to set its own price, one that has remained unchanged in three years. Clearly, there is an imperative need to diversify products and markets and to industrialize. Nevertheless, as the Worldwatch Institute has noted, less than 0.1 percent of tropical logging is done on a sustained-yield basis, so the Quintana Roo experiences are significant examples of what could be done elsewhere.

In Chihuahua is a much more troubled case, one holding great potential but presenting equally great challenges. Chihuahua and Durango between them have the most commercially important forests in Mexico, with the two states contributing 50 percent of the country's forestry production.

The richness of the resource has led to intense interest on the part of national and multinational economic concerns, as well as multilateral agencies. For example, a joint project by a major multinational bank and a timber company envisions vast pine and eucalyptus plantations in Chihuahua. A \$90 million World Bank project will pump in production credit and extend road networks, and provide lesser funds for environmental protection.

In the midst of all this, the Asociación Rural de Interés Colectivo General Felipe Angeles (ARIC-Felipe Angeles), with member communities in both Chihuahua and Durango, has taken on the daunting pursuit of profit and efficiency in a former state enterprise, the Promotora Forestal de la Tarahumara (PROFORTARAH). The ARIC includes 185 ejidos and 30,000 peasant families, controls highland pine and oak forests of over a million hectares (with 437,000 hectares having commercial value), and over 25 sawmills and other wood-processing facilities.

But the magnitude of the resources the ARIC commands is matched by the magnitude of its problems. In 1990, the operation was beset by mechanical failures,

credit difficulties, low productivity, and internal disorganization. Also, many ejidos harbor ethnic divisions between Tarahumara Indian and mestizo members, with the Indians frequently marginalized from participation in the forest industry. The ARIC undoubtedly has many years of struggle ahead, but the experience in the Sierra Juárez suggests that its task is not impossible.

Added to the range of locally controlled initiatives in sustainable forest management that have emerged in the last decade are the efforts by the local and regional forest community organizations to build a national presence. Both the Productores Forestales y Agropecuarios de Mexico (PROFOAGREMEX) and the IAF-supported Comisión Forestal of the Unión de Organizaciones Regionales Campesinas Autónomas (UNORCA) are currently trying to combine the various regional and local efforts into a national coordinating body for marketing, technical assistance, and sustainable forest management. The consolidation of national-level organizations would also be a benchmark in a decades-long struggle to put community-based sustainable forest management on the natural resources agenda in Mexico. ♦

—David Bray

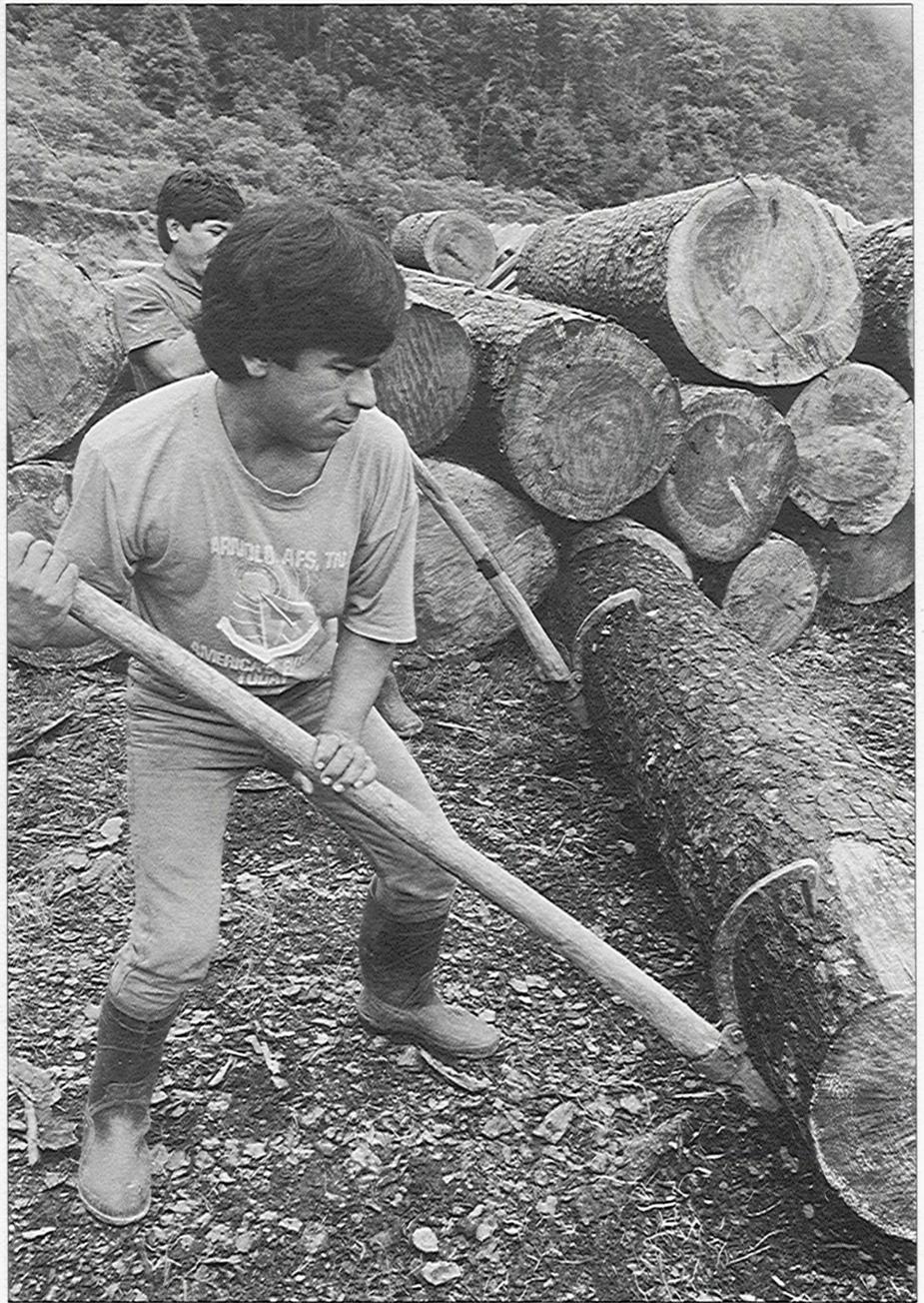
25 years but in perpetuity. Outraged, the communities mobilized to defeat that attempt, obtaining legal and other kinds of help from their supporters. In 1982, the communities at last won their struggle, in the process establishing a major precedent in community control of natural resources in Oaxaca and in Mexico. Now the question of management arose.

Despite having lived their lives in the forest, the community members were primarily small farmers who knew little about forestry other than cutting trees with a chain saw and loading them onto trucks. Furthermore, the communities would have to face these questions on their own as ODRENASIJ, having met its primary purpose of defeating the concession, collapsed in 1983.

Slowly, the individual communities began to learn how to manage the forests, logging operations, and small forestry enterprises. They also discovered that selling their timber at the prevailing market price permitted previously undreamt-of capitalization opportunities. The community of San Pablo Macuilianguis again led the way in November 1981: It signed a contract with FAPATUX but this time as an equal partner, owner, and seller of a market-priced good.

By the mid-1980s, timber profits permitted communities to buy trucks and winches and to invest in sawmills and furniture shops, creating their own forestry enterprises. Profits were also channeled toward social benefits for the entire community: schools, health clinics, roads, and community water works. One organization of communities, the Unión de Comunidades y Ejidos Forestales de Oaxaca (UCEFO), even directed part of its profits into a modest pension plan for widows. Most strikingly, the majority of these investments were made out of current income, with the few loans incurred quickly repaid.

With many fits and starts, internal political struggles, and external pres-



Workers maneuver a log toward a truck for hauling to the Comaltepec community sawmill. At its peak, the enterprise has employed 15 residents in the mill and another 50 cutting timber in the mountains.

ures, the communities began to develop a "forest culture" and, eventually, also began to federate to meet common needs. Santiago Comaltepec, the community of Ricardo López Luna, is one example of this pattern.

SANTIAGO COMALTEPEC: A MICROCOSM

Although lying in a primarily Zapotec region, Santiago Comaltepec is the

westernmost Chinantec Indian *municipio* in the Sierra Juárez. Its 2,000 inhabitants occupy 18,366 hectares of mountains and valleys that include highland pine and oak, cloud forest, and montane tropical ecosystems. The municipal seat rests at the bottom of the deep, narrow Comal River valley, 71 winding miles from the city of Oaxaca and 6 miles from the Oaxaca-Tuxtpec blacktop highway.

The forests of Comaltepec have ex-

perienced every stage of the forest struggle in the Sierra Juárez. In 1961, FAPATUX began cutting timber there and continued, under annual contracts, until 1967. From 1967 to 1974, Comaltepec joined the Unión de Pueblos Abastecedores, spearheaded by its neighbor San Pablo Macuiltianguis, and logging was almost entirely halted. Then in 1975, after FAPATUX made some concessions, the company began cutting Comaltepec's forests again. From 1980 to 1982, however, the community suspended cutting by FAPATUX, became an active member of ODRENASIJ, and finally celebrated with the rest of Oaxaca's forest communities the definitive end of the mill's concession rights.

FAPATUX's withdrawal as administrator coincided with a rising global focus on tropical forests, and Mexican and U.S. environmental organizations quickly became interested in Comaltepec's mammals, rare butterflies, and ancient plant associations.

During this same period, some of the professionals and students who had supported community struggles for local forest management created NGOs to formalize their work.

EMERGING CONFLICTS: BIORESERVES VERSUS SAWMILLS

Struggling to manage its own forests, Comaltepec has found itself split internally, as is much of the outside world, among conservationists, community foresters, and national timber interests—and even those who are indifferent to the fate of the forest. In the mid-1980s, the battle was expanded with an attempt to establish a bioserve in Comaltepec. At the same time, the community was struggling to get a sawmill up and running. Each effort, the bioserve and the sawmill, had support from local NGOs—one with an environmental orientation, one with a development

orientation—with each NGO being supported in turn by an international donor with the same respective interests. However, the bioserve ran afoul of the centripetal forces of Oaxacan municipal politics.

The state's 570 *municipios*, one-third of all municipalities in Mexico, are products of Oaxaca's fragmented topography and ethnicity. Within many of the *municipios* are smaller population centers known as *agencias*, which may be relatively distant from the municipal seat. Many of these *agencias* have long nursed dreams of municipal independence; and Comaltepec has such an *agencia*, La Esperanza, located near the region of the proposed bioserve.

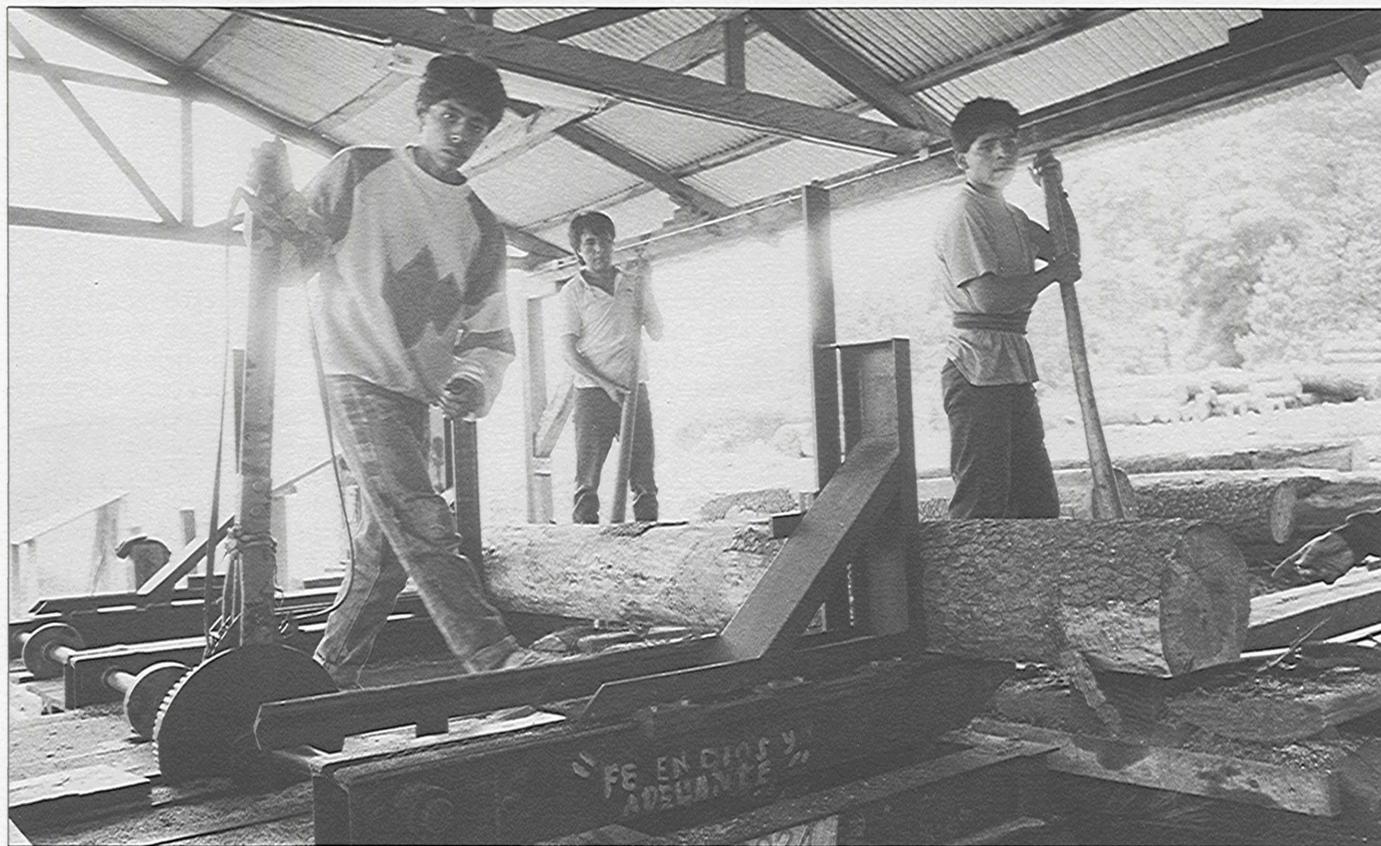
The local environmental NGO made some errors when it approached the *agencia*, inducing it to see in the bioserve a possible road to greater autonomy through new boundary surveys. When the municipal seat realized that the bioserve could serve as a Trojan horse to foment municipal secession, the environmental NGO and, indirectly, the international conservation group that supported it were expelled from the community, with the bioserve becoming a casualty of the conflict. The merits of a bioserve in and of itself were secondary to the fact that the initiative had upset the delicate equilibrium of municipal geopolitics.

As with conservation, community forestry in the form of Comaltepec's community-owned sawmill has also fallen victim to municipal politics. When FAPATUX's concession was not renewed, Comaltepec quickly established a timber-producing unit, legally registering the Unidad de Aprovechamiento Forestal Cerro Comal in November 1983. The unit received its first annual cutting permit the same year and began selling lumber to the FAPATUX pulp mill.

Cutting at modest levels for several years, Comaltepec never reached 7,000 cubic meters (less than half



A Comaltepec logger harvests trees from a fire-damaged area. During the past decade, small farmers who knew little more about trees than cutting them down with chain saws have had to learn how to manage forest systems.



Workers plane logs at the Comaltepec community sawmill. Such mills are often equipped with outmoded, inefficient machinery that reduces market flexibility. Comaltepec plans to buy portable mills that can be hauled on the back of trucks to timber sites in order to precut wood for processing and make selective harvesting more economical.

their approved annual cut) and in most years cut far less than that. Further, because of an intense fire that burned over part of their land in 1983, nearly all of the timber logged has been fire damaged. Thus, like most communities in the Sierra Juárez, Comaltepec was profoundly conservative in its first steps toward forest management.

As timber production became more systematic, Comaltepec gained enough confidence to begin planning for a sawmill and to inventory its forest resources. For both purposes, the community relied upon the support of the previously mentioned Estudios Rurales y Asesoría, one of the area's newly founded NGOs, which was receiving funding from the Ford Foundation.

By 1987, the sawmill began operations, and sales of both sawn timber and logs permitted a vastly increased capital flow. In that year, Comaltepec was able to finish the sawmill and buy a used tractor, several trucks, and a winch for hauling logs up the steep

slopes. Profits also went into a secondary school, clinic, municipal hall improvements, and, more recently, plans for another step into value-added processing—building a carpentry shop to produce furniture. When operating at its peak, Comaltepec's sawmill has employed up to 15 people in the mill itself and as many as 50 in the mountains. With ERA's support and full community participation, Comaltepec also developed a land use plan that was democratically approved by the community general assembly in June 1988.

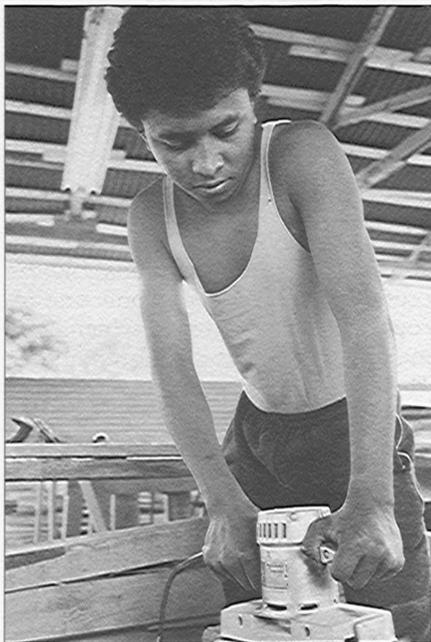
Although most community members were pleased with the infrastructure and employment brought by the sawmill, some remained concerned about its role in forest management. This became a serious issue in early 1990, when a new municipal president was elected from the region of La Esperanza, a man who had been identified with the agencia's earlier attempt to establish a bioserve. Arguing that the sawmill was being inefficiently run and was losing money,

the president shut down the sawmill in April 1990 on the grounds that Comaltepec needed to take a more-careful look at what it was doing to the forest.

Supporters of community forestry argued that in his profit analysis the president had factored in only one accounting period, during which time major investments had been made. They also noted that the sawmill continued to process only timber damaged by the forest fire.

This dispute highlighted the degree to which the community had aligned itself into pro- and anti-sawmill camps, and also into a faction that was primarily concerned with its members' coffee plantings in the montane tropical area, with no strong feelings about the mill. In any event, the sawmill, like the bioserve before it, fell victim to municipal politics.

However, after the mill had been idle for a year, the same president had a change of heart. The sawmill was reopened in March 1991 (albeit very late in the cutting season) because of



Top: Workers stack planed building beams in the Comaltepec mill yard. Bottom: The community enterprise at nearby Capulápan has started a furniture-making business to add more value to their milled wood; Comaltepec plans to follow suit. The profits are reinvested in the business and in schools and other services.

employment pressures and reportedly because the president was satisfied that it would now be appropriately administered. Comaltepec is back in the timber business for the time being, but how well the enterprise can compete in a marketplace that requires dependability in production remains an open question.

SEEKING A COMMON GROUND

Wrestling with the question of how to combine democratic processes with efficient business management, ERA, other Oaxacan NGOs, and the community see no clear answer. Two Mexican community forestry experts, Miguel Szekely and Sergio Madrid (the latter a member of ERA), have tried to square the anthropologists' traditional image of community integration with the contentiousness they have found regarding forest use. According to them, "It is important to recognize some elements of community life as fundamental: the oft-cited consensual decision making, ritual offices, voluntary community labor, feast days, and other moments in community life. . . . [However,] we

feel that consensus does not imply uniformity but the contrary, the harmonization of different interests, with a focus on the common good."

Szekely and Madrid see knowledge as the only way to harmonize diverse interests in the forest and have tried to train a large number of community members in the various aspects of managing a community forest enterprise. But tensions between democracy and efficiency will continue, and in the meantime, the communities and the NGOs add new and complex challenges to the brew.

ERA, now teamed up with another Oaxacan NGO called Servicios Comunitarios (SERCO), began a new phase of support for communities in the Sierra Juárez and the Sierra Sur of Oaxaca in early 1990. Assisted by a grant from the Inter-American Foundation, SERCO and ERA responded to community requests for intensive training in all aspects of forest and business management by running a school workshop on forest management and carpentry near the city of Oaxaca, facilitating a decisive step into furniture manufacturing to add more value to community production. Although the NGOs were able



A community worker plants a pine seedling on a slope in Santiago Comaltepec. The area naturally tends toward low-price oak, so systematic pine reforestation is needed to maintain profits and ecodiversity.

to begin this program in other communities, their efforts in Comaltepec were basically stymied by the aforementioned political shifts.

In the meantime, the World Wildlife Fund (WWF), an international conservation organization working with Mexican professionals, has been invited by municipal authorities to work with Comaltepec on the conservation and appropriate use of its biological resources, including a reprise of the bioreserve idea. With past experiences in mind, WWF, SERCO, and ERA are moving much more cautiously and with an enriched understanding of the complexities of democratic community control of forests. Differences in perspective still remain in Comaltepec and among NGOs and international donors. Conservationists, for example, worry that the degree of logging Comaltepec's forests can take is limited. Steep slopes and vulnerability to soil erosion make the construction of logging roads a questionable activity. Foresters, on the other hand, believe that by carefully

selecting stands of trees to be cut, forest damage will be greatly reduced and the community will benefit economically from sustained-yield harvesting. They also point out that pines age and die as part of their life cycle, and if they are not harvested, an important economic resource is lost.

There are signs that conservationists and community foresters are beginning to understand one another's views. Alejandro de Avila, a Mexican anthropologist working with WWF, questions the idea of an untouchable reserve. "I'm not in agreement with the idea of a conventional reserve; it isn't viable in Comaltepec," he says. "For centuries the forests of southern Mexico have been used by human beings for firewood and other purposes."

De Avila thinks the most feasible route to conservation would be an extractive reserve, where traditional use of resources could be controlled. Francisco Chapela of ERA agrees that Comaltepec's biological richness needs to be carefully tended. "Its genetic resources are like a huge library;

some volumes are hardly ever used, but at some point every volume will be useful to someone. All those books, all those genes, have to be preserved," he observes. Ricardo López Luna believes there is room for everything in Comaltepec—timber exploitation, bioreserves, coffee farming—and goes on to speculate about the Japanese lepidopterist who told him how the community might be able to breed rare butterflies on its land.

Ironically, just as community factions are working to resolve their differences, an external force once again threatens Comaltepec's control over its forest resources. The Comisión Federal de Electricidad, the public utility charged with generating electricity for Mexico's expanding cities, has for years been considering a possible dam in Comaltepec and has now set up a camp to do field studies. Such a dam would flood the projected bioreserve, among other areas, and Ricardo López Luna hopes the reserve's ecological value can be used to forestall the Comisión's designs.

STRENGTHENING COMMUNITY MANAGEMENT

Even as Comaltepec wrestles with conservation and development of its resources, community members are participating in another development effort, one with both economic and civic implications. With support from SERCO and ERA, Comaltepec helped found a new intercommunity association, the Unión Zapoteca-Chinanteca de la Sierra Juárez (UZACHI) in 1989. Composed of one Chinantec and four Zapotec communities, UZACHI includes several of the communities that formed ODRENASIJ. Through UZACHI, Comaltepec can deal with two of the most vexing issues facing community forest organizations: the *servicios técnicos forestales* (STF), or forest technical services, and the Fideicomiso Fondo Nacional de Fomento Ejidal (FIFONAFE), or community development trust funds.

The STF authorizes how many and which trees a community has permission to cut in a given year, sending a professional forester out to do the *marqueo*, marking with a *martillo*, or stamping tool, each tree that may be cut that year. The STF is supposed to provide a range of other forest management services in addition to the *marqueo*. Currently, associations of professional foresters have an exclusive concession from the federal government to provide these services, for which they are paid out of sales.

Communities have long complained that they pay steep fees for scarce services, and organizations such as UZACHI have argued that, since they can hire their own professional staffs, they should have the authority to provide their own *marqueo* and other technical services. UCEFO in Oaxaca won this right a few years ago, and now UZACHI has received provisional permission to do its own *marqueo*.

It was a moment of both symbolic

and economic significance in October 1990, when Chucho Hernández, recently graduated forester and native of the UZACHI member community of Xiacui, entered another member community, *martillo* in hand, to do the *marqueo* as an UZACHI employee. Jaime Cano, president of the oversight committee of the community of San Mateo Capulápan de Méndez, notes its economic importance: "Last year here in Capulápan we paid over \$12,000 for forest technical services. This year, we are paying a much smaller amount to UZACHI as a part of Chucho's salary, and the rest we can keep for the enterprise."

UZACHI is also instituting selective cutting as a tool of sustainable forest management, abandoning FAPATUX's high-grading practices. With selective cutting, only a portion of mature trees are taken out in addition to diseased, malformed, or poorly spaced trees, resulting in a healthier, better-spaced stand. Many of the best specimens are left as seed stock for natural reforestation.

Commercial forest areas are divided into ten sections, with selective harvestings in a given section every ten years, sufficient time to ensure a sustainable harvest without seriously modifying the natural structure of the

immediate need to reforest with pine because lower value oak now occupies over 60 percent of community holdings. Oak is a naturally dominant succession species, so to maintain pine after cutting takes more-concerted reforestation efforts. In Comaltepec, some reforestation has already begun; community children, for example, have helped reforest eight hectares.

More systematic and regular efforts need to be undertaken in all of the communities, however. Attention also needs to be given to agroforestry practices, particularly with coffee-growing in Comaltepec's montane tropical region.

THE NEED FOR NATIONAL LEVEL ORGANIZATION

FIFONAFE is a trust fund that represents another paternalistic relic now under grassroots pressure for greater openness and efficiency. It was established to receive the proceeds of the stumpage fee on timber and other kinds of agricultural production. In theory, the communities would then present development projects to the fund to get their investment capital back. In practice, however, it has been very difficult for communities to find out how much money they have de-

UZACHI is also instituting selective cutting as a
tool of sustainable forest management . . .
resulting in healthier, better-spaced stands.

forest and the ecological benefits it provides (although some conservationists dispute this last point).

Although pine and oak regenerate vigorously, communities in the Sierra Juárez need to take much more decided steps to manage their forests. In Capulápan, for example, there is an

posited and to get access to it. Without technical assistance, communities have a hard time formulating viable proposals, and even these can have trouble getting through the bureaucracy. Individual communities have been unable to do much about these problems, and UZACHI hopes it will

have enough clout to push FIFONAFE toward greater efficiency. Ultimately, however, the communities hope to retain this investment capital for their own development projects.

But UZACHI itself is only a small, new organization of five communities with limited influence over Oaxaca's forestry sector. To increase its presence, technical capacity, and capital and credit potential, UZACHI helped form a confederation in Oaxaca in January 1991. The Sociedad de Silvicultores de Oaxaca, S.C., includes a second organization from the Sierra Juárez, the Unión de Comunidades Ixtlán-Etla, as well as forest communities from the southern Sierra. The Sociedad eventually hopes to become the second significant forestry organization to emerge in Oaxaca (after

utilized oaks, reduce existing oak stands, and create space for pine reforestation. A project to establish an *astilladora*, or wood-chipping machine, would allow sales to FAPATUX's pulp mills at a more advanced stage of processing and a higher price. This project is particularly important because market trends in forest products show paper production to be more dynamic than sawn wood.

There are also a number of smaller investments that should be made. For example, many community sawmills are inefficiently run and need intensive technical assistance. The Sociedad and its advisors are also acutely aware of the possibility of a Mexican free trade agreement with the United States and Canada and its probable impact on local timber production. In

immediate challenge of forming its own technical team from disputing *técnicos*. External pressures emanate from local government, which is accustomed to controlling most peasant organizations. The Sociedad's resolutely apolitical stance and multiparty membership oblige it to fight for legitimation from local political authorities.

MORE THAN ECONOMICS

As the Sociedad struggles to consolidate itself, its value to Oaxaca and the Mexican nation becomes more clearly defined. The immediate value is not necessarily economic. For example, Mexico's 1990 trade deficit of \$314 million in forest products will not be satisfied by the community enterprises in the Sierra Juárez. FAPATUX, for example, must now import raw materials from northern Mexico because of declining supplies from Oaxaca. In reality, however, timber industries rarely contribute significantly to national development because of government inefficiency in capturing forest rents. As occurred in Oaxaca, a few timber companies realize windfall profits, with neither government nor local communities accruing much benefit. But in the Sierra Juárez today, the real value of the modest current production is retained entirely by the local communities, a genuine breakthrough in grassroots development.

These community enterprises also represent another kind of development, with a less easily calculable value. Because they are exploiting their own timber, the communities are concerned with the sustainability of its economic value and ecological services for future generations of Mexicans. The emergence of UZACHI and the Sociedad also promises to contribute to a more democratic rural society in Mexico. Determinedly nonpartisan and fo-

In the Sierra Juárez today, the real value of current production is retained entirely by local communities, a genuine breakthrough in grassroots development.

UCEFO) in the last decade, and joins the growing roster of other community forestry organizations at the national level in Mexico.

Through the Sociedad, more-ambitious community development and conservation projects can be undertaken. Lucas Pérez Ruíz, president of UZACHI and a schoolteacher in the community of La Trinidad, says that "the Sociedad will strengthen us and enable us to get more resources. We need to find a way to use sawdust industrially, get wood chippers [for news pulp], and deal with the problem of oak dominance."

The Sociedad is preparing a variety of investment projects to present to financing sources. One such project, for charcoal production, would allow the communities to exploit the under-

fact, timber from the United States and Canada and from other Latin American countries is entering Mexico now, and many sawmills have already gone under. The Sociedad and its members are competing in an international market with more-efficient producers from other countries, and they are scrambling to increase their know-how.

In addition to the economic challenge, the Sociedad also faces internal and external pressures. Internally, it is off to a rocky start because of conflicts between SERCO and ERA, the two NGOs that had collaboratively supported its formation. Differences over strategies and the disposition of scarce resources have led to a falling-out between the two groups, which has presented the Sociedad with the

cused on their interests as timber-producing peasants, the organizations represent the new face of autonomous civil society in Mexico. Further, as the World Bank's Michael Chernea has noted, these kinds of grassroots institutions should be rightfully considered "a form of capital accumulation" in their own right.

The experience of Comaltepec and other communities in the Sierra Juárez, as well as in Chihuahua, Quintana Roo, and other areas of Mexico, suggests that the *New Scientist's* "optimistic premise" of the compatibility of conservation and development is not unfounded. A new awareness is growing among many development and environmental organizations that sustainability cannot occur without both forces: There should be no conservation projects that are not also development projects and no development projects that are not also conservation projects.

In the years to come, citizens, bu-

reaucrats, and leaders at all levels of the global community will be wrestling with exactly how to bring this about. Comaltepec's leaders and citizens must find a way to successfully manage their community's entry into the global economy in the last decade of the twentieth century; in doing so, they must decide whether it will be as coffee farmers, timber producers, forest stewards—or maids and construction workers in Santa Monica. Perhaps it will be as a combination of them all. Citizens and leaders of the world outside Comaltepec must be prepared to respect the community's decisions and to help it gain the best available knowledge on which to base its decisions. ♦

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Members of the UZACHI association of forest communities use their new computer for making a complete inventory of local forests by species and age in order to plan efficient and safe selective harvesting. A new confederation, which gives members a national voice, financed the computer.

Human Organization and "Mexico: Campesinos and Coffee" in Hemisphere, co-authored with Luis Hernández.

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Demystifying the Tragedy of the Commons

The Resin Tappers of Honduras

A federation is battling misguided macropolicies to help communities save "their" trees and the nation's forests.

This forest belongs to the people of San José de Protección, Comayagua," says don Víctor Manuel Sánchez, founder of the community's agroforestry cooperative and a member of the national federation of resin tappers. He speaks slowly and firmly, giving voice to sentiments commonly heard in the rural highlands of Honduras. Yet his circumstances convey the precariousness of his convictions. Sánchez is speaking from the jail where he and other co-op leaders are being detained after being arrested the night before for trespassing.

For years members of the cooperative have tapped resin from pine trees growing on lands under the jurisdiction of the *ejido*, or the local municipality. Recently, a large tract of ejidal land was sold to an outsider from the capital city of Tegucigalpa who wished to enclose it for other purposes. When local resin tappers persisted, the new landowner had their leaders arrested.

Although the facts seem straightforward, the roots of the conflict are

Denise Stanley

tangled. The landowner has title to the soil, but the state owns the trees. In the past, a state agency had given the cooperative's resin tappers usufructure rights and assigned them a production quota. Now it claimed neutrality.

Here, in microcosm, is the renewal of a long-standing debate over who owns the nation's forests and how they should be used. These questions were supposed to have been answered in 1974, when Honduras established the Sistema Social Forestal, or Social Forestry System, within the Corporación Hondureña de Desarrollo Forestal (COHDEFOR) to halt clearcutting by European and North American lumber companies, regulate the extraction and marketing of forest products, and finance government development programs. In effect, Law 103 nationalized the forests and created COHDEFOR to administer their use. COHDEFOR would implement its mandate by encouraging farmers to join cooperatives or other work groups that would harvest forest resources, combat fires, and prevent overgrazing, illegal cutting, and slash-and-burn agriculture.

By the early 1990s, the system was in disarray. While producing only 15 percent of the nation's exports,

woodlands continued to shrink at such an alarming rate they would vanish by the turn of the century. More than one-third of the rural population still lived in forested areas, yet they remained among the nation's poorest people. Critics charged that drastic reforms were needed to prevent Honduras from falling victim to what an influential body of research has called "the tragedy of the commons."

This term was coined by Garrett Hardin in 1968 to describe how communal lands are inevitably degraded as population pressure rises and people rush to use available resources before others can do so. At about the same time, Harold Demsetz (1967) assigned blame for this depletion to communal forms of ownership that "fail to concentrate the cost associated with any person's exercise of his communal rights on that person." The remedy was to establish clear private property rights since an individual owner would "attempt to maximize [the land's] present value." Later writers of "the property-rights school," including Theodore Panayotou (1989), argued that public ownership also led to resource exhaustion and should be privatized along with other forms of communal property.

Arguments concerning the relative superiority of public or private own-

A community resin tapper from the federation FEHCAFOR assesses a pine tree, near the end of its resin productivity, to harvest firewood.



Modern resin-tapping methods can sustain the productive life of trees for up to 40 years. Left to right: A co-op worker carefully scores pine bark with a blade. Resin flows through the scars, often aided by sulfuric acid, into a delantal, or canal, accumulating in a plastic cup attached below. Each tapper brings the resin from his trees to a central collection site, which every two days sends a shipment to the processing plant in Tegucigalpa.

ership misinterpret the value and legitimacy of common property and communal management. Other authors have stressed the logic and sustainability of common property regimes. As Bromley (1989) writes, a confusion of terms exists. A common property regime is not a situation of open access; common property has a well-defined group of authorized users, a well-defined resource that the group will manage and use, and a set of institutional arrangements with rules of use for the resource. Like private property, common property can contribute to sustained forest management. S.V. Ciriacy-Wantrup and Richard Bishop (1975) also argue that common property, and communal management of resources, is not a disaster: "Common property is not 'everybody's property.' The concept implies that potential resource users who are not members of the group of

co-equal owners are excluded."

Although the failures of the Honduran Social Forestry System are increasingly obvious, the diagnosis and cure are not. In reality, neither state, private, nor common property regimes have spotless records in environmental protection. The experience of cattle ranching in much of Latin America shows how private ownership can contribute to deforestation (Nations and Komer 1983), while the experience of Swiss and some African livestock herders shows that communal grazing systems can be ecologically sound (Netting 1976; Swallow 1990), suggesting that factors other than property ownership are at work.

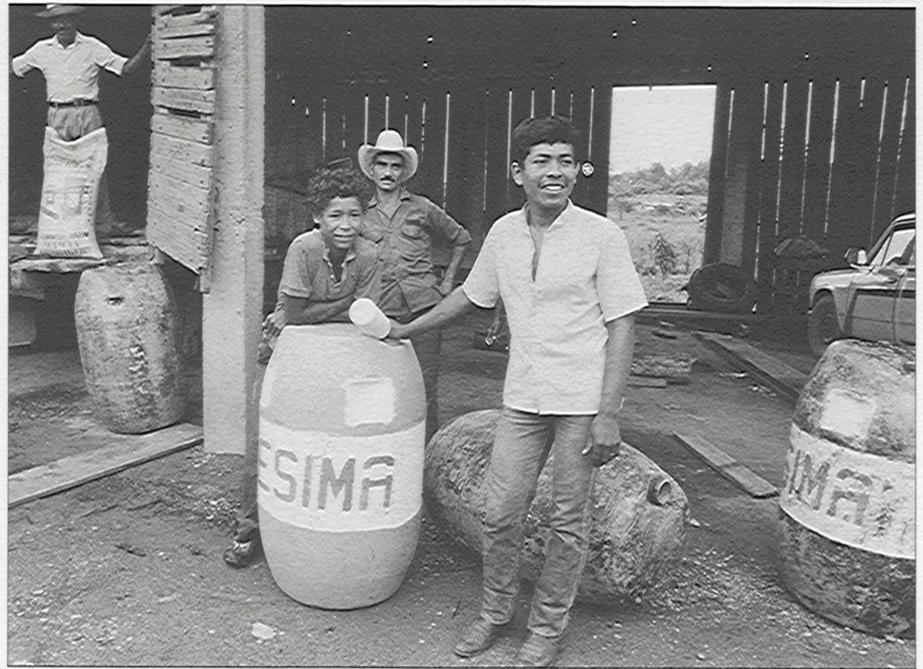
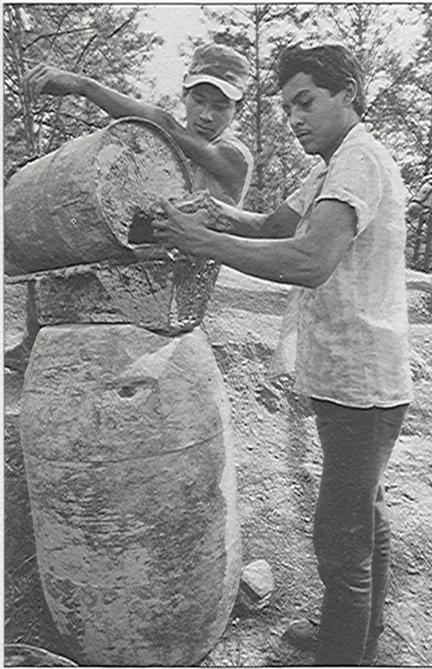
Identifying those factors is crucial not only for Honduras, where the government is considering the privatization of its woodlands, but for rubber tappers in Brazil, nut gatherers in Peru, and other promising community efforts elsewhere in Latin America to increase incomes among the poor while protecting dwindling forests. The experience of the resin tappers in the Federación Hondureña de Cooperativas Agro-Forestal (FEHCAFOR) suggests how the tragedy of the commons can be avoided. A look at two affiliates—the Cooperativa Villa Santa-Los Trozos and the Cooperativa San Juan de Ojojona—reveals three determining factors: secure tenure, economic incentives, and institutional capacity.

SECURE TENURE

"If a tree is productive, it can last 20 to 25 years," says Rosalio Espinal, president of FEHCAFOR and member of the Cooperativa Villa Santa-Los Trozos. "These trees are our livelihood, so we must protect them."

Juan Francisco Martínez, secretary of the Cooperativa San Juan de Ojojona, adds that "the government says the forests belong to COHDEFOR, but we are the ones who put out the fires, clear the underbrush, and look after the trees."

Long years of stewardship have convinced resin tappers that the forest is theirs, but despite their passionate conviction, national policymakers remain unconvinced that the rural poor can manage this resource. As the country undergoes a program of economic restructuring, reforms are being proposed for the state forestry system that threaten to reduce access by resin tappers and other community groups. These reforms are unlikely to work if they misread the cause of the past failures, confusing public ownership with common property and common property with open access. That is, one must understand the relationship between the prescribed Social Forestry System and actual tenure, that "bundle of rights" to extract value from an area that includes how people perceive, partition, own, and defend resources,



formally and informally (Fortmann and Ridell in Raintree, et al. 1987).

Currently, Honduran resin tappers operate under a combination of common, state, and individual property regimes. As previously mentioned, the state owns the trees, while the topsoil is privately, nationally, or municipally owned. Although Article 29 of Law 103 establishing the Social Forestry System apparently assigns to cooperatives and community groups exclusive access rights to tap resin and extract timber from national forests, legal tenure, in practice, is highly conditional.

To begin with, each cooperative must renegotiate its lease annually through a sales contract with COHDEFOR that spells out how many barrels of resin can be taken and how many board feet of lumber can be cut. The cooperative can only sell its timber to the authorized local sawmill, which has exclusive rights for marketing products from its "tributary" area. The contract also binds the cooperative to "submit unconditionally" to COHDEFOR's forest management plans in the area, forbids the cooperative from trying to block any contracts COHDEFOR signs with third parties, and specifies that "access to the area of resination is unrestricted."

The cooperatives that have prospered under the Social Forestry System have been able to informally or-

ganize and defend their tenure rights and the forest itself. The Cooperativa Villa Santa-Los Trozos is a prime example.

Villa Santa is a rural town of 2,500 people in the municipality of Danli in the department of El Paraíso. Covered by a thick pine forest canopy and receiving abundant rainfall in excess of 1.5 meters annually, the surrounding mountainous zone is being populated by settlers from the parched southern areas of Honduras, including Sabana Grande and Nueva Armenia.

On May 16, 1973, the town's residents blockaded the main road for 24 days to keep tractors from an Italian sawmill from clearcutting the forest. "We felt obliged to defend the forest, even though we did not know what it could give us," says Policarpo Alvaringa. Assisted by university students and lawyers from Tegucigalpa, 12 strike leaders who became known as *los primitivos*, or the wise old men, decided to form the cooperative Alvaringa would one day lead. A concession to use 22,000 hectares of national forests was obtained from the newly organized COHDEFOR, and the co-op obtained 216 sets of modern tapping equipment on consignment from the Maya resin-processing company. After dividing the land among individual members for care and harvesting, the community was in business.

Members paid a quota into a sav-

ings fund for each barrel of resin they tapped, allowing the cooperative to purchase a truck for transporting resin from centrally located pickup stations to the processing plant in Tegucigalpa. A consumer store was opened to buy staples and agricultural supplies in bulk for discount sale. In 1980, the co-op began to market logs from trees past the resin cycle; they then diversified their income sources by marketing tree sprigs as binding material to tobacco companies in a nearby valley. By 1989, the cooperative had nearly 200 members and a reserve fund of nearly \$30,000.

The key to this success has been the cooperative's ability to limit access to the forest. Today, most members have fenced in their tracts and live near enough to monitor entry. Forest claims can be bequeathed to family members after death, or transferred following resettlement, by making provisions with the cooperative secretary. A sharecropping arrangement, or *medias*, has been worked out that allows members to rent out their trees to a worker, who receives half the resin collected. And on two occasions, the co-op leadership has met with the national director of COHDEFOR to stop sawmill logging and other outside incursions.

The Cooperativa San Juan de Ojojona, located in the department of Francisco Morazán, has not been so fortunate. The area, which has been a

resin-tapping center since the practice was introduced to Honduras in 1913, is marked by extreme poverty, growing aridity, rapidly dwindling forest cover, and high out-migration to nearby Tegucigalpa. In 1966, 60 peasants from several villages in the municipality of Ojojona joined together to form the nation's first cooperative for marketing resin. The Cooperativa San Juan blossomed under the Social Forestry System initiated in the early 1970s, growing to more than 300 members, acquiring a truck, and starting a consumer store. Co-op leaders rose to prominent positions in the new national federation, FEHCAFOR.

The bubble burst in 1979 when the president, who was a former mayor of the municipality, absconded with nearly \$50,000. The organization was left in shambles. By 1989, resin production had plummeted to only 180 barrels, or 45 metric tons, less than 7 percent of the production in Villa Santa. Today, the Cooperativa San Juan has only 35 members, and has reserve capital of only about \$1,000.

The San Juan resin tappers live far from each other and far from their assigned plots, making it difficult to tend trees properly or defend them from outsiders. Cooperative President Bienvenido Martínez sadly noted that "anyone can come in to steal our resin cups, cut wood, and start fires . . . because the forests are ejidal, and there are no fences."

In this arid zone above valleys deforested by the cattle expansion of the 1950s, trees are increasingly sparse,

use. The package of new legislative proposals to reform the social forestry system threatens to undermine strong cooperatives that have managed, despite COHDEFOR's policies, to achieve informal tenure rights, and push the weaker ones quickly over the edge.

Some of these proposals are intended to give economic incentives for forest protection, while potentially increasing government revenues. COHDEFOR's monopoly on wood exports has ended, and the stumpage fee for logging trees has nearly doubled. Also being discussed is a plan in which farmers would be paid to plant trees, tree ownership would be ceded to private property owners, and tax breaks would encourage conservation and rational use.

The transfer of usufructure rights to private owners would have an immediate impact on resin tappers such as those in San José de Protección, where outsiders are rapidly buying up the land. The main threat, however, comes from legislation to privatize public lands. One scenario would expand the 58 tributary areas over which 63 functioning sawmills currently have jurisdiction, and give them exclusive rights to manage all production activities, including resin tapping, and the responsibility for reforestation. An alternative approach would pass forest jurisdiction from COHDEFOR to municipal governments, but resin tappers suspect the result would be the same. Lumber companies have the capital to promise greater short-term profits, and FEHCAFOR manager Salvador Meza

kept intact for long periods, providing habitat for flora and fauna, maintaining watersheds, and preventing soil erosion. By offering small farmers a long-term, environmentally sound "cash crop," resin tapping discourages slash-and-burn agriculture by co-op members, and can sow the seeds for increased farmer receptivity to more sustainable methods of subsistence farming as well. Farmers living "with" the forest prove to be effective firefighters against both natural and manmade blazes, and cooperatives have mobilized their members on numerous occasions to keep their livelihoods from going up in smoke.

Meanwhile, FEHCAFOR officials and forestry technicians point to numerous examples of overexploitation by Honduran sawmills under the existing tributary system, and wonder, since many are foreign owned, if the mills will be committed to preserving the nation's forests over the long term once restraints are removed. Even if lumber companies are required to reforest, clearcutting disrupts habitat and magnifies many of the other ecological threats resin tapping avoids.

In late 1988, FEHCAFOR placed an advertisement in *La Tribuna*, Honduras's most prominent daily newspaper, warning the public that expansion of the tributary areas will "deliver [the forest] to the service of a few sawmills, hurting the majority of the Honduran people, who would be converted into poorly paid day laborers." Falling income will presumably increase the rate of migration to already burdened urban areas, and those who remain behind will have little incentive to protect someone else's property.

Whether resin tappers earning long-term income from pine trees or whether sawmills turning those trees into plywood for quick export will better safeguard forest cover is yet to be determined. What is certain is that cooperatives, like the one in Villa Santa, can operate as private corporate bodies to efficiently use forest resources and spark rural development among campesino farmers.

ECONOMIC INCENTIVES

Secure tenure is a prerequisite for successful forestry cooperatives, but it is not sufficient. Evaluating tree-

"Peasants are not villains or blind—they are rational, goal-oriented, economic actors."

and the rate of natural regeneration is low. Even if the cooperative had the knowledge and resources to reforest, the prevailing system of "open access" makes it futile. Both resin tapping and the forest verge on extinction.

The experience of these two cooperatives shows that the key to viable community forestry is the ability to control access to the resource base and develop rules for managing its

wonders if the resin tappers' case will be misunderstood by "mayors who are very open to political pressure, and know little or nothing about forest care."

If lumber companies are able to enclose the forests and lock out community enterprises, it will affect both the rural poor and the environment. Sap can be harvested from a tree for as long as 40 years, after which it can be cut for firewood or milling. Stands are

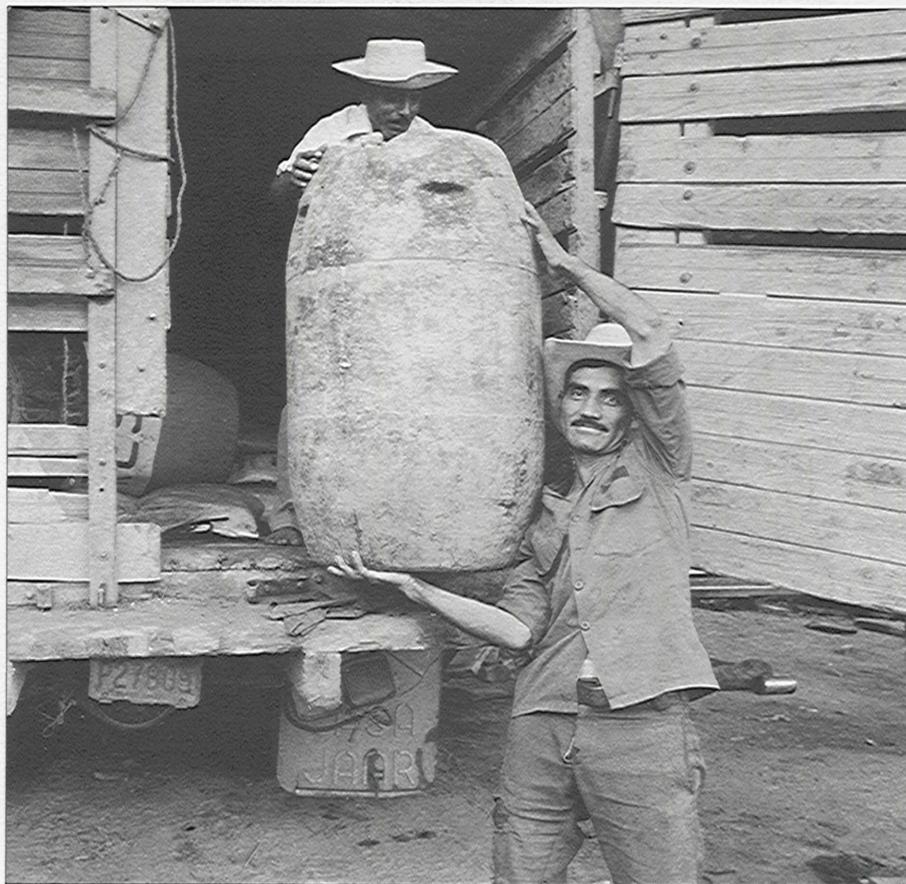
planting programs in Haiti, anthropologist Gerald Murray has said: "Ecological protection and reforestation occur only as secondary effects to activities that generate income. ... Peasants are not villains or the blind [who need] to be educated, but rational, goal-oriented, economic actors."

Rosalio Espinal of the Villa Santa cooperative explains it more directly, saying, "We do not want to cut pine trees before they finish the resin cycle because that would be like butchering a milk cow."

Most resin tappers are small farmers who have taken up the trade to earn cash income to buy needed consumer goods and tide them over during the lean months while subsistence crops are being planted and before they are harvested. Working alone, a farmer can spend two or three days a week installing tubes and plastic drain cups into pine trees of the species *pinus oocarpa*, *tecun amania*, *caribaiea*, *pinabeta*, and *costanero*, thinly scoring the bark with a blade to avoid damaging the wood, and pouring sulfuric acid into the scars to increase the flow. During the height of the resin-tapping cycle from January to May and during mid-summer, a farmer can collect as much as a quarter metric ton of resin sap monthly per stand of 500 trees, earning approximately \$300 for the annual season. In Villa Santa, some tappers have access to as many as 2,000 trees, with the average being around 1,000.

Unfortunately, the terms of trade have been highly volatile during the past decade, and future profitability is in question. Drastic price swings in the international market have created a boom-and-bust cycle, rising to \$41 per quarter metric ton in the early 1980s, before plummeting to \$16 in 1984, and inching back up to \$28 four years later. From this fluctuating gross price, resin tappers paid nearly \$10 per quarter metric ton in steady taxes to COHDEFOR and municipal governments and in co-op dues.

Part of the problem has been the resin tappers' inability to obtain market leverage domestically. They sell their resin to three companies that process it for export to the United States, Japan, and Europe as turpentine, or as rosin for soaps, dyes, and adhesives. The three firms have formed a legal oligopsonistic accord



Members load a resin barrel onto the co-op truck for low-cost transport to the processing plant. Now FEHCAFOR plans to increase profit margins by processing resin for direct export.

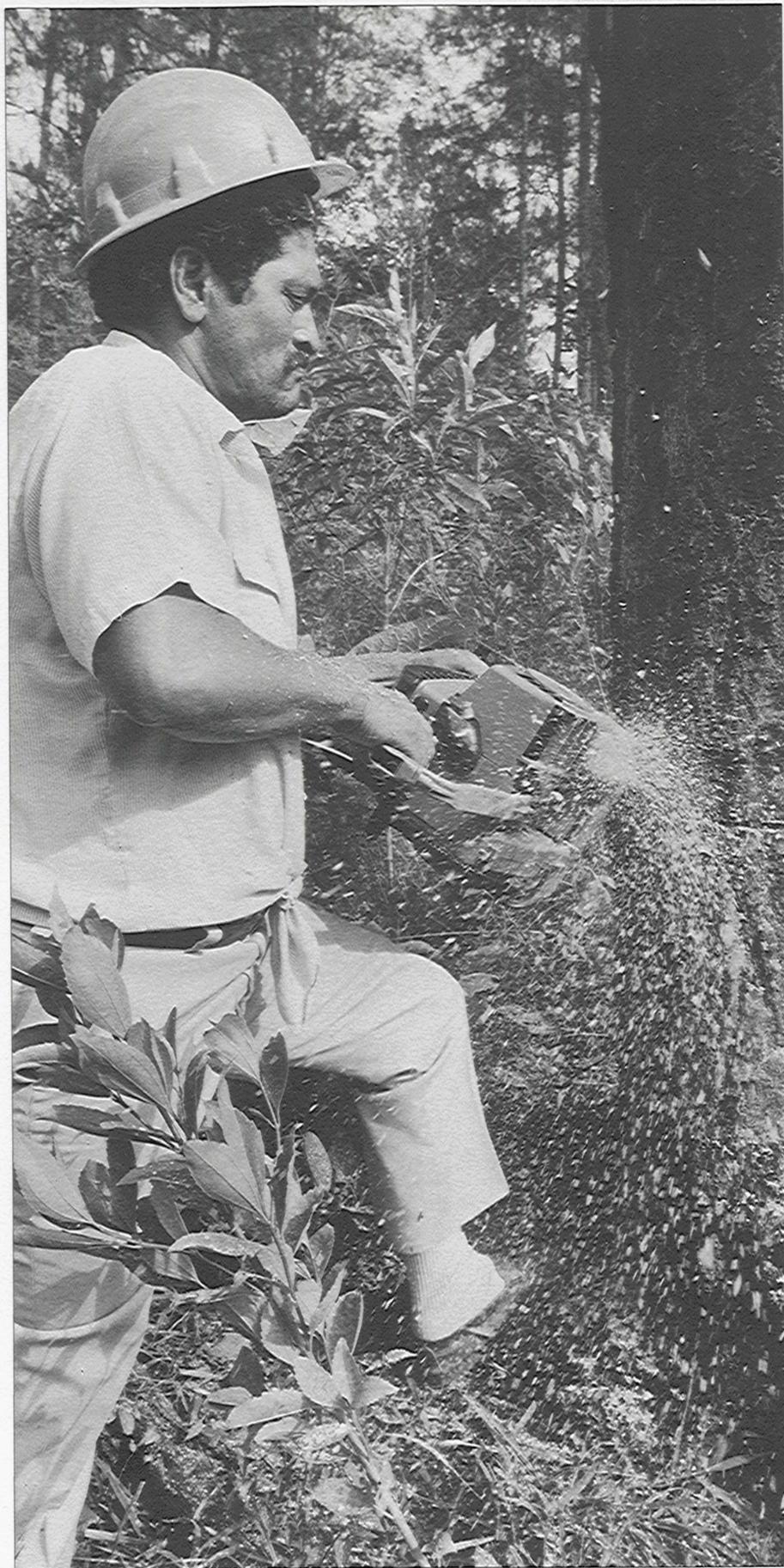
known as the Resin Fund, which sets the fixed price they will pay tappers and divides the processing pie into equal wedges. The Fund does offer price stability for the six-month tapping season, but it has also been pegged to quality standards that tend to exclude resin collected from the poorest tappers and from marginal woodlands.

These economic trends affect farmers' decisions about whether to continue resin tapping. With the Resin Fund refusing to buy much "dirty" resin and having been burned by the wild price swings of the past decade, a number of cooperatives, many of them affiliated with the Central Nacional de Trabajadores del Campo, a national farm federation, have abandoned resin tapping for cutting firewood. Moreover, economic changes in 1990 make the situation precarious.

In March of that year, newly elected Honduran President Rafael Leonardo Callejas announced a lib-

eralization of the foreign exchange system, a de facto devaluation that inadvertently threatened to drive resin tappers out of business. The action was designed to encourage exports for Honduran agro-industries while cutting imports and the trade deficit. The resin-processing companies were able to improve their domestic balance sheets by converting at a higher rate dollars earned abroad, while using their control of the resin market to avoid passing any of the profit through to tappers by paying them higher prices. Meanwhile, tappers were being squeezed at the other end as their input costs soared after import duty waivers and sales tax exemptions were abolished. The price of inputs such as sulfuric acid doubled, while the costs of plastic cups and steel blades increased by 30 percent.

After the companies refused to raise product prices, in May 1990 the FEHCAFOR cooperatives decided to withhold their resin from the market.



Left and above: Only those trees that have reached the end of the resin cycle (after 20 to 40 years) are sawn down and sold as lumber or firewood for supplemental income.

By July, the cooperatives had negotiated a price increase of 20 percent, and sales resumed. Following another six months of tortuous negotiations, the Resin Fund announced that a further increase to \$52 per quarter metric ton would take effect in February 1991.

The common element in the dangers posed by plans to change the forest tenure system and undertake economic structural adjustment has been the invisibility of resin tappers to policymakers. The ability of FEHCAFOR to negotiate higher prices showed what could be accomplished through organization. But some farmers, including FEHCAFOR manager Salvador Meza, thought that something more than organized reaction was needed. "It would be better," he said, "if we could expand our business by processing our own resin."

INSTITUTIONAL CAPACITY

The success of a cooperative or other community group involved in natural resource management depends on its usefulness to the people who join it. There must be an economically and legally secure activity if the enterprise is to get off the drawing board. Once people have come together, dynamic leadership and the development of managerial skills are needed to maintain the consensus and transform the enthusiasm of shared ideals into the nuts and bolts of essential services. The experiences of the Cooperativas Villa Santa and San Juan de Ojojona offer clues about why some commu-

nity institutions gel to form a workable consensus while others cannot.

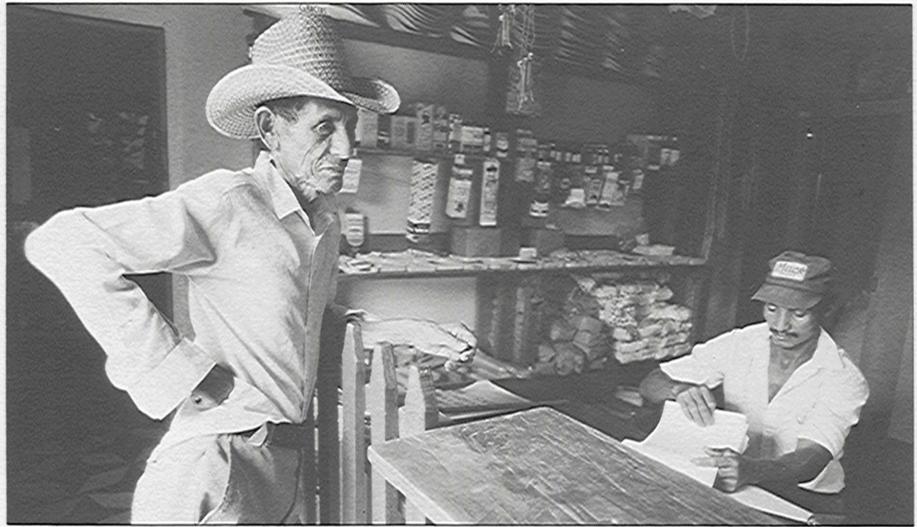
One might think that the crucial failure limiting the San Juan cooperative was its lapse in leadership when a former president embezzled funds. Surprisingly, both the Villa Santa cooperative and the federation FEHCAFOR itself suffered similar lapses, with the latter actually dissolving before being revived in 1984 by the Confederación Hondureña de Cooperativas (CHC). Before turning to the national level, it is instructive to see what can be learned from the resiliency of Villa Santa at the local level.

Four lessons can be learned. First, members shared a powerful experience of common participation in a community movement. Genaro Osorio, one of the 12 primitivos present at the outset says, "It was the strike to block the sawmill from tearing up this place that got us motivated to start this co-op." The mystique of acting together to protect the forest adhered to the organization that followed, binding its members together.

Second, the Villa Santa area is plentifully endowed with natural forest tracts and a climate favorable for resin production. Most members have access to parcels in excess of 1,000 trees, allowing them to earn enough to conserve the resource rather than cash it in. Mild temperatures in the area are conducive to the sulfuric-acid tapping method, which effectively doubles traditional yields. Good roads have facilitated the transport of resin, and the payoff from group marketing has encouraged diversification into other forest-based production activities. Multiple use strengthens the conservation ethos, and allows the cooperative to weather erratic price swings in one commodity.

Third, members were able to obtain credit to buy modern tapping equipment and learned how to use it from the beginning of the cooperative. "People from Maya [the resin-processing company that supplied the equipment] taught don Luis Alonso how to attach the cup and canal," recalls Felipe Alemendares, one of the first members. "He experimented with this and showed me; it was quite easy and we all caught on quickly."

Almost by default, since COHDEFOR did not provide communities in the Social Forestry Sys-



FEHCAFOR cooperatives such as this one benefit the whole community by opening stores to sell staples and farm supplies in bulk at discount prices.

tem with much in the way of credit or technical assistance, the cooperative stumbled on the "farmer first" adaptation of appropriate technologies that has been at the heart of numerous other successful rural development programs (Robert Chambers, et al. 1989). These methodologies, which have been pioneered by non-governmental organizations (NGOs) throughout much of the developing world, show that farmers teaching farmers what they have learned from tinkering with new technologies in their own fields are often far more likely to succeed than extension agents trying to recreate experiments created by scientists at centralized research stations. Ironically, because the "farmer first" approach led to local adoption of the state-recommended cup-and-canal method, the cooperative earned the respect of COHDEFOR, gaining the ear of influential people who could help stop encroachment by sawmills into the forests around Villa Santa.

Finally, the strong participation within the cooperative led to the diffusion of leadership skills so that when the first president drained the organization dry, a new group of leaders rose up to reclaim those resources and reenergize the community enterprise. Remembering those days in 1985, Rosalio Espinal, one of the new leaders, says, "It was sad the way previous managers had robbed us of what we had worked so hard to make, but we younger men decided

to fight back and recover the car and the money that was taken." The capital that was saved allowed the cooperative to buy its truck, start the consumer store, and make new investments.

The deficiencies of the Cooperativa San Juan de Ojojona are a mirror image of Villa Santa's strengths. The diffuse membership scattered among several communities, the already depleted ecological base of the area, the inability to sustain production or diversify its sources to make forestry attractive, and the weak leadership have undermined the ability to form a strong consensus around tenure rights and manage those claims effectively to curtail outside encroachment.

The common property literature revolves constantly around this theme: A breakdown in group decision making is the prime cause of common property regimes passing into open access and overexploitation. Community forest organizations must be sufficiently strong to exclude outsiders. The apparent failure in San Juan should not obscure a silver lining that might one day be mined if it is not overlooked by outside agencies. Five new cooperatives joined FEHCAFOR in 1990, raising the total membership from 2,700 to 3,145 individuals. What this suggests, despite the still unresolved conflict endangering what remains of the commons, is that resin tappers understand they must join together at some level to cut transport

costs, market their product competitively, and broker outside support.

If that vision is to become a reality and a force for protecting the commons, it is vital to strengthen institutional coherence and decision-making capability. An IAF grant of \$249,000 to FEHCAFOR in 1986 has provided resources to strengthen both the federation and its member cooperatives. A rotating loan fund has been established so that member cooperatives can finance efforts to diversify production and boost yields. The establishment of such funds is crucial since few rural communities in

Honduras have sources of informal credit, much less banks. Firefighting equipment has also been purchased that helped extinguish two blazes in Ojojona and another in Protección in 1989 alone. Leadership training programs and technical assistance to improve management, bookkeeping, and production skills were offered by FEHCAFOR, the Instituto de Formación Cooperativa, and the CHC.

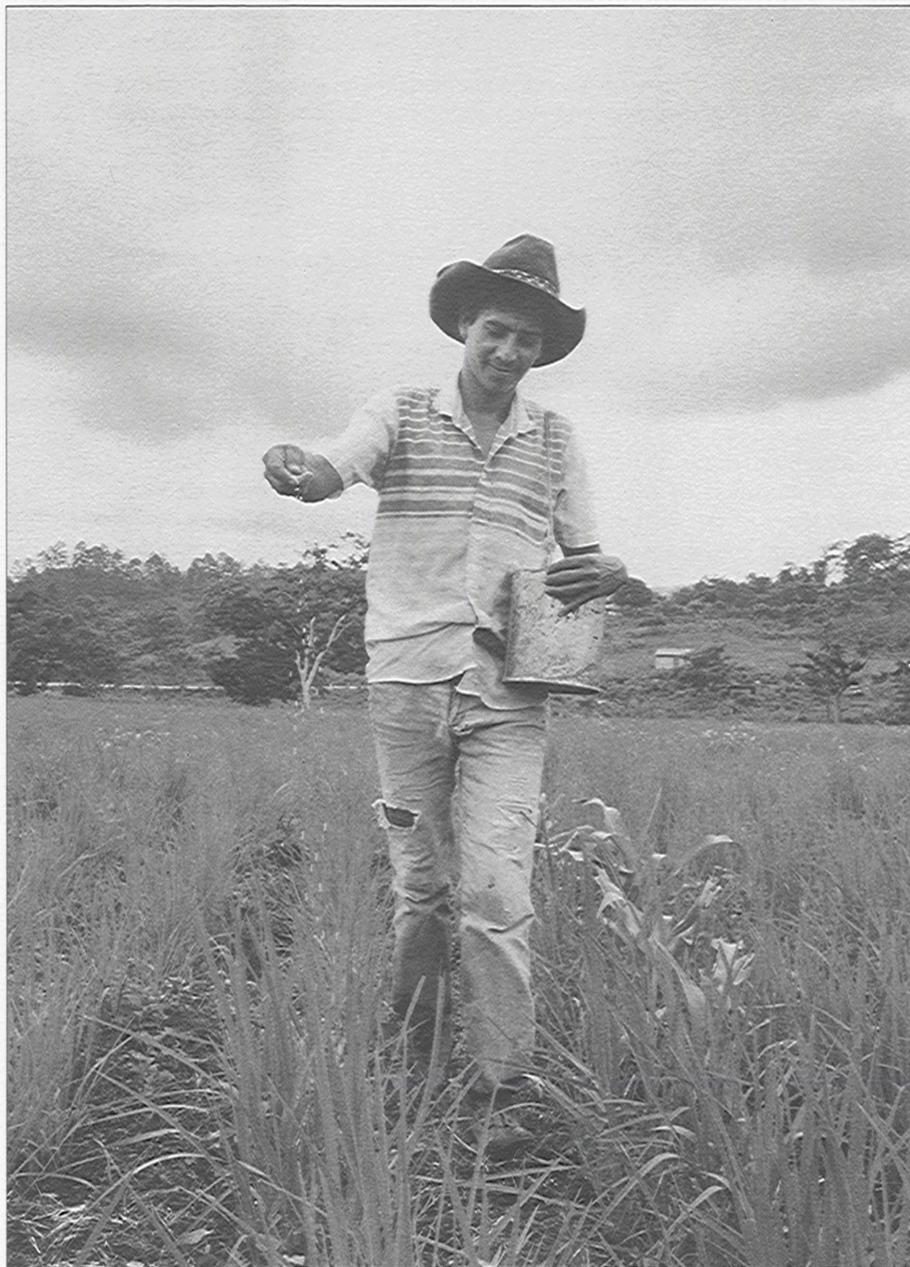
Today, Rosalio Espinal, who helped revitalize Villa Santa, is the president of FEHCAFOR, which has undergone a rebirth of its own. Wrecked by leadership abuses in the

late 1970s, it was reborn when the national confederation of cooperatives decided that an umbrella organization was needed to facilitate market transport and to negotiate higher prices for resin tappers. Since 1984, it has tripled in size to 48 affiliates, representing over half the country's 6,000 resin tappers and accounting for nearly 70 percent of production.

Espinal must be satisfied that since FEHCAFOR's reemergence, resin prices paid to tappers have more than tripled. Yet he must also be aware from his experience in Villa Santa that market diversification is key. Efforts by COHDEFOR to manage its own resin-processing plant to compete with the big three failed in the mid-1980s, so that might be too ambitious a step for the federation right now. Plans are underway, however, to construct a large warehouse and plant for filtering resin, which could then be exported to processors in the United States and Europe.

Pending an in-depth study of the economic, social, and political feasibility of such an undertaking, there are other signs emerging from local cooperatives that point to new opportunities and a looming danger. When the revolving loan fund was established to diversify production activities, many groups chose to bypass forest diversification to intensify grain production, plant coffee bushes, or start small-scale animal husbandry projects. In one sense this reflects the uncertain market conditions for resin, and the promising markets for other crops being opened up by NGOs such as World Neighbors in Guinope, where farmers have been able to increase their corn and bean yields four-fold in the past five years through intercropping, soil conservation, and organic manures. Since resin tappers are also farmers, channeling investments for maximum return is only natural.

However, it may also signal a growing unease at what is happening to the forest itself. Trees are often seen as "a gift of God," which will regrow naturally to provide resin, firewood, fence posts, animal fodder, shade, and building materials. It is still rare to think of trees as a source of water or, as a national radio program says, "the lungs of the nation." Yet farmers in Villa Santa and Ojojona



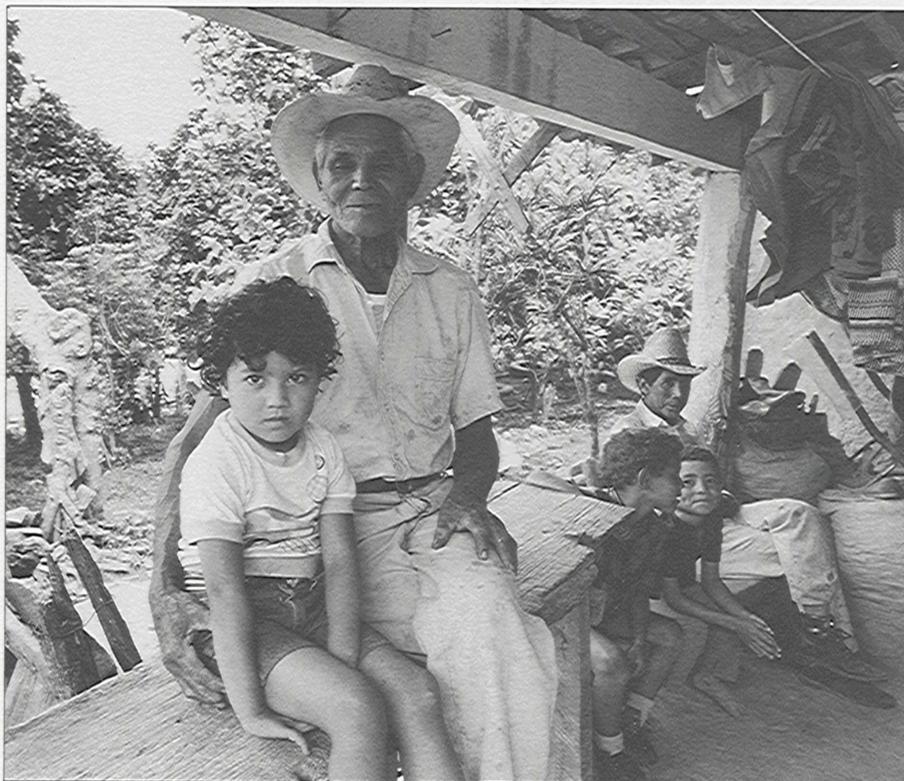
Small farmers of the Cooperativa Villa Santa supplement their resin-tapping income by projects designed to boost grain yields and diversify production.

have begun to complain that rainfall has decreased markedly during the past 20 years and that the soils are "tired." Even though the resin-tapping cycle lasts from 20 to 40 years, farmers cannot help but notice that among the 500 to 1,000 trees currently being worked, only 100 to 200 new saplings are growing up naturally to replace them.

To avoid long-term decline, forest community members must have access to training in reforestation and in how to integrate farm and forest management for sustainability. Farmer-to-farmer efforts, such as those that led co-op members to replace plastic cups with recycled metal cans, or the experiments in San Juan de Ojojona that showed the cup-and-canal method could be just as productive without using sulfuric acid, suggest that innovation is available at the local level. The question is how to harness it. There is no effective federation-wide program to share what is being learned in individual co-ops, and COHDEFOR technicians are rare visitors to the field and have yet to even devise an education campaign to make the cup-and-canal technology widely available.

The experience of the Cooperativa Villa Santa shows the promise of what can be done, the remaining question is what will be done. Many developing countries such as Honduras still have valuable forest cover remaining, and community groups in place to undertake successful natural resource management. The question is whether governments and international donors have the will to support full and secure tenure rights for these groups and the wisdom to structure market incentives that will make their businesses economically viable. If the answer is yes, then the rural poor will have the opportunity to improve their livelihoods while securing their future and our own. ♦

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Cooperative members, young and old, are involved in resin-tapping. Their future rests on government and donor support for strong organizations to manage and reforest community woodlands and market their production.

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Bringing the World to Rio

Barbara Annis

The 1992 U.N. Conference on Environment and Development must negotiate a minefield of unspoken issues.



Brazilian Embassy in Washington, D.C.

A printed sign outside Globalwarming, a new nightclub in Amsterdam, Holland, proclaims: "The U.S. government says it needs more study, the Dutch government is afraid it will flood the country, Third World countries say they can't afford to do anything about it, and everyone is talking about it."

Indeed, everyone seems to be talking about one aspect or another of the global crisis that will be spotlighted at the largest international conference ever to be convened on any subject—the United Nations Conference on Environment and Development (UNCED). The mandate of the conference, to be held in Rio de Janeiro in June 1992, is so encompassing almost no group, regardless of its mission, has to stretch its operational scope (as health organizations, say, did for the 1990 UN conference espousing "literacy for all") in order to gather under the UNCED umbrella.

Trade, environmental education, environmental emergencies, the transfer of technology, and the financing and restructuring of international systems to meet environmental challenges are among the officially designated "crosscutting" issues fea-



UN Photo 175567

Left: A birds-eye view of Copacabana Beach in Rio de Janeiro, Brazil, site of the 1992 UNCED conference. Above: Maurice Strong, Secretary-General of UNCED. Strong hopes the conference will draft international conventions on the atmosphere, climate change, and other key environmental issues.

tured on the conference agenda. In-depth looks are also promised for protection of the atmosphere; energy; climate change; the ozone layer; air pollution; protection of the quality and supply of freshwater resources; protection of the oceans and seas and development of their resources; protection and management of land resources, including ways to offset or halt deforestation, desertification, and drought; conservation of biological diversity; management of biotechnology; management of wastes and toxins and the prevention of illegal dumping and disposal; improvement of living and working environments; ecologically sound urban and rural development; and the safeguarding and enhancement of human health and quality of life.

Is there anyone untouched by at least one of these topics? Citizen groups, nonprofit organizations, and government agencies are all gathering their forces to influence the final direction of the conference. Some believe that when everyone at last gathers in Rio, the only remaining task will be to negotiate the wording of the final document expressing a prearranged consensus.

Thus preconference preparation is underway at a series of regional roundtables, covering topics such as indigenous Americans and the living and working conditions of the poor, as well as the more technical aspects of environmental protection. These preconference roundtables are intended to develop "national reports" for presentation in Rio.

There are also signs, however, that despite the shared sense of urgency, forging a consensus will not be easy. Organizations are discovering that conference preparation requires more than producing an attractive brochure or a catchy video illustrating a pet project. Many groups, in fact, are experiencing an identity crisis. The very breadth of UNCED, which many see as its primary virtue, is for others its largest defect. Organizations are being forced to make policy decisions, take a stand, on issues that cut across areas of specialization or raise controversies they had always tried to avoid.

Some groups have hired additional staff and are working practically around the clock to meet the challenge of defining institutional ca-



Clara Riascos

Air pollution from traffic congestion in cities such as Bogotá, Colombia, is one of the thorny issues on the table at the 1992 UNCED conference.

pability and identifying what they really want the Rio conference to accomplish.

Others seem paralyzed. One person, requesting anonymity, described what her large, Washington, D.C.-based environmental organization was doing to prepare for UNCED by responding, "Absolutely nothing." She then lamented the profound anxiety that was causing her group to play "ostrich," putting off inevitable decision making by refusing to deal with it as long as possible.

One reason for that anxiety is tactical. Many environmental organizations in Washington and around the world have existed happily for years by overtly leaving politics and policy issues alone. They have cultivated bipartisan or apolitical images in order to generate broad financial support from the public.

Although most groups identify themselves and their environmental colleagues on the political spectrum from right to left, as a rule, they wrap themselves in the protective mantle of Nature.

UNCED is now forcing groups to relate their environmental positions to development issues such as eco-

nomie equity, in the process calling into question informal alliances of political convenience. For instance, some U.S. environmental groups critical of World Bank projects that threaten environmental damage have worked with members of the U.S. Senate, who dislike the World Bank and its brand of foreign assistance, to slash funding for the Bank.

Those attempts were unsuccessful and, ironically enough, have helped steer the Bank towards a brokering role for meeting the global environmental challenge. In 1990, the World Bank established a Global Environmental Facility (GEF) to support projects in developing countries that reduced global warming, preserved the earth's biological diversity, protected international waters, and prevented further depletion of the planet's ozone layer.

The GEF is a three-year, \$1.5 billion fund. Fifteen environmental protection projects, estimated to cost \$214 million, and 11 technical assistance proposals totaling \$59 million have already been identified and are expected to be implemented by mid-1991. Participating agencies include not only the Bank but the United Nations Development Programme (UNDP) and the United Nations Environment Programme (UNEP). Nongovernmental organizations (NGOs) are encouraged to design and carry out individual projects, and a special window for small NGO grants will be established for that purpose later this year.

The Inter-American Development Bank (IDB) has also begun to shift its priorities. For example, it recently instituted a major forestry policy to help member countries utilize and conserve forest resources in ways that balance environmental, economic, and social benefits. The move to dramatically increase support for environmental protection and the sustained management of natural resources is an outgrowth of efforts begun in 1982 to protect forest people and foster the creation of sustainable forest industries. The IDB has also increased its support for conservation through the establishment of national parks and other protected reserves.

Although the policy drift of the large multilateral development institutions and national governments brings them toward the positions

staked out by leading NGOs, they do not yet speak with a single voice and are far from the harmony needed to produce consensus in Rio. Some groups in fact despair of ever achieving such unanimity and are planning an alternative conference to draft a document more focused on human rights and equity. Indeed, some experts believe that environmental problems require innovative social thinking to be resolved.

M.E. Peñón de Cotter of the Costa Rican-based Fundación Arias recently told development specialists convened for the Society for International Development's 20th World Conference that "traditional discrimination against women has produced cultural practices which reinforce women's exclusion at all levels." When trying to analyze the link between concepts about women, population, and natural resource management, she says, it is clear that women are the "clue" to finding the relationship between population and natural resource management. She called for a "new concept of development" that incorporates women's rights and participation as a central strategy.

Peñón and many others preparing for Rio see a clear need for the active participation of women and other marginalized groups in coming to grips with the environmental crisis. World population is growing by almost 95 million people per year—more than at any time in human history, according to Carl Haub, director of information and education at the Population Reference Bureau in Washington. Traditional expectations hold that economic growth brings population growth under control, but it is no longer certain that the planet's resource base can sustain the macro-development strategies of the past, much less intensify them in the future. And if marginalized populations are forced to consume their patrimony by adopting survival strategies that exhaust the fragile ecosystems they often inhabit, the losses may not be limited to their children, but extend to the world's children.

Giving women, indigenous peoples, and the poor a voice and a stake in sustainable local development may be crucial, but who will speak for these constituencies at the official conference in Rio? They are not well represented by state agencies or the



Involving women is crucial for sustainable local development, but many think they will be underrepresented in Rio de Janeiro.

multilateral donors, and many environmental organizations, as previously noted, have focused on simple conservation rather than handle these political hot potatoes.

Equally problematic for some groups is the degree of advocacy around these issues generally associated with the South side of the environmental question. If the South cannot afford cleaner technologies, will it be expected to sacrifice development?

This social breach on the more technical issues poses troubling questions for UNCED to resolve. For instance James MacKenzie, writing for the World Resources Institute in "Issues and Ideas" *Toward a Sustainable Energy Future: The Critical Role of Rational Energy Pricing*, advocates a change in industrialized energy consumption patterns as a step toward dealing with climate change.

He sees growing energy use building up greenhouse gases, "inexorably leading to long-term, if not irreversible changes in the planet's climate . . ."

MacKenzie believes energy use is the common thread among a list of perilous threats and maintains that only far-reaching energy policies can

cut them down to size. Yet the economic pain of that process encourages an "ostrich" strategy in industrial and developing nations since the danger, despite its magnitude, is impending, not immediate. Thus, the U.S. National Energy Strategy (NES), unveiled in February 1991, after nearly 18 months of work by the Department of Energy and other federal agencies, criticized some of the scientific studies justifying the conclusions of MacKenzie and others and recommended further research.

Anthony Churchill, director of the World Bank's Industry and Energy Department, and Robert Saunders, chief of the Bank's Energy Development Division, concur. They say, "Faced with great scientific uncertainty in this much debated topic [of global warming], developing nations should pursue those energy options that make good economic as well as environmental sense."

But what constitutes good economic as well as environmental sense? Sandra Postel for World Watch Institute says: "The solution to many environmental problems may be found where they began—in government fiscal policy. By reshaping taxes and subsidies, we can steer the economy toward sustainability." Unfortunately, she adds, "Government decision makers are often blind to the ecological price of their pursuits."

The multiplicity of these issues is taxing the resources and expertise of environmental organizations. The road to Rio is marred by potholes that smart directors want to steer clear of without sacrificing their groups' maximum participation. Despite the difficulty of the task, what is clear among the various groups working their way toward UNCED in Rio is the growing awareness that the global economy and the world ecosystem are intertwined, that conservation and development are two sides of the same coin. The needs and aspirations of the present must be met without compromising the ability to meet those of the future. ♦

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Sustainable Growth: A Bad Oxymoron

Herman E. Daly

Impossibility statements are the very foundation of science. It is impossible to: travel faster than the speed of light; create or destroy matter-energy; build a perpetual motion machine, and so on. By respecting impossibility theorems we avoid wasting resources on projects that are bound to fail. Therefore economists should be very interested in impossibility theorems, especially the one to be demonstrated here, namely that it is impossible for the world economy to grow its way out of poverty and environmental degradation. In other words, sustainable growth is impossible.

In its physical dimensions, the economy is an open subsystem of the earth ecosystem, which is finite, nongrowing, and materially closed. As the economic subsystem grows, it incorporates an ever greater proportion of the total ecosystem into itself and must reach a limit at 100 percent, if not before. Therefore, its growth is not sustainable. The term "sustainable growth," when applied to the economy, is a bad oxymoron—self-contradictory as prose, and unevocative as poetry.

Economists will complain that growth in gross national product is a mixture of quantitative and qualitative increases and therefore not strictly subject to physical laws. They have a point. Precisely because quantitative and qualitative change are very different, it is best to keep them separate and call them by the different names already provided in the dictionary. To *grow* means "to increase naturally in size by the addition of material through assimilation or accretion." To *develop* means "to expand or realize the potentialities of; to bring gradually to a fuller, greater, or better state."

When something grows it gets bigger. When something develops it gets different. The earth ecosystem develops (evolves), but does not grow. Its subsystem, the economy, must eventually stop growing, but can continue to develop. The term "sustainable development," therefore, makes sense for the economy,

development is a cultural adaptation made by society as it becomes aware of the emerging necessity of nongrowth. Even "green growth" is not sustainable. There is a limit to the population of trees the earth can support, just as there is a limit to the populations of humans and of automobiles. To delude ourselves into

It is impossible for the economy to grow its way out of poverty and environmental degradation but it is precisely the nonsustainability of growth that gives urgency to the concept of sustainable development.

but only if it is understood as "development without growth"—that is, qualitative improvement of a physical economic base that is maintained in a steady state by a throughput of matter-energy that is within the regenerative and assimilative capacities of the ecosystem. Currently, the term "sustainable development" is used as a synonym for the oxymoronic "sustainable growth." It must be saved from this perdition.

Politically, it is very difficult to admit that growth, with its almost religious connotations of ultimate goodness, must be limited. But it is precisely the nonsustainability of growth that gives urgency to the concept of sustainable development. The earth will not tolerate the doubling of even one grain of wheat 64 times, yet in the past two centuries we have developed a culture dependent on exponential growth for its economic stability. Sustainable

believing that growth is still possible and desirable if only we label it "sustainable" or color it "green" will just delay the inevitable transition and make it more painful. ◇

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Development Notes

BACK TO THE FUTURE FOR MEXICAN FARMERS

Researchers, government representatives, and farmers gathered in Tabasco, Mexico, from February 28 to March 2 of this year to discuss the technical and social problems of reconstructing *camellones*, an intensive agricultural system of raised fields developed by the Mayas in the wetlands of Mexico during the sixteenth century. The conference—sponsored by UNESCO's Program for Man and the Biosphere, the Fundación Universitario Veintiuno, A.C., the U.S. Agency for International Development, the IAF, and the Maya Sustainability Project of the University of California, Riverside—drew some 115 participants from Mexico, the United States, Canada, Chile, India, Belgium, El Salvador, Ecuador, and elsewhere.

The conference was called to update research on the *Camellones Chontales* project sponsored by the Tabasco state government in the late 1970s and early 1980s to rebuild raised fields in local swamplands. It was hoped this would increase yields, provide income for the state's Chontal Indians, and revitalize their traditional culture. Although some projects were successful, others have been criticized for poor design, low productivity, and failure to involve the Chontales in decision making.

Conference participants visited several sites. In Oxiacaque they found that *camellones* had been abandoned due to poor productivity and unpredictable flooding, while in Tucta raised fields were still being used for growing subsistence crops.

One panel discussed some of the newer research strategies to study *camellones*, including a mathematical model of water flow through the raised fields. Other presentations focused on soil nutrients; the diversity of edible fish and clam species found in the canals surrounding the

camellones; and examples of similar experiments underway in other tropical regions.

Participants emphasized that successful introduction of *camellones* depends on accurate knowledge of local swamplands, particularly soil conditions and water flows, and on participation by the Chontal people in planning, implementing, and adapting the new systems. The panel recommended exchanges between Chontal farmers and farmers of *chinampas*, the raised beds developed by the Aztecs and still used in the Valley of Mexico. Although local organization building was deemed vital for long-term success, a steady flow of funding from outside sources was needed for the foreseeable future.

A summary report of conference findings and recommendations is available from the University of California, Riverside, and a book of edited conference papers will be published in early 1992. As a result of this conference, its sponsors will solicit resources to arrange exchange visits between farmers in the Valley of Mexico and in Tabasco to share information. The University will also co-sponsor a graduate student for three months to study existing *camellones* and identify communities where they once existed but are no longer used. A related conference held in August at the University of California, Riverside, on Hispanic agriculture in Mayan areas has inspired a group of wetland researchers working in Belize to also visit Tabasco.

For materials and additional information about the conference, contact Juan J. Jiménez-Osornio, Department of Botany and Plant Science, University of California, Riverside, California 92521 (phone: 714-787-4748) or Miguel Chávez L. at IREBIT, Apartado Postal 320, 86000 Villahermosa, Tabasco, Mexico (FAX: 931-42425).

—Barbara Kohnen

ANDEAN CULTURE COMES TO WASHINGTON

From June 28 to July 7, 1991, Andean indigenous folklife was on vivid display at the Smithsonian Institution's twenty-fifth annual Festival of American Folklife held on the National Mall in Washington, D.C. Four organizations representing the diverse cultural traditions of Peru, Bolivia, and Ecuador joined groups from Alaska, Mexico, and the Amazon rain forest as part of the festival's Native American program.

The Inter-American Foundation sponsored 14 indigenous participants from the Bolivian highland communities of Tiahuanaco and Jalq'a, along with eight villagers from the island of Taquile on Lake Titicaca in Peru. Also present, representing Andean lowland culture, was the Federación de Centros Shuar from the Ecuadorian rain forest. The groups offered spectators a glimpse of the richness of Andean folklife, including traditional farming techniques, textile production, crafts, food, dance, music, and rituals.

The exhibits were designed to simulate the experience of visiting an Andean community. Jalq'a and Taquileño weavers demonstrated how a variety of textiles are made. The Tiahuanaco participants exhibited a replica of *Suka Kollus*—the raised-field farming beds dating from pre-Columbian days—that produce sustainable yields of interrelated crops despite adverse weather. These and other production techniques were presented as examples of how traditional systems coexist with the environment.

The Smithsonian's "museum without walls" created an open learning environment. Participants from the four groups shared their music and ceremonial dances, and invited onlookers to join in. Weavers explained how looms were made and yarns hand spun, and opened a



Annette Oliveras

Visitors to the American Folklife Festival enjoy the music of performer Alejandro Huatta Machaca from the island of Taquile, Peru.

window into their culture by deciphering the complex symbols contained in textile patterns.

At the same time, Andean participants were eager to learn more about North American society and the other exhibits on the Mall. Anthropologist Gabriel Martínez expressed the amazement of the Jalq'a weavers at the Smithsonian's Museum of Natural History, particularly its dinosaur display. "The Jalq'a were overwhelmed," he said, and they plan to use dinosaur figures in a new line of textiles.

Important exchanges also took place with other festival participants. Alejandro Flores of Taquile was captivated by the technique of the Indonesian boat builders who built graceful and sturdy craft without using nails. The Indonesians and Taquileños used translators and sketched diagrams to exchange ideas about boat construction and fishing, and the similar role of both in each culture. The Indonesians were par-

ticularly intrigued by the organizational ability of the Peruvians, and expressed interest in one day visiting Lake Titicaca to deepen the exchange.

Presenters—including Gabriel Martínez working with the Jalq'a, archaeologists Oswaldo Rivera and Alan Kolata working with the Tiahuanacos, anthropologist Elayne Zorn working with the Taquileños, and IAF Representative Kevin Healy—acted as mediators between visitors and festival participants. They served as translators and guided workshops on textile production, agriculture, instrument making, and stone-and-thatch construction designed to show how respect for tradition was crucial for successful development projects.

Two events highlighted the arrival of Andean culture in Washington. The first was the traditional *saludo*, or greeting, presented at the festival's opening ceremonies by the Shuar participants from Ecuador. A reception sponsored by the Bolivian Embassy was then held at the Smithsonian's S. Dillon Ripley Center to celebrate Jalq'a and Tiahuanaco participation in the festival and to inaugurate the museum's special exhibit of Jalq'a textiles and traditional ceremonial costumes. Both events were attended by U.S. government officials, including Senators Paul Simon and Tom Harkin, and Secretary of Agriculture Edward Madigan; international dignitaries such as Bolivian Ambassador Jorge Crespo Velasco and the president of the IAF, Ambassador Bill K. Perrin; and prominent Andean scholars such as ethno-historian John Murra. Amid the pageantry, the spotlight shone unfailingly on the Taquile, Tiahuanaco, Jalq'a, and Shuar participants, illuminating their talents, creativity, and commitment to using their culture as an effective tool for development.

—Steve Herman

PLANTING THE SEEDS OF FRIENDSHIP IN OAXACA

Civilizations for many centuries have logged the forests of the Oaxaca Valley to build their cities and fuel their fires. Now much of the timber is gone, and valley rivers are stained with the run-off topsoil they carry to the sea.

A cooperative effort to reverse the environmental damage in the valley began when 50 members of Neighbors Abroad from Palo Alto, California, visited the city of Oaxaca to celebrate the twenty-fifth anniversary of their sister city relationship. Sparked by a mutual interest in the ecology of the valley, the cities set two goals: to restore the *ocote* pine forests of the area by planting 250,000 trees before the year 2000, and to foster ecological awareness to preserve the quality of the valley's air, water, and soil.

The Patronato de Ecología del Estado de Oaxaca was organized to implement this program. As its first reforestation site, it selected the slopes of Cerro del Fortín, not far from the spot where the statue of Benito Juárez gazes over the city.

Responding to Oaxaca's request for technical collaboration, Palo Alto sent a landscape architect/ecologist. She and her Oaxacan colleagues assessed water access, slope orientation, and soil depth. Together they determined the optimum size and spacing of holes for planting.

Schoolchildren carrying seedlings formed a parade the following spring to celebrate the beginning of the reforestation project, and the first hillside trees were planted in June 1990. The project partners then installed a drip-irrigation system to water the pines during the dry season and planted native shrubs and oaks to hold moisture and fight erosion.

Project supporters in Oaxaca and Palo Alto have attracted aid from a variety of donors: sites and labor



ITDG/P.A. Harris

Two workers in Peru prepare manzanilla for milling, using a diesel-powered, easily assembled tray-drier developed by ITDG for low-cost, efficient processing.

from the Oaxaca city council; 1,000 pine seedlings from the Mexican government; hand-held augurs and bits for tree-posting from the Palo Alto city council; drip-irrigation equipment and airline tickets from businesses in Palo Alto; and a financial grant from the technical assistance program of Sister Cities International. Although such assistance is vital to the project, the primary catalyst has been the growing spirit of friendship and respect between the citizens of these two cities that promises to make the Oaxaca Valley green again for future generations.

—Peter Loan

SMALL IS STILL BEAUTIFUL

When E. F. Schumacher, founder of the Intermediate Technology Development Group (ITDG), asked himself what would be the best technology for the rural poor in Asia, Latin

America, or Africa, he responded provisionally: It should be much more intelligent, efficient, and scientific than the traditional technologies that kept people poor, yet be much simpler, cheaper, and easier to maintain than the highly sophisticated systems of the industrialized West. The answer was to invent something intermediate, a technology in between what was presently available.

This theory gave birth to the ITDG, which this year celebrates two-and-a-half decades of work helping the rural poor acquire the tools and trades needed to lift themselves out of poverty.

Surveying its legacy of promoting appropriate technology in over 60 countries, the group has much to be proud of. From initial aims scribbled down on the back of an envelope, the ITDG has achieved international renown. During the last 25

years, Intermediate Technology has grown from a staff of 5 to over 200. It has offices in six countries: Kenya, Zimbabwe, Sudan, Bangladesh, Sri Lanka, and Peru. The ITDG also has consultants worldwide and has contact with more than 50 development organizations. This expertise is tapped through a wide and varied list of publications about appropriate technology, many of them provided free of charge.

According to its information officer, the ITDG's ability to gather and rechannel information is one of its most important contributions to development. The key to greater impact during the next 25 years is in listening to what the Third World poor believe their problems are, not what industrial nations say they are. The ITDG intends to continue giving the poor a voice in decisions about their future and a platform for articulating their "angle" on the debt and environmental crises.

To mark the twenty-fifth anniversary, a special publication has been commissioned to chart the corresponding history of development. *Mastering the Machine: Poverty, Aid and Technology* by Ian Smillie reviews the "technology factor" in Third World development and assesses what has been learned about appropriate technology. The book, published in October, suggests how different types of agencies, from multilateral donors to local NGOs, can more effectively combat poverty and stimulate production.

Intermediate Technology will also be issuing a fourth edition of its first publication, *Tools for Agriculture*. This buyer's guide briefly describes hundreds of agricultural implements and provides addresses and phone numbers for more than 1,500 suppliers around the world. An edition in French will be published by the French agency Groupe de Recherche et d'Echanges Techniques.

—Maria Lang

BRAZILIAN NGOs COME OF AGE

After a decade of phenomenal growth, Brazil's nongovernmental organizations (NGOs) are now displaying the maturity needed to consolidate their key role in community development and civic advocacy. This was clearly shown in Rio de Janeiro at the First International Meeting of NGOs and UN System Agencies, which was organized by nine leading Brazilian NGOs and the United Nations Development Programme (UNDP).

The conference, held August 6-9, 1991, brought together representatives from more than 160 Brazilian NGOs, 40 international donors, and 35 NGOs from Latin America, Asia, and Europe. Underlining the signifi-

cance of the event was the presence of the Agência Brasileira de Cooperação (ABC), the most comprehensive contact yet between the NGO community and the Brazilian government agency responsible for fostering and monitoring international development aid.

A range of experienced development thinkers and practitioners addressed the four-day conference. The thread tying together their presentations was the linkage between democracy and development. Speaker after speaker added up the mounting human and environmental costs incurred by traditional macrodevelopment models, and reiterated the need for greater equity and participation. Renowned Brazilian political scientist Francisco Weffort acclaimed the unprecedented surge of freedom in Latin

America, but warned that its civilian governments were paradoxically confronted by a deepening "crisis of governability" that threatened the very core of democratic society.

Alan Wolfe, a dean at the New School for Social Research in New York, argued that neither the state nor markets could solve all developmental dilemmas. He proposed formation of strong civil societies around families, communities, and autonomous grassroots organizations as a path to sustainable development.

This perception was extended by others who thought that new development paradigms depended on concerted efforts by civil societies in both the North and South. As the conference's final document states, the prospect for such change rests on the "capacity of the 'planetary civil society' to participate in the debate to define the course of development cooperation."

The conference was a milestone for Brazilian NGOs, exposing many of them for the first time to global development issues and offering them a platform to engage multilateral agencies such as the UNDP in frank discussions about specific policies and practices. The meeting also encouraged contacts between NGOs, laying the foundation for potentially significant South-South and South-North networking initiatives.

In hosting the conference, Brazil's NGOs demonstrated they have come of age as social actors who not only provide key services to grassroots organizations but who are increasingly important catalysts for democratizing their national society. As sociologist Herbert de Souza of the Instituto Brasileiro de Análises Sociais e Econômicas stated: "NGOs are microorganisms in the creation of new democratic processes. They are laboratories for the future, the seeds out of which a democratic utopia can one day grow."

—John Garrison ◇

IAF GRANTEES IN THE NEWS

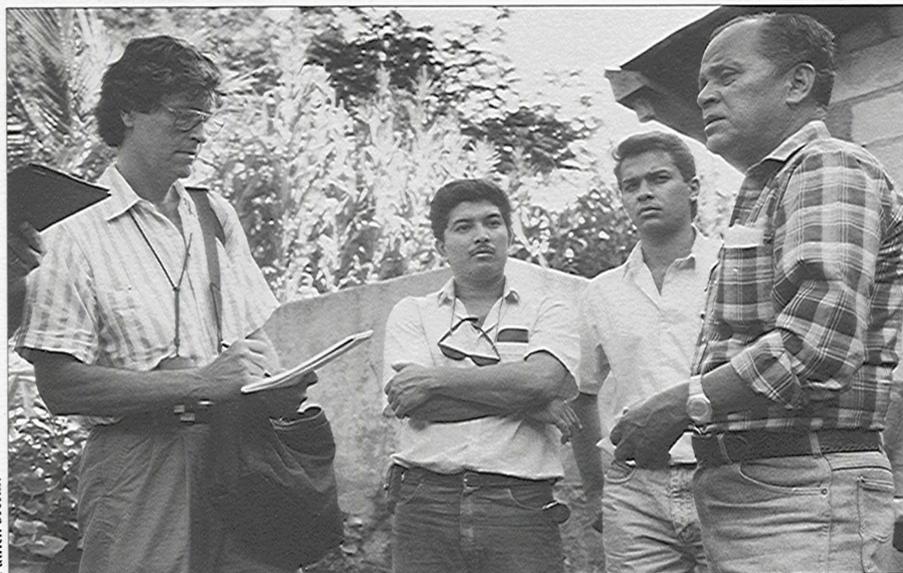
El Espectador of Bogotá, Colombia, reported that John Mayr, director of the **Fundación Pro-Sierra Nevada de Santa Marta**, received the 1990 John Harriet Dunning Award from the Nature Conservancy for the foundation's work in conserving South American forests. ● An article in the *Latin American Weekly Report* states that Brazilian President Fernando Collor de Mello has launched a major effort to reduce the country's inordinately high murder rate for minors. The **Instituto Brasileiro de Análises Sociais e Econômicas**, working with São Paulo University, determined that between March and August 1990, 457 youth were murdered in São Paulo, Rio de Janeiro, Salvador, and Recife. ● Several

groups participating in the Smithsonian Institution's 25th annual American Folklife Festival were cited by the Bolivian newspaper *Presencia*. They include the Jalq'a textile weavers from the group **Antropólogos del Sur Andino** in Bolivia, members of the **Comité de Turismo de Taquile** in Peru, and the Shuar and Achuar from the **Federación de Centros Shuar-Achuar** in Ecuador. ● María la Loaiza, president of the **Asociación de Trabajadoras del Hogar**, was quoted in *El Tiempo* of Bogotá, Colombia, on her efforts to "dignify" the profession of household workers. The association informs workers of their legal and economic rights, and helps register members with the Instituto de Seguros Sociales, the Colombian social security agency. ◇

—Compiled by Maria Lang

Inside IAF

A Community Script for Environmental Solutions



Patrick Breslin

Filmmaker John McGannon (left) talks with Elias Sánchez (far right) from the Loma Linda experimental farm. The Loma Linda model is innovating training techniques for involving the entire family in environmentally sound production.

Carol Ann Craig

With its latest production almost ready for viewing, the IAF's Grassroots Development Video Series is widening its focus to identify how local groups responding to local needs can, like pieces of a jigsaw puzzle, offer clues to the solution of complex common problems. The three previous videos—*The Women's Construction Collective of Jamaica*; *A Cooperative Without Borders: The First Step*; and *Alpacas: An Andean Gamble*—told the story of singularly imaginative projects. They have been greeted enthusiastically, winning several film awards, but educators wanted something more.

For over a year, the IAF's Development Education Office talked with teachers and discussion leaders across the country to identify topics of interest. The problem that inter-

ested most of them was the threat to the world environment and how it affected—and was being affected by—poor people. Teachers, professors, and many community groups in the United States are now familiar with rain forest destruction in Brazil and the accelerating deforestation of Central America. Students, instructors, and citizens alike feel overwhelmed by the enormity of the problem. What is lacking, and what educators are clamoring for, is information about what people on the front lines are doing, and how they might be helped to reduce the danger.

After screening the work of several filmmakers, IAF staff members selected John McGannon and Susu Wing of Intersection Associates to help tell this story. Intersection's productions, which have tackled a variety of social issues in Europe, the United States, Latin America,

and the Soviet Union—including the award-winning, three-part documentary *Elder Abuse and Family Neglect*—demonstrate that videos can thoroughly explore complicated themes by allowing the people affected to tell the story.

Discussion with IAF field staff led the preproduction team to Honduras, where articulate representatives from a well-organized environmental network introduced an array of local efforts attacking the environmental problems of the country and the region. Organizations such as the Asociación Hondureña de Ecología, Amigos del Bosque y Campo, the Instituto de Investigaciones Económicas, and Agua para El Pueblo opened the door for visits to key projects—some of them IAF-funded, many of them not.

One group was producing textbooks on environmental education for schoolchildren; another was lobbying to preserve poor people's access to the natural resources of the Gulf of Fonseca; while many others were using model farms to adapt appropriate technologies so that small farmers can expand sustainable agriculture. A larger-scale integrated program was exploring how all aspects of rural development—whether working with youth, growing crops, or building latrines and housing—were tied to the environment.

Participants in all of these projects are already well aware of the need to take care of their environment. They know that the land and its resources are their children's main legacy. Yet many feel the pressure to consume that legacy now. Ironically, economic development programs, from small credit funds to large infrastructure projects to national growth policies, often carry hidden environmental costs that are forcing people to make hard choices. Agrarian reform and colonization programs that offer more land, for ex-

Reviews

ample, also encourage or require farmers to use agrochemicals intensively. Jobs on large shrimp farms are welcome to cash-strapped peasants needing supplemental income, but they know the farms are rapidly depleting links in the food chain that would otherwise sustainably feed their families.

After several months of planning how to tell this complex story, a film crew returned to shoot footage that reflected the dilemmas, ingenuity, and beliefs of ordinary people trying to live off the land without destroying it. The earlier exploratory trip had accustomed local people to being interviewed and filmed, allowing the crew to work quickly and unobtrusively in settings ranging from small hamlets to the offices of government officials. Small farmers in their fields, engineers at dam sites, and representatives from the shrimp industry in the capital city expressed their opinions freely and naturally. What they said was more engaging and informative than any script that could have been written for them to read. People shared their beliefs, how they want to live their lives, and the hopes they have for their families, communities, and country.

Once the filming was complete, McGannon and Wing began the laborious task of boiling down 1,000 minutes of raw footage into a coherent 30- to 40-minute video. Interviews with U.S. specialists were added not to offer policy advice but to serve as points of reference for audiences. Most of the experts described how thinking about development and the environment is being transformed by the efforts of people like those who had been interviewed in Honduras.

The open, collaborative approach to production of this video allowed local people to take an active role in shaping the script, giving all the participants involved a chance to explain their actions and motives. The



Mary Allegretti (left), president of the Brazilian Instituto de Estudos Amazônicos in Curitiba, and Chico Mendes (right), former leader of the Brazilian rubber-tappers' movement, worked side by side, before his 1988 murder, to protect the Amazon rainforest. In 1991, Allegretti joined Antonio Andaluz, president of the Instituto PROTERRA in Peru, and Arturo García, national coordinator of the Coordinadora Nacional de Organizaciones Cafetaleras in Mexico, as the first three recipients honored by the new Dante B. Fascell Inter-American Fellowship Program. One fellowship is awarded yearly to a distinguished leader, who will strive to disseminate successful approaches to grassroots development throughout the hemisphere. These three will share their expertise in ecodevelopment. Competition for the next Award will be held in 1993.

result has been not only a balanced treatment of the issues, but a clearer sense of what the stakes are when measured by people's lives. Both hopeful and realistic, this video will allow people who have been struggling in isolation to bring their message into homes, schools, and community centers throughout the hemisphere. ♦

CAROL ANN CRAIG is the IAF development education specialist.

TAKING CARE OF SIBO'S GIFTS: AN ENVIRONMENTAL TREATISE FROM COSTA RICA'S KEKOLDI INDIGENOUS RESERVE, by Paula Palmer, Juanita Sánchez, and Gloria Mayorga. San José, Costa Rica: Asociación de Desarrollo Integral de la Reserva Indígena Cocles/KéköLdi, 1991.

Sally W. Yudelman

Although Costa Rica is perceived as an environmentally conscious nation, successive governments have focused more strictly on the conservation of biological diversity than on the rational management of natural resources, ironically resulting in widespread ecological deterioration. Costa Rica has the highest rate of deforestation in Central America. Severe erosion, caused largely by the spread of cattle ranching during the last several decades, affects some 17 percent of the country. Rivers, lakes, and marine habitats are increasingly contaminated by agricultural runoff, industrial waste, and sewage, killing fish, shrimp, and turtles. Key aquifers are polluted by garbage dumps, and the indiscriminate use of pesticides menaces human health. Driven off their lands by the expansion of export agriculture, campesinos in the Talamanca region have invaded the Cocles/KéköLdi Indian reserve, destroying hundreds of acres of rain forest. Pressure on the reserve is increasing as large-scale agroindustry leaves more and more peasant farmers without land of their own.

Soon the world will celebrate the Encuentro de Dos Mundos, or the "Encounter of Two Worlds," commemorating the five-hundredth anniversary of the European discovery of the Americas. The underside of that encounter has been the devastation of indigenous tribal groups throughout both continents by conquest, disease, miscegenation,

assimilation, and a relentlessly continuous assault on native landholdings. Today, the remnants of indigenous culture in Costa Rica are seriously endangered, counting scarcely 25,000 individuals, less than 1 percent of the population.

In *Taking Care of Sibö's Gifts*, sociologist Paula Palmer, who has lived and worked for many years on the Talamanca coast, and Juanita Sánchez and Gloria Mayorga, members of the directive board of the Asociación de Desarrollo Integral de la Reserva Indígena Cocles/KéköLdi, tell us the other side of the story: what is happening to the people who live in the rapidly disappearing forests. This small jewel of a book takes us into one tiny corner of the surviving indigenous world to meet the BriBri and Cabécar peoples, showing us their myths, legends, and customs, how they live, what is happening to their culture, and what they are doing to save it. There are maps of the reserve, photographs of people and their activities, oral histories, and appendices that list the names and uses of forest products and medicinal plants.

The authors and other members of the community also explain what it means to be indigenous. "Born into the clan of our mothers, we speak our own languages and follow certain ancient customs. . . . We remember the history of our people, and we obey the laws that Sibö [God] gave our ancestors. . . . These laws prohibit the unnecessary destruction of our forests and the animals Sibö created. . . . We do not chop down the trees we use for thatch, blankets, or straps. . . . Only people who do not know their uses destroy them. . . . Sibö requires of us that we kill only what we need to eat and use all of the hunted animal, wasting nothing. . . ."

Most of the animals indigenous to the reserve—pacas, wild pigs, armadillos, monkeys, crocodiles, jag-



Illustration from *Taking Care of Sibö's Gifts*.

uars—are now gone, victims of hunters with dogs and headlamps who have ignored Sibö's laws about the use of natural resources.

During the 1970s, Costa Ricans concerned about protecting indigenous rights set up the Comisión Nacional de Asuntos Indígenas (CONAI). An executive decree in 1976 established a number of reserves, among them the Cocles/KéköLdi. As a result of faulty surveying by CONAI, nonindigenous campesinos were included within its boundaries. Since traditional Indian law prohibits the reduction of Indian reserve territories, the KéköLdi people want CONAI to buy the farmers out. Unfortunately CONAI cannot afford to do so.

This book is an effort to help raise the needed funds. Purchased properties will be incorporated into a single title with reserve land held collectively by the KéköLdi people. It is clear that until the boundary issues are settled and campesinos leave the reserve, conflicts between forest people and squatters and hunters will continue.

The Asociación de Desarrollo Integral de la Reserva Indígena Cocles/KéköLdi was formally constituted in 1987 to enforce tribal law throughout the reserve. The Asociación also has environmental, economic, and cultural objectives: to stop poaching of wildlife; to breed the green iguana (an endangered species) in semidomesticated circumstances in order to generate community in-

come; to protect the trees and plants needed for home construction, baskets, string bags, blankets, and medicines; to reforest; and to pass on traditional skills, language, and culture to the next generation through an indigenous education program.

At a recent conference on the sustainability of African agriculture held in Arusha, Tanzania, paleontologist Richard Leakey noted that, since life on Earth began, there have been five major episodes during which entire classes of species became extinct. With the current rapid loss of biodiversity and species, we are on the edge of the sixth. If humanity does not survive, he warned, it will happen despite the fact that we are the first species with the knowledge to prevent its own extinction.

Taking Care of Sibö's Gifts reminds us that a respectful relationship between man and nature is key to survival. The KéköLdi's efforts to save their world and their culture before it is too late merit not only our respect and support, but perhaps more important, our attention. In a sense, they speak for us all. ♦

SALLY W. YUDELMAN, a senior fellow at the International Center for Research on Women, has recently been working on a study of women, poverty, and the environment in Latin America.

The English edition of the book is available from *Cultural Survival*, 53-A Church St., Cambridge, Massachusetts 02138, (phone: 617-495-2562). First published in Spanish in 1988 as *Cuidando los Regalos de Dios* by the Vice Chancellor's Office for Social Action of the Universidad de Costa Rica, it will be republished in early 1992 in an expanded version by Editorial Universidad de Costa Rica. To request a copy write to either *Cultural Survival*, at the above address, or Asociación ANAI, Apartado 170-2070, Sabanilla Montes de Oca, Costa Rica. (phone: 246-090)

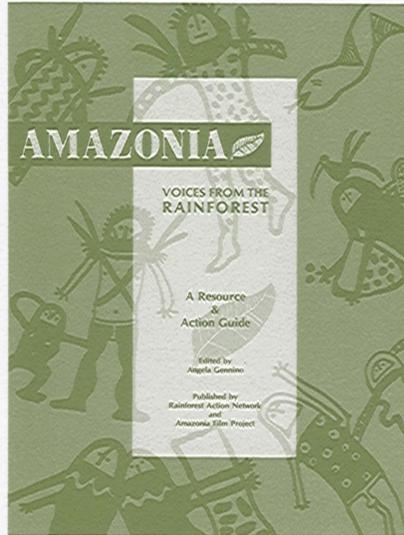
Resources

The editors of one resource featured in this issue of Grassroots Development speak of a "sea change in world affairs" that has swept environmental concern into the public spotlight. They attribute the sweep of that movement, in part, to worldwide coverage of events in the Amazon region, where over 10,000 square kilometers are torched monthly, and an Indian culture disappears each year.

Once viewed as a cornucopia of natural wealth for fueling national development in South America and supplying the industrial world with raw materials, the Amazon region is showing signs of exhaustion. The goals of some competing interests may be benign in themselves, but combined together and pursued to excess, they threaten to destroy a fragile resource base, much of which may vanish before mankind understands its potential value. Since the crisis affects not only the region but may also endanger the global climate, efforts are under way to adjust consumption and production patterns in the industrialized North and help the inhabitants of the Amazon region develop markets for sustainable methods of development that will improve their quality of life while protecting the forest for future generations. The following resources explore some of these path-breaking efforts.

A good place to start the search for solutions is with a copy of **Amazonia: Voices from the Rainforest**, an in-depth organizational guide prepared by the Rainforest Action Network.

Designed to help concerned people and groups pool resources and knowledge, this manual briefly describes the array of public and private forces threatening the Amazon region: the drive to extract petroleum, timber, and ores without factoring in long-term costs; clear-cutting land for cattle ranching; slash-and-burn agriculture by small



farmer colonists; coca farming; and the financing of large governmental infrastructural projects such as hydroelectric dams by multilateral development banks.

The volume then profiles over 250 organizations worldwide that are working to protect the Amazon ecosystem. Of particular interest are the country sections on indigenous organizations and the NGOs that support them.

Two such groups are the Federação das Organizações Indígenas do Rio Negro (FOIRN) and the Assessoria e Serviços a Projetos em Agricultura Alternativa (AS-PTA). FOIRN, a federation of Indian communities from the Rio Negro area of Brazil, is pushing to establish legal reserves that will protect their lands from indiscriminate outside development. AS-PTA, a support NGO, helps small farm communities exchange new techniques and ideas in sustainable agriculture and marketing.

Among the many other South American entries listed are organizations from Bolivia, Brazil, Colombia, Ecuador, Guyana, Peru, Surinam, and Venezuela. According to *Amazonia*, many of these groups are un-

aware of the widespread concern in the North over the plight of the rain forest and its inhabitants and would welcome concrete assistance.

Although the manual is currently available only in English, the Action Network expects to publish a Spanish edition by the end of 1991 and plans a Portuguese version for the future. To obtain a copy, contact the Rainforest Action Network, 301 Broadway—Suite A, San Francisco, California 94133. (phone: 415-398-4404)

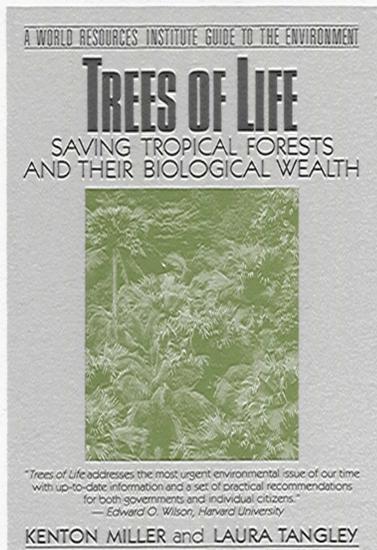
The next item comes from the World Resources Institute (WRI), which has created the WRI Guides to the Environment to help concerned readers navigate the maze of scientific and economic issues affecting the world's environment: from the greenhouse effect; to tropical deforestation and the accompanying loss of species; to energy and transportation alternatives; to the environmental implications of agricultural and industrial development; among others.

For its second guide, the institute has produced **Trees of Life** to highlight the increasing interdependency between the fates of rapidly vanishing tropical forests and the people who inhabit them, noting in the foreword that "when forests die, so do traditions and livelihoods."

Beginning with a broad historical and contemporary overview of the world's forests, *Trees* addresses in its final three chapters possible partners in a coalition to halt the destruction. "What Can Governments Do?,"

"The Forest's Volunteer Protectors," and "What Can You Do?" provide examples of ongoing conservation efforts and offer a range of suggestions for those who would like to help. The authors close by urging U.S. citizens—among the principal consumers of tropical hardwoods—to become informed and involved. This book shows them how.

Readers may request ordering



information from Beacon Press, 25 Beacon Street, Boston, Massachusetts 02108. (phone: 617-742-2110)

Conservation-oriented periodicals abound, and among the more useful is one from the Tropical Conservation and Development Program at the University of Florida.

Called simply the **TCD Newsletter**, its format includes an informative mix of research reports, fellowship announcements, descriptions of past and pending events related to conservation and development, new literature titles and book reviews, and other items.

Of particular interest to outside readers is the "Action" section which details important conservation efforts identified by program faculty and students.

For example, the newsletter recently noted that *Medicina Da Terra*, a Brazilian ecological organization that works with indigenous peoples to identify effective traditional medications and prevent deforestation, has just acquired 20,000 acres of virgin tropical rain forest in the state of Amazonas. This land, acquired with support from concerned U.S. contribu-

utors, will remain in its natural state.

To order a subscription to the *TCD Newsletter*, which publishes items in English, Spanish, and Portuguese, write to the Center for Latin American Studies, University of Florida, Gainesville, Florida 32611. (phone: 904-392-0375)

The International Rivers Network, an organization dedicated to preserving the world's natural waterways, publishes **World Rivers Review**, a bimonthly covering a broad spectrum of topics. A recent issue, for example, brought news of a national environmental coalition in Brazil; exposed the shortcomings of Brazil's Balbina Dam, which flooded 2,360 square kilometers of rain forest yet generates under half of planned output; and offered a sobering look at 12 problems that dam builders have been unable to solve.

Although the newsletter's focus is worldwide, much of its contents apply to Latin America. For subscription information and a publications list, including a special report on threats to Chile's Bio Bio River, often referred to as "the Colorado of South America," write to the International Rivers Network, *World Rivers Review*, 301 Broadway, Suite B, San Francisco, California 94133. (phone: 415-986-4694)

Another newsletter comes from the Arctic to Amazonia Alliance, formerly known as the New England Tropical Forest Project. The Alliance's quarterly newsletter, **Arctic to Amazonia Alliance Report**, will expand to 12 pages with the next issue, which will feature project profiles, a resources section, and articles on topical subjects, such as oil drilling in Ecuadorian forests.

The Arctic to Amazonia Alliance is a nonprofit educational organization devoted to grassroots contacts

between indigenous and nonindigenous peoples that promote environmentally conscious development. Its tapper-to-tapper project links maple sugar harvesters in Vermont with Brazilian *seringueiros*, or rubber tappers, to develop sustainable technologies that will help save the rain forest. The Alliance also supports the Kinikinau medicinal plant project to reclaim overgrazed Amazonian soil through an indigenous farming technique suitable for growing native medicinal plants, while simultaneously preserving traditional medical knowledge and promoting economic self-sufficiency.

To subscribe, write to the Arctic to Amazonia Alliance, P.O. Box 73, Stafford, Vermont 05072. (phone: 802-765-4337)

The final resource will be useful to those seeking to preserve the rain forest by protecting the people who live there and have a vested interest in promoting sustainable development. The Indian Law Resource Center in Washington, D.C., has produced a handbook on the mechanics of filing international human rights complaints. **Indian Rights, Human Rights** details applicable international law and identifies when and where complaints should be filed to be effective. According to the Center, this handbook is designed to help potential plaintiffs determine the appropriate response, recognizing that the most promising remedy is not always a formal complaint. Aside from its procedural material, the handbook offers an extensive bibliography of sources and lists 24 NGOs specializing in Indian rights.

The handbook may be ordered from the Indian Law Resource Center, 601 E Street S.E., Washington, D.C. 20003. (phone: 202-547-2800) ♦

—Lynda Edwards

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The Foundation has created four fellowship programs to support development practitioners and researchers from Latin America, the Caribbean, and the United States whose research and career interests concern development activities among the poor. Two of these programs support field research in Latin America and the Caribbean at the master's and doctoral levels; another brings Latin American and Caribbean scholars and practitioners to the United States for advanced training; a new program, the Dante B. Fascell Inter-American Fellowship, supports grassroots development dissemination activities of distinguished Latin American and Caribbean leaders.

Fellowship topics of primary interest are: 1) the nature of effective grassroots organizations among the poor; 2) the nature of effective intermediary or service organizations; and 3) systematic appraisals of local development activities such as studies of development programs and projects designed to reach the poorest populations, including small businesses in the informal sector, female-headed households, isolated indigenous populations, and artisanal fishermen.

Applications and inquiries should be directed to:

IAF Fellowship Program
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