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World Wildlife Fund

Third Year Report
on the
Matching Grant
for a

Program in Wildlands and Human Needs

awarded by the

United States Agency
for International Development

Grant No.: PDC-0268-G-SS-5092-00
Period Covered: Oct. 1, 1987 through Sept. 30, 1988

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WWF/AID WILDLANDS AND HUMAN NEEDS PROGRAM: THIRD YEAR PROGRESS REPORT

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WWF/AID WILDLANDS AND HUMAN NEEDS PROGRAM

THIRD YEAR PROGRESS REPORT

SUMMARY

The future of the earth's biological diversity is inextricably linked to improving the quality and security of life of rural populations: so they are not forced to deplete their resources to survive; to create the conditions necessary for populations to begin to stabilize; and to make it logical and prudent for them to invest in longer term sustainable exploitation strategies.

On September 30, 1985, the United States Agency for International Development (USAID) awarded the World Wildlife Fund US (WWF) its first matching grant. Grant funds provided WWF with the means to develop a new field program linking the preservation of biological resources with the needs of the rural poor. The underlying assumption of the program is that the biological resources of concern to conservationists are threatened by the inability of the rural poor to sustainably meet their development needs from these and adjacent lands. It is also a premise of the program that the destruction of natural resources will, in the longer term, worsen the plight of those who depend upon them. WWF has just completed a three year program in Latin America, the Caribbean, and Africa to develop model field projects which integrate the management of natural resources with grassroots development. Projects are also underway in Asia which are not formally part of the marching grant.

The program is focused on management of native forests and biological diversity, wildlife utilization, fisheries and watershed protection. The model projects seek to benefit local people through income generation, land titling, enhanced access to and improved management of wildland resources and a variety of small scale community development projects. In several instances, projects are undertaken in collaboration with development-oriented PVOs (private voluntary organizations).

The Wildlands and Human Needs Program is a central program within WWF directed by a Vice President responsbile for international development activities. Two WHNP Project Officers have joint appointments with geographic regional programs.

Upon completion of the inital three year grant program expenditures totaled $2,071,621 of which 83% was expensed directly in the field. Of this amount slighty over 50% of the funds were provided by WWF. A total of 19 projects received support, nine of which are considered model projects. Two projects have been completed and two others have been integrated into the regular WWF program.

I. BACKGROUND TO GRANT AND PROJECT CONTEXT

The World Wildlife Fund, an independent, nonprofit organization which, since 1961, has been active in international conservation of wildlife, natural habitats and natural resources, has become increasingly aware of this conservation/development link. Initially WWF focused primarily on individual species protection. This strategy was expanded to include habitat preservation and later entire ecosystems. With the initiation of the Wildlands and Human Needs Program (WHNP) in 1985, WWF expanded its extensive field level project experience in the developing world to include rural development issues.

The WWF network is one of the preeminent private organizations in the international conservation field, with a combined annual budget of more than $64 million. WWF-US itself has a budget of $19 million and professional program staff of 35 with degrees ranging from law to the biological sciences,. Nine staff members are former Peace Crops volunteers. WWF has a broad range of programs in areas such as wildlands and wildlife conservation management, environmental education and training, scientific research, and development of resource management policy. The bulk of the WWF professional staff is organized into three regional teams: Latin American, Asia and Africa, but there are also theme programs including science, species (primates and plants program), Traffic (which deals with international trade in species), public policy and NGO development (to assist development of third world non-governmental organizations). WWF-US has 26 years of experience in developing and supporting field projects, initially in Latin America and the Caribbean but with an Africa program beginning in 1983 and Asia beginning in 1985. In the past year WWF supported 264 projects in 51 countries.

This program represents one of the first joint ventures between a development oriented agency and a nature conservation group, which focuses specifically on the integration of these two fields. This grant provides financial support for long term model field projects as well as more experimental initiatives. In addition, these funds allowed WWF to institutionalize its development oriented activities and establish a separate program with its own project criteria and staff.

During the first three years of the program, WWF developed close ties to the US PVO development community through an Advisory Committee. The committee meets twice a year and includes representatives of CODEL, Catholic Relief Services, Save the Children Federation, Pan American Development Foundation, International Institute for Environment and Development (now the Center for International Development and Environment), Office of Private and Voluntary Cooperation of AID, Christian Children's Fund, CARE, International Center for Research on Women, InterAmerican Foundation, Cultural Survival, The Organization of American States and Africare.

Natural ecosystems throughout the planet are facing ever increasing pressure from human development. Depletion of the natural resource base will also reduce development options for the millions of rural people who depend upon wildland resources. The shear numbers of people dependent upon the resource base is the major threat. WWF has approached the population issue indirectly in the recognition that increasing the quality of life of rural populations (their health and that of their children, increased opportunities for women and assurance of resource ownership) is perhaps the most fundamental precondition to the population stabilization necessary to relieve pressure on the environment.

Many biologically important wildlands in the developing world have survived as a result of their distance from centers of national economic activity. But also as a result of this distance, the rural communities in or adjacent to such areas often represent society's destitute, left behind in the overall development thrust of government programs. The growth in numbers and the fundamental needs of these people are commonly perceived as a major threat to the long-term viability of wildland areas. In contrast, the premise of the matching grant is that only through a focus on these populations will we find the key to long term sustainable management of wildlands and preservation of biological diversity.

The basic challenge for the Wildlands and Human Needs Program is to design projects which maintain the ability of natural systems to produce an array of goods and services for human benefits without depleting their natural values. Many of the biologically diverse project sites face severe limitations on their capacity to sustain greatly increased or more sophisticated levels of exploitation. These areas lack immediate potential for more intensive development due to their soil classification, topography, or natural characteristics. These are often the only areas available for the rural poor and their further deterioration will increase poverty. On such marginal areas management of land in its relatively natural state may offer the best option for extraction of a sustainable flow of goods and services for meeting local human needs.

The Wildlands and Human Needs Program begins with the identification of a critical biological resource, such as the extensive tropical forest of the Pacaya-Samiria National Reserve in Peru or the wildlife riches of Zambia. It is at the frontier where man presses against these unique natural resources that some of the poorest of the poor tenaciously cling to a marginal existence. The isolation of these rural populations makes their access to government resources limited. They rarely have the political power or economic tools to attain assistance or gain rights to the limited available resources. Lacking such power, in many of the project sites without external funding it is unlikely that local villages could improve their situation. Providing "extension service" to assist such communities is one benefit which may be provided by the Wildlands and Human Needs Program. It is also in these areas where one finds indigenous people, such as the Awa of Ecuador, whose cultural as well as physical survival is inextricably linked to the maintenance of natural wildlands. The characteristic shared by these groups is their direct utilization of wildland resources for food, building materials, medicine, recreation and other utilitarian uses.

A goal of the wildland projects is to provide a sustainable, secure source of resource, be it water, fish or firewood, that might otherwise be jeopardized by existing practices, in Malawi and Costa Rica for example, the projects provide communities access or rights to resources from which they would be excluded by a traditional protected area approach. It would be difficult for natural agencies such as parks services, charged with protection of natural resources to introduce modified, multiple use approaches without the moral and programmatic endorsement of an external organization such as WWF. Community groups in the Central African Republic directly rely on the natural ecosystem as hunter-gatherers and in Dominica and Zambia are organized into forestry cooperatives and wildlife utilization programs; some are fishermen dependent upon mangroves to provide nurseries for their fisheries, others are farmers forced on to ever steeper slopes and dependent upon the forests above to prevent erosion and landslides.

The Wildlands and Human Needs Program does not seek to identify a single solution to the problems of poverty and biological destruction. Most of the rural poor, who this program seeks to benefit, practice multiple approaches in meeting their needs. Interaction with the local community to identify impediments to development is the essential first step of each project if it is to address specific local needs. The WWF strategy seeks to increase local flexibility and receptivity to change by spreading, or ourselves absorbing, exposure to risk. In many rural communities, wildland resources provide one element in a diverse approach to subsistence. Wildland resources also provide fundamental survival insurance...a free, naturally occurring, inflation proof, source-of-last-resort for the poor when other resources fail. The Wildland program seeks to strengthen diversity-oriented survival strategies and wherever possible to encourage additional enterprises which improve the overall quality of life in rural communities.

In seeking to address specific needs identified as part of the project, rather than assuming in advance that credit or employment or land title are the locally desired benefit, makes the Wildlands and Human Needs Program rather innovative, perhaps even revolutionary, for a conservation organization. While identifying discretely different needs between projects, we have been slower, unfortunately, to recognize the potential differing needs between members of the communities themselves. As a result, we have not determined whether specific gender concerns require project attention. A high priority for the next year is to correct this deficiency with a more through analysis of the communities with whom we are working.

II. PROJECT METHODOLOGY

Project Strategy

The strategy of attaining conservation through development recognizes that responsibility for conservation lies primarily with government, whereas use of natural resources rests largely on private initiative. The two often are not inherently incompatible but often fail to occur harmoniously for lack of communication, conflicting goals, wrong incentives and other reasons. In recent years in many developing countries, especially in Latin America, governments have become more aware of their shortcomings in achieving sound natural resource management at the local level. At the same time these governments acknowledge how important and urgent sound resource use has become. Simultaneously, public interest in conservation has increased.

This evolving political and social reality has provided a favorable context within which integrated conservation and development projects can be initiated. In order to provide some structure for the program the World Wildlife Fund established criteria for selecting project sites for inclusion in the Program and has applied these criteria to choose sites in Latin America and Africa. Most of the sites exhibit the following characteristics:

- an area of high biological significance, often but not always, with an officially declared protected area (the Dominica forestry project, Awa reserve of Ecuador and Mt. Oku in Cameroon being exceptions);

- a peripheral zone that buffers the biologically important area;

- people living in the protected area or the peripheral zone who use natural resources from the biologically significant area;

- in Latin America, the Caribbean and Asia projects generally include a local NGO whose principal interest is conservation of the protected area and who believe that sound development of its natural resources by and for the people who use it will help conserve the protected area;

- with the exceptions noted above, government involvement in protection and management of the area.

The strategy of attaining conservation through development assumes several characteristics of the site and of the population of resource users:

- the site has high conservation value; it contains species or habitat of high scientific or social interest at the international level or of special interest locally;

- the site is subject to strong development pressure; current resource use is near, or even beyond, capacity or probably will be so in the near future;

- in many instances outside interests threaten to usurp resources from local people (be they campasinos threatening native people or government supported forestry programs competing with village users in Dominica);

- the site exhibits some degree of development opportunity; it has under-utilized resources, resource use could improve or benefits from existing use can be redistributed;

- data exist or can be obtained to determine the resource capacity and development capacity of the site;

- the local population engages in diverse economic activities; use of several resources, as opposed to dependence on a single resource, provides flexibility, spreads risk and increases receptivity to change;

- local people have secure rights to natural resources or, where rights are lacking, a major project goal is to secure such rights to enable people to make long-term investments in conservation because they feel secure in the likelihood that they will realize the benefits of the investments;

- a limiting factor prevents people from increasing or improving resource use; removal of the limiting factor will promote development, hence conservation. The limiting factor can be technical, political, legal or institutional;

- appropriate technology or institutional or social innovation can overcome the limiting factor; the technology meets peoples needs and is within their means. Usually it will build on existing practices and skills and uses local materials;

- o local populations can make decisions and carry them out; they can assess their needs accurately and choose means to satisfy them that rely primarily on existing community resources.

With the exception of Africa, WWF has generally focused on local NGOs as its principal nexus to each site. In the African project WWF leadership still provides external expert working as advisers to WWF or to a government agency. WWF offers financial support, training, technical assistance, administrative and managerial expertise and, not least, the international stature and reputation of the World Wildlife Fund. WWF seeks to build a partnership with each local NGO or government agency that strengthens it and makes it more self-sustaining. Most of the project leaders have a "learning by doing" philosophy and, therefore, informal, on-site training predominates over formal training although a workshop scheduled for November 1988 will begin to formalize program training and numerous project personnel have attended training courses with program support. WWF maintains close contact with project staff by correspondence, field visits by its staff and consultants and by inviting field personnel to Washington.

Development at each site consists of using resources from the priority area or the peripheral area by the local people in ways that provide adequate income or other benefits while maintaining the quality of the resources. To catalyze development requires close interaction with local people to determine what stands between them and higher or more sustainable yields; i.e. identifying limiting factors to development. The next step applies a solution that eliminates or resolves the limiting factor. Sometimes the solution is technical, and often entails action in the political and social areas as well. Once a solution is in place, it must be sustained. This means people must be convinced that it works and must be able to apply it or gain access to it themselves or by way of institutions they trust and participate in. Hence the significance of appropriate technology, training, and institution building in the success of the projects.

The resource being used may be the principle object of conservation concern such as the wildlife in Zambia, or more commonly, be secondary resources as seen in the fisheries and aquaculture projects of St. Lucia. In a few instances, notably with land title in Gandoca in Costa Rica and the Awa in Ecuador and health care at the Dzanga-Sangha in the Central African Republic, the benefits provided are ancillary to the biological resources obtained directly from the priority site. Whether provision of legal rights and health care, and the resulting dialogue with local communities, will impact on actual resource utilization remains to be proven.

The ultimate goal of the World Wildlife Fund, conservation of the protected area, rests on support and collaboration of the local people. It also requires effective management by local and governmental institutions. When resource users and institutional interest groups act on the belief that conservation furthers their interests, conservation will result. Periodic inventories of resources will be needed to show whether conservation is actually occurring at project sites. Baseline data is important and its gathering, or analysis where data exists, has taken a secondary role to action oriented projects during the last several years. Strengthening baseline data is a priority for the next phase of the program.

Modifications

The original 1985 project proposal established four major activities to achieve the program goal "to improve the management of critical wildland areas to assure that they can be used sustainably, in support of human progress and to preserve ecological values."

> " -- identify specific areas where resource needs, adjacent communities and institutions provide high potential to establish success models or pilot wildlands projects involving local resource users;
>
> " -- undertake field research, development and experimentation with sustainable resource management techniques for specific wildlands but which will be applicable to a wide range of wildland areas and their associated human communities:
>
> " -- from among the experimental projects develop demonstration areas which exemplify appropriate management techniques and will be utilized as training sites; and,
>
> " -- implement training (through workshops, seminars and development of materials) and local education projects to invoke participation by communities associated with wildlands and to disseminate information on the concepts and technologies developed."

Considering the rather revolutionary change this program represented in WWF's conservation orientation, there has been surprisingly little variance from the original goals or activities. Within the WHNP itself the change has been primarily one of nuance. The original program viewed local communities as "beneficiaries" or objects to whom the program provided goods, educated or "invoked participation." From a more knowledgeable vantage point of the third program year, the original activities have a subtlety paternalistic "doing things for people." The program now seeks to reverse this tendency by learning from and working with local communities. This is turn has required modifying expectations of how quickly projects can be started and where the initiative must reside. It has also lead us to begin, albeit belatedly, to address issues of gender in projects.

A second variation from the original methodology was an orientation toward establishing categories or typologies of projects for purposes of comparison. Three types of wildlands were targeted:

"(1) wildland areas where a major management objective involves sustainable/rational use of natural resources particularly as they relate to people living within an area.

"(2) wildland areas where forestry or other resource development projects can be undertaken, sustainably, in buffer zones surrounding the designated unit, without causing damage to the central area; these buffer zones could be managed wildlands or other areas.

"(3) wildland areas that protect key resources for the benefit of people in adjacent areas or downstream, such as nursery areas which sustain fisheries outside the area, or key watershed protection areas for hydro-electric, potable water or irrigation projects."

In fact, several projects are underway in each of these types of circumstances but the program is no longer seeking a generalized blueprint applicable to these characteristics. Rather the program has found that preconceived categories can cause one to over look apparently minor, but occasionally critical, differences in each project site or community circumstance. The revised objective is a conceptual framework or broad guidelines for rural conservation and development field projects.

III. MONITORING AND EVALUATION

The Wildlands and Human Needs Program started three years ago, and actual funding to its Latin American projects arrived in the field shortly thereafter. In the case of Africa, projects are generally a year and a half old. The Program approach, although often talked about, has been seldom experienced in the field; this approach is new not only to the WWF, but to the project implementors themselves and to the institutional context with in which they occur. It required WWF to gain practical field experience and a track record before seriously evaluating results; however, it also made it important that experimental approaches be better recorded, monitored and evaluated.

These facts impacted the mid term evaluation of the program conducted in August 1987. That evaluation focused on trends and patterns rather than the projects' physical outputs. These project level trends provide insights into the way the program was working and identified the principal needs that must be taken care of in order to facilitate program development in the future.

Baseline Data, Targets and Indicators

The mid-term evaluation was concerned with the lack of a strategy to promote, record and channel the projects' learning on the specific strategies being tried at each site. In order to derive generalizations, concepts, and policy guidelines in the Program's area of concern, additional effort was called for to improve communication channels with the Program, and cross-fertilization opportunities between projects. The formal Wildlands training program and provision of technical journals this year in part addresses this concern. The extraordinary amount of public information and case studies (discussed under long-term project implications) reflects substantial progress during the last twelve months.

The WHNP dissemination program has as a variety of targets, including: policy makers and program designers; between the Program and the projects; among the projects; and the general public. The goals of the dissemination program are threefold: to emphasize the importance of linking the preservation of biological resources with the needs of the rural poor within the environment and development community; to focus attention on the issues of resource depletion and degradation, and to share the ideas, lessons, and perspectives among, and from, the field projects.

The dissemination program is focusing on a variety of methods to provide information to these diverse audiences. At the present time, there are several avenues which are already being utilized to improve the information concerning the projects.

Communication between WHNP staff, within WWF and field project staff and the projects themselves will be improved through several facets. The Spanish WHNP newsletter will communicate specific results and actions. This information will be useful to augment linkages among the projects. Direct information exchange, especially within the Latin American programs, will result from the November meeting in Colombia. Discussions have begun with the authors of Two Ears of Corn, a classic on PVO field projects, to participate in a workshop for WWF project officers and program directors on practical linkages between conservation and development.

Policymakers and the general public will be better informed about conservation and development projects through a series of 6 case studies being prepared on the WHNP program and field projects. These case studies are currently being prepared by a former newspaper correspondent with expertise in Latin American development issues. The purpose of the studies is to describe the threats to natural resource use or biodiversity that prompted the establishment of the projects. They also provide information about the specific projects, their objectives, and their accomplishment.

Policymakers and program directors will be able to learn from a formal analysis of the critical factors in the success of the WHNP conservation and development projects. This analysis will be prepared as part of a joint WWF/CF Policy Paper series. Case studies in this series will draw on examples of WHNP to provide an on-the-ground perspective that will influence institutional program development and the implementation of conservation and development projects. In addition, the conceptual framework will provide a vehicle for substantive discussion between the WHNP program staff and the PVO community.

In 1988 the WHNP has already had considerable impact on thinking at the World Bank leading to proposals to establish a "Biological Diversity Project Preparation Facility". It is proposed that the facility would use the WHNP as pilot projects to initiate larger scale Bank appraisals. The proposed facility might include a permanent staff of 28-30 in addition to consultants and with an operating budget of 10-20 million over 10 years and project funding over the same time period of $4-8 billion. It remains uncertain whether such a facility will in fact be established; indeed, it is uncertain whether funding at that scale is even desirable or possible without damaging the very characteristics which seem to point toward field level success. Nevertheless, the existence of the discussion within the World Bank indicates the growing impact on policy makers of what began as a very modest AID funded experiment.

In addition to the World Bank, and as described in "Development Education", WHNP supported projects are gaining the attention of the local, national and international conservation and development communities. There is no doubt that even though most of the projects are yet to be fully consolidated, they are already serving as models and are at least encouraging others to take a similar approach. WWF has noticed that in the last five years there has been a marked shift in the proposals we receive from primarily projects with a strong preservation orientation to projects with a more integrated approach. This has been, at least to some degree, influenced by the WHNP projects and the materials and publicity related to this program.

The Wildlands and Human Needs Program has scored some of its greatest accomplishments in its impact on institutions. Through the implementation of the field projects, new local institutions are being built, and existing organizations are being

strengthened or reoriented. While the needs that justify the projects' existence had been evident before, the Program has acted as a catalyst, facilitating or initiating action toward the solution of identified problems.

WWF funding has not only permitted innovative activities to take place outside normal budget and programmatic priorities, but has triggered the commitment of local support to the projects. While the value of external funding tends to be a common feature in most overseas projects, it has particular importance in this case because of the kind of activities that the Program covers. Most other funding sources -- external and local -- tend to either cover the "development" field (production, credit, infrastructure, etc.) or the "conservation" field (protected areas' management, species and habitat preservation, etc.). The Wildlands and Human Needs Program in contrast, has been willing to accept proposals that entail activities in both fields. By opening up to those innovative proposals, the Program has filled a great gap in development and conservation funding, and has become an important source of support for non-traditional projects.

On the other hand, the dependability of the Program in terms of continued funding is also crucially important to all field projects because of the long maturation period that most project activities entail. In response to concerns expressed in the mid term evaluation, WWF has revised its policy on annual project renewal to lessen uncertainty and the work load in the field. A number of field projects include within their design potential sources of future funds to cover recurring costs.

Benchmarks

No benchmark is of greater significance than the commitment of the communities affected by or participating in the program. Local reception is directly related to its choice of tackling issues and problems that are perceived by those communities as being vitally important for their survival or well being. Each project housed under the Program has started by addressing some problem seen as an obstacle to rational resource management; one that coincides with the communities' perception of it as a critical need. Thus the acceptance of the Gandoca project, because it is trying to solve a land titling problem; or the St. Lucia project that tries to facilitate commercialization of the fishermen's catch, or create new income sources through its sea moss growing project and through its alternative charcoal producing plantations. The same is true for the other projects where new agricultural, forestry opportunities, wildlife utilization or employment opportunities are being sought to compensate the communities for their loss of access to reserve resources. Most of these problems would have existed even if conservation of these resources had not been attempted, and often constitute typical community development problems. By attempting their solution or amelioration, the projects are making a contribution to improving the quality of life of local peoples in very specific ways. In return, the latter tend to be willing to collaborate with the projects' efforts in resource management. To the extent that these projects manage to put certain resources at the communities' reach, and foster local, regulated administration of those, the projects will receive strong and sustained support from the communities.

The Program is committed to facilitating community participation in resource management, but during its initial two years most projects fall short from truly practicing it. Later projects, particularly in Africa and Asia, have increased

participation even in the design phase of the projects and in actual implementation decisions. In Latin American and the Caribbean when direct resource utilization is being fostered, the resources increasingly are the ones protected by the reserve, showing increased confidence in the communities' ability to comply with a conservation and rational management role within the reserved area.

The Program has not established new technological benchmarks but rather has focused on the solution of basic community problems (like land tenure, agricultural productivity, etc.). Thus the program is paving the way for old solutions to work effectively to solve identified problems (land surveying, credit provision, pest control, etc). Nevertheless, projects that involve direct community responsibility for resources management (such as St. Lucia, Gandoca or Mt. Oku) need viable alternatives to traditional resource use patterns which may require some technological innovation.

Just as new technology is not a universal benchmark, protected area management is not necessarily central, and in some cases is only collateral, to the project's main resource management focus. Projects with a strong protected area component include Pacaya-Samiria in Peru, Sian Ka'an and Sierra de Manantlan, both in Mexico, Cuyabeno in Ecuador and Dzanga-Sangha in CAR. In the other projects the protected areas' management component holds a less prominent position. The Gandoca-Manzanillo Wildlife Reserve in Costa Rica may become a special use zone under private ownership, while at Mt. Oku the reserve may be managed by the community. The St. Lucia project focuses on coastal resource management and utilization in the buffer zone around the Maria Islands, with less attention to administration of the Maria Islands Reserve itself. The Zambia wildlife utilization is based on multiple use of the country's Game Management Areas rather than its system of traditional national parks. The Awa project in Ecuador may never involve a protected area in the formal sense. As a result, park management indicators are not really appropriate to the WHNP and other bench marks will have to be devised.

An important benchmark is the ability of the project to strengthen or secure legal rights over resources for local communities. Many of the Latin American projects face an important legal restraint, as a result of restriction under national legislation of resource utilization by local communities inside protected areas. For example, the Pacaya-Samiria project is encountering this obstacle in its effort to promote alternative productive activities, particularly agriculture, within the reserve via credit, as no credit is given without legal land title. It is clear that national legislation has not evolved yet in the direction of empowering local communities as rational resource managers; such legislation continues to conceive the areas' protection as a function of its isolation from human intervention. This must become a program objective in Latin America in the future and is discussed under recommendations. On this benchmark geographic differences have emerged. By working outside protected areas in St. Lucia and Dominica the legal constraints have been bypassed while in Africa the projects in Cameroon, Central African Republic and Zambia specifically focus on protected areas where local resource use can legally be permitted. In Lake Malawi overcoming these restrictions, through rezoning the national park, was the major program accomplishment.

1988 Evaluation

In order to evaluate progress over the initial three years of the project, actual results have been assessed and compared with the original Logical Framework (in bold types below).

Original Logical Framework
(as revised 1/21/85)

1. Program Goal: **Sustainable management of natural resources in wildland areas.**

   Measures: **improved management practices and institutional capacity so wildlands retain biological values while contributing to human needs and progress.**

   The basic measures remain valid however our experience over the last three years would lead toward more complex indicators - particularly the role of participation and sustainability (ecological, social, financial). This reflects a growing awareness that establishment of a process is as important as specific results at a particular moment in time.

   Verification:

   - **adoption of management practices, program concepts and policy reformation in specific pilot field projects;**
     All model projects have adopted new or modified approaches to resource management and to conservation; however, these must continue to evolve and be modified over the next several years if an innovative process is to be firmly established.

   - Means: **consultants/experts evaluation workshop at end of year 3;**
     The external evaluation was conducted at the end of year 2 and an evaluation of African projects is expected next year. The ecodevelopment workshop scheduled for Nov 1988 will include evaluation of the programs by a dozen Latin field directors.

   - Assumptions: **benefits from wildlands can be made relevant to local populations within meaningful time period.**
     Permanent benefits from conservation of wildlands have not yet been established in the communities in which we operate. However, short term benefits have been delivered and a new, interactive decision process established to provide the basis to sustain the projects until these longer term benefits can be realized.

2. Project Purposes:

   - **research techniques for community based approach to integrate management of wildlands into rural development;**
     In practice during its first three years the WHNP has not approached integrated management from a research perspective. The program did not establish hypothesis which could then be tested, rather action oriented field projects engaged in conservation and rural development were identified or

created. A major objective for the second phase of the WHNP is to draw lessons from the practical field experience but we no longer view the WHNP as a "resource" exercise.

- **develop and implement 6 management plans testing techniques of community benefit and biological maintenance;**

  Eight management plans have been developed in Latin America focused on community links to biological conservation. One management plan (Mt. Oku/Kilum Mt, Cameroon) is half completed.

- **strengthen institutional capacity (governmental and private) to manage wildlands for biological, economic and social goals;**

  A workshop/training approach has bee used in Latin America to prepare plans thereby strengthening institutional understanding and capacity in multiple use approaches to conservation. In addition individual project personnel have been trained from virtually every project through programs at CATIE, and USFWS short courses and considerable capital equipment has increased institutional effectiveness. In the CAR 10 scouts have been recruited, trained and now work in the reserves and in Zambia over 80 village scouts as well as 15 GMA Unit leaders have been trained.

- **heightened awareness of government authorities of the relationship between managed wildlands and human needs;**

  The WHNP has provided an important link between often remote field projects or relatively obscure government agencies and NGOS and government officials and policy makers. In Mexico, the President of Mexico has visited the Mantalan Reserve and the Governor of Quintano Roo is very familiar with Sain Ka'an. The Costa Rica President knows the Gandoca project which has been visited by the Minister of Natural Resources. The Vice President of Guatemala opened a WHNP supported meeting on conservation and sustainable development. The Ministry of Foreign Affairs in Ecuador is the lead agency in discussion of a binational biosphere reserve based on the Awa project. The Minstry of Agriculture supports the Kilum/Oku Mt. effort in Cameroon and the President of CAR has been actively involved with the establishment of the multiple use reserves. We have met twice with the President of Zambia and his ministers to discuss the ADMADE program.

- **improved exchange of information between professionals concerned with wildland and development issues;**

  The three most important initiatives have been the establishment of the WHNP advisory committee with its PVO representation, a series of south-south exchanges between project staff and specific joint projects between WWF and several different PVOs. WWF headquarters has also become an active participant with the development community through InterAction, International Development Conference and Overseas Development Council.

- **strengthen and educate local community and resource users to benefits available from wildlands.**

  Our experience in the field and with our PVO colleagues has caused a considerable reorientation of the program away from the implicit "we" educate "them" about benefits, many of which local groups know very well. Rather we have become more interactive with local communities mutually identifying constraints (legal or technical) to increasing local benefits and seeking to overcome those constraints. Indicative of the reverse flow of education has been the renaming of the Mt. Oku project in Cameroon to Kilum Mt. as a result of local discussions revealing that WWF's original name implied project control by one group or resource users over another.

E.O.P. Conditions:

- **a group of self sustaining wildland areas, at least one operating as a training site, applying techniques of community involvement and providing community benefits;**
  By the end of the third year the WHNP involved 18 ongoing projects three of which serve as training sites (Awa/La Planada in Ecuador/Colombia for Central and South America, S.E. Coast, St. Lucia for the Caribbean and Lupande, Zambia -- to date just for the ADMADE program but in the futher possibly for the SADACC region). It would be premature to claim any project has reached self-sustaining although most have strong local leadership and growing institutional strength.
- **an informal network of professionals concerned with human focused wildlands**
  The network of professionals is growing although it remais informal. The Spanish WHNP newsletter will be an important vehicle as well as the Wildlands newsletter produced in Zambia. South-south exchanges are becoming common place and other conservation organizations, notably Conservation International, have refocused their programs toward people-centered conservation.

Verification

- **annual review of program;**
  Annual review of the WHNP has occured although the second year was quite late and the third year somewhat so. The reports have been reviewed by AID and the WHNP Advisory Committee.
- **periodic in depth audits of individual wildland projects;**
  In August 1987, the five most mature projects received field evaluations. In addition four wildland projects (2 in Latin America and 2 in Africa) will receive more informal case study write ups for the WWF letter.
- **roster of wildland/human needs professionals**
  We have not found it worthwhile to establishg a roster of wildland/human needs professionals. To date that community is sufficiently small and area specific that it has not seemed necessary to move beyond our informal network.

Assumptions:

- **Relative political stability in countries where pilot projects are undertaken;**
  The operative word must be "relative" for while none of the countries of operation have been subject to major political upheavals, a number suffer from serious financial problems, most notably Peru and Mexico. In addition for a brief period at appeared Zambia would come under the Brook Amendment. To date the projects have not been compromised by these national level difficulties.

- **successful implementation also requires cooperation and commitment of government agencies and NGO's in countries concerned and by regional organizations (esp. CATIE and ECNAMP) to collaborate with the projects and training.**
  Government Agency and NGO collaboration with the WHNP has been extremely good in most instances. In the case of CAR and Zambia government support is the heart of the program while in Latin American it is primarily NGOs. However, in the latter case, most particularly in Mexico, friction has developed between the implementing NGO and the government which feels it has been left out. This is an important issue to address in the future. With the exception of Ecnamp in the Caribbean as an implementing agent and CATIE training programs, regional organizations have not been as important as originall envisioned.

3. <u>Outputs</u>:

- **potential model field projects identified, by category and geographic area, demonstrating human needs approach to wildland management;**
  As articulated this output would result from the project purpose to "research techniques..." and represents a more academic orientation. Model projects have indeed been identified but not to fit within a predetermined "typology". As this output has evolved we are beginning to analyze successful projects in order to develop general lessons and a conceptual framework which will be an output of the second phase of the program.
- **specific human needs-oriented management plans for wildland areas completed;**
  8 management plans completed and a ninth almost finished.
- **pilot and demonstration wildlands to transfer techniques established;**
  All WHNP projects hope to become bases for the transfer of techniques but as of 1988 three are formally functioning in this role: Lupande, Zambia; Awa/La Planada, Ecuador/Colombia; and S.E. Coast, St. Lucia.
- **regional training program initiated to strengthen professional and institutional capacity to sustainably manage wildlands;**
  Considerable training has taken place or been supported through the WHNP. We have been a major supporter and have thus encouraged inclusion of the development orientation into 4 regional workshops, 2 model seminars of CATIE, the FWS wildland refuge mangement seminar; individual projects have been used for practical south-south training (Awa Ecuador field staff to the Kuna project, Panama; La Planada, Colombia staff to Sian Ka'an, Mexico; Pacaya Samiria, Peru staff to Mexican reserves; Cuyabeno staff to Costa Rica; and Honduras conservationists to the Mexico wildlands projects). The Unviersity of the West Indies, Barbados Natural Resource program has been launched but at this stage could only be considered partially successful. A SADACC regional training program using Zambia and Zimbabwe experience is under discussion.
- **on-going community programs involved in wildland management strengthened.**
  On-going community programs have been stregthened at all 18 project sites, indeed several would not even exist but for the WHNP. However, as we look to the second phase of the program special emphasis will be given to actual community lead or co-management activities. The most active community role

to date is found in the most mature projects (S.E. Coast, St. Lucia and Gandoca, Costa Rica) although Kilum Mt., Cameroon has considerable potential.

Magnitude:

- **report summarizing potential wildland and human needs projects for Central America, South America, Caribbean and 3-4 countries in Africa;**
  Annual reports summarize status of WHNP projcts supported. Once the conceptual framework is completed it might be possible to identify projects undertaken by other organizations which fit within the framework.
- **6 management plans developed over the three year program;**
  8 plans have been completed most using a training workshop format.
- **2 demonstration sites with operating programs including on-going training;**
  The Awa/La Planada and S.E. Coast projects are demonstation efforts with on-going regional training; Lupande, Zambia has national level training underway. The Gandoca project presents strong demonstration/training potential but has not been developed for that purpose.
- **1 field based workshop or seminar in year 3;**
  The field based workshop occured 3 1/2 years into the program, six months later than hoped.
- **5 professionals trained annually;**
  See training summary discussed above under "outputs".
- **community programs underway around 6 priority areas;**
  Community programs are underway in and around virtually all WHNP. The exceptions are the Awa and Cuyabeno projects where activity has focused on community resource management of indigenous groups within the reserves and has not yet addressed the needs of campinsios outside the reserve areas. In addition, the Dominica forestry project has only now organizationally reached the stage of initiating community level activity.
- **publication of management plans or case study material on 4 pilot projects;**
  4 case studies have been completed for the S.E. Coast, St. Lucia and Gandoca, Costa Rica and are in draft form for Kilum Mt, Cameroon and ADMADE, Zambia. Management plas have been published as noted above.
- **regional and Africa-Latin American exchange of experience through informal professional interchange.**
  Inter-regional exchanges have been active within Central and South America but have not occured between the Caribbean projects. Exchanges between the African projects or Africa and the Western Hemisphere have not occured. The differences between these various projects have lead us to conclude that considerable thought would be required to justify the costs of such exchanges. Alternatively sharing of experience between WHNP projects and nearby or substantively similar PVO projects might be more productive and will be considered under phase two of the program.

Verification:

- o specific materials (report, inventory, management plans, training materials) by their existence and peer review;
  Verification of project outputs has been through annual project reports as well as produced materials, such as management plans. Project reports are reviewed by WWF senior management and reigonal professional staff in addition to the WHNP staff. The increased public exposure of the projects will also result in outside evaluation of whether these projects truly are examples of sustainable development.
- o projects through site visits based upon baseline data.
  Projects are all subject to at least annual site visits by WHNP staff and often by other conservation/development professionals (Gandoca, for example, by InterAmerican Foundation; the Awa by Cutural Survival). A program weakness remains that this verification of outputs is judged against goals and objectives in the original proposals rather than specific baseline data. The need to organize data, where it exists, and gather it, where it does not, is an important need for the next project phase.

Assumptions: availability of inputs.

4. Inputs:

- o funds to support specific field projects, management plans and training;
  Funds needed for the projects, both from USAID and WWF have been available as needed except as noted below.
- o WWF staff to develop and manage program and projects;
  WWF staff to develop and manage the projects has been available but is less than optimal. Headquarters staff has not been sufficient to provide prompt reporting nor of the expertise to meet the social science needs of the biologically trained project staff. This additional more intensive staff input (not anticipated when the original proposal was submitted) cannot be made available except at the expense of on-going projects.
- o technical assistance of WWF including
  - research capacity
  - management plan development
  - educational development

  WWF has not provided technical assistance to projects in the form of reseach but we have activily participated in management plan development. The WWF education program is much smaller than it was when the original proposal was approved as we have come to believe that environmental education is best addressed through local institutions, especially NGOs, which are culturally appropriate and able to maintain on-going involvement in a cost efficient manner. Thus educational technical assistance has been provided using local institutions rather than by WWF.
- o cooperative institutional infrastructure:
  - IUCN relationship
    The WWF link with IUCN has proven to be of no relevance to the Wildlands and Human Needs Program.
  - other WWF national organizations
    The link with other WWF national organizations has provided a source of funds for several projects and recent discussions with

WWF-UK concerning their ODA supported Korup project in Cameroon provide an opportunity for collaboration on actual project implementation.

- **working relationship with other PVO's through past grants**
  Links with development oriented PVO's is not based upon past grants but have become an element in several joint projects.
- **existing cooperative relationship with countries and indigenous organizations in target countries**
  WWF on going relationships with indigenous NGOs has been extremely important in Latin America where in many cases they serve as actual project implementors. In Africa where NGOs are relatively weak and where historically WWF-US worked in East Africa. New and valuable linkages now exist with governments, with ICBP (International Council for Bird Preservation) in Cameroon and with the Peace Corps in CAR, Sierra Leone, Malawi and Honduras.

o **cooperative network with regional conservation/resource organizations - i.e. CATIE and ECNAMP.**
Regional conservation organizations have played useful roles in several projects (Ecnamp as implementor of the St. Lucia projects and CATIE as a trainer for the management workshop in Pacaya Samiria) but were far less central than was anticipated at the time the original proposal was prepared.

<u>Implementation target</u>: **$2 million of 2.5 of program funds to be spent on in-country involvement.**
The original implementation target sought to transfer 80% of the financial resources to the field. In fact $1,660,000 of $2,010,000 expended, or 83%, of program expenses were expended directly on projects in the Third World. As noted above under staff inputs, this strong institutional commitment to see the maximum funds get to the field may have been to some extent at the expense of other non-monetary support WWF might have provided.

<u>Verification</u>: Quarterly progress reports.
Quarterly financial reports have been provided indicating compliance with implementation targets.

<u>Assumptions</u>:

o **at least stable financial position at WWF (i.e. not premised on continued growth at level of last five year);**
We did not assume the continued strong financial growth of WWF was essential to meet the financial targets. In fact the unprecedented 30% annual growth rate has continued over the last three years).

o **maintenance of existing or equivalent WWF staff capability.**
The initial staff involved a director serving half time and a full time deputy director. During 1988 the program staff was a director 50%, deputy director/Latin America 70%, Caribbean project officer 20% and Africa project office 50%. In the second phase of the program an administrative assistant will be added together with a social scientist 30%.

Monitoring and Evaluation Plans

One of the major emphases of the program in the coming year will be to consolidate the planning, monitoring, and evaluation process. Two types of activities will be promoted during 1989: improving the learning process and the dissemination of information. Learning activities are those activities which help the projects themselves, as well as the program, improve the quality of current and proposed conservation and development activities. Information dissemination will emphasize improving the flow of information between the headquarters office and the projects and among the projects themselves where we have been quite active in 1988. We are continuing to expand the external communication of information and lessons learned about the WHNP to a wider audience detailed under "development education."

The mid-term evaluation report raised several issues related to improving the quality of monitoring and evaluation activities at the project level. However many in the development community feel such activities require training of individuals to oversee these functions at the project level. They go hand-in-hand with institutional strengthening. The additional activities to be implemented in the next year are described below.

Within the program, one of the overall objectives will be to develop a manual which provides a conceptual framework or guidelines for the program. In short, it will explain the philosophy underlying the program, and provide practical information and examples on ways of implementing WHNP. It will identify the critical components of different types of WHNP projects, including ways to establish monitoring and evaluation systems. Finally, it will explain the reporting requirements under the WHNP and provide examples.

Planning activities within WHNP will be supported in a variety of ways including the meeting of the Latin American WHNP project managers in November. At this meeting, discussion of planning activities to be undertaken within each project, requests for support from WHNP staff, and coordination of activities for similar projects will be part of the workshop. WHNP staff will work closely with staff of new projects to assure that monitoring and evaluation systems are initiated from the outset.

Monitoring of projects by field staff themselves will be strongly promoted. At the November meeting, WHNP staff will work with the field staff to help them identify what indicators will be most useful for them to monitor. Many of the Latin American projects for example, collected extensive baseline data on the project sites. However, they do not have well developed monitoring systems which allow them to collect information which can then feedback into a planning process. WHNP staff particularly using the additional social science capability over the next year will support this activity through regular site visits, the development of guidelines, and specific communication with the projects on these topics. WHNP Director attended a one week training workshop on Rapid Rural Appraisal which, with appropriate modifications, has considerable potential as a monitoring tool.

Evaluation has already provided important insights in strengthening both the WHNP as well as individual field projects. This emphasis will continue, and be augmented in the coming years. Within the project, as more projects reach a level of "maturity" where they can reasonably be evaluated, we will conduct several evaluations to extract lessons about what can be improved. However, it is important to stress that these evaluations will be done as part of an ongoing system, rather than in isolation. Therefore, we will

assist field staff in conducting their own evaluations, within a training type format. This will strengthen the institutions and field projects, provide input from the local community, and increase the feedback to the WHNP in order to improve the program and respond directly to needs identified by the program.

One of the issues that the WWF headquarters staff will address is the appropriate way to include gender issues within the projects. Special attention will be given to the status of women and their participation in the field projects using advice form the ad hoc subcommittee of the WHNP advisory committee. Improved information on the activities of women at the present time will be collected during 1989. Furthermore, new projects which are developed in the future will specifically address this concern at the time the project is initiated.

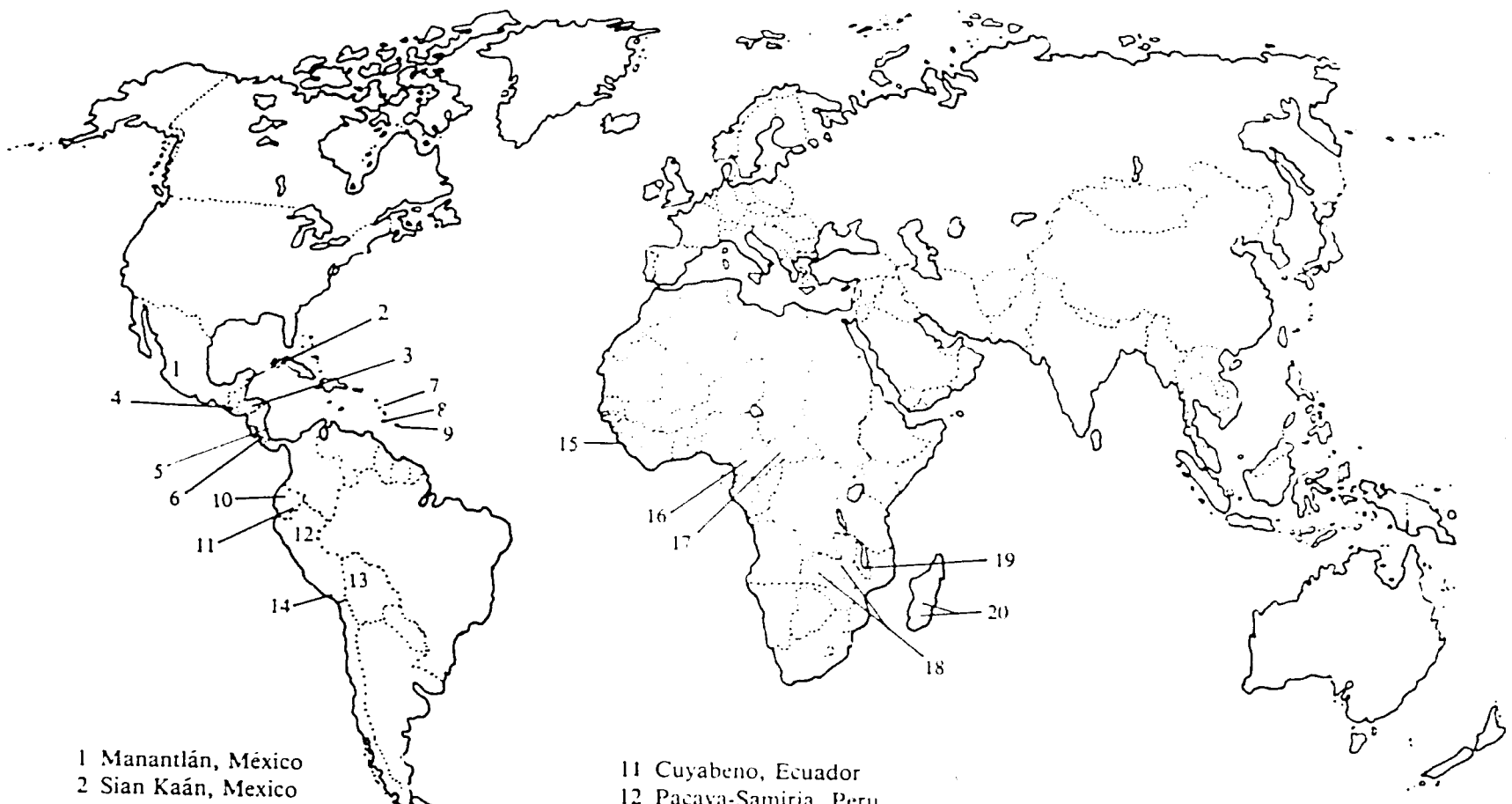
IV. REVIEW AND ANALYSIS OF PROJECT RESULTS--BY COUNTRY

Introduction

In its third year the program gained full momentum. During the first three years of the matching grant program, a total of 19 projects were initiated with grant funds. At this time 9 model projects are operational, one more than the original program target (additional biological diversity funds were put into the program for program activity in Madagascar. With the completion of that funding mechanism this probably should not be considered a model project over the next five year period). The number of projects supported under the matching grant has stabilized, in part due to concerns of US AID that Program staff not become overextended. Several projects in secondary countries have become part of the regular WWF conservation program or have been completed. However, the overall Wildlands and Human Needs Program of WWF (including those projects not covered by the AID matching grant) continues to grow making additional demands on project staff's time.

The WHNP Advisory Committee has met as a group only once this year and individual members provide advice on an ongoing basis. The Committee has been extremely helpful in broadening WWF's perspective on rural development issues and needs, the operation of development organizations and key topics such as community participation and project evaluation. Joint projects are underway with three advisory committee organizations, WWF and Cultural Survival, WWF and Africare and WWF and CARE, and more informal cooperation is becoming commonplace for example, provision of a trainer for the Wildlands and Human Needs workshop by Save the Children, Colombia.

WWF/AID
WILDLANDS AND HUMAN NEEDS PROJECT SITES
1987—1988



1 Manantlán, México
2 Sian Kaán, Mexico
3 R.o Plâtano, Honduras
4 Monterrico, Guatemala
5 Gandoca, Costa Rica
6 Cabecar Indians, Costa Rica*
7 Dominica Forestry, Dominica
8 Southeast Coast, St. Lucia
9 University of the West Indies, Barbados*
10 Awá Ethnic Reserve, Ecuador
11 Cuyabeno, Ecuador
12 Pacaya-Samiria, Peru
13 Beni, Bolivia
14 Lake Titicaca, Peru
15 Outamba-Kilimi, Sierra Leone*
16 Mt. Kilum, Cameroon
17 Dzanga-Sangha Forest, Central African Republic
18 ADMADE, Zambia
19 Lake Malawi, Malawi*
20 Beza Mahafaly & Andohahela, Madagascar

* Completed

WHNP Projects Supported During Third Project Year

LATIN AMERICA AND THE CARIBBEAN

Introduction

In Latin America there is impressive local expertise in wildland planning and management due to over ten years of national and international emphasis and support for technical training activities. In addition, an extensive communications network exists between conservationist and conservation organizations and WWF is closely tied into this system. In Central America, for example, a regional network of NGO conservation group's has been established. In addition, there have been no less than four regional Central American conservation meetings in just the last two years. In Latin American there is also a great deal of support for this pragmatic, development oriented, approach to conservation and this topic was at the forefront of discussions at all of the above mentioned meetings. Latin Americans have been for many years, at least verbally promoting the integration of wildland protection with development providing a base of support for the program. In 1987 a regional conservation action strategy was produced by representatives from each of the Central American nations and this document stresses the need for integrating conservation of wildlands with rural development needs. The Caribbean Conservation Association, which coordinates much of the wildland protection activities in the Caribbean, has also fully endorsed this integrated resource management strategy. And, in South American, nearly every wildland management plan which has been developed in the last few years includes the promotion of sustainable development as a primary management objective.

However, as technically competent and committed as the Latin American conservationists are, they have little experience in the development aspects of this integrated approach to linking conservation with development. Most of the problems that have arisen in this program deal with the human needs aspects of the projects. Community relations and organization, extension and education have all caused some project setbacks. As noted previously many of Latin America's protected areas legally prohibit local resource use and national governmental agencies are often reluctant, even when not legally prohibited, to actually transfer decision making and control to local resource users. Finally, in many cases, the techniques for appropriate development practices in fragile ecosystems such as tropical rain forests, have yet to be perfected, further inhibiting the progress of the projects.

But efforts to resolve all of the above problems have been initiated. The WHNP evaluation which was carried out with AID financial support in 1987, provided both the headquarters management and the field projects with considerable insight on the strengths and weaknesses of the program. Five field projects were looked at in detail and an analysis was made of the headquarters operation. As a result of this evaluation and in recognition of the above mentioned shortcomings of the program, several new initiatives have been launched to address there issues. At the headquarters level, a regional WHNP newsletter has been put together in order to improve interproject communication and dissemination of information on integrated development topics. With the assistance of the WHNP Advisory Committee, a workshop on rural development philosophy and techniques will be carried out in November of 1989. In addition, at the field level, all of the project managers have been encouraged to put greater emphasis on the rural development aspects of their activities and, in fact, they have responded

enthusiastically to this request. And, several of the field project staff have gained valuable first hand experience in rural development that is rapidly changing their perspective on conservation techniques.

The WHNP in Latin America continued to evolve in its third year of development. Two new secondary projects were added to the program; the Monterrico Biotope Reserve in Guatemala and the Beni Biosphere Reserve in Bolivia. Another secondary project, the Graduate Program in Environmental Studies in Barbados was completed.

PROJECT SITES

MEXICO

Sierra de Manantlan Biosphere Reserve

This reserve covers an area of approximately 100,000 hectares in southwestern Mexico, in the states of Jalisco and Colima. The area is of international importance because its cloud forest harbors probably the single most important genetic resource and agricultural discovery of this century: the primitive, diploid perennial species of wild corn, Zea diploperennis, found in 1978. In addition, an extraordinary mixture of neotropical and nearctic fauna and flora are found in the area because of its geographic position. Of equal importance is the fact that the area protects the best 20,000 hectares of the 70,000 hectares of montane cloud forest which remain in Mexico. This ecosystem formerly covered 1.5 million hectares, but most has been destroyed by logging operations and slash and burn agriculture. With 1,500 inhabitants, mostly indigenous peoples living in ejidos and communal lands around the periphery of the reserve, it presents an excellent opportunity to create a model of integrated natural resources protection, conservation and wise resource use, fully involving local populations as primary beneficiaries. These rural populations regularly harvest resources from the reserve, including firewood, timber for construction and wildlife.

In the first half of 1986, a training workshop on protected area planning and management was held for 35 participants from the University of Guadalajara and other institutions involved in the reserve's management. A two-year operational plan for the Biosphere Reserve and the 1,250-hectare ecological reserve within it have been completed. The long-range plan has now been written and much of the operational plan is now implemented. Scientific investigations are being carried out on a variety of topics with emphasis on studies needed to identify appropriate land use practices within and adjacent to the reserve. Education and extension programs with local inhabitants are aiming at improving their quality of life while reducing negative impacts on the resources of the area. The reserve ecodevelopment unit has established programs in several of the regional ejidos. These programs include activities such as aquaculture and agricultural and cattle raising techniques, as well as health and education projects. Many of the ejidos have voluntarily assisted the reserve in fighting forest fires which continue to cause serious problems during the dry season.

The WHNP financially supported the development of this operational plan and provided technical assistance during the planning exercise, and a WWF consultant continues to provide assistance. There are now over 50 staff members working at the reserve, and the President of Mexico recently attended the inauguration of the site. The management strategy which is currently being implemented has several different

components including: ethnoecology, environmental education, ecodevelopment, forestry, soils and watersheds, flora, fauna, cartography and photointerpretation, information and data processing, publicity, public relations, field station management and administration. In late 1988, the reserve will sponsor an international conference on the status of research on Zea diploperennis.

Work on all of these facets have been carried out to varying degrees with substantial progress reported on several fronts. The environmental education program in particular has received a great deal of support as has basic research which will be needed to more fully develop the ecodevelopment projects. A major threat to the reserve, however, has been the continued and increasing incidence of fire in the reserve during the dry season. Not only does this affect natural resources, but it also consumes valuable time, energy and monetary funds. The WHNP has been assisting the project in identifying fire management training opportunities.

The Sierra de Manantlan project was one of five WHNP field projects to receive outside evaluation in Aug./Sept 1987. One of the major problems which could one day prose a major threat to the viability of this project, has been the absence of solid lines of communication between the project managers and the Mexican government agency charged with wildland management (SEDUE). In fact, at this time, there is little communication between the reserve managers and SEDUE. The reasons for this rift are varied and complicated, but not uncommon in Mexico. Reserve managers are aware of the need to improve their relations with government, but thus far have been unsuccessful in achieving success. It is hoped that the planned meeting on Zea diploperennis, will provide an opportunity to develop cooperative agreements with this important government agency.

Sian Ka'an Biosphere Reserve

The Sian Ka'an Biosphere Reserve in the Mexican State of Quintana Roo is a biologically important region of international significance. The 1.2 million acre reserve protects a complicated hydrologic system composed of marshes, mangroves, lagoons, marine and reef environments, as well as tropical forests. Mayan archeological sites are scattered throughout the area, and most of these have yet to be investigated. There are several small fishing villages in the coastal sector of the reserve with a total population of over a 1,000 people and a growing number of Mayan subsistence farmers are settling on the reserve borders. The reserve is managed by a unique consortium of governmental and non-governmental entities.

The reserve managers are focusing their efforts on protecting wildland resources while facilitating sustainable development for those living in and adjacent to the reserve. A management plan has been written and ecodevelopment activities have been initiated. Several that are supported by WWF include a lobster management program which has been actively endorsed by the fishermen, a sustainable horticulture project which seeks to stabilize migrating agriculturalists, a palm study that is developing a sustainable harvesting program for several valuable palm species, and experiments on environmentally sound cattle raising techniques being conducted near the reserve. This project is using improved pasture, irrigation and fertilizers to increase forage production. This forage project, as well as the palm study and the lobster project, have produced extension materials which are being distributed to local residents. In late 1988, a full-time extensionist will be hired with WWF support and will be charged with the transfer of

technologies developed in the reserve to the surrounding communities. The fishermen and farmers that have participated in these pilot projects are quite supportive of the program. In addition to these projects, a nature tourism plan was designed in 1987 which includes the development of a tourism circuit and interpretive trails and facilities. This tourism plan has not been fully implemented for several reasons, but will still play a role in raising funds for the various conservation projects. A non-governmental conservation group called "Amigos de Sian Ka'an" has been established and is cooperating with the government in the production of interpretive materials for the reserve. A new research project which is currently in the implementation stage, will quantify the wildlife resource harvesting practices of the local Mayan Indians in order to better manage important game species for their sustainable use. It appears that work done at Sian Ka'an is planting the seed for the development of a conservation strategy for the entire state of Quintana Roo.

The WHNP has supported all of the above-mentioned programs and is assisting Amigos with their institution building efforts. Also planned is an education and extension program in the buffer zone of the reserve. With WHNP funding, work has been initiated on this plan. While there is little active resistance to the project, there are still many individuals living adjacent to the area that do not understand its purpose or special status. Amigos is currently managing much of the budget of the reserve. It has become well-established and, in addition to managing all of the WHNP projects, has also developed an operational plan for the reserve and has published a variety of educational materials. Their extensive involvement in what is essentially a government project has caused some problems with SEDUE, the federal wildland managing agency although efforts are being taken to improve these relationships and expand WHNP direct support to Mexican government agencies involved in the reserve. The governmental/ non-governmental conflicts, during a period of nearly two years, threatened the status of this project, are becoming somewhat common in several countries in Latin America. These issues can be resolved through careful negotiations, and the WHNP is working with Amigos and other regional NGO's to insure that these interagency problems are avoided.

GUATEMALA

Management and Administration of the Monterrico Biotope

The Monterrico Biotope Reserve is located in one of the most biologically diverse coastal Pacific areas in Guatemala. The 4,000 hectare site encompasses species rich wetlands and mangroves, as well as sandy beaches that are annually visited by nesting sea turtles and over 30,000 Guatemalan tourists. Approximately 2,000 people live within the borders of the reserve, and another 1,000 live close by and, along with the reserve residents, regularly harvest fish and seafood, waterfowl and other wildlife, mangrove and turtle eggs from the reserve. In many cases this harvesting has led to serious depletions of these potentially renewable resources.

The biotope is managed by the Conservation Center of the University of San Carlos (CECON), which manages a system of protected wildlands made up of eight different units scattered throughout the country. CECON has worked in the Monterrico area for several years, although a shortage of funding and personnel has impeded the progress of the project.

The 1988 grant should accelerate the development of the project and during this year basic resource collection has been nearly completed and work is proceeding on the development of the management plan for the site. This plan will include ecodevelopment projects with the local communities and already plans are being put into place for the construction of iguana raising facilities (for food), and a joint program with the local schools has helped to improve protection of the nesting sea turtles. An education and extension program is being developed and will soon be implemented with the support of WWF. Several training workshops for reserve staff from Monterrico and other Guatemalan wildlands have also been recently carried out with the support of WWF. One of these training events focused on community relations, extension and education programs. CECON staff have participated in workshops on the captive raising of wildlife as a food source and this knowledge will be transferred to reserve inhabitants via CECON's education and extension program.

HONDURAS

The Rio Platano Biosphere Reserve

The 300,000 hectare Rio Platano Reserve in the Caribbean watershed of Honduras protects varied tropical habitats, ranging from cloud forest to lowland rainforest, pine savannah, coastal lagoons and mangroves. Several hundred Miskito Indians and some Paya Indians inhabit the core zone of the reserve and regularly harvest fish and wildlife to supplement their diet of corn, beans, rice, yucca, platano and other fruits and vegetables. Many archeological sites are also found in the reserve and include intriguing petroglyphs carved into large boulders along the Platano river. Nearly seven thousand campesinos live in the buffer zone of the area and in addition to clearing land for crops also cut firewood and hunt and fish. Logging companies are also active in the buffer zone.

This unique combination of natural and cultural features has convinced UNESCO to declare the Platano a "World Heritage Site." However, in recent years, the reserve has been beleaguered by a variety of resource threatening activities. These include the invasion of reserve lands by the above mentioned agricultural colonists in the buffer zone and the upper watershed, the illegal commercial harvesting of timber products by Honduran commercial logging companies, gold mining and the settlement of several hundred Nicaraguan Miskito Indian refugees within the borders of the unit.

The site is managed by the Honduran Department of Renewable Resources (RENARE) and the Honduran Ecological Association (a non-governmental conservation group) as a Man and the Biosphere (MAB) Biosphere Reserve. A management plan with a strong rural development component was written in 1979 and parts of it have been implemented. Resource inventories and anthropological studies have been carried out and a visitor center and guard stations constructed.

In 1987, WIINP supported the elaboration of an operational plan which assessed management problems and identified needed protection and ecodevelopment activities in the buffer and cultural zones of the reserve. The plan was developed using a workshop format led by a WWF consultant with the active participation of over a dozen governmental and non-governmental agencies, the reserve inhabitants and resource users. Over 30 individuals participated in this inter-institutional workshop, which included three

weeks in and near the reserve assessing the status of the project and drawing up an emergency operational plan.

The situation in the buffer zone is critical with extensive deforestation and inappropriate land use practices. Many of these colonists are moving to the site from other ecologically degraded lands in southwestern Honduras. The emergency strategy which was developed calls for extensive inter-institutional cooperation and a variety of emergency actions ranging from increased forest management and protection to agricultural extension. The WHNP supported continued implementation of this plan, which features environmental education and extension and viable economic alternatives to destructive land use practices that are currently threatening the reserve. A field office has been established near the reserve buffer zone in Dulce Nombre de Culmi and this team is initiating field activities, especially extension and education programs, as well as data collection. In addition, Miskito Indians from the interior of the reserve have visited the threatened buffer zone area in an effort to more closely involve them in the management and protection of the reserve. With support from the WHNP, the field project manager participated in a wildland management workshop in Mexico and visited several Mexican reserves. WWF technical advisors visited the site several times, and during their most recent visit in July 1988, they assisted the field team in identifying priority activities. In addition, WWF is helping the Honduran Ecological Association to secure additional project funding from other sources, including the local AID Mission.

Of all of the Latin American WHNP, the Rio Platano Reserve is perhaps the most problematic. The extent and severity of the threats to the resources of the reserve are far greater than most of the other projects, but, unfortunately a portent of things to come for many Latin American wildlands. For this reason the WHNP has continued to support the project although the level of support which we can provide falls far short of the resources needed to appropriately manage this multifaceted effort. It is hoped that the considerable attention and media coverage which the Platano has received will catalyze other potential donors to become involved through technical and financial assistance. In addition, it is important that integrated conservation methods be developed that can function under a crisis situation, in anticipation of similar situations which very likely will be occurring throughout the region in the very near future.

COSTA RICA

Gandoca Land Titling and Wildlife Refuge

Located on the southeast coast of Costa Rica near the Panamanian border, the Gandoca project area encompasses a wild strip of Caribbean beach, lowland primary rainforest, and an important wetland area. Until recently, this region was isolated from the rest of the country. Two coastal communities make up the bulk of the human settlement with a total population of around 2,000 people. One of these villages is made up primarily of small farmers and ranchers of Hispanic origin, the other is principally "Carib" fishermen and cacao farmers. Both of these settlements have existed for decades. Indian communities which inhabit inland villages are being brought into the project this year. Road building in the region, however, has resulted in a dramatic influx of subsistence farmers and commercial logging operations from outside the region and this has caused tremendous impacts on the social stability of the aforementioned communities. Forest cutting has accelerated both to clear land for crops and cattle and to demonstrate ownership of untitled land (according to Costa Rican law, land not titled must be

"improved" to show ownership, this usually means "deforested"). Hunting pressure on wildlife has also increased with a marked reduction of several wildlife species.

The New Alchemy Institute (ANAI), a private Costa Rican non-profit association, has initiated an integrated land use project which will test the premise that land titling of small farming plots will retard deforestation rates. (A description of ANAI's ecodevelopment approach is contained in a recent article from Grassroots Development found in Attachment E.) Their project focuses on securing land titles for the long-term residents of the area. In addition, they have initiated several ecodevelopment projects, including the establishment of 23 cooperatively managed tree nurseries for agroforestry. They also carry out agroforestry extension work to insure that these diversified tree crops are successfully established and sustainably managed and they are assisting in the marketing of these products. Other potential ecodevelopment activities include aquaculture, wildlife harvesting programs, ecotourism and they are studying the feasibility of sustainable harvest of tropical reef fish for the pet trade. A national wildlife refuge has been declared within the project area as a direct result of the Land Titling Program and other ANAI efforts, and this is jointly managed by ANAI and the government of Costa Rica. The management strategy for this refuge will permit some utilization of plants and animals on a controlled basis.

The WHNP has provided financial assistance for the land titling programs and technical training for the manager of the wildlife refuge and for other project staff. In addition, during the first year of the program WWF supported the development of the management plan for the wildlife refuge carried out by several wildland management students of the Tropical Agricultural Research and Training Center (CATIE). In 1987 WHNP activities supported additional sustainable development projects such as the initiation of an iguana propagation project and plans are in the works for a nature tourism program. The titling process continues and several of the titles should soon be issued. The titling has proven to be a long, arduous process although it now does appear that many of the titles are really to be issued. New projects for 1988-89 include an education and extension program, increasing opportunities for women to become involved in project activities, and initiating an evaluation of the exact impact of land titling on deforestation rates and levels of environmental awareness. Deforestation continues within the reserve, although at a slower rate than before project implementation. In 1988 the congressional "diputado" from the region introduced a bill into Costa Rican Congress which, if passed would have removed protective status for the wildlife refuge. This was an attempt by those landowners who would financially benefit from logging and cattle to remove restriction on the development of the region. The resolution was not approved in Congress, and the incident could serve as a catalyst for broader understanding and support of the project. Some recently arrived colonists are actively resisting the titling process and have caused serious problems for reserve managers, but extension and education programs are helping to resolve these problems.

Land Use of the Cabecar Indians of La Amistad Biosphere Reserve (Completed)

The Cabecar Indians, one of Costa Rica's few remaining groups of indigenous peoples, inhabit the heavily forested Talamanca mountains that make up an important component of the La Amistad Biosphere Reserve in south-central Costa Rica. The La Amistad reserve encompasses an array of ecosystems ranging from isolated "paramo" above 4,000 meters to lowland rain forest. The reserve includes a mosaic of national parks, forests and Indian Reservations that are cooperatively managed by several

different agencies.

The Wildlands Unit of the Tropical Agricultural Research and Training Center (CATIE) assisted the Costa Rican National Park Service in the development of a management plan for the reserve. This plan includes an inventory of the cultural and natural resources of the reserve including anthropological studies of the indigenous peoples inhabiting the area.

Funds from the WHNP supported the work of an anthropologist studying the land and resource utilization practices of several hundred Cabecar Indians: this included identification of the role that Cabecar Indian women play in resource utilization. This information was incorporated into the management plan of the reserve which is oriented towards both protection and sustainable utilization of resources by native peoples. Management programs are being developed to insure that the Cabecar can continue their traditional lifestyles with minimal impact on fragile resources.

ECUADOR

Cuyabeno Wildlife Production Reserve

Cuyabeno is one of nine wildland areas designated for immediate attention by the Ecuadoran Department of National Parks. This Amazonian reserve covers an area of 254,760 hectares of humid tropical forest and swamp forest and harbors significant populations of manatees, fresh water dolphins, tapirs, caimans, giant armadillos, several of the spotted cats and other species listed as rare or endangered. In addition, the reserve surrounds a legally recognized tribal reserve of several hundred Siona-Secoya Indians. A multitude of serious threats to the reserve, such as oil exploration, the advancing agricultural "front," made up of thousands of colonists, african oil palm plantations, a recently arrived group of "non-resident" Indians and illegal hunting threaten the integrity of the unit.

A wildland planning consultant, sponsored by WWF, has worked with park officials in the development of emergency measures for addressing these issues. The long-term goal of the project is to protect both the natural and cultural resources of the region while providing a sustainable harvest of wildland resources for the utilization of the surrounding population. In addition, nature tourism is a growing economic activity in the reserve and Siona-Secoya Indians have become actively involved in guiding these visitors through the area.

The WHNP supported the Ministry of Agriculture in the development of an operational plan which addresses these resource management issues. In 1987, a comprehensive management plan was completed in a workshop setting which details all of the proposed management activities. The planning team was assisted by a WWF supported consultant. The reserve was surveyed and these issues were discussed with key individuals and organizations affecting the reserve. The plan will be used to initiate short-term and long-range protection and development activities. Extension and education activities are being promoted in the buffer zone and negotiations with petroleum companies have resulted in their support for some of these activities. An ambitious program for the captive propagation of wildlife such as capybara and deer for human consumption is also being developed. The director of this reserve participated (through WHNP support) in a three week mobile seminar on wildland management

facilitated by CATIE in Central America. In addition, the Amazon region parks coordinator attended a workshop on wildlife refuge management in Mexico, also through wildland program support.

Because of the absence of the reserve director, and the lack of transport, this project progressed little during the third year of the program. However, a new proposal for the project was just approved and, the AID Mission in Ecuador has also contributed funding for the operation of the reserve. Our funding and the AID mission funds should provide sufficient financial resources to initiate many of the activities proposed in the management plan. These activities can be roughly categorized into the following programs: education, protection, research, administration, public use and ecodevelopment.

Awa Ethnic Forest Reserve

The Awa Indians of Ecuador occupy a largely forested, mountainous tract of land in northwestern Ecuador, bordering Colombia. In fact, their traditional lands actually straddle both countries (approximately 100,000 hectares in Ecuador, 400,000 in Colombia). The Awa are scattered in small settlements throughout this region, farming small agricultural plots in the forest and extensively utilizing fish and wildlife as a primary source of protein. Medicinal plants are also widely used and trees and other floral species are harvested for building and construction materials.

Cultural Survival, which is represented on the WHNP Advisory Committee, has supported community development projects and land titling activities in this region for several years. Through contact with this organization, WWF became involved in the project. In an effort to protect the Awa nation, their wildland territory and their future development options, steps were initiated to establish an Awa Ethnic Forest Reserve.

With the support and technical assistance of the WHNP, a reserve management planning team has been organized which is made up of a multidisciplinary group of resource planners, anthropologists, biologists, community development specialists and representatives of the Awa peoples, the government of Ecuador, and also CONAIE, an Ecuadorian Indigenous Confederation.

The team leader participated in a wildland management training seminar and the project consultant presented a paper on the effort at the General Assembly of the International Union for the Conservation of Nature held in Costa Rica. The planners are now in the field gathering data which will form the basis for subsequent resource management programs. WWF has supplied a wildland planning specialist who helped to facilitate a two week wildland planning course for project participants. This workshop better prepared field personnel for the difficult task of planning resource management and ecodevelopment activities for a large, isolated area. La Planada, another WWF supported wildland management project in Colombia, which borders on the Awa territory has served as another source of technical support for the project and as a staging area for workshops and meetings between the Awa of Ecuador, and those in Colombia. The WHNP field advisor, through based in Ecuador, has also been active in Colombia in an attempt to initiate a similar effort with the Awa on that side of the border. A long-range goal of the project is the establishment of a binational biosphere reserve established for and managed by the indigenous residents of the area. Field work has now been initiated in Colombia and there basic natural and cultural resource data is being collected which will later be used in the development of the Colombian sector of

the management plan. In addition to data collection and resource planning, this project has been instrumental in helping the Awa to organize at the community and national level. This has resulted in the initiation of health and education programs in nearly every Awa village, and has begun the process of "cultural recuperation."

PERU

Pacaya-Samiria National Reserve

Pacaya-Samiria National Reserve in the northern Amazon of Peru, an area of 2,080,000 hectares (the size of the state of New Jersey), is one of the largest conservation units in Latin America. Encompassing vast expanses of lowland forest, serpentine rivers and oxbow lakes, the area is one of the few Amazonian reserves whose objectives permit the rational use of its renewable resources. Nearly 40,000 individuals in several dozen small communities surround the reserve and regularly harvest fish, wildlife, trees, and plants from the area. Wildland resources form the basis of their subsistence development. In addition, these same products are commercially harvested for markets in Iquitos and other large cities. Pacaya-Samiria was established originally as a fisheries reserve in 1940, but was never actually managed until the recent creation of COREPASA, an interagency task force which was formed to develop and implement an operational plan.

With funds and technical assistance from WWF, a planning team composed of 25 individuals from 12 different agencies developed a comprehensive reserve management plan in 1986 in a workshop setting. The plan includes an inventory of the natural and cultural resources of the reserve as well as the detailed management activities needed for their appropriate conservation and protection. The plan is oriented toward meeting the natural resource-based development needs of the people living adjacent to the reserve while protecting fragile ecosystems. This document has been widely distributed and has been used as a model for planners at other wildland sites.

The plan is ambitious and calls for a variety of well coordinated conservation actions related to reserve protection, reserve management, investigations, environmental education and sustainable rural development projects. Because the reserve is so vast and isolated, management and vigilance requires large amounts of equipment and numerous staff. The WHNP has committed support for the implementation of this plan and is funding a variety of ecodevelopment activities ranging from biological studies related to wildlife species of economic value to education and extension programs in the surrounding regions. In addition, we have sponsored the participation of the reserve staff in international conferences on wildland management. The published management plan is also being widely distributed.

In 1987 and 1988, detailed one-year operational plans were developed to help identify day to day reserve management. This plan also includes a "self-evaluation" of the previous year's effort (this was in addition to the AID funded evaluation of this project during 1987). With the support of the WHNP, a mobile "aquatic" seminar was carried out. Nearly 40 reserve staff, local school teachers and development workers and two WWF consultants traveled throughout the reserve by boat to learn more about the site, its environmental resources and problems and needed actions. This workshop also resulted in the development of a detailed education and extension plan for the region surrounding the reserve. WHNP funding also supported general management, protection

and research at the site as well as the construction of a large cargo boat to help provide needed supplies to reserve staff neighboring communities. Two investigation administrative centers were also built in the reserve. Several reserve staff, through WHNP support, also participated in national and international conferences and workshops.

The third year of WWF assistance supported numerous projects, activities and material purchases but placed special emphasis on the education and extension programs. Detailed plans for these activities were completed with the assistance of two WWF supported consultants and are now in the implementation phase. Work with surrounding communities has also increased and extensive programs are being designed and initiated. A major hindrance to the full development of this project has been the problems of transportation and logistics. The area is very large, and isolated, and this has proven to be a formidable obstacle for providing the supplies and manpower needed for full and timely project implementation. The construction of a large transport boat, with the financial assistance of WWF, should help to alleviate at least some of these problems.

Lake Titicaca National Reserve

The Lake Titicaca National Reserve, which is managed by the Forestry Institute of Peru (INFOR) encompasses nearly 35,000 hectares of wetlands and fresh water aquatic ecosystems in Lake Titicaca near the town of Puno. The reserve is divided into two units that both include extensive reed marshes that not only harbor large numbers of waterfowl but also serve as a source of building material, food, forage, fuel, and myriad other utilitarian uses for the Uros Indians that occupy nearly 40 floating islands (also made of reeds) that are within the reserve borders. The lake is heavily fished and hunted by these reserve residents, and by many of the nearly half a million people that live around Titicaca and regularly utilize this valuable resource. More than 40,000 tourists a year visit the reserve and this has provided a fairly steady source of income not only for the tour operators but also for the Uros, many of whom are engaged in the production of arts and crafts.

Inappropriate management of both the lake and the surrounding terrestrial ecosystems has begun to adversely affect the quality of the reserve's natural resources, and the lives of both the Uros and other lake users. Uncontrolled harvesting of reeds and changing water levels has degraded this important habitat and water quality has been adversely affected by sediments, domestic and agricultural pollution. Waterfowl have been overhunted in some areas and egg collection has also reduced duck populations.

The WHNP initiated support for the reserve project in 1987. The first year of the effort focused on the training of reserve staff, the evaluation of existing management programs, and the initial work on the development of a new management plan for the reserve. Short-term goals for the project include better protection of reserve resources, maintenance and improvement of the quality of life of the resident Uros based upon the sustainable utilization of renewable resources, and better integration of regional development projects with the conservation efforts of the reserve administrators. It is hoped that in the long-term, this project will serve as a catalyst for widespread support for resource management activities all around the lake (including on the Bolivian side) and perhaps the establishment of a Greater Lake Titicaca Ecosystem Biosphere Reserve

encompassing not only Titicaca but also the surrounding terrestrial ecosystems that directly effect the lake.

In 1987 training activities were facilitated for nearly every member of the Titicaca Reserve staff. The Peruvian Conservation Association (APECO) was hired as the project consultants, and has worked closely with reserve personnel in the elaboration of the new management plan. This will feature a heavy emphasis on ecodevelopment programs and education and extension. Already educational activities in and around the reserve have been increased and this, combined with more effective resource management has resulted in a marked improvement in the state of the renewable resources. The cooperation of the Uros Indians has been and will continue to be a key element in the success of the project.

At the time of this writing (September 1988), the new reserve management plan was nearly complete. The development of this document has been a long and difficult task that involved numerous agencies and individuals. APECP organized the planning program and WWF responded to their request for additional technical assistance. The plan will now be used to develop the second year proposal for the project. APECO has also helped to organize craft cooperatives among Uros Indian women living in the reserve. In the next year of the project, a new staff member will be added to the Titicaca Reserve staff that will work as a full time liaison between the reserve administration and the regional development community.

BOLIVIA

Beni Biosphere Reserve Environmental Education Program

The Beni Biosphere Reserve, which encompasses nearly 1.1 million hectares of tropical gallery forests, open savannas and wetlands, is rich in species diversity and endemism. The area, which is located in the Bolivian Provinces of Balivan and Yacuma, is occupied by the primarily hunter gatherer Chimone Indians, cattle ranchers and farmers. The site is managed by the Bolivian Academy of Sciences, the Development Corporation of the Beni, and Conservation International. In addition, several other governmental and nongovernmental agencies are cooperating with the reserve managers on various aspects of the management program. The reserve has, as its principal goals, both the protection of wildland resources and biological diversity, and the development and implementation of sustainable development programs which will ensure the ecologically and culturally sound development of the region.

At this time a long term management plan for the site is being designed. In addition, reserve infrastructure is being developed and the administration of the site is well-established. The WHNP has recently supplied a grant to the Interdisciplinary Center for Community Studies (CIEC), for the implementation of their education and extension program for the reserve communities. The project is divided into five phases. The first phase, completed during 1988, focused on a profile of the socioeducational characteristics of the local population. The second phase, which is currently being initiated, involves the development and dissemination of educational programs through the training of local teachers. The third phase will focus on the identification of appropriate land use technologies to local resource users. In phase four this information will be communicated through rural extension programs and the final phase will evaluate all of these activities.

This program is aimed at all facets of the local population, and will include special activities for women and for the indigenous populations. It is hoped that this program will foment the knowledge base and environmental awareness needed to support reserve protection and ecodevelopment projects.

DOMINICA

Cottage Forestry Project

Dominica, largest (290 sq. mi.) of the Windward Islands in the Caribbean, is mountainous, wet and still 65% covered with native forests. These harbor a variety of endemic species and provide important habitat for migratory birds from the north. The country itself, however, is one of the hemisphere's poorest nations and declining economic output has been exacerbated by devastating hurricanes. Forest resources are vital to development, but land capability studies indicate that large-scale timber extraction is not feasible due to rugged topography, high rainfall and lack of roads in the interior. Also, in the past, large-scale logging has caused serious environmental damage and has not resulted in long-term economic benefits for the country. Investigations show, however, that a small business approach to forest utilization provides a viable alternative to high-volume logging. This approach features:

1. Labor-intensive harvest techniques which minimize damage to soils and residual vegetation and create substantial employment in rural communities.

2. Incentives to sawyers to assure sound silvicultural practices, full utilization, reforestation, and respect for parks and protected areas.

3. High value added to raw materials by stimulation of secondary cottage industries, especially furniture making and handicrafts, thereby increasing rural incomes while not significantly increasing demand on forest resources.

4. Preference given to communities in proximity to the forest resource for logging and cottage industry development so as to create vested interest in conservation.

The pilot WHNP being developed in Dominica is designed to demonstrate a private sector approach to achieving conservation and development objectives. It aims to improve conservation and small business practices to 1) enhance the value of forest resources; 2) reduce wastes; 3) keep forest lands productive, 4) derive more value from raw materials; and 5) increase income and employment for rural communities. The process is being facilitated through a central purchasing and market agency. This agency is promoting conservation measures and reforestation, and will provide a central depot for drying, dressing and treating lumber produced by small-scale sawyers, supplying furniture and craftmakers with quality lumber on a regular basis, organizing markets for finished wood products and providing market information and design assistance for the craftsmen.

The Caribbean Conservation Association's Eastern Caribbean Natural Area Management Program (ECNAMP) is initiating the project. The WHNP is providing funds for the start-up costs during the early years of the program.

In 1987 there were several project advances although these were offset by a major setback. A project consultant was hired along with a Dominican forester counterpart who was assigned to the project by the Dominica Forest Service. An office for the project was established and a contract between the government and the Caribbean Conservation Association (the project facilitator) was drafted and signed. Initial contacts were made with the sawyers and their support for the project was enlisted. A site was chosen for the construction of the drying depot and plans were readied to begin construction of this facility. Unfortunately, the project consultant resigned from his position at the end of the year. Prior to the recent delay the WHNP sent a team made up of program staff, ECNAMP and a forester from the Caribbean National Forest in Puerto Rico to evaluate the project and strengthen its conservation components. This has formed the basis for the next stage of the project.

In 1988 a new project manager (a Dominican businessman) has been hired and is working closely with both lawyers and the government. The U.S. Forest Service, through a cooperative agreement with WWF, is providing technical assistance to the project. The Articles and Memorandum of Association of the Cottage Forest Industries have been drafted, but not yet finalized. The solar kiln has been established and construction is underway on a storage shed and new office. Over 130 sawyers have attended organizational meetings and 23 have signed up to participate., It is felt this is sufficient to initiate the project and allow future recruitment based upon the actual experience of these leaders. While this has helped better focus and accelerate the project, progress continues to be painfully slow and the government Forest Service, while not hostile continues to be overextended and therefore finds it difficult to be an active participant.

ST. LUCIA

Southeast Coast Management Project

St. Lucia is a rugged volcanic island lying between Martinique and St. Vincent in the Windward Islands of the Lesser Antillean chain. It encompasses an area of 616 km., which includes hardwood forest, mangrove swamps, coral reefs, seagrass areas and fine beaches. With a population of 124,000, growing human pressures, such as firewood cutting for charcoal production, small-scale farming, fishing and tourism development has adversely affected the fragile natural resources base. Many of the inhabitants of the island derive their livelihoods directly from the utilization of wildland resources, such as lobster, conch and sea urchin. The country's precarious economic situation and need for outside revenue make the pressure to accept potentially damaging development proposals very strong.

In 1980, the Caribbean Conservation Association's Eastern Caribbean Natural Area Management Program (ECNAMP) identified the southeast coast of St. Lucia as a priority area for conservation in the Lesser Antilles. ECNAMP has assisted individuals and institutions in St. Lucia to conserve environmental resources and contribute to the economic development of the area while respecting the socio-cultural attitudes of the people. Initially the project focused on resource information gathering and encouraging public participation. Project activities since 1982 have been divided into various sub-programs: education, training, cultural conservation, marine conservation, tourism and recreation. Two small islands within the project area were declared a nature reserve and an interpretive center was built and opened to visitors. Local fishermen have

become actively involved in a fisheries management program. Tree plantations for firewood have been established in an effort to relieve cutting of mangroves.

The WHNP is supporting Phase II of the Southeast Coast project which continues and expands earlier activities and addresses several new components. These include conservation work in the upland watersheds and environmental protection efforts in the coastal town of Vieux Fort and surrounding areas. All of these projects are being woven into an integrated coastal management plan. Training is an ongoing and important element in the project with workshops focusing on mariculture, resource management, mangrove management, tourism development, environmental education and university classes for students from the University of the West Indies. Project activities are facilitated by the St. Lucia National Trust, the Central Planning Unit, the Fisheries Management Unit, the Forestry Division, the Naturalist Society and others. Each project is supervised and conducted by one or several institutions which provide guidance and follow-up commitment. Local resource users participate on a continual basis both through informal activities and with the establishment of local organizations.

In 1987 and 1988 significant advances were made in several aspects of the project. The fisheries co-op which was established with the help of ECNAMP advisors, completed work on a storage facility and fish cleaning station. The co-op has initiated "self-regulating" fishing practices to control its own harvesting of marine resources. The technology of "sea moss" production was further refined and several local individuals, under the guidance of project staff, carry out sea moss cultivation projects using simple and cheap but effective technologies. An experimental firewood plantation has been established and, despite its need for increased maintenance, shows promise for relieving some of the pressures that charcoal makers put on the mangroves. An agricultural project has also been initiated for local residents although it is too soon to evaluate the success of this effort. In addition, several graduate students from the University of the West Indies Resource Management Program (another WHNP project) have used the site for their field work research and have carried out valuable data collection and analysis for the project. This site was visited by the AID funded evaluation team in 1987 and will be the subject of a WWF case study in 1988. The evaluators felt the protected area project and the sea moss project, developed by the ECNAMP marine biologist and supported with WHNP funds, were the most successful components. The sea moss project uses a raw material with an existing technology and produces for a known, reliable market.

In this third year, this project has reached a point of transition from a primarily consultant organized and managed project to a technically self-sufficient, and somewhat sustainable effort. Local resource users are quickly becoming the resource managers and are increasingly able to make informed project decisions without the need of advisors. For this reason, WWF has requested that the program managers develop in 1988-89, a written strategy for ensuring the smooth transition of many of the subprojects into the hands of the locals. This strategy will outline long-term project goals and the actions needed for their realization. WWF will be providing the Southeast Coast project team with technical assistance in the development of this long-range, self-sufficiency strategy. In addition the project will continue to function as the primary training site in the region and during the next year may be established as the "Caribbean Center for Community Based Resource Management." This project is the model for the entire Wildland Program as the first to enter this transition phase.

CARIBBEAN GENERAL

Resource Management Graduate Course/University of the West Indies, Barbados (completed)

In October 1986, the University of the West Indies' Center for Resource Management and Environmental Studies (CERMES) in Barbados initiated the English-speaking Caribbean's first graduate course in resource management. This milestone is the culmination of a long effort to bring relevant environmental training to the region. Traditionally local management authorities have been weakened by the extended departure of staff for training in continental settings which are not always appropriate or relevant to island realities. The University of the West Indies addresses this problem with a one-year certificate program and Caribbean-based field projects.

The Caribbean Conservation Association, through its Eastern Caribbean Natural Area Management Programme (ECNAMP) is helping to develop this program and will assist in identifying field training opportunities for graduate students from the small islands of the eastern Caribbean.

The WHNP has provided funding for ECNAMP's involvement in this program and organizational aspects of the center's establishment and in monitoring field projects to be carried out by the students. A major focus of the study is management and multiple use of island ecosystems.

It is expected that the project will be expanded to include additional courses and research opportunities. Students in the program are already involved in the Southeast Coast/St. Lucia project which is also supported by the WHNP. While helping to launch this project as a means to expand sustainable development thinking in the region, as a field based program the CERMES project was not intended as a long term model project.

AFRICA

Introduction

During the Program's third year Africa has finally become a significant element both in terms of projects and particularly innovative approaches. Three model projects were initiated and two secondary projects (Lake Malawi and OKNP in Sierra Leone) continued to receive support prior to becoming part of the regular WWF program. Contacts with development oriented PVO's have strengthened WWF contacts with non-conservation rural groups and wildlife utilization is becoming an organizing approach among individuals and institutions, especially in the Southern Africa region.

PROJECT SITES

ZAMBIA

ADMADE Administrative Management Design for Game Management Areas

Zambia contains some of the largest remaining concentrations of African savanna wildlife and has a high degree of local dependence on wildlife resources, particularly among the isolated rural populations. Thus Zambia has the potential to design a multiple use conservation approach which is an inseparable part of the traditional cultural system. Zambia has a system of nineteen National Parks covering 8% of the country which are to be managed according to strict conservation standards. Buffering these parks are 32 Game Management Areas covering 22% of the country. GMA's were established for multiple use and local human benefits; however, without a government extension program, GMA's have not contributed significantly to either national or local economy. This project supports the Lupande Development Project which serves as a pilot program and training center, and expansion into other Game Management Areas in Zambia's Luangwa Valley and adjacent to Kafue National Park.

Luangwa Valley in Eastern Zambia and is one of Africa's most important wildlife areas containing about 25,000 elephants and perhaps 100 black rhinos as well as large populations of buffalo, hippo and crocodile and a full range of predators and small game. The valley contains five national parks all surrounding sparsely settled Game Management Areas which also contain significant wildlife populations and supporting an important safari hunting industry. Most of the 40,000 people of Luangwa Valley are poor subsistence farmers. Social services, such as schools and health centers, are inadequate. Little investment has been made in agriculture and development projects have passed them by. There is a lack of arable land for the growing population to expand and grow food.

Kafue National Park is located on the plains of the Kafue River, its vegetation consists of open grassy floodplain, miombo woodland and teak forest. In the northwest is perennial swampland which supports a population of red lechwe, a species limited to the broad floodplain of Central Africa. Noteworthy fauna include numerous large mammals such as elephant, black rhino, buffalo and antelope. Kafue National Park is surrounded by 8 GMAs which share many of the same development problems as the GMAs in the Luangwa Valley.

The Lupande Development Project (LDP), a grassroots effort to incorporate local villages into a program of sustained yield management of wildlife resources. The Lupande project tests whether local indigenous communities can work jointly with the National Park and Wildlife Service (NPWS) to manage and conserve wildlife resources in those buffer zones. The project includes activities that exemplify village participation, a culling scheme supported by Africare and development of a local safari hunting industry managed for the benefit of the communities in the area. An important element of the program is the wildlife revolving fund established by NPWS for development projects in the local communities and to support recurring costs needs of the Department. The second phase of the project is the expansion of the Lupande model into other parts of the country under the government's new national policy for Game Management Areas (ADMADE).

The LDP attempts to coordinate a government agency, local villages and wildlife resources into workable self-perpetuating system. Wildlife related village employment has expanded from 10 in 1985 to almost 70 in 1987. A major project focus is to provide income to cover recurring costs and to support development to benefit villages.

During 1988 the program focused both on continued support of the LDP as the pilot for ADMADE and its replication in other GMAs. At Nyamaluma, location of LDP the area patrolled by local village scouts, trained and employed under this program increased by 30% over last year. Poaching is down 90% from 1985 and snares are less common indicating growing local acceptance. This can be attributed in part to meetings of local leaders (particularly village headmen) which is a primarily decision body for the GMA and is documented by a locally conducted attitude survey in GMA's inside and out of ADMADE. The local safari company has not yet attained the target of 80% local employment but progress is noted, a constructive dialogue established with the community and low cost meat is being supplied by the company. In 1988 the Africare supported culling program employed 20 permanent staff putting K6,000/month in salaries into the local community (in addition to 40% of the annual profits) from a cull of 10 hippo, 35 impala and 3 buffalo. All recurrent costs are now covered by project earnings so, except for a few Africare subsidized capital expenses, it is close to attaining sustainability. Ecological monitoring continues to provide a baseline of the ecological sustainability of the pilot project.

In this third project year, the replication process began in earnest. Nine GMA's are in the ADMADE program (5 under the Wildlands Program). Based on the LDP model about $50,000/yr is needed to make a GMA fully self sustaining (including capital replacement costs). Currently most GMAs in the ADMADE program average $30,000 exclusively from safari concession fees. The program, therefore, must focus on expanding services on income, such as wildlife utilization, over the next few years. Two local staff biologists were hired to provide logistical and technical backstopping to unit leaders in the field. The Unit Leaders were trained at Nyamaluma along with 72 village scout recruits who underwent a 4 month course. A 60 page Unit Leader Manual, complete with necessary forms and structures, was drafted and is about to go to press while the project created the first locally produced Wildlands and Human Needs Newsletter (see Attachment E). A vehicle for the program headquarters and a vehicle for two GMAs were purchased.

As a result of discussion in July, a proposal was prepared to the USAID Mission for K4,000,000 for the ADMADE program to be managed through the revolving fund. This would provide very important matching resources and we hope such Mission support will be forthcoming for other WHNP projects.

CAMEROON

Mt. Kilum Project (formerly Mt. Oku Project)

Cameroon's triangular shape embraces a wide variety of habitats. The north and central parts of the country are characterized by savannas and woodland and contains the majority of Cameroon's parks and other protected areas. Farther south and east are Cameroon's equatorial rain forests, the most biologically diverse in Africa. Three rainforest parks are being developed with WWF support. The western part of the country includes the most extensive mountain system in West Africa with its unique montane forests which have one of the highest levels of endemism in the whole of

Africa. Mount Oku has been identified as the only extensive area of forest remaining in the Bamenda Highlands and in critical need of conservation action.

The Mount Oku project is designed to stem further degradation of these forests and surrounding farmland and pasture by legislation, by extension, by developing existing sustainable forest-based industries (beekeeping, wood carving, and extraction of medicinal products) and generating local income. The project is also promoting the planting of native tree species in highly degraded forest, in badly eroded areas and on farmland.

Long range goals include: Preparation and implementation of a detailed land use management plan for Mount Oku; initiation of ecological studies of threatened species; gazettement of Mount Oku as Protected Forest; establishment of local reforestation and regeneration program using indigenous tree species of particular socio-economic value; integration of conservation measures into agricultural and grazing practices through the provision of audio-visual aids for agricultural extension workers; promotion of sustainable forest-based industries and marketing assistance, especially beekeeping, woodcarving and medicinal uses; and establishment of a conservation education program to promote environmental awareness throughout the North West Province. Peace Corps, which is cooperating with the project, is well placed within Cameroon to help the project realize these goals.

The Oku forests protect an important watershed and provide a livelihood for local people. The region is one of the country's most densely populated with an estimated 180,000 people (83/sq.km.). There are two main groups of rural people in the Oku region, the settled farmers and the nomadic Fulani herdsmen. Honey, woodcarving and the extraction of Pygaeum bark for medicinal use are important local economies on Mount Oku with potential for improvement. About 30% of Oku farmers supplement their income with beekeeping and about 100 people belong to the Oku Honey Cooperative, one of only two honey cooperatives in Cameroon. The region has a strong cultural significance and is a known medicinal center.

Mount Oku is a major water catchment area including Lake Oku, a shallow crater lake. The forested slopes of the mountain supply many surrounding villages including Oku (population 36,000) and feed the three major drainage systems in one of the most densely populated provinces in Cameroon.

In December 1987 a project headquarters was established in Oku village. During the last year, the project has embarked on three major programs: the demarcation of a Forest Reserve boundary, the initiation of an environmental extension program and the initiation of tree propagation trials.

With the continuing destruction of the Oku forests, an agreement and demarcation of a Reserve boundary with the local people has been the project's first priority. In each village adjoining the forest, meetings have been held where the slide show "Trees for Life", developed earlier in the project, is shown with a taped commentary in the Oku language. The meetings, some lasting as long as five hours, have been very well attended and have given an opportunity for villagers to have their questions about the reserve discussed in detail. The time following the meetings have been reserved for meetings in the field with villagers and farmers' representatives in order to walk and discuss the boundary. A total of 9 film-show/meetings have been held, and a total of 36 km of boundary marked, approximately a third of the total reserve boundary.

The public awareness and extension program has been assisted by the publication of the first issue of the project's newsletter FEN. The newsletter has proved very popular and a total of 450 copies have been distributed. The secondment of a Cameroonian environmental education officer to the project from the National Office of Forest Regeneration (ONAREF) is planned for October 1988.

The project has successfully negotiated for the use of a plot of land for the establishment of an experimental nursery for indigenous tree species. The main nursery area has a holding capacity of approximately 16,000 tree seedlings in polypots. With a shading canopy and an irrigation system, it is now fully functional. The nursery currently holds 5,200 tree seedlings of 15 species, which should be ready for planting in June 1989. The nursery has prompted a good deal of interest locally and further afield, and has been especially useful in providing the project with a tangible focus for local people.

The full cooperation and involvement of the traditional authorities and the Administration at all levels have been secured. A Memorandum of Understanding for the project has been prepared with the Government and will be signed early in this next year.

In consultation with the local people and the Forestry Department, it was deemed more acceptable to use the name "Kilum" rather than "Oku" in the naming of the reserve and the project. Within the reserve area, traditional rights have been held by Oku, Kom, Mbororo and Nso peoples. The name "Kilum", given by the Oku people to the peak of Oku Mountain, is universally used and accepted by these peoples.

The objectives for Year One as outlined in the project proposal have been met only in part. Preparations in UK and administrative delays in Yaoundé both took longer than expected, and effectively reduced the time that could be spent in the field. Nevertheless, the project is moving along well and has been extremely successful in involving the local resource users in the region, an important indicator for sustainability.

CENTRAL AFRICAN REPUBLIC (CAR)

Dzanga-Sangha Forest Reserve

Following a short-term survey by a WWF/NYZS sponsored team a proposal was prepared for a project to create a multiple-use reserve in the Dzanga-Sangha tropical lowland forest of the Central African Republic. The project is promoting the creation, development, protection and management of the Dzanga-Sangha Dense Forest Reserve in southwestern CAR for the conservation of its important floral and faunal components. The area contains the CAR's last strongholds of gorilla, forest elephant, bongo, forest buffalo, chimpanzee and many other lowland tropical forest wildlife species as well as diverse examples of lowland tropical forest habitats.

The forest is also inhabited by pygmies who traditionally practice hunting and gathering throughout the region. Many of these people have developed serious health problems as they have become more sedentary in response to development initiatives. The primary form of development and utilization in the region is selective logging on a concession basis. Indications are that logging and long-rotation gardening add to the

habitat heterogeneity of the area by changing vegetation structure and improving species diversity, benefiting the animal populations and the hunter-gatherers inhabiting the area.

The government of the CAR recognizes the need for conservation and management in the forest from growing outside economic pressures and has requested aid in designing and implementing this project. A multiple-use approach of this type is a major innovation in what has to date been a primarily protection oriented park system. The WHNP program will be supporting two co-directors, a technical assistant to coordinate protection and management of the proposed forest reserve, and a development specialist from the CAR to direct community aspects of the project.

Project objectives include: 1) defining a development/conservation policy for the people living in and around the Dzanga-Sangha Forest; 2) preparing and implementing a management plan zoning the reserve into allowable uses including selective logging, long-rotation gardening, traditional hunting and gathering and protected zones; 3) setting up a feedback system to monitor management practices in the reserve; 4) training local inhabitants and government personnel in joint management of the reserve; and 5) establishing a health care system for the pygmies. A priority of this project is to provide hands-on experience to local inhabitants living in the area and government forestry and wildlife personnel who will be charged with planning and management of the multiple-use reserve.

During 1988 a project accord was negotiated and signed with the Government formally recognizing the project. Two co-directors have been assigned to run the project, one by WWF and the other by the Government.

The project has developed a training program for local inhabitants in park protection and management practices. This has resulted in the employment of 20 staff as park guards, who successfully brought an end to the largest ivory smuggling operation in the region by confiscating 110kg of ivory worth $11,000 to the Government. The training program continues to identify candidates for park employment.

A management infrastructure is being developed to run the program of rural development and conservation. Staff housing is being built and plans are being developed for offices and an improved health facility. A revolving fund is being set up so that funds brought in locally by the project are, at least in part, channeled back to the region for rural development and park protection. Discussions are underway with Sofitel, a French hotel company, regarding the setting up of a small scale tourist operation based on the relative ease of viewing forest wildlife in the project zone.

Preliminary results of a health needs assessment for the region indicate that medicines are not available in Bayanga to treat the more common ailments and that the pygmy population is not being given equal access to the existing health facilities. The project is working with local community leaders to improve nutrition, access to drugs by coordinating transport and upgrading the health facility currently being used.

Peace Corps has assigned three volunteers to the project as extension agents in community development, fisheries and environmental awareness and has asked for an assessment by its Office of Training and Program Support (OTAPS) of agroforestry and health needs. In conjunction with WWF, a US mission will be going out in early 1989 to further develop the program.

MALAWI

Lake Malawi National Park (completed)

Lake Malawi probably contains the largest number of fish species of any lake in the world. There are nearly 400 described species and a further 200 known but not yet described. Endemism is also very high as only about 20 of these species are found anywhere other than Lake Malawi. Of particular note are the 350 (and many more undescribed) species in the family of Cichlidae which constitute 30% of all known cichlids; all but five being endemic.

In addition to its significance for conservation, the Lake Malawi fishery is of extreme importance to the people of Malawi, providing 60-70% of the country's animal protein intake. Some 30,000 tons of fish are caught every year. Commercial trawlers account for about 7,000 tons a year, but most of the catch is taken using traditional methods. Much of the catch is smoked (causing great stress on local fuelwood resources) or sun-dried and sent inland for sale in local markets. With more than 16,000 fisherman, fishing is the main lakeside industry. Managing the fishery on a sustainable yield basis is of obvious importance, however, indications are that in some areas of the lake catches may be declining.

Lake Malawi National Park was created in 1980 and declared a World Heritage Site in 1984. The park serves as a reservoir for breeding stocks and for the protection of nesting sites. As such, the park is an important component of fisheries management in the lake. There are a number of enclave fishing villages associated with the park with a total estimated population of over 8,000 people. Creation of the park has removed resources (fuelwood, building materials and traditional fishing areas) that were available to the local population in the past. Project provisions attempt to provide for some of these lost resources. A comprehensive master plan for the development of Lake Malawi National Park has been prepared which forms the basis for the project in the park.

This project is a cooperative effort between Malawi's Department of National Parks and Wildlife, the Department of Fisheries, the Department of Forestry, the UNESCO World Heritage Fund, the U.S. Peace Corps and WWF.

The park development component includes the provision of essential equipment, the construction of interpretive facilities and the development of conservation education programs for park visitors.

Funds from the Wildlands and Human Needs Program are to support the extension component designed to address local fishermen in the village enclaves adjacent to the park. Initially, assessments of the environmental impact of traditional fisheries and of the attitudes of local fishermen will be undertaken. From this preliminary study, an appropriate program of conservation education will be designed. In addition, environmentally sound development projects will be promoted for the benefit of the local people. The establishment of woodlots and possibly, fish farming and beekeeping will provide alternatives to present ecologically damaging activities in the park.

Two Peace Corps Volunteers arrived in Malawi in October 1987 to coordinate the project. Construction of the interpretive facilities are well underway and a number of houses for the centers staff have been constructed. A design for the interpretive center

was approved and the foundation dug and concrete poured. Most of the building materials are now on site and building is moving ahead quickly. A project vehicle was purchased and is now available to the project.

The project has been coordinating extension work with the Forestry Department and a tree nursery is being constructed to produce approximately 45,000 trees. The nursery is incorporating the project's forestry study plots and will produce seedlings for distribution this year. The project will stress planting of native tree species such as Acacia albida. The European Community has informed the project that its area has been selected as part of the Nankumba Peninsula Fuelwood Project.

An education extension program focused on deforestation is being developed to stress anti-wildfire and pro-tree planting. A series of comic book flyers are being developed to promote this activity. They will be used in conjunction with school programs and local women's groups. A water-skills workshop was held in April 1988 to train park staff in swimming, boat handling and safety, water safety and rescue, etc. The workshop was jointly planned and implemented with Peace Corps (OTAPS) and the US National Park Service.

WWF expects to continue support for the Lake Malawi project through its Africa program, however, in order to facilitate concentration on model projects the next phase will probably not be considered a WHNP project. This decision will be based upon a site visit expected early in 1989.

SIERRA LEONE

Outamba-Kilimi National Park (completed)

The Outamba-Kilimi area of Sierra Leone is characterized by gallery forest and Guinea Savanna along the north-west border of the country. It has a high diversity of primates including one of the largest chimpanzee populations in Sierra Leone. WWF has been actively involved in the establishment and infrastructure development of this, Sierra Leone's first national park, for seven years. The project has evolved into integrating conservation and rural development in the region by identifying and implementing a much needed rural development project with the aid of the local people around the park.

The project's objectives are: 1) To assist the Forestry Department in the implementation of a management plan developed earlier in the project; 2) To provide "in-service" training to the staff of the Forestry Department who are concerned with conservation; 3) To work with people who live in and around the park and develop a rural development strategy which will benefit these people and foster their support for the park; 4) To assist with conservation programs in areas close to the park.

The US Peace Corps currently has one volunteer working with local village leaders to identify and meet some of their rural development needs. He is also responsible for collaborating with park personnel on day-to-day park administration. A management plan has been completed and some aspects are being implemented. A Chiefdom Council has been set up to involve local leaders in park decision-making and rural development issues.

Most of the current work in the area involves improving park facilities. A number of new staff members have been employed raising the total staff to 27. Trails have been opened in the park, patrol programs have been developed and visitation has increased. Support from the local community has improved with the increased visibility of the park and improved dialogue between staff and the local leadership. Training programs have been implemented and staff equipped with field gear. A number of bridges around the park have been improved allowing better access for villages in the area and to the park itself. This secondary project is being phased out of the Wildlands Program. Funding from WHNP has allowed this project to re-orient itself to begin to address many of the local concerns in the project area and has put the project on a better footing towards long term sustainability. Peace Corps is assigning two more volunteers to the area with expertise in extension and rural development and WWF expects to continue modest support of the project through its Africa program budget.

Madagascar

Madagascar will be subject to a separate detailed report.

SECONDARY COUNTRY PROJECTS

It is suggested that one aspect of the Program approach not be replicated in future years. WHNP supported projects were originally proposed to be divided into "Model Project" and "Secondary Projects". The Model Projects represent multifaceted, well-integrated conservation development efforts where WHNP funding is directed at a variety of activities, all coordinated by the project facilitators. The Secondary Projects were envisioned as individual pieces of more comprehensive efforts or to support special opportunities and events such as conference participation, training, specific investigations, etc. It was expected that the model projects would generally be large budget efforts while funding for secondary projects would be in the range of $5,000.

The bulk of program activity and funds are concentrated on the core projects; however, during its third year the Wildlands and Human Needs Program continued to support innovative shorter term secondary projects or support projects for subsequent WWF full support. Established when the program was created three years ago, secondary projects seek to broaden the scope of the Program and to test and document different approaches in a range of settings. These projects include preparation of case studies, training, inter-project exchanges of experience and addition of key new components to ongoing projects (with particular attention to joint ventures with development PVOs).

In order to qualify for funding, secondary projects must meet at least two of the following criteria (projects in parenthesis are existing Wildlands secondary projects developed during the program's initial three years):

o Represent a major programmatic innovation:

- in its approach to linking rural development to conservation;

- in a new ecological zone or human circumstance (unlike many of the

program's rather sparsely populated tropical sites, Peru's Lake Titicaca is surrounded by nearly a million people heavily dependent on the protein from this oasis in a harsh, arid environment);

- in working with new beneficiaries or resource users (none of the model projects to date focus on the issue of women in development as its first priority. This concern will be added to existing projects, but through the secondary project mechanism, WWF retains the ability during the life of the grant to include a project specifically addressing this issue.);

- in applying a new technique (WWF is particularly interested in including future projects which address the issue of risk reduction in different ecological circumstances, income generation and biologically sustainable investment strategies and test differing approaches to resource ownership in the context of conservation of biological resources).

o Require only a short term financial commitment:

- involve adding one component to a larger effort at a critical point in time the Lake Malawi project presented a one time opportunity to include the sustainable use of 8,000 fishermen, located in village enclaves, into the park's zoning system);

- to start a project which can then be moved to other funding, including regular WWF regional program funds (for example OKNP in Sierra Leone) or to an AID OPG;

- meet a specific data requirement necessary to complete a project (research on the land use of the Cabecar Indians enabled the management plan of La Amistad Biosphere Reserve in Costa Rica to incorporate their needs).

o Provide an opportunity for joint programming between institutions of the development and conservation communities (Ecuador's Awa Indian project is the first joint venture of WWF and Cultural Survival).

o Link several Wildlands and Human Needs projects:

- through cooperative training and use of project sites (both of which are objectives of the first graduate program in natural management in the English speaking Caribbean at the University of the West Indies);

- by comparisons and sharing project experiences with common problems (including south-south exchange opportunities and through parallel projects, a role which the Cuyabeno Wildlife Production Area, in Ecuador's tropical Amazon, will serve for work in Peru's Pacaya Samiria model project).

Program experience has led WWF project staff to believe that the Model, Secondary project distinction should be rethought. In fact, most of the model projects can not effectively administer large amounts of money and the program is committed to maintaining project budgets at sustainable, therefore modest levels. WWF has found that grants of about $60,000, even for large, multifaceted projects, often strain local financial administrative capabilities. Administrative limits are especially an issue for fledgling

NGO efforts such as those represented by many of the Latin American projects where WHNP projects average around $35,000.

In relation to the secondary projects, we have found that $5,000 or less is insufficient, on the one hand, to carry out complete Wildlands projects, while, on the other, due to the integrated nature of WHNP projects it is difficult to isolate one activity for funding from among the host of closely related activities. The exception has been "start up" projects where secondary project funding has been utilized very effectively to start a project down the local development track which might not have been possible without the WHNP financial "carrot". Examples include: Lake Malawi, Sierra Leone, and the Cabecar Indian projects.

The WHNP staff feels the distinction between Model and Secondary Project categories should be reconsidered during the next project period. Short term or catalytic projects should be transferred to other funding and all remaining WHNP projects (perhaps 12 under the matching grant and 8 supported from other sources) should meet the criteria/conceptual framework to be established for the model projects.

V. MANAGEMENT: REVIEW AND ANALYSIS OF HEADQUARTERS/SUPPORT FUNCTIONS

Planning and Management

The original WHNP project design envisioned a small Washington based staff which would identify wildland projects, locate individuals and institutions to serve as project managers and to provide oversight and evaluation. In essence we expected to operate like a traditional foundation albeit in an unorthodox field of activity. As the program has evolved responsibilities of program staff have gone beyond project identification to include short term technical assistance, intensive project design, development and training, particularly in Africa. This approach is staff intensive. However, the greater reliance on Washington staff in the early stages of project development has had the beneficial effect of allowing increased use of indigenous individuals and institutions in actual project management, a key factor, we believe, in project sustainability.

The Wildlands and Human Needs Program fits into a central position in the matrix of WWF activities. WWF organizes itself along both regional and programmatic lines but Program projects are integrated within the organizations overall geographic plans. While this assists in influencing the whole WWF program it means the Wildland Program suffers from some of the identity questions familiar to AID's Central Bureaus. As noted in the last annual report, a significant portion of the Director's time was taken up as the WWF-US representative on the WWF-International Conservation Committee requiring four trips annually to Europe. During 1988 this responsibility was reassigned to free up time for the Director to work with AID.

Regular WWF staff specializing in biology, education and non-governmental organizations all know about the Wildlands and Human Needs Program, visited and monitor projects and contributed expertise. Decision making about specific projects and project components involves the full geographic staff of the organization thus broadening its impact on the organization. During 1987 WWF considered the establishment of an

"International Development Program" of which the Wildlands matching grant would be the core of activities. This allowed for inclusion of non-matching grant development projects. However, with the considerable public profile of the Wildlands and Human Needs Program in 1988 it seems more sensible to use the matching grant as the primary vehicle for all WWF sustainable development model projects.

The original program goal was to explore more humane and economic approaches to conservation and its objectives have grown to include sensitivity to issues such as participation, gender roles and scale. As a model, the WHNP has already been extremely successful within WWF. More and more projects have become virtually indistinguishable from those in the program (the Osa project of the WWF forestry program or Annapurna in Nepal, to cite two recent examples). What then is the future role of WHNP within WWF as its uniqueness diminishes?

Three lessons or needs provide a partial answer. The first, identified in the evaluation, is the need for greater communication between the WHNP projects to share experience and provide intellectual perspective for committed individuals faced with day-to-day problem solving. Many of the fledgling efforts suffer through nearly identical problems, often following the same sequence. The Latin American ecodevelopment workshop scheduled to take place in November 1988 is our initial response. In addition we expect to provide a greater flow of material to isolated project sites.

Perhaps a more controversial response would be to view the WHNP staff within WWF increasingly as a source of technical assistance to other elements of the organization (and eventually to other conservation NGOs and development PVOs). Thus, as the model projects become stronger, program staff may spend more time building the sustainable development aspects of other WWF projects rather than producing a large number of projects parallel and in competition with the WWF's existing regional programs.

Finally, the WHNP needs to take its experience and, through consultations with the advisory committee, begin to identify the elements and components of a model sustainable development/conservation project. Such a conceptual framework will provide a reference point to assist project directors in monitoring their own approaches, while providing a mechanism to challenge and alter headquarter based biases. The conceptual model should be the subject of scrutiny from both development oriented PVOs and conservation professionals.

As the WHNP approach has begun to influence program design throughout WWF it is increasingly difficult to distinguish which projects are part of the WHNP and which are not in the program. This definitional issue is not trivial. If the Program is limited to a relatively few model projects which are part of the matching grant it forgoes a major opportunity to shape and influence the fundamental institutional direction of WWF. It would also leave the incorrect impression that linkage of conservation and development in field projects remains a small, perhaps peripheral, focus of WWF. If, on the other hand, the increasing number of "regular" WWF projects which have adopted the community oriented approach are considered part of the program, it could usurp a major portion of the WWF activities and perhaps blur the leadership role of the AID matching grant. This issue has not been settled during the project year; however, presently under discussion is a proposal that the Program be composed of model projects defined by the

conceptual framework to be developed over the next six months and that these projects should be primarily, but not exclusively, part of the AID matching grant.

Senior management at WWF fully concur in and support the concepts and methods of the Wildlands and Human Needs Program. During the third year of the Program WWF President, Bill Reilly, personally visited 2 project sites (Gandoca, Costa Rica and Game Management Areas, Zambia).

A new development at WWF is the establishment of the Osborn Center for Economic Development as a joint program with the Conservation Foundation. The Center will draw on expertise from both its parent organizations. The Osborn Center will specifically assist the Wildlands Program through use of Katrina Eadie, a social scientist, who will assist with development of baseline data gathering, evaluation and addition of gender oriented activities within projects. In addition a number of joint presentations have been undertaken between the Wildlands Program and the Osborn Center (see development education below).

WWF Staff Resources

During the third year of the program staff resources budget to the program included 50% of the Program Director (WWF VP Michael Wright), 70% of Deputy Director responsible for Latin America (Dennis Glick), 20% for Caribbean project officer (Gus Medina), 50% for Africa project office (Tom McShane) and 10% for WWF Africa Program Director (Rick Weyerhaeuser).

Dennis Glick

Visited the following WHNP sites during the third year:

Sierra de Manantlan Biosphere Reserve, Mexico
Southeast Coast Project, St. Lucia
Dominica Forestry Project, Dominica
Sian Ka'an Biosphere Reserve, Mexico
Rio Platano Biosphere Reserve, Honduras
Gandoca Integrated Development Project, Costa Rica and
met with Gandoca staff in San Jose
Met with Monterrico project managers in Guatemala City

Several of these sites were also visited by other WWF Latin America staff. The Monterrico Biotope was not inspected by Glick but he met with project staff in the capital.

Site inspections noted above included interviews with project staff and local resource users as well as regional and national government and nongovernmental officials. In addition, Glick visited other potential WHNP sites in Latin America and worked with resource managers to develop project proposals.

D. Glick attended two international conferences as the representative of both the WWF Latin American Program and the Wildlands and Human Needs Program. These included the Second Central American Congress on Natural and Cultural Management held

in October in Guatemala and at the First Regional Environmental Action Congress in Nicaragua in May.

Considerable time was spent administering these projects in the central office. Tasks included project proposal development assistance, project proposal review and justification, financial administration, project review and evaluation and technical support for projects which include the identification, purchase and mailing of numerous publications and documents to field projects. In addition, central office responsibilities included consultant relations with the several field consultants which have been contracted for projects. Glick developed, helped draft, oversaw production and distribution of the first Wildlands bulletin in Spanish. Other activities to strengthen the network included initiation of a program of periodic mailings on sustainable development technical materials to WHNP field staff and facilitating participation of field staff in a variety of training exercises.

Glick organized the Advisory Committee meeting focusing on the planning of the WHNP Workshop on Rural Development: Concepts and Techniques for Wildland Managers. Based on this advise, he subsequently has organized and secured staff for the November 1988 workshop. Glick also keeps the Advisory Committee periodically updated on the program and worked with other organizations preparing material on the WHNP as seen in the section on "Development Education". He also prepared a slide show on WHNP for the WWF press conference on the program

In order to expand his own training experience in rural development, Glick attended an AID sponsored training program on "Holistic Resource Management" an innovative (and at times controversial) approach to ecologically sustainable management.

Gus Medina

Visited the following WHNP sites in the third project year:

Southeast Coast Project, St. Lucia
Dominica Forestry Project, Dominica

In March, G. Medina visited the Southeast Coast Project in St. Lucia. He spent four days with the project staff discussing project objectives, achievements and difficulties. He visited each sub-project, including the Palmiste fishermen, fuelwood management and agricultural production, sea moss management and cultivation, sea egg management, and the Maria Island Nature Reserve.

Also in March, G. Medina visited the Small Business Approach to Conservation Project in Dominica at the time of the 4th meeting of Caribbean Foresters held in Dominica. He spoke with the new project director concerning the project's status and visited several of the proposed timber areas. He also visited a large scale logging site and several sawmills. He met with the USDA Forestry Service concerning the agency's support for the project and the Peace Corps both of which are positive.

In September G. Medina organized a meeting in Dominica that brought together several regional forestry experts. The purpose of the meeting was to discuss the conservation components of the Small Business Approach to Conservation Project.

Project staff, the regional experts, and a WWF staff person met for three days on how to ensure that conservation was integrated into the overall execution of the project.

In Aug/Sept 1988 Medina attended the Caribbean Conservation Association Annual General Meeting in Fort-de-France Martinique which provided an opportunity to review status of both the Dominica and the St. Lucia projects.

Tom McShane

Visited the following project sites during the third year:

Kilum Mt. Project, Cameroon-Dec 1987
Dzanga-Sangha Project, Central African Republic-Jan 1988
Liberia-June 1988 (potential secondary project)
Abidjan, Côte d'Ivoire-July 1988 (potential secondary project)

The Kilum Mt. Project site was visited at the end of 1987 to follow-up on activities and interview project staff, local resource users and governmental and non-governmental organizations. Discussions were held regarding the use of the project as model for further conservation efforts in the montane forests of Cameroon with the Government and other potential donors. The WHNP was discussed in an interview on the radio.

The Central African Republic was visited in early 1988 to prepare for turning over the project to the current co-directors and sign the project accord with the Government. Formal signing of the project was widely covered in the press and promoted by the President over the radio and on television. Discussions were held with Peace Corps regarding their involvement in the project.

In June 1988 McShane visited Liberia in response to US AID interest in supporting development activities around Sapo National Park. Through the Mission's PVO/NGO Support Project, WWF has requested funds to expand a current WWF conservation and development project to other villages. This project is modeled on the WHNP but will not be funded under the program.

In July 1988 a visit was made with WWF Executive Vice-President Kathryn Fuller to the REDSO West and Central Africa office to discuss the WHNP and its implications for other projects in the region. Discussions were also held at the African Development Bank regarding this program and its approach to conservation.

McShane has been taking part in a joint action by the Experiment in International Living (EIL) and CARE to develop a program for the PVO/NGO component of the Africa Bureau's NRMS initiative to improve the capabilities in natural resource management by PVO's and NGO's in Africa. In addition he joined Glick in attending the AID sponsored seminar on Holistic Resources Management.

McShane has presented papers on the WHNP to the Second Symposium on Social Science in Resource Management at the University of Illinois, the World Bank, the American Association of Zoological Parks and Aquariums (AAZPA) and at various seminars.

Rick Weyerhaeuser

Undertook the following WHNP related missions in 1988:

Lake Malawi National Park, Malawi
Two program development missions to Botswana
Program development mission to Uganda

Africa Program Director, Rick Weyerhaeuser, visited the Lake Malawi National Park Project, working with the Malawi Government, local AID Mission and the US Peace Corps resulting in official approval for the project, identification of Peace Corps workers and field action.

Two program development missions were undertaken to Botswana and definite potential exists if sufficient funds are available or may be funded by the mission itself. The project is likely to be modeled on the Zambia WHNP. In February Weyerhaeuser visited Uganda to develop the joint WWF-CARE "Development Through Conservation" (DTC) project to be funded by the mission and Africa Bureau. It is interesting to note that while not formally part of the WHNP, in fact this project was one of only two proposed Africa projects in the original proposal (but at that time the local mission would not approve the project).

Weyerhaeuser also spoke on the link between African conservation and human needs at the AAZPA conference and in a presentation to the WWF/CF Board of Directors.

Michael Wright

Visited the following project sites in during the third year:

Game Management Areas, Zambia-Oct 1987
Program development mission to Nepal-Dec 1987
Costa Rica-Jan 1988
Game Management Areas, Zambia-July 1988

Two weeks were spent in Zambia in Oct 1987 finalizing the project developed during the previous months. Three GMAs were visited including the Lupande pilot project. Extensive negotiations were undertaken with Zambian conservation organizations. The AID Mission was most supportive as was the U.S. Ambassador. During the visit the WHNP was discussed with the President of Zambia and on local television.

A trip was taken in December 1987 for WHNP development in Nepal. Although the Annapurna project will not be within the new 5-year matching grant, it may receive funding from the local AID Mission and was designed specifically using the experience of the Human Needs Program. It continues to be a high profile example of linking conservation and development and thus broadens awareness of the matching grant.

In the fall of 1987 Wright attended a conference on Wildlife Utilization in Sub-Saharan Africa held in Harare, Zimbabwe which include a presentation on the

Zambia pilot project. The trip also focused on establishment of a network of Wildlands and Human Needs projects in southern Africa with an exploratory trip to Botswana anticipated in 1989.

In January 1988 the Program Director attended the IUCN General Assembly in Costa Rica involving a presentation on the Program and the opportunity to meet with numerous project directors present, particularly the Awa project in Ecuador and Gandoca in Costa Rica.

In July 1988 Wright joined WWF President Bill Reilly in assessing the program in Zambia. GMA's were visited and meetings held with local people, community leaders, project staff, and the President. The U.S. Ambassador was most helpful as were Mission staff. One particularly gratifying result appears to be a significant counterpart funds contribution of 5 million Kwacha directly to the project from the AID Mission.

In September 1988 Wright met with ECNAMP project administrator for the Dominican Forestry Project to review the status and slow progress. An oversite visit is scheduled for the next project year.

One of the most dramatic results of the WHNP has been the cooperative relationships fostered with PVOs and other NGOs in discussions with AID. As a result, Wright continues to be the focal point for a series of negotiations concerning potential joint ventures including: International Institute for Environment and Development-The Nature Conservancy-World Wildlife Fund dealing with biological diversity support of AID Missions and Bureaus, CARE-WWF in a major AID Mission and Africa Bureau project in Uganda, Cultural Survival-WWF in Ecuador, Africare-WWF in Zambia, WWF-The Nature Conservancy-Caribbean Conservation Association in the Caribbean and most recently Experiment in International Living-CARE-WWF for work with NGOs and PVO's in Africa.

As Director, Wright represents WHNP interests in the planning, budget and senior management meetings. With the maturing of the program, an increasing amount of time has been spent bringing the program to the broader NGO and PVO communities. In this role during the last program year, he made presentations to a CODEL seminar on Sustainable Development in New York, attended the InterAction Annual Meeting in Philadelphia, and the WRI colloquium on "US Policy in the 1990's" and was a speaker on the program at the Toronto, Canada Conference on Common Futures: An International Forum on Sustainable Development. Program presentations have also been made to several U.S. foundations with growing interest in support of international conservation activities.

Fund-Raising and Marketing

Financial support is the most obvious and pressing need for the projects included in the Program. The development (fund-raising) staff of WWF continue to feel that the Wildlands Program is not the best candidate for its direct mail appeals; however, these small individual gifts provide a significant portion of the general funds which are a portion of the match. Importantly, as the third project year ends a decision has been taken to use the program as the basis for a year-end appeal to WWF major donors (annual gifts of over $1,000 per year). This represents a belief that the public, especially the influential public, is prepared to support what a few year's ago would be considered highly risky links between conservation and development.

During its third year, the program has received considerable foundation matching funds including an Alton Jones Foundation grant to Madagascar; another Alton Jones grant to the WWF Wildlife Program has matched AID funds for Pacaya-Samiria, Rio Platano, and a partial match for Sierra de Manantlan, Cuyabeno and Sian Ka'an; the Weyerhaeuser Foundation has provided funds for Dominica and this last year for Gandoca; Cultural Survival helps to fund the Awa project; the Heinz Foundation matches the AID funds for the S.E. Coast project, St. Lucia; WWF-Netherlands has provided matching funds for Malawi; and WWF-Canada for Monterrico and a partial match for Sierra de Manantlan, Cuyabeno and Sian Ka'an. Several major donors have more than matched the AID funds for Zambia and there is a foundation matching grant pending for Kilum Mt.

The third project year became year when the Wildland and Human Need Program burst upon the public scene through talks, case studies, third party publications and emulation by other organizations (suddenly it seems everyone is laying a claim to the field). These developments will be discussed under "Development Education."

Role of Board of Directors

Presentations on the Program were made to the Board during this year focusing particularly on Africa and a more extensive presentation on sustainable development (highlighting the Wildlands and Human Needs Program) was made to the WWF Council. The WWF Board continues to review major new project initiatives in their oversite role and will review on-going projects every three years to facilitate evaluation.

Development Education

As project activity has consolidated and strengthened during the third project year there has been a virtual explosion of public awareness of the Program and the link between development and conservation. In fact, the program had the somewhat dubious honor of being declared a "buzz word" in an article on the new approach to conservation entitled "The Preservation Paradox" in the April 25, 1988 issue of U.S. New and World Report, which also briefly discussed the Zambia and Dominica projects.

Presentations on the Program during the third year were made to both general public and selected forums including a press briefing at WWF on Sustainable Development on May 12, 1988, to the Toronto Conference on Common Futures: An International Forum on Sustainable Development held June 17-20, 1988, to the WWF Council and to the Biological Diversity Task Force of the World Bank. Presentation featuring the Africa aspects of the program were made twice to the World Bank, once to the WWF Board and to the AAZPA (American Association of Zoological Parks and Aquariums) as well as other presentations noted under staff activity.

Articles on individual wildlands projects appeared in:

- The South East Coast, St. Lucia project was discussed in The Common Property Resource Digest, No.7, June 1988.

- The Gandoca, Costa Rica project in the Smithsonian's Biological Conservation Newsletter, No.63, June 1988

- The Cuyabeno project, Ecuador is mentioned in "Conservation of Traditional Agroecosystems", BioScience, Vol.37, No.3, March 1987.

- The Zambia Game Management Areas Project was described in the WWF Letter, No.1, 1988

- The Zambia Wildlife Revolving Fund is a case study in Economics and Biological Diversity: Developing and Using Economic Incentives to Conserve Biological Resources by Jeffrey McNeely.

- The Program Deputy Director, Dennis Glick, is quoted in "Beyond National Parks" in BioScience, Vol.38, No.3, March 1988 and the Sian Ka'an project is the subject of a second article "A New Era for Biosphere Reserves" in the same issue

- The Awa/La Planada project is discussed in "Biosphere Reserves, Buffers and Boundaries" in BioScience, Vol.38, No.7, July/Aug 1988

- The Wildlands and Human Needs Program was described in Multinational Environmental Outlook, May 12, 1988

The program approach has also received some publicity which focuses on the human needs and population linkage but uses projects which are not part of the matching grant:

- an article on the Annapurna, Nepal project in The Philadelphia Inquirer, June 5, 1988

- reference to the Program link to population groups in Nepal and Thailand in "Population-Environmental Linkages and Sustainable Development" in Populi, Journal of the UN Population Fund, Vol.15, No.3, 1988

- discussion of the Ban Sup Tai, Thailand project in the CF Letter, No.3, 1988.

As noted previously, the Program has produced its own newsletter in Spanish with the first issue being an 18 page description of project activities. In addition, on their own initiative, the Zambia project has begun production of the "Zambian Wildlands and Human Needs Newsletter."

Sian Ka'an, Mexico; Gandoca, Costa Rica; La Amistad Biosphere Reserve, Costa Rica; Awa/La Planada, Ecuador; Cuyabeno, Ecuador; Mt. Oku, Cameroon (and two non-matching grant Human Needs Projects - Khao Yai, Thailand and Irian Jaya, Indonesia) are all used as case studies in the Earthscan book Saving Tropical Forests by Judith Gradwohl and Russell Greenberg published in 1988.

The Wildlands and Human Needs Program itself as well as the Sian Ka'an, Mexico; Lupande, Zambia; S.E. Coast, St. Lucia and Annapurna, Nepal projects were all featured in Bankrolling Successes: A Portfolio of Sustainable Development Projects, by W.V. Reid, J.N. Barnes, and B. Blackwelder for Environmental Policy Institute and National Wildlife Federation.

As the Project's third year ends a decision has been made to undertake a series of case studies for a popular audience initially to be featured in WWF Letter. Written by Roger Stone (author of Dreams of Amazonia and former WWF VP for Communication) two are completed in draft and two more in preparation.

VI. FINANCIAL REPORT[1]

Wildlands and Human Needs Expenditure and Projections

A. By Project Year Sept 30-Oct 1

		Actual	Budgeted
1. Year 1 Sep 30, 1985-Oct 1, 1986			
Operations	AID	$28,495.0	40,500.0
	WWF	28,495.0	40,500.0
Indirect Costs	AID		16,000.0
	WWF		63,920.0
Grants	AID	156,272.0	214,500.0
	WWF	150,587.0	214,500.0
Total Yr 1		363,849.0	589,920.0
2. Year 2 Sep 30, 1986-Oct 1, 1987			
Operations	AID	43,704.5	42,500.0
	WWF	43,704.5	42,500.0
Indirect Costs	AID	28,829.0	16,000.0
	WWF	28,829.0	63,920.0
Grants	AID	281,246.0	288,000.0
	WWF	357,927.0	288,000.0
Total Yr 2		784,240.0	740,920.0
3. Year 3 Sep 30, 1987-Oct 1, 1988			
Operations	AID	47,453.0	44,500.0
	WWF	44,054.0	44,500.0
Indirect Costs	AID	26,588.0	16,000.0
	WWF	26,588.0	63,920.0
Grants	AID	388,561.0	351,000.0
	WWF	358,289.0	351,000.0
Evaluation	AID	30,000.0	20,000.0
	WWF	2,000.0	
Total Projected Yr 3		923.533.0	890,920.0

[1] excludes Madagascar biodiversity funds which will be accounted for separately

Program Total			
	AID	1,031,148.0	1,049,000.0
	WWF	1,040,473.0	1,172,760.0
		2,071,621.0	2,221,760.0

Wildlands and Human Needs Expenditure and Projects

B. By WWF Fiscal Year June 30-July 1

1. FY 86 (partial): Oct 1985-June 1986

Operations	AID	23,328
	WWF	23,328
Grants	AID	106,878
	WWF	102,257
FY 86 Total		255,791

2. FY 87: July 86-June 1987

Operations	AID	33,097
	WWF	33,097
Indirect	AID	21,599
	WWF	21,599
Grants	AID	207,380
	WWF	298,190
FY 87 Total		614,962

4. FY 88 July 1987-June 1988

Operations	AID	49,322
	WWF	45,923
Indirect	AID	35,634
	WWF	35,634
Grants	AID	348,538
	WWF	332,018
Evaluation	AID	30,000
	WWF	2,000
FY 88 Total		879,069

5. FY 89 (partial) July 1-Sept 30, 1988

Operations	AID	10,690
	WWF	10,690
Indirect	AID	5,883
	WWF	5,883
Grants	AID	158,799
	WWF	129,854
Partial FY 89 TOTAL		321,799
Program Total		$ 2,071,623

Explanation of Budget Items

Financial Analysis

Detailed project specific financial expenditures are contained in the country data sheets in Attachment C. The purpose of this section is to analyze expenditures to date.

Pace of Expenditures

In its report on the first year of the WHNP, WWF expressed its concern with the pace of expenditures. At that time expenses were $185,000 for AID, substantially below the original budget estimate primarily due to slower than anticipated project development in Africa. As indicated on graph 1, second year expenditures of $784,240 were above the original budget projections and put the program on schedule. Expenditures during the third program year indicate the program expenditures meeting budgeted figures. The increasing pace of expenditures, although now stabilized, remains at an annual level just under $1 million.

Indirect Costs

At the time the WHNP was originally proposed, WWF did not have in place any mechanism to separately account for indirect costs and we were operating with a provisional rate of 12.2% of total expenditures. Due to an inadequate accounting system in place at the time, WWF was not able to bill AID for indirect costs during the Sept 31, 1985-Oct 1, 1986 period. In year two of the program, a new accounting procedure was put into place and the actual rates as a percentage of salary and benefits which have been audited under A 110 provision were 94.82% for FY 87, 85.60% for FY 88 and 88.00% for FY 89. The FY 87 and 88 rates are audited while the FY 89 rate is provisional.

Evaluation

The independent field evaluation was conducted by AID at five of the field projects of the WHNP at the end of its second year. $30,000 was added to the project for this purpose and is included in year 3 funds. A match was not required for these funds.

Comparison of actual expenditure with proposed budget

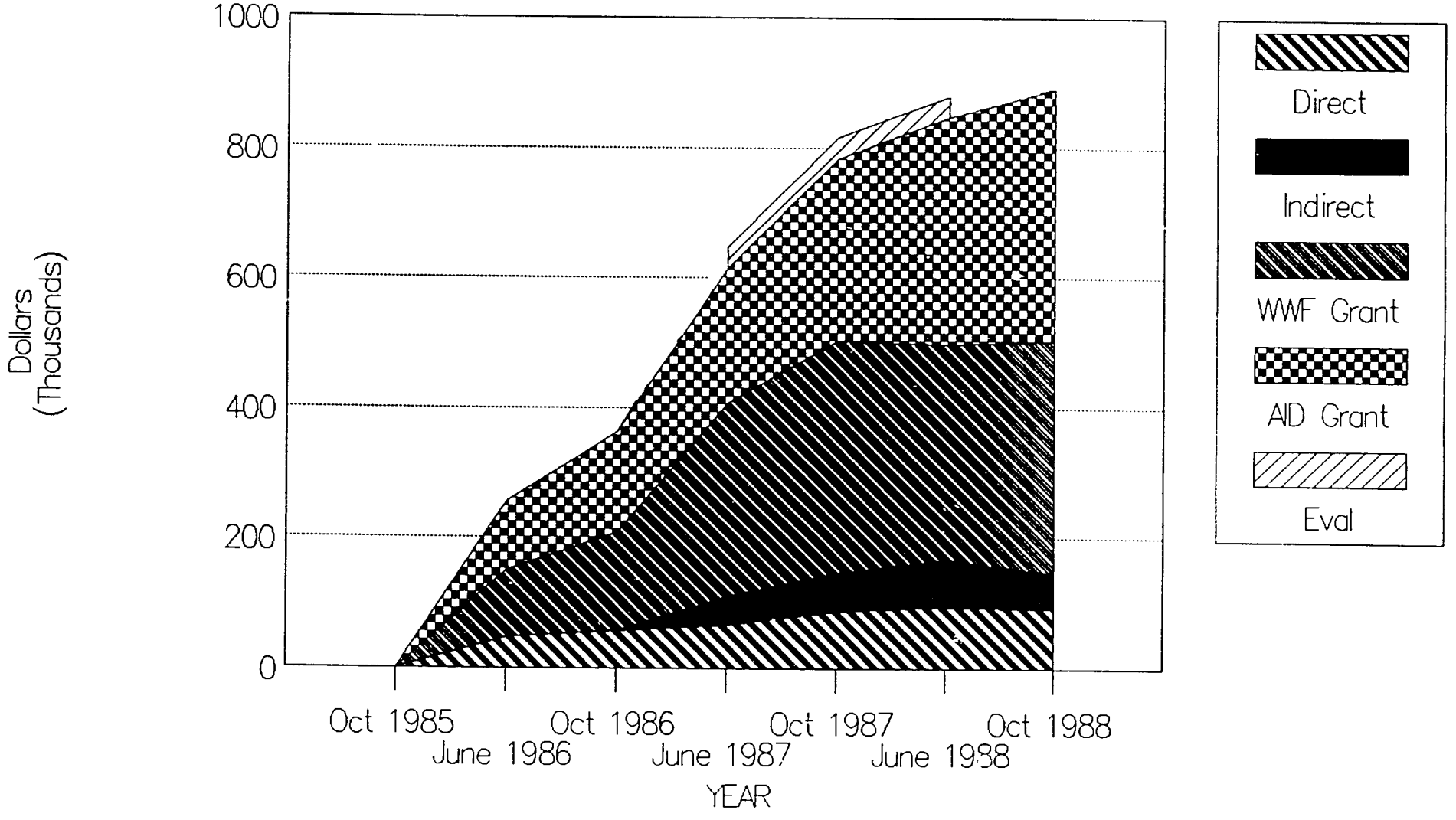
This comparison is seen on Graph 2. As noted previously, at the end of the project's third year the cumulative total was $2,221,760 budgeted compared to $2,069,622 actual expenditure. Differences between actual and budgeted figures are primarily due to changes in indirect rates which in year 3 was $26,744 less than originally budgeted. This difference resulted from an indirect rate based on a percentage of salaries and benefits rather than the total program expenses.

Cost sharing

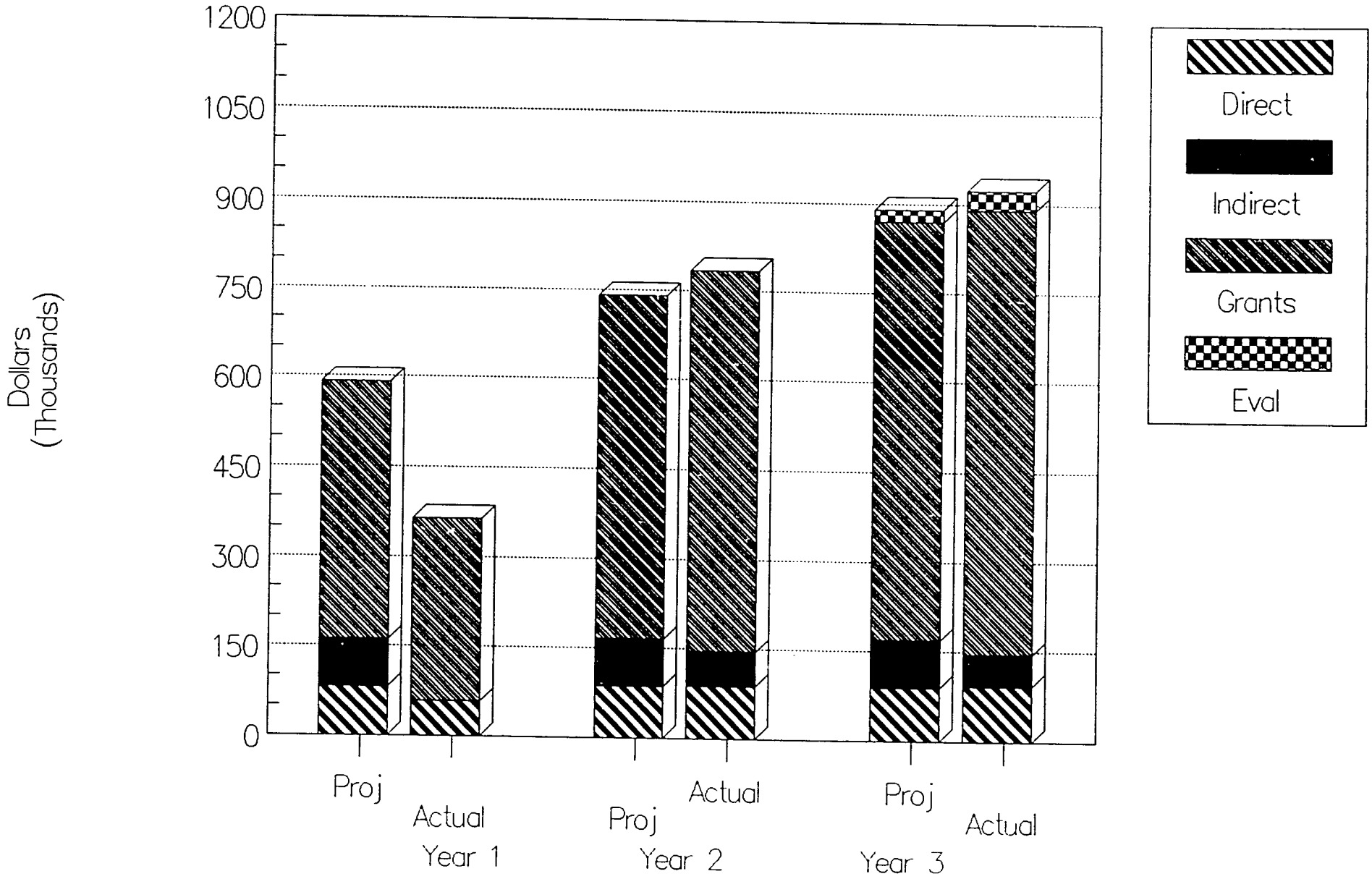
At the conclusion of the third project year WWF was about $40,000 ahead of its 50-50 matching requirement (recognizing that the funds for evaluation did not have to be matched). While WWF completed its matching requirement, the original budget proposed that WWF contribute a greater share of the indirect costs. As a result of the revised rate and modified base, the total indirect costs have been substantially reduced and the cost sharing adjusted to reflect the 50-50 match applied to the overall program.

Graph 1: Pace of Expenditures

1985 – 1988



Graph 2: Projected/Actual Expenditures



VII. LESSONS LEARNED

1. Costs and Benefits

A common conservation focus, and an argument utilized in the original proposal, is that many biologically important areas lack the potential to sustainably produce benefits or that what potential exists the benefits have been appropriated by other groups. Certainly where such potential is lacking or can not be realized without permanent destruction of the unique biological resource, protection rather than sustainable use, is the appropriate conservation objective. In such a situation "mitigatition" or provision of some alternative benefit may be the only benefit which the program can provide. We must avoid the naive belief that in all instances the interests of conservation and local needs can be easily or completely harmonized or that the benefits of conservation and use are both attainable without limitations on either. In these instances the projects have tended to provide benefits which are collateral to those of interest to conservationists (land title, health benefits, etc.) as something of a quid pro quo or in compensation for the cost of limiting access to resources with which we as conservationists are concerned (Gandoca's swamp or Dzanga Sanga's elephants and their ivory). In contrast, another group of projects are succeeding in large part because the potential for increased benefits does exist and the program removes obstacles to local people realizing these improvements: in the case of Malawi the obstacle many be a government regulation while in Cameroon it is competition for the resource from outside parties. This approach seems to have a higher risk of failure (from a conservation perspective), as a result of actually involving local people in decision making about the future of the very resources of concern to WWF (the forests of Dominica or the wildlife of Zambia's GMAs). However, the underlying principle of the program is that a mix of national and local authority is critical to break the traditional conservation approach where the benefits were received nationally or internationally while the costs were borne locally.

Strict benefit analysis of the projects is difficult because of the nature of wildland resource benefits; i.e. that they are often intangible or difficult to measure. While dollar values can be given to some wildland derived goods and services, such as firewood and lumber, many other utilitarian benefits such as soil protection, medicinal plants, water for hydro power, industrial and domestic use, recreational and spiritual values are more difficult to assess. In addition, it is perhaps preferable to not put a dollar value on all of these benefits, least they be deemed less "economically" valuable than some other lucrative but ultimately destructive use.

Likewise, cost estimates can also be problematic because of the difficulties associated with predicting the future of these often times crisis prone projects. Because many of the areas are isolated and a logistical nightmare to manage, implementation schedules and costs are subject to a wide array of disruptive factors. Financial costs are seldom lower than predicted, and usually far higher. In addition, projects almost invariably demand support for a longer period of time than what was originally predicted.

2. Institution Building

The Mid-course evaluation stated that it is in this area that the program had been most successful: "...through the implementation of the field projects, new local institutions are being built, and existing organizations are being strengthened." WHNP has worked closely with the NGO development program in WWF to identify those elements most critical to the success of the implementing institutions. In several cases, funds from other WWF programs have gone directly to institution building. The program is also working on other activities that will enhance local organizations in a variety of ways. Specialized training for project managers, increased awareness and promotion of rural development issues, and increased attention to planning, monitoring, and evaluation activities will encourage further strengthening.

The greatest successes in the program have been achieved, so far, where an existing counterpart, already familiar with conservation or development activities, has been the implementing organization.

3. Sustainability

A major focus of the program has been on the related issues of long-term sustainability and self-sufficiency. The WWF strategy to address these fundamental questions includes: use of local personnel, and especially indigenous NGO's; keeping recurrent costs low (even the model projects are small scale by most development standards); stressing self-reliance and avoiding dependency on foreign funds and exotic technologies; use of local technical knowledge to lower risk. Initially, sustainability can be addressed through participation of beneficiaries and inventories to assure project design is geared to local circumstances. Local involvement in execution and even modest contributions (though in kind, off-season labor and locally raised funds) can test whether projects address real needs, abilities and limitations. Rural communities can be tenacious in support of projects which are seen to address their priorities. Project directors are selected who are local and, when not, are committed to living and working at remote sites.

Local resource users are often unorganized and vulnerable. With little margin for error, potential beneficiaries are reluctant to be exposed to the risks inherent in new technologies and have difficulty sustaining them if payouts are not immediate or if success if episodic. Despite the slower pace the approach entails, demonstration projects, using local resource users wherever possible, will be used which allow a community to make its own value judgments on the merits of new approaches. Project flexibility is important and adaptation over the life of the project is encouraged in light of new information and local reaction.

The sustainability of projects is greatest where the implementing organization is a locally based NGO with broad-based local participation. The complexity of the projects requires that a longer time horizon is assumed to see results than was anticipated. The importance of encouraging local participation and in developing the organization and skills, at the local level, which is necessary to execute the projects has become clear in projects in all three project regions.

It is clear that support must be based within the communities for sustainability to develop. Examples such as the recent development in the St. Lucia project, where plans

are being developed to turn the project over to the local community, provide models of how this transfer should go. However, it will be important to carefully monitor the critical issues which will face the community to determine what assistance, if any, will be necessary over the long term to ensure sustainability.

4. Benefit Distribution

In all of the projects where the focus of the project is geographically based, the benefits are designed to enhance the quality of life for the residents living in or near the parks, buffer zones, or areas of critical concern. The extent to which benefits are received by the community rather than households or individuals is determined by the particular orientation of each project. These are determined based on the critical needs defined by project staff and local communities in each case. For example, the Lake Malawi project has worked largely at a community level, attempting to improve the material and non-material benefits received in broad terms. More commonly, projects benefit individuals as well as communities the Gandoca project helps individuals obtain land title; which will in turn stabilize the community. Projects strive for benefits which are virtually guaranteed if credibility is to be established with local resource users. Similarly project managers must be careful and realistic regarding what is promised to local populations understating possible benefits and letting results, not promises, drive the program.

The extent to which benefits are distributed based on gender are more subtle, although present in many of the projects. Direct benefits to women have been promoted in projects such as the Lake Titicaca National Reserve, where women will obtain income through participation in a crafts cooperative. Projects oriented toward male dominated activities (logging, fishing, hunting) or toward the community (land title) may have non-monetary benefits which, because they increase household or community stability, greatly benefit women and children. It has been well documented that women and children suffer more when community instability or family life is disrupted, because they have fewer opportunities open to them. Men can migrate and obtain work as wage laborers in cities or agricultural areas more easily than women. Therefore, protecting the resource base and allowing its sustainable use, benefits households and communities in a myriad of ways.

Finally, there are a variety of benefits that occur to individuals and institutions that have resulted from the program. Training for individuals is one important feature. Strengthened institutions is another. One of the important components of the project monitoring system in the future will be to look at all of the benefits, both direct and indirect, which the project has promoted. Then, a system will be devised to help projects identify and track those parts which are vital to the success of their projects: persons trained; changes in income levels; title obtained, trees planted, etc. Perceptions of the benefits by residents involved, as well as those who are not residents must also be monitored. We must be careful that benefits are not limited to a certain group of aggressive "street wise" locals who know how to function within a competitive system. It is in this regard that gender related concerns must be strengthened. The WHNP staff will work with the field projects underway to support these activities. New projects will be asked to identify many of these criteria as part of the baseline data collection.

Special note on: Native Peoples and the WHNP

Conservation in the Third World has been marked in the last decade by increasing involvement of native peoples in wildland protection efforts. Traditionally protected areas were seen as enemies, evicting native people in the name of conservation or establishing human zoos. This perception is quickly changing. As natural area destruction becomes widespread, indigenous populations have found that the creation of protected wildland units such as national parks and biosphere reserves can be an effective tool for securing land rights and appropriately managing natural resources in a market economy. Conversely, conservationists have recognized that native peoples can be a valuable ally in the struggle to preserve the biodiversity of the tropics. And, from a more pragmatic view, several of the last unprotected wildlands in Latin America are occupied by indigenous populations, many of whom have been in these areas for centuries and certainly longer than conservationists.

With the above in mind, it is not surprising to find that the WHNP is supporting several projects that involve native populations. In Latin America, these include the Manantlan and Sian Ka'an reserves in Mexico, the Rio Platano reserve in Honduras, the Cabecar Indian project in the Amistad reserve in Costa Rica, the Gandoca Integrated Land Use project, also in Costa Rica, the Awa Ethnic Forest reserve and the Cuyabeno reserve in Ecuador, the Lake Titicaca reserve in Peru, and the Beni reserve in Bolivia. Native groups involved in these project activities include the Maya, Miskito, Paya, Cabecar, Bri Bri, Siona, Secoya, Awa, Uro, Chimone and others.

Because of the relative novelty of this approach to wildland protection in Latin America, both conservationists and native peoples are still identifying appropriate methodologies and shared goals for realizing this integration. In some case, such as in the Rio Platano and Sian Kaan Biosphere reserves, it has been the conservationists that have taken the initiative to establish protected reserves in areas occupied or utilized by native populations. In other sites, most notably the Awa Ethnic Forest reserve, the indigenous peoples themselves have taken a leading role in designating, planning and managing their territory as a protected wildland unit. The WHNP has provided the technical assistance, training and financial resources to support this process.

It is interesting, if not surprising, to note that the most successful wildland protection projects involving indigenous people are those which have been initiated by the local population themselves. Many wildland conservationists, though generally sincere in their attempts to incorporate the needs and desires of natives occupying protected natural areas, still lack an understanding of cultural characteristics and indigenous land use practices. In addition, and perhaps understandably, reserve managers still sometimes view native peoples as a potential threat to conservation efforts. However, this attitude is rapidly changing and several recent conservation conferences and workshops in Central and South America have included this topic in discussions and activities.

It is hoped that in the very near future, a regional conference on native peoples and natural resources will be held in Latin America. The WHNP is promoting this idea and will probably be a co-sponsor of the event.

5. Local Participation

The PVO advisory committee has helped reinforce certain project characteristics including: the role of community participation, use of local resources, self-help labor, low cost, able-to-be-repaired technologies, and other lessons learned by our PVO colleagues. The program, and its project directors, have yet to master all the subtleties of local participation. Participation has been defined as seeking local involvement in project design and sharing of decision making to them during actual implementation. In some instances, our partners are government agencies whose traditional role has been exclusion of local people from resources, not extension to them (or resource management agencies which legally cannot relinquish control over resources even if convinced of the merits of doing so). In other cases, social science advice could simply help project personnel design community development approaches more effectively rather than reinventing community linked activities project-by-project. The instances where local participation and conservation goals mesh most comfortably is when conflict over resources exist and we can strengthen the claim of a competing group or where a resource is clearly deteriorating and we can provide alternatives during the period needed for recovery.

It is the WHNP experience that projects are likely to be more successful when they involve local people from the start and are designed to meet a specific need identified by the community. Success can be measured in a variety of ways; however, elements such as sustainability, leadership development, and local control are more likely when local participation is encouraged.

As the most "mature" project, the St. Lucia Southeast Coast Management Project is a good example of the Wildland Program approach. Although the specific conservation need was defined by those outside the community, the St. Lucians defined what would be needed to improve and attain the conservation goals. They needed assistance to define and implement ways to increase income and better utilize resources. Now that has been done, they are able and willing to carry out activities themselves, as long as they have support for needs that may arise in the future. In a sense, in 1988 the project "graduated" from one phase to another. For integrated resource management projects, this represents the ideal process.

The participation of women in many of the wildlands project has been indirect rather than direct. This has been especially true in the early phases of some projects, where it has been important to focus directly on the activities which were most threatening in many of the buffer zones: logging/forest clearing, fishing, hunting are among the most ecologically harmful activities which needed to be stopped or modified. In Latin America, these activities are traditionally carried out by men. As the NGOs have achieved success in these activities and become known in the community, greater attention has been directed toward encouraging women's participation For example, the Gandoca and Beni projects are now encouraging greater participation by women in the project and one of the co-directors of the Kilum Mt., Cameroon project is focusing specifically on gender issues. Many of the extension education activities have included women in the project design and execution from the start.

One hypothesis which remains to be tested is whether harmful ecological impacts can be mitigated by increasing the income capacity of women. It is possible that increased income generation or productivity of women will directly benefit total household income, which in turn may reduce the pressures for household members to

engage in environmentally damaging activities. However, the empirical evidence which exists on this question is not conclusive. Therefore, it is important for projects to encourage the greatest participation possible within the bounds of the projects. In addition, we need to monitor use of increased income. Contrary to popular expectation the poor tend to invest some of their increased income rather than simply consume more; however, in the rural areas where the Wildlands Program operates, there are few investment "opportunities" and some choices, such as increased cattle, may actually be environmentally damaging.

The evaluation highlighted the need for the field projects to differentiate "education" from "participation". They indicated that increased attention should be oriented to improving the knowledge base of project staff in both of these areas. These are among the issues to be addressed at the La Planada Retreat. Additional materials have been sent to project staff to orient them to these topics. The WHNP has gained access to a social scientist through the Osborn Center, a joint WWF-CF initiative, in order to address these issues. Finally, the program director has recently completed a US AID sponsored training course on Rapid Rural Appraisal Techniques which has considerable potential application to community involvement in project design.

6. Leadership Development

Leadership development is a critical component of the success of many of the wildlands program activities, which goes hand-in-hand with institutional development. The program has been addressing leadership development in a number of ways, from formal training through courses or workshops for students and project staff to informal activities to support local leaders.

In addition to institutional strengthening a critical benchmark must involve leadership. The organizations which have received funding from the Program, most of which are non-governmental, are staffed by competent and committed people who manage the projects efficiently and effectively. In practically all cases, these leaders have been able to achieve a high degree of coordination with governmental, non-governmental entities and, most importantly, with local village leaders, thus enhancing the reach and impact of project activities. An exception at the moment exists in Mexico where government-NGO relations are somewhat negative. Leadership is primarily national; however, an urban national may be as much an "expatriate" in a rural setting as any foreigner. Fortunately the program has been able to attract either nationals or foreigners who are prepared to live with the local people and are committed to their attainment of the leadership role.

It will become increasingly important for the program to learn how to encourage local participation and leadership simultaneously. From the PVO community we have learned the strong leaders may be the same individuals who do not encourage broad based participation. Encouraging leadership in such a way that it encourages the development of a set of long-lasting skill, while at the same time encourages long-term, broad based participation is a difficult challenge. Especially as the field projects seek to "graduate" field projects to local organizations (where that has not yet occurred), they must be certain that the leadership and institutional mechanism exist for the long-term sustainability of the projects.

7. Innovation and Technology Transfer

The goal of sustainablity requires the eventual withdrawal of most external funding; however, initially such funds may be critical to absorb some of the risk involved in the rural poor undertaking new activities. The Program has taken the view that previously existing, locally tested techniques are more likely to succeed than major, complex and imported solutions. Thus the program does not stress innovation or new technical solutions.

Nevertheless, many of the projects do involve modest technical innovations or adaption of technologies which are new to the area, but are known to work effectively in other situations. Those which have met with the greatest success (St. Lucia- sea moss; Sian Ka'an palm and lobster) are those which have used a combination of approaches to work with local people. Important conditions are that local people should have participated in the innovation or transfer process, so the products or technology will have been tested by users.

Most effective technology transfer occurs when peers exchange information. In other words, local peoples are trained as trainers and they carry information to their fellow resource users. Technology transfer programs should feature the training of trainers, rather than the training of individual resource users. "Hands-on", "on-site" training is most effective. South-south exchanges are an effective vehicle for technology transfer.

Another approach is for projects to have an "extensionist," whether explicitly defined that way or not. Use of extension techniques and education components have been successful at increasing general understanding of project objectives and methods. However, extension and education should not be confused with participation. Improving or modifying existing technologies or activities, based on the recommendations of the local community has been most effective. Allowing them to participate in the modification, transfer or training process has led to the greatest success.

The third year of the program has reinforced our initial view that WHNP funds are not best used to develop whole new technologies but rather to draw on those that are used locally, test them and demonstrate their worth more broadly. The ultimate goal is to assist people within a given community to achieve lasting improvement in their social and economic condition through an incremental process which sustains the biological resource base upon which they depend or within which they reside. Modest improvements of local traditions are much more readily adopted and often more effective than radical new techniques. Thus, most WHNP project activity focuses on improvement of the efficiency of already locally validated systems of resource management.

8. Policy Implications

The issue of benefit distribution raises perhaps the difficult policy question of legal rights to resources (the rights to the increased resources themselves; the rights to resources within the protected or managed area which forms the heart of each WHNP project or most difficult of all the allocation of rights among genders in a community). In Africa, the three major WHNP projects all focus on establishing or creating protected areas where local access and use of wildlife or wild resources is legally recognized. In the Caribbean most of the project activity is taking place on private lands or in the

commons outside protected areas. Similarly, in the Annapurna Conservation Area in Nepal, a major project modeled on the WHNP experience, a whole new category of managed land is being established primarily with the objective of legalizing village control over resources in the protected area and retaining and distributing income within the local area.

The governmental policy issue of legal right is avoided to an extent in the Caribbean, Africa and Asia by working in multiple use areas but the ethical issue between resource users remains. In Latin America it is beyond the capability of many of the field projects to tackle structural problems or legal issues without beginning a wholesale revision of protected area legislation. The multiple use approach with community management must prove itself capable of conserving resources over a much longer time frame before the Program would promote major policy changes in the existing Latin American protected area network which has been built up at great personal and financial costs over decades. Rather than revising the existing system we encourage use of these approaches in new areas.

In future years of the program, the WHNP should work closely to help define the critical issues which threaten to undermine the field projects. Although initially these issues have been defined primarily in legal terms, there are a variety of governmental policies, including legal issues, that could affect the performance of the field projects. Helping to organize regional or international organizations to define and address these issues should increasingly become an objective of the program. Thus, the program would encourage appropriate field based responses through local institutions, and promote policy reforms at appropriate governmental or institutional levels. The link to the Osborn Center will be particularly valuable in this regard as has been the dialogue we have established with the Environmental Department of the World Bank.

9. Collaboration/Networking with other Agencies

In some of the Latin American countries, it has been easy for field projects to establish linkages and work with Governmental authorities; in others, there have been some difficulties in obtaining support, material or otherwise for project activities. In areas where there have been difficulties, WWF could potentially help organize other groups to mediate or it could directly adopt a stronger role and act as a "facilitator" if necessary. In many instances the projects have helped to create and strengthen a variety of linkages among institutions. For example, many of the interdisciplinary teams which have developed operational or management plans for reserves are drawn from a variety of public and private institutions. The increases the institutional base of knowledge in those agencies, as well as the commitment, to supporting the reserve.

Project discussions with PVOs during the first three years of the project have lead to several joint projects. The Awa/La Planada project in Ecuador/Colombia undertaken with Cultural Survival and the Zambia project built upon early work of Africare. The WHNP has encouraged ties to the development community beyond the program itself. Lead by the WHNP Director, cooperative efforts are underway with the Ford Foundation in Indonesia and Zimbabwe and in Uganda with CARE's forestry program funded by the Uganda AID Mission and the Africa Bureau. The WHNP has also played the lead role for WWF in the development of two potential tripartite arrangements: First a joint effort with IIED and TNC to assist USAID linking biological diversity to international

development efforts and most recently a proposed joint venture with CARE and the Experiment for International Living to work on NGO development in Africa.

Through the WHNP, WWF has participated in the CODEL hosted "Dialogue on Improving Collaboration among NGOs Working in Environment, Development and Population" and helped to support the Smithsonian Symposium on "CULTURE: The Missing Element in Conservation and Development".

The Advisory Committee met during the program's third year to review and discuss the proposed Wildlands and Human Needs Training program scheduled for November 1988. A principle staff resource at the seminar/workshop is provided by Save the Children of Colombia. The focus of the Advisory Committee on such specific topics was most valuable and we expect the next meeting to review the proposed conceptual framework.

A fundamental premise of the original WHNP proposal was the ability to replicate the experience of Latin America and the Caribbean in Africa. The original proposal stated: "We expect that techniques used in Latin America will be applicable to similar biomes in Africa, such as the tropical forests of Uganda. The community structure will be different in Africa, and different techniques may be required to achieve self-sufficiency for wildland programs. However, much the same issues will motivate our program in Africa, and successful projects will use similar elements. Indeed, in some instances the greater human pressure on wildlands in Africa has accelerated the process of community involvement in wildland management when compared to Latin America." In some respects this has proven to be the case, for example, concerns with the legal limits on access to resources on protected areas of Latin America has lead the program to focus on multiple use areas in Africa. However in one significant respect transatlantic replication has not occurred. NGOs have formed a keystone to the WHNP strategy in many Latin projects; however, traditional environmental NGOs are a scarce commodity in much of Africa. In a number of instances such wildlife NGOs that do exist are expatriate dominated. In Africa the program has successfully relied on government agencies indicating that NGOs may not be pivotal in launching a WHNP project. Nevertheless, we continue to believe a base beyond the government will be important and in Africa we will be looking toward traditional/community groups which have some of the characteristics of an NGO as well as seeking to add environmental concerns to the agenda of multipurpose NGOs.

Special note on collaboration with the Peace Corps:

During the program's third year, a particularly valuable collaborated arrangement developed in the African Wildlands and Human Need Projects. Peace Corps has increasingly had more direct interaction with AID in the last five years than during its early history. This cooperation is now being actively promoted. The WHNP is benefitting from this relationship and has been able to introduce the need to link conservation and development issues to Peace Corps.

Of the five WHNP projects in Africa, four involve Peace Corps Volunteers (PCV's) to varying degrees ranging from project executants in Malawi and Sierra Leone to technical experts in Cameroon and the Central African Republic (CAR). Only the Zambia project, in a country which has no Peace Corps program, is without PCV's.

The WHNP has had an important influence on the direction Peace Corps programs have taken. The necessity of addressing the needs of the rural poor in conservation projects is now being included by Peace Corps as in Sierra Leone where a park project funded by WWF and staffed by PCV's is looking at rural development and the need for increased community participation as a result of WHNP funding. The project has resulted in the inclusion of rural agriculture and health PCV's in an area where a parks program was the only Peace Corps presence. In Malawi, volunteers responsible for the conservation and development project at Lake Malawi are addressing fuelwood and alternative protein needs of rural people in addition to park management and development.

In countries where specific technical expertise is lacking Peace Corps, through its Office of Training and Program Support (OTAPS), provides not only technical people but, back-up support, training, assessment and equipment. In the CAR, a fisheries volunteer is being trained and equipped by OTAPS before beginning to work on the Dzanga-Sangha Dense Forest project. Additionally, OTAPS technical staff will be visiting the project to assess agroforestry possibilities and Peace Corps input requirements. In Cameroon, a PCV is providing technical support to the Mt. Oku Honey Cooperative to improve quality and marketing of their product. Local income derived from the Oku forests is a valuable incentive for montane forest conservation.

It is anticipated that cooperation with Peace Corps will continue to increase through the next phase of the WHNP. PCV's are uniquely placed to interact at a community level and provide much needed technical support to WHNP projects in Africa, as well as Latin America. The program in that region has now established similar links and we expect PCVs as active participants in the Rio Plantano project in Honduras.

Special note on collaboration with the Biosphere Reserve Program:

Unesco's Man and the Biosphere (MAB) Program, a multifaceted effort to study the relationship between human development and planet's natural ecosystem, includes one project which has become a key component of several of the WHNP field projects. This effort, known as MAB 8, the Biosphere Reserve Program, is attempting to establish a global network of protected natural areas that represent the major ecosystems of the planet. However, in addition to protection, these reserves are also being used to identify, study, and transfer appropriate land use practices that could minimize the impact of human development on these ecosystems. Biosphere reserves typically include a core natural area and often encompass rural communities and areas under human exploitation. Both natural and cultural conservation are priority management goals for these reserves.

Several projects supported by the WHNP lie within biosphere reserves. These include the projects in Sian Ka'an and Manantlan in Mexico, the Rio Platano in Honduras, the Cabecar Indian Reserve in Ecuador (a proposed biosphere reserve), and the Beni reserve in Bolivia. All of these are important natural areas, but also distinguished by the efforts of land managers to incorporate, rather than exclude, local residents into management programs.

The Biosphere Reserve Program has attracted a great deal of attention from the conservation community in Latin America where it is strongly supported by local conservationists as an appropriate wildland management strategy for a third world setting. But while guidelines for biosphere reserve management support integrated

development and the research, monitoring, extension and evaluation needed to make it work, the lack of human and financial resources has inhibited widespread implementation of these projects. Consequently, despite a management structure conducive to technology transfer, many biosphere reserves are barely distinguishable from more traditional wildland units such as national parks, even though their managers often would welcome the initiation of ecodevelopment projects.

The WHNP has helped several biosphere reserve managers to identify, design and implement integrated rural development projects. The program is playing a key role in helping MAB in Latin America to realize its potential at several biosphere reserve sites. In addition to providing technical and financial assistance as well as training opportunities, the WHNP has also helped to facilitate another major goal of the biosphere reserve program, the development of a global communications network between these reserves. Biosphere reserve managers have visited other reserves as part of WWF's commitment to "south-south" exchanges, and communication between projects has been stimulated through correspondence, regional conferences and the new WHNP newsletter.

This Unesco program has been heralded as one of the most significant innovations in conservation concepts; however, the program has failed to reach its potential in Latin America and has even less impact on Africa and Asia. Though modest in its total monetary contribution, the impact of the WHNP on the initiation of ecodevelopment work in several Latin American biosphere reserves will have, we hope, considerable impact on strengthening the implementations of the biosphere reserve concept and defining the program as an important contribution to land use planning beyond protected areas.

10. Replication of the Approach

There are a variety of elements in many of the projects which are replicable. Yet it would be a serious mistake to think that any of the projects could be transferred to other areas. The specific conditions and elements which are important vary from site to site, community to community. Each project must be carefully custom tailored to the national, cultural, economic and institutional/political idiocrasies of its location. As William and Elizabeth Paddock pointed out some years ago in their critique of international assistance "If a project succeeds, it is because it is right for the place, because the air and the water and the land are right. Some know-how may be important, some money may help to get it going more quickly, but no amount of either will make a project right for the wrong spot."

What can be transferred though is an understanding of the approach and philosophy, the processes, techniques and materials used, and what has worked, what hasn't and why. It is clear that these experiences will vary by the type of project, the region of the world, and the capabilities of the local community and NGOs.

In a short amount of time, there has been a remarkable growth and acceptance of the importance of an integrated approach to conservation within WWF, within the international conservation and development communities and, perhaps least surprisingly, within rural communities themselves. Yet the program wants to emphasize in the coming years a systematic approach to a better understanding of the field projects. While no wholesale transfer of information or technologies will occur, we will develop broad guidelines and implementation strategies to be promoted in the future. This will allow future projects to build on a solid knowledge base of what the critical elements in many projects have been. We hope to replicate experience if not actual projects. An analysis

of five rural development success stories concluded that "...the blueprint approach never played more than an incidental role in their development. These five programs were not designed and implemented - rather they emerged out of a learning process in which villagers and program personnel shared their knowledge and resources to create a program which achieved a fit between needs and capacities of the beneficiaries and those of the outsiders who were providing the assistance. Leadership and teamwork, rather than blueprints, were the key elements." David Korten "Community Organization and Rural Development: a Learning Process Approach", 1980.

VIII. RECOMMENDATIONS

After three years of experience WWF and the Wildlands and Human Needs Program has accumulated practical experience and can begin to formulate recommendations, primarily to improve our own preformance, and more hestinatly, to other donors and to colleagues in developing countries.

To Project Leaders and PVOs

1. The WHNP should develop a conceptual framework against which projects can test various strategies and to allow the project leaders to see how their projects fit into the overall program objectives. At the same time, the conceptual framework must avoid a rigidity which stifles responsiveness to communities and project flexibility.

2. Project leaders are practically oriented problem solvers but the WHNP headquarters staff should devote additional time to assist their preliminary efforts to record and analyze field level conservation and development experience. The WHNP needs to balance action and introspection - The former dominated during the initial matching grant but additional attention is now needed on the latter and on the dissemination of the knowledge gained.

3. Several management aspects of the WHNP need to be analyzed and adjusted: the relationship between indepth management of existing model projects versus the creative opportunity provided by new project ideas and the proper balance between provision of financial resources and support though WWF staff expertise. It is recommended that additional WWF staff commitment be made with special attention to the model projects.

4. It is recommended that three aspects of the program begun during 1988 be expanded in future years: first, the training of project staff, community and government personnel; second, preparation of materials and case studies linking resource management with rural development and third, joint projects with development PVOs (when such efforts are built on field level interest, not mandated by the home office.)

5. WWF has evolved from a grant maker to third parties to an operating foundation which plans and helps develop projects collaborating with local partners. Nevertheless, institutionally provision of funds are still perceived as the primary benefit provided by WWF. It is recommended that greater attention be given to the provision to projects of staff services and support functions with an increased emphasis on social science/development expertise.

6. Although a start has been made during 1988, WWF still needs to strengthen access of the WHNP to women and also its program of monitoring and learning (the term learning is deliberately recommended rather than evaluation).

7. To effectively locate the WHNP within WWF's regional structure, the program should constitute the twenty-one best integrated conservation and development projects, representing WWF's long term commitment to understanding the challenge of this field. The distinction between model and secondary projects should be dropped. Where WHNP projects are located in presently non-matching grant countries (such as Nepal and Thailand) mission approval should be sought to enable WWF support to be used to meet its 2:1 match. WWF should continue to pursue development oriented approaches with its regular program.

To Country and Local Leaders

8. New resource management approaches are needed to complement traditional protected areas. These approaches need legal and policy instruments which support multiple use of areas and particularly which encourage allocation or sharing of benefits not to central treasury but with local communities. Examples to be investigated include availability of credit in multiple use areas even when full title to land does not exist (when activities are consistent with management objectives) and wider application of the revolving fund approach utilized in Zambia.

9. Government training programs focused on resource management agencies (parks and wildlife departments, forest services) should be expanded to include extension training and community development skills.

To Donors and other Organizations

10. Project methodologies should be flexible and able to be modified to reflect lessons learned and also new opportunities or constraints. These projects are extemely dynamic, we are learning more every day and changing our perceptions about project design and implementation. While the basic goals of the effort remain unchanged, the strategy for realizing them has been altered. Donors need to be flexible enough to allow project leaders to make these mid-course corrections.

11. Undue adherence to a requirement of replication may jeopardize project effectiveness. The "style" of each successfull WHNP is important and must be tailored to its particular circumstances in the belief that the best locus of a solution is as close to the problem as possible; and that the dignity of the recipient is always more important than the aid itself. Guidelines and training programs may be more significant project results than attempts to replicate actual project activities.

12. Support should be provided for establishment of a Project Preparation Facility. Such a facility has been proposed by several individuals within the World Bank in recognition of the need for grant funds and the extended time period required to develop community based resource management. Projects developed could subsequently receive major Bank or other donor funding. The facility should be

housed within and NGO/PVO and it must be given flexibility and indepndence to investigate why, when many lessons of successful rural development are known, they are so difficult to practice at the scale and within the structure of large aid agencies. The WHNP staff could provide the core of such a facility at WWF.

13. Continued and expanded donor support for projects which integrate specialities, fields, objectives will be important if a new professional alinement is to develop which seeks to bridge the gap between human and resource management concerns. These programs will, at these early stages, be inherently staff intensive while results will be long term.

IX. ATTACHMENTS

Attachment A

PVO Project Reporting Information
on AID Supported PVO Projects

PVO PROJECT REPORTING INFORMATION ON AID SUPPORTED PVO PROJECTS

OMB No. 0412-[illegible]
Expiration Date: 03/31/89

FOR OFFICIAL USE ONLY

PVO Type	Project Number	
Appropriation	Level	
Country Code	Fund Type	Technical Code
Project Officer	Key 1	Key 2

PROJECT INFORMATION (PRIMARY)

Name of Organization: World Wildlife Fund		Grant/Contract Number: PDC-0268-G-SS-5092-00
Start Date (MM/DD/YY): 9/30/85	End Date (MM/DD/YY): 9/30/88	AID Project Officer's Name: Margarite Potee

AID OBLIGATION BY AID-FY ($000)

FY	AMOUNT	FY	AMOUNT
LOP [redacted]			

Activity Description

The Manantlan Biosphere in Mexico covers an areas of approximately 100,000 hectares in southwest Mexico. The site is of international significance because its cloud forest harbors the most important agricultural discovery of the century, Zea diploperennis, a wild perennial species of corn. Nearly 1500 people live in the surrounding area and regularly harvest wildlift, timber and plants from the reserve. the project seeks to establish a multiple use management plan for the reserve that will ensure the protection of improtant species and allow for sustainable development activities. The area is managed by the University of Gaudalajara and other government institutions.

Status

In the first half of 1986, a training workshop on protected area planning and management was held for 35 participants from the University of Guadalajara and other institutions involved in the reserve's management. A two-year operational plan for the Biosphere Reserve and the ecological reserve within it have been completed, and most of the long-range management plan has also been drafted. Much of the operational plan is noe implemented. Scientific investigations are being carried out on a variety of topics with emphasis on studies needed to identify appropriate land use practices within and adjacent to the reserve. Innovative education and extension programs with local inhabitants is aimed at improving their quality of life while reducing their negative impacts on the resources of the area. A community health program and a citrus project have been initiated as part of the reserves ecodevelopment program. Work was also begun on a plan for the sustainable management of the forest resources by the local "ejidos." This project was evaluated by the AID Wildlands evaluation team.

COUNTRY INFORMATION (SECONDARY)

Country: Mexico	Location in Country (Region, District, Village): States of Jalisco and Colima
PVO Representative's Name: R. Michael Wright	Local Counterpart/Host Country Agency: University of Gaudalajara

COUNTRY FUNDING INFORMATION ($000)

YEAR	85-86	86-87	87-88	88-89	89-90
AID $	12,500	15,000	10,000	23,000	18,000
PVO $	12,500	15,000	10,000	23,000	18,000
IN KIND					
LOCAL	300,000	300,000	350,000	160,000	170,000
TOTAL [redacted]	325,000	330,000	370,000	206,000	206,000

AID 1550-11 (6-86)

(See Instructions & OMB Statement on reverse)

PVO PROJECT REPORTING INFORMATION ON AID SUPPORTED PVO PROJECTS

OMB No. 1412-0030
Expiration Date: 03/31/89

FOR OFFICIAL USE ONLY

PVO Type	Project Number	
Appropriation	Level	
Country Code	Fund Type	Technical Code
Project Officer	Key 1	Key 2

PROJECT INFORMATION (PRIMARY)

Name of Organization: World Wildlife Fund		Grant/Contract Number: PDC-0268-G-SS-5092-00
Start Date (MM/DD/YY): 9/30/85	End Date (MM/DD/YY): 9/30/88	AID Project Officer's Name: Margarite Potee

AID OBLIGATION BY AID-FY ($000)

FY	AMOUNT	FY	AMOUNT

LOP [redacted]

Activity Description

The Sian Ka'an Biosphere Reserve in Mexico is a 1.2 million acre wetland area that protects a diversity of lowland and coastal ecosystems ranging from tropical forest to coral reefs. The area is being managed for multiple uses and, though sparsely populated, is important for supporting the local economies of the regional populous, especially local fisherman who are being integrated into resource management programs. Four projects being supported by the Wildlands program include: El Ramonal Agricultural Development, Spiney Lobster Management Project, Ecological Study and Management Evaluation of Three Palm Genera in the Sian Ka'an Reserve and the Sian Ka'an Ecotourism Project. An intensive forage production project and a rural education project were added to this WHNP site in 1988. In addition a joint project with SEDUE will produce interpretive materials for visiting tourists.

Status

The El Ramonal Project has already established esperimental agricultural plots with local inhabitants of the reserve. Agroforestry techniques are being taught to locals and their activities are being monitored. The Spiney Lobster studies have been initiated and local fishermen are cooperating with marine biologists in providing data and implementing management techniques. The Palm Study is well underway with much of the basic data gathering being carried out and work on the palm management plan in the initial stages of development. The ecotourism project has focused on the development of tourism infrastructure and marketing. This project was evaluated by the AID Wildlands evaluation team.

COUNTRY INFORMATION (SECONDARY)

Country: Mexico	Location in Country (Region, District, Village): Quintana Roo
PVO Representative's Name: R. Michael Wright	Local Counterpart/Host Country Agency: Amigos de Sian Kaan

COUNTRY FUNDING INFORMATION ($000)

YEAR	85-86	86-87	87-88	88-89	89-90
AID $	14,133	20,000	20,000	23,000	15,000
PVO $	14,133	20,000	20,000	23,000	15,000
INKIND	5,000	10,000	10,000		
LOCAL	5,000	10,000	20,000	30,000	50,000
TOTAL	38,266	60,000	70,000	76,000	75,000

AID 1550-11 (6-86)

(See Instructions & OMB Statement on reverse)

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PVO PROJECT REPORTING INFORMATION
ON AID SUPPORTED PVO PROJECTS

Expiration Date: 03/31/89

FOR OFFICIAL USE ONLY

PVO Type	Project Number	
Appropriation	Level	
Country Code	Fund Type	Technical Code
Project Officer	Key 1	Key 2

PROJECT INFORMATION (PRIMARY)

Name of Organization: World Wildlife Fund		Grant/Contract Number: PDC-0268-G-SS-5092-00
Start Date (MM/DD/YY): 9/30/85	End Date (MM/DD/YY): 9/30/88	AID Project Officer's Name: Margarite Potee

AID OBLIGATION BY AID-FY ($000)

FY	AMOUNT	FY	AMOUNT
LOP			

Activity Description

The Monterrico Biotope Reserve which is managed by the University of San Carlos, protects an ecologically and economically important mangrove area on the Pacific coast of Guatemala. The area is occupied by several thousand rural villages who regularly harvest fish and wildlife and mangrove trees in the reserve. The project seeks to work with the local population to appropriately manage this use to insure the sustainable supply of wildland resources while protecting fragile ecosystems and biological diversity.

Status

This project has existed for several years but has progressed in fits and starts due to lack of budget and trained staff. Financial and technical support from the WHNP should improve the quality and continuity of CECON's efforts. This first year of WWF collaboration will focus on education and extension programs with local resource users. This will also provide funding needed to continue inventories of natural and cultural features, the development of appropriate technologies for resource utilization (such as the raising of iguanas as a food source) and the completion of the reserve management plan. Several reserve staff also participated in WWF supported workshops on wildland management and environmental education.

COUNTRY INFORMATION (SECONDARY)

Country: Guatemala	Location in Country (Region, District, Village): coastal Pacific area
PVO Representative's Name: R. Michael Wright	Local Counterpart/Host Country Agency: Conservation Center of the University of San Carlos (CECON)

COUNTRY FUNDING INFORMATION ($000)

YEAR	88-89	89-90			
AID $	15,000	15,000			
PVO $	15,000	15,000			
IN-KIND					
LOCAL	10,000	15,000			
TOTAL	40,000	45,000			

AID 1550-11 (6/85)

(See Instructions & OMB Statement on reverse)

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PVO PROJECT REPORTING INFORMATION
ON AID SUPPORTED PVO PROJECTS

OMB No. 0412-0530
Expiration Date: 03/31/89

FOR OFFICIAL USE ONLY

PVO Type	Project Number	
Appropriation	Level	
Country Code	Fund Type	Technical Code
Project Officer	Key 1	Key 2

PROJECT INFORMATION (PRIMARY)

Name of Organization: World Wildlife Fund		Grant/Contract Number: PDC-0268-G-SS-5092-00
Start Date (MM/DD/YY): 9/30/85	End Date (MM/DD/YY): 9/30/88	AID Project Officer's Name: Margarite Potee

AID OBLIGATION BY AID-FY ($000)

FY	AMOUNT	FY	AMOUNT
LOP			

Activity Description

The 300,000 hectare Rio Platano Reserve in the Caribbean Watershed of Honduras protects varied tropical habitats, ranging from cloud forest to lowland rainforest, pine savanna and coastal lagoons and mangroves. Several hundred Miskito Indians and some Paya Indians inhabit the area and regularly harvest fish and wildlife to supplement their diet of corn, bean, rice, yucca, platano and other fruits and vegetables. However, in recent years, the reserve has been beleaguered by a variety of resource threatening activities. These include the invasion of reserve lands by agricultural colonists in the buffer zone and upper watershed, the illegal commercial harvesting of timber products by a Honduran commercial logging company, gold mining and settlemet of several hundred refugees within the border of the unit. The site is managed by the Honduran Department of Renewable Resources (REMARE) and the Honduran Ecological Association (a non-governmental conservation group) as a Man and the Bioshphere (MAB) Reserve. A management plan with strong rural development component was written in 1979 and parts ave been implemented. Resource inventories and anthropological studies have been carried out and a visitor center and guard stations constructed.

Status

The WHNP supported the elaboration of an operational plan which was developed by a multi-institutional planning team. This study assessed management problems and identified needed protection and ecodevelopment activities in the buffer and cultural zones of the reserve. The plan was developed using a workshop format led by a WWF consultant with the active participation of a variety of governmental and non-governmental agencies and the reserve inhabitants and resource users. Over 30 individuals participated in this inter-institutional workshop, which included three weeks in and near the reserve assessing the status of the project and drawing up an emergency operational plan. A plan implementation team has been formed and is establishing a base in the buffer zone. They have now begun to carry out several of the management programs identified in the operational plan.

COUNTRY INFORMATION (SECONDARY)

Country: Honduras	Location in Country (Region, District, Village): Platano River Watershed
PVO Representative's Name: R. Michael Wright	Local Counterpart/Host Country Agency: Honduran Ecological Association

COUNTRY FUNDING INFORMATION ($000)

YEAR	85-86	86-87	87-88	88-89	89-90
AID $	19,563	20,000	20,000	17,000	15,000
PVO $	19,562	20,000	20,000	17,000	15,000
INKIND					
LOCAL	10,000	30,000	30,000	25,000	100,000
TOTAL	49,125	70,000	70,000	57,000	130,000

AID 1550-11 (6-86)

(See Instructions & OMB Statement on reverse)

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PVO PROJECT REPORTING INFORMATION
ON AID SUPPORTED PVO PROJECTS

Expiration Date: 03/31/89

FOR OFFICIAL USE ONLY

PVO Type	Project Number	
Appropriation	Level	
Country Code	Fund Type	Technical Code
Project Officer	Key 1	Key 2

PROJECT INFORMATION (PRIMARY)

Name of Organization: World Wildlife Fund		Grant/Contract Number: PDC-0268-G-SS-5092-00
Start Date (MM/DD/YY): 9/30/85	End Date (MM/DD/YY): 9/30/88	AID Project Officer's Name: Margarite Potee

AID OBLIGATION BY AID-FY ($000)

FY	AMOUNT	FY	AMOUNT
LOP			

Activity Description

The Gandoca Land Titling and Wildlife Refuge Project is a multifaceted effort which inlcudes estalbishment and management of a wildlife refuge combined with extensive land titling of the surrounding areas to local campesinos. Local populations will be trained in agroforestry and aquaculture extension while receiving basic environmental education. The project is being carried out by a Costa Rican Institution, ANAI. The premise behind this project is that if given title to the land and the technology to sustainably utilize it, small farmers will appropriately manage forest farms and resources.

Status

The communities have been organized and a regional census and survey of the area have been completed. Most of the legal work related to acquiring the land title is also finished. Nearly 25 communally operated tree nurseries have been established and agricultural extension programs are being carried out. The wildlife refuge has been officially established by presidential decree and an operational plan has been written and is being implemented. The reserve manager, with a grant from this program, participated in a regional workshop on coastal management. Other ecodevelopment activities have been initiated including a reef utilization program and ground work is being laid for an ecotourism and environmental education program. This project was evaluated by the AID Wildlands evaluation team. Land titles should be issued to at least 300 farmers before the end of FY 89.

COUNTRY INFORMATION (SECONDARY)

Country: Costa Rica	Location in Country (Region, District, Village): Gandoca
PVO Representative's Name: R. Michael Wright	Local Counterpart/Host Country Agency: ANAI

COUNTRY FUNDING INFORMATION ($000)

YEAR	85-86	86-87	87-88	88-89	89-90
AID $	26,000	25,000	20,000	25,000	23,000
PVO $	26,000	25,000	20,000	25,000	23,000
INKIND					
LOCAL	15,000	20,000	25,000	90,000	100,000
TOTAL	67,000	70,000	65,000	130,000	146,000

AID 1550-11 (5 86)

(See Instructions & OMB Statement on reverse)

PVO PROJECT REPORTING INFORMATION
ON AID SUPPORTED PVO PROJECTS

Expiration Date: 03/31/89

FOR OFFICIAL USE ONLY

PVO Type	Project Number	
Appropriation	Level	
Country Code	Fund Type	Technical Code
Project Officer	Key 1	Key 2

PROJECT INFORMATION (PRIMARY)

Name of Organization: World Wildlife Fund		Grant/Contract Number: PDC-0268-G-SS-5092-00
Start Date (MM/DD/YY): 9/30/85	End Date (MM/DD/YY): 9/30/88	AID Project Officer's Name: Margarite Potee

AID OBLIGATION BY AID-FY ($000)

FY	AMOUNT	FY	AMOUNT
LOP			

Activity Description

The project on Land Use by the Cabecar Indians of the Telire Indian Reserve located within La Amistad Biosphere Reserve of Costa Rica will provide a comprehenive reivew of land use practices by indigenous peoples. The project provides financial asistance to an anthropologist affiliated with the Tropcial Agricultural Research and Training Center (CATIE) who will study the methods used by the people, the quality and quantity of the resources exploited and how the resources are being used. The project results will provide the basis for management guidelines for the Telire Reserve which will then form part of a more general management plan for La Amistad Biosphere Reserve being prepared by an interdisciplinary, interinstitutional planning team coordinated by CATIE and the Costa Rican National Park Service.

Status

The investigator has lived with the Cabecar Indians for several months. The initial studies are complete and a final technical report submitted. This document was incorporated into the management plan for the reserve which was completed in 1987.

COUNTRY INFORMATION (SECONDARY)

Country: Costa Rica	Location in Country (Region, District, Village): LA Amistad Biosphere Reserve
PVO Representative's Name: R. Michael Wright	Local Counterpart/Host Country Agency: CATIE

COUNTRY FUNDING INFORMATION ($000)

YEAR	85-86				
AID $	2,400				
PVO $	2,400				
INKIND	3,000				
LOCAL					
TOTAL	7,800				

AID 1550-11 (6-86) (See Instructions & OMB Statement on reverse)

PVO PROJECT REPORTING INFORMATION
ON AID SUPPORTED PVO PROJECTS

OMB No. 0412-0040
Expiration Date: 03/31/89

FOR OFFICIAL USE ONLY

PVO Type	Project Number	
Appropriation	Level	
Country Code	Fund Type	Technical Code
Project Officer	Key 1	Key 2

PROJECT INFORMATION (PRIMARY)

Name of Organization: World Wildlife Fund		Grant/Contract Number: PDC-0268-G-SS-5092-00
Start Date (MM/DD/YY): 9/30/85	End Date (MM/DD/YY): 9/30/88	AID Project Officer's Name: Margarite Potee

AID OBLIGATION BY AID-FY ($000)

FY	AMOUNT	FY	AMOUNT
LOP			

Activity Description

Cuyabeno Wildlife Production Reserve: The long term goal of this project is to protect both the natural and cultural resources of the reserve while providing a sustainable harvest of wildlife for the utilization of the regional population. The five stages of the project are: 1. Meetings between the coordination team (a private consultant and the director of the reserve) and various indigenous groups, NGOs and governmental organizations to organize the Planning Workshops of Stage 3. 2. On-site assessment of the Cuyabeno Reserve to serve as background information for Stage 3. 3. Two planning workshops of more than 30 governmental organizations and NGOs to prepare a draft master management plan for Cuyabeno. 4. Editing of draft and publication and distribution by Dept de Parques Nacionales. 5. Implementation of the management plan.

Status

Stages I-V of the project were completed. A wildlands planning consultant, sponsored by WWF, worked with the Director of the Cuyabeno Reserve and the Coordination Team. Meetings and interviews were held with park officials to develop emergency measures for effectively addressing these issues. Key individuals and agencies were also consulted and the emergency management guidelines drawn up. Interviews ad meetings with several groups have been held although the large workshops originally planned for Stage III were substituted with smaller meetings. The plan was finished, printed and is now being distributed. While there was little progress in FY88 due to the absence of the project director and the lack of a vehicle, work in 1989 will focus on implementing the management strategy. Through support of the WHNP, the reserve director attended a wildlands management course.

COUNTRY INFORMATION (SECONDARY)

Country: Ecuador	Location in Country (Region, District, Village): Amazon Region-Napo Province
PVO Representative's Name: R. Michael Wright	Local Counterpart/Host Country Agency: Dept of National Parks

COUNTRY FUNDING INFORMATION ($000)

YEAR	85-86	86-87	87-88	88-89	89-90
AID $	6,500	6,000		20,000	15,000
PVO $	6,500	6,000		20,000	15,000
INKIND	4,000	10,000			
LOCAL			20,000	20,000	50,000
TOTAL	17,000	22,000	20,000	60,000	80,000

AID 1550-11 (6-86)

(See Instructions & OMB Statement on reverse)

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OMB No. 0412-0520
Expiration Date: 03/31/89

PVO PROJECT REPORTING INFORMATION ON AID SUPPORTED PVO PROJECTS

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PVO Type	Project Number	
Appropriation	Level	
Country Code	Fund Type	Technical Code
Project Officer	Key 1	Key 2

PROJECT INFORMATION (PRIMARY)

Name of Organization: World Wildlife Fund		Grant/Contract Number: PDC-0268-G-SS-5092-00
Start Date (MM/DD/YY): 9/30/85	End Date (MM/DD/YY): 9/30/88	AID Project Officer's Name: Margarite Potee

AID OBLIGATION BY AID-FY ($000)

FY	AMOUNT	FY	AMOUNT

LOP

Activity Description

This project seeks to develop a comprehensive management plan for the protection, management and development of the recently established Awa Ethnic Forest Reserve which encompasses nearly 100,000 hectares of densely forested mountainous terrain in northwestern Ecuador near the Colombian border. The area is occupied by the Awa Indians who have been fully incorporated into the management planning process. They will eventually assume full management responsibilities for the reserve.

Status

Substantial community development and organization work has been carried out within the reserve. The management team has been organized and the team leader has participated in training programs and is now coordinating the field work. A training workshop on-site with entire management team was carried out in 1988 with the assistance of a WWF planning consultant. In addition, a representative of the project, presented a paper on the project at the IUCN General Assembly in Costa Rica. Similar work has now been initiated on the Colombian side of the Awa territory and prospects look good for the creation of an international indigenous reserve which straddles the border of both countries.

COUNTRY INFORMATION (SECONDARY)

Country: Ecuador	Location in Country (Region, District, Village): Awa Ethnic Forest Reserve
PVO Representative's Name: R. Michael Wright	Local Counterpart/Host Country Agency: CONAIE

COUNTRY FUNDING INFORMATION ($000)

YEAR	87-88	88-89	89-90		
AID $	25,000	20,000	20,000		
PVO $	25,000	20,000	20,000		
INKIND					
LOCAL	30,000	30,000	30,000		
TOTAL	80,000	70,000	70,000		

AID 1550-11 (6-86) (See Instructions & OMB Statement on reverse)

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PVO PROJECT REPORTING INFORMATION
ON AID SUPPORTED PVO PROJECTS

OMB No. 0412-0036
Expiration Date: 03/31/89

FOR OFFICIAL USE ONLY

PVO Type	Project Number	
Appropriation	Level	
Country Code	Fund Type	Technical Code
Project Officer	Key 1	Key 2

PROJECT INFORMATION (PRIMARY)

Name of Organization: World Wildlife Fund		Grant/Contract Number: PDC-0268-G-SS-5092-00
Start Date (MM/DD/YY): 9/30/85	End Date (MM/DD/YY): 9/30/88	AID Project Officer's Name: Margarite Potee

AID OBLIGATION BY AID-FY ($000)

FY	AMOUNT	FY	AMOUNT

LOP [redacted]

Activity Description

Pacaya-Samiria National Reserve in the northern Amazon of Peru, with an area of 2,080,000 hectares (the size of New Jersey), is the second largest conservation unit in Latin America. Encompassing vast expanses of lowland forest, serpentine rivers and oxbow lakes, the area is one of the few Amazonian reserves whose objectives include the rational use of its renewable resources. The area was established originally as a fisheries reserve in 1940 but was never actually managed until the recent creation of COREPASA; an interagency task force which was formed to develop and implement an operational plan. Nearly 40,000 people live around the reserve and regularly utilize the region for the harvesting of fish, wildlife, trees, plants and other wildland resources.

Status

With funds from WWF, a planning team composed of over 25 individuals from 12 different agencies developed a comprehensive reserve operational plan in 1986. The plan includes an inventory of the natural and cultural resources of the reserve as well as the detailed management activities needed for their appropriate conservation and protection. The plan is oriented toward meeting the natural resource based development needs of the 40,000 people living adjacent to the reserve while protecting the fragile natural ecosystem. It calls for a variety of well coordinated conservation actions related to reserve protection, management, resource investigations, environmental education and sustainable rural development projects. In 1987 the plan implementation was initiated. Reserve infrastructure was improved and extensive education programs were developed and are now being carried out. This project was evaluated by the AID Wildlands evaluation team. In 1988, the WHNP has focused its support on education and extension programs. A detailed education plan was completed with the help of a WWF consultant.

COUNTRY INFORMATION (SECONDARY)

Country: Peru	Location in Country (Region, District, Village): Dept of Loreto
PVO Representative's Name: R. Michael Wright	Local Counterpart/Host Country Agency: COREPASA

COUNTRY FUNDING INFORMATION ($000)

YEAR	85-86	86-87	87-88	88-89	89-90
AID $	25,000	25,000	25,000	27,000	20,000
PVO $	25,000	25,000	25,000	27,000	20,000
INKIND	20,000	25,000	30,000		
LOCAL	20,000	30,000	30,000	40,000	60,000
TOTAL	90,000	105,000	110,000	94,000	100,000

AID 1550-11 (6-86)

(See Instructions & OMB Statement on reverse)

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PVO PROJECT REPORTING INFORMATION
ON AID SUPPORTED PVO PROJECTS

Expiration Date: 03/31/89

FOR OFFICIAL USE ONLY

PVO Type	Project Number	
Appropriation	Level	
Country Code	Fund Type	Technical Code
Project Officer	Key 1	Key 2

PROJECT INFORMATION (PRIMARY)

Name of Organization: World Wildlife Fund		Grant/Contract Number: PDC-0268-G-SS-5092-00
Start Date (MM/DD/YY): 9/30/85	End Date (MM/DD/YY): 9/30/88	AID Project Officer's Name: Margarite Potee

AID OBLIGATION BY AID-FY ($000)

FY	AMOUNT	FY	AMOUNT

LOP [redacted]

Activity Description

This project will consolidate management of the Lake Titicaca National Reserve which seeks to protect reserve natural resources while providing a steady flow of wildland derived goods and services for the Uros Indians living within the reserve boundaries and the thousands of individuals living adjacent to the unit. It is hoped that the project will serve as a catalyst for initiating sound resource managment programs throughout the lake and surrounding terrestrial ecosystem which are occupied by nearly a half million Peruvians and Bolivians.

Status

In 1987 work began on the development and implementation of a new management plan for the reserve. Basic data collection on natural, cultural and economic characteristics has been collected and this will form the basis for management programs. Nearly the entire reserve staff has been sent out for special training courses and the NGO conservation group APECO has been hired to provide technical assistance and program guidance. The management plan should be completed by the end of 1988. The next phase of the project will focus on plan implementation and stepped up efforts to fully integrate reserve protection into the development plans of the many national and international agencies working in the Puno region.

COUNTRY INFORMATION (SECONDARY)

Country: Peru	Location in Country (Region, District, Village): Lake Titicaca National Reserve
PVO Representative's Name: R. Michael Wright	Local Counterpart/Host Country Agency: INFOR/APECO

COUNTRY FUNDING INFORMATION ($000)

YEAR	87-88	88-89	89-90		
AID $	12,000	12,000	13,000		
PVO $	12,000	12,000	13,000		
INKIND					
LOCAL	10,000	10,000	5,000		
TOTAL	34,000	34,000	31,000		

AID 1550-11 (6-86) (See Instructions & OMB Statement on reverse)

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PVO PROJECT REPORTING INFORMATION
ON AID SUPPORTED PVO PROJECTS

OMB No. [illegible]
Expiration Date: 03/31/89

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PVO Type	Project Number	
Appropriation	Level	
Country Code	Fund Type	Technical Code
Project Officer	Key 1	Key 2

PROJECT INFORMATION (PRIMARY)

Name of Organization: World Wildlife Fund		Grant/Contract Number: PDC-0268-G-SS-5092-00
Start Date (MM/DD/YY): 9/30/85	End Date (MM/DD/YY): 9/30/88	AID Project Officer's Name: Margarite Potee

AID OBLIGATION BY AID-FY ($000)

FY	AMOUNT	FY	AMOUNT

LOP [redacted]

Activity Description

The Beni Biosphere Reserve in Bolivia encompasses vast expanses of savannah, wetland, riverine and tropical forest ecosystems. The area is also occupied by the primarily hunting and gathering Chimase Indians and also utilized by a growing population of Mastizo colonists. The reserve is managed by the Bolivian Academy of Sciences in cooperation with the national and international organizations. Both resource protection and promotion of sustainable development are the dual goals of reserve management. Final modifications are being made on the plan and much of the reserve infrastructure has been put in place.

Status

The WHNP is supporting a five phase environmental education program which includes the collection of socioeconomic data related to the reserve population and the design and implementation of education and extension programs. These programs will be oriented around the development needs and cultural characteristics of this population. The project is currently in Phase II of its development--the actual design of activities. Considerable baseline data has already been gathered.

COUNTRY INFORMATION (SECONDARY)

Country: Bolivia	Location in Country (Region, District, Village): Balivan and Yacuma Provinces
PVO Representative's Name: R. Michael Wright	Local Counterpart/Host Country Agency: Interdisciplinary Center for Community Studies (CIEC)

COUNTRY FUNDING INFORMATION ($000)

YEAR	88-89	89-90			
AID $	7,000	7,000			
PVO $	7,000	7,000			
INKIND					
LOCAL	7,000	10,000			
TOTAL [redacted]	21,000	24,000			

AID 1550-11 (6-86) (See Instructions & OMB Statement on reverse)

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PVO PROJECT REPORTING INFORMATION
ON AID SUPPORTED PVO PROJECTS

Expiration Date: 03/31/90

FOR OFFICIAL USE ONLY

PVO Type	Project Number	
Appropriation	Level	
Country Code	Fund Type	Technical Code
Project Officer	Key 1	Key 2

PROJECT INFORMATION (PRIMARY)

Name of Organization: World Wildlife Fund		Grant/Contract Number: PDC-0268-G-SS-5092-00
Start Date (MM/DD/YY): 9/30/85	End Date (MM/DD/YY): 9/30/88	AID Project Officer's Name: Margarite Potee

AID OBLIGATION BY AID-FY ($000)

FY	AMOUNT	FY	AMOUNT

LOP

Activity Description

The Dominica Forest Resources and Development Project is envisioned as an environmental and culturally sound cottage forest industry effort which seeks to maximize economic returns from small scale forest resource utilization controlled and operated by the local populous as a means of reducing environmental impacts and increasing economic benefits of logging operations. The project is based on the theory that when local businesses receive the direct benefit of resource utilization they have a vested interest to defend those resources and will, in fact, actively support sustainable forestry practices. The Eastern Caribbean Natural Areas Managers Program (ECNAMP) is the project manager and has been very effective in initiating development oriented conservation projects throughout the Caribbean. The US Forest Service is also providing technical assistance.

Status

This project, intended to serve as a design phase for a subsequent two and a half year implementation period, has focused on a detailed analysis of the economics of the forestry market. This study is now complete and has determined the feasibility of the various outlined projects and their economic and ecological impact. A comprehensive project proposal has been developed and is in the initial implementation phase. A project office has been established and cottage forest industry workers have been incorporated into the project planning process. The project coordinator however resigned from his position at the end of 1987 and this temporarily halted project development. A new project manager has been hired, and with the help of the US Forest Service technical consultant, the project now seems to be moving again.

COUNTRY INFORMATION (SECONDARY)

Country: Dominica	Location in Country (Region, District, Village): Forested zones
PVO Representative's Name: R. Michael Wright	Local Counterpart/Host Country Agency: ECNAMP

COUNTRY FUNDING INFORMATION ($000)

YEAR	85-86	86-87	87-88	88-89	89-90
AID $	9,000	25,000	20,000	25,000	20,000
PVO $	4,300	25,000	20,000	25,000	20,000
INKIND					
LOCAL		40,000	60,000	10,000	10,000
TOTAL	13,200	90,000	100,000	60,000	50,000

AID 1550-11 (6-86) (See Instructions & OMB Statement on reverse)

PVO PROJECT REPORTING INFORMATION
ON AID SUPPORTED PVO PROJECTS

OMB No. 0412-0020
Expiration Date: 03/31/89

FOR OFFICIAL USE ONLY

PVO Type	Project Number	
Appropriation	Level	
Country Code	Fund Type	Technical Code
Project Officer	Key 1	Key 2

PROJECT INFORMATION (PRIMARY)

Name of Organization: World Wildlife Fund		Grant/Contract Number: PDC-0268-G-SS-5092-00
Start Date (MM/DD/YY): 9/30/85	End Date (MM/DD/YY): 9/30/88	AID Project Officer's Name: Margaritee Potee

AID OBLIGATION BY AID-FY ($000)

FY	AMOUNT	FY	AMOUNT

LOP [redacted]

Activity Description

The Integrated Coastal Management Project on the Southeast Coast of St. Lucia is a sustainable development effort which integrates natural resource protection, research and training. Public participation in conservation and development is the central feature of this project. The project encompasses all the major ecosystems characteristic of small insular environments in the Caribbean including seagrass beds, reefs, mangroves, dry forests, beaches and cliffs. Human activities which will be integrated within the project include artisanal fisheries, tourism, charcoal production, recreation, sand-mining, urbanization, industry and agriculture.

Status

The Maria Island Nature Reserve and Museum has been established and management has been handed over to the St. Lucia National Trust which now receives only minor technical assistance from ECNAMP. After baseline studies and six months of training in charcoal production, a charcoal cooperative has been established which plans to market charcoal to local supermarkets. This has included the establishment of firewood plantations. A fishing cooperative has been established in Sarvenas Bay and a cooperative equipment storage facility and fish processing station built. Sea moss mariculture has been conducted for the past year at four sites and several local individuals are not participating in sea moss production. Initial studies are underway to determine sea egg population sizes, distribution and potential harvest impact. An appropriate agricultural project was initiated and small farming plots are being established. During 1988-89, strategies are being developed for ensure the smooth transition of this project from primarily consultant managed to technical and administrative self-sufficiency by the local resource users.

COUNTRY INFORMATION (SECONDARY)

Country: St. Lucia	Location in Country (Region, District, Village): Southeast coast of St. Lucia
PVO Representative's Name: R. Michael Wright	Local Counterpart/Host Country Agency: ECNAMP (E. Caribbean Nat. Areas mgmt Program)

COUNTRY FUNDING INFORMATION ($000)

YEAR	85-86	86-87	87-88	88-89	89-90
AID $	23,900	25,000	20,000	25,000	25,000
PVO $	23,900	25,000	20,000	25,000	25,000
INKIND					
LOCAL				25,000	
TOTAL	47,000	50,000	40,000	75,000	50,000

AID 1550-11 (6-86)

(See Instructions & OMB Statement on reverse)

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PVO PROJECT REPORTING INFORMATION
ON AID SUPPORTED PVO PROJECTS

Expiration Date

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PVO Type	Project Number	
Appropriation	Level	
Country Code	Fund Type	Technical Code
Project Officer	Key 1	Key 2

PROJECT INFORMATION (PRIMARY)

Name of Organization: World Wildlife Fund		Grant/Contract Number: PDC-0268-G-SS-5092-00
Start Date (MM/DD/YY): 9/30/85	End Date (MM/DD/YY): 9/30/88	AID Project Officer's Name: Margarite Potee

AID OBLIGATION BY AID-FY ($000)

FY	AMOUNT	FY	AMOUNT
LOP			

Activity Description

In October 1986, the University of the West Indies' Center for Resource Management and Envriomental studies (CERMES) in Barbados initiated the English-speaking Caribbean's first graduate course in resource management. This milestone is the culmination of a long effort to providing relevant environmetnal training to the region. Traditionally local management authorities have been weakened by the extended departure of staff for training in continental settings. The University of the West Indies addresses this problem with a one-year certificate program and Caribbean-based field projects. The Caribbean Conservation Association, through the Eastern caribbean Natural Area Management Programme (ECNAMP) is helping to develop this program and will assist in identifying field training opportunities for graduate students from the small islands of the eastern Caribbean.

Status

The WHNP has provided funding for ECNAMP's involvement in this program and organizational aspects of the center's establishment and in monitoring field projects to be carried out by the students. A major focus of the study is management and multiple use of island ecosystems. It is expected that the project will be expanded to include additional courses and research opportunities. Students in the program are already involved in the Southeast Coast/St. Lucia project which is also supported by the WHNP.

COUNTRY INFORMATION (SECONDARY)

Country: Barbados	Location in Country (Region, District, Village): University of the West Indies
PO Representative's Name: R. Michael Wright	Local Counterpart/Host Country Agency: University of the West Indies

COUNTRY FUNDING INFORMATION ($000)

YEAR	85-86	86-87	87-88	88-89	
AID $	17,038	17,500	17,500	7,500	
PVO $	17,038	17,500	17,500	7,500	
INKIND					
LOCAL	100,000	100,000	100,000	30,000	
TOTAL	134,076	135,000	135,000	45,000	

1550-11 (6-86)

(See Instructions & OMB Statement on reverse)

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PVO PROJECT REPORTING INFORMATION
ON AID SUPPORTED PVO PROJECTS

OMB No. 0412-0033
Expiration Date: 03/31/89

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PVO Type	Project Number	
Appropriation	Level	
Country Code	Fund Type	Technical Code
Project Officer	Key 1	Key 2

PROJECT INFORMATION (PRIMARY)

Name of Organization: World Wildlife Fund		Grant/Contract Number: PDC-0268-G-SS-5092-00
Start Date (MM/DD/YY): 1/88	End Date (MM/DD/YY): 1/94	AID Project Officer's Name: Margarite Potee

AID OBLIGATION BY AID-FY ($000)

FY	AMOUNT	FY	AMOUNT

LOP [redacted]

Activity Description

Zambia contains some of the largest remaining concentrations of African savanna wildlife and has a high degree of local dependence on wildlife resources. Thus Zambia has the potential to deisng a multiple use conservation approach which is an inseparable part of the traditional cultural system. This project beginning with the grassroots Lupande Development Project (LDP), aims to help the government to realize the value of its Game Management Area's (GMAs) wildlife resources which have not yet contributed significantly to either the national or local economy. The LDP seeks to incorporate local villages into a program of sustained yield management of wildlife resources. The second phase of the project is the expansion of the LDP model into other GMAs under the government's new national policy for these areas.

Status

During 1988 the program focused both on continued support of the LDP as the pilot for ADMADE and its replication in other GMAs. At Nyamaluma, location of LDP the area patrolled by local village scouts, trained and employed under this program increased by 30% over last year. In 1988 the Africare supported culling program employed 20 permanent staff putting K6,000/mo in salaries into the local community (in addition to 40% of the annual profits). All recurrent costs are now covered by project earnings so, except for a few Africare subsidized capital expenses, it is close to attaining sustainability. Ecological monitoring continues to provide a baseline on sustainability. This year the replication process began in earnest. Nine GMA's are in the ADMADE program (5 under the Wildlands Program). Two local biologists were hired to provide technical assistance to unit leaders in the field. Unit Leaders and 72 village scouts were trained and a Unit Leader Manual was drafted. The first locally produced WHNP newsletter was produced and 2 vehicles purchased for headquarters and GMA's.

COUNTRY INFORMATION (SECONDARY)

Country: Zambia	Location in Country (Region, District, Village): East and Central Zambia, Eastern Province Luangwa Valley, Kafue National Park
PVO Representative's Name: R. Michael Wright	Local Counterpart/Host Country Agency: National Parks and Wildlife Service

COUNTRY FUNDING INFORMATION ($000)

YEAR	88-89	89-90	90-91		
AID $	68,150	68,000	68,000		
PVO $	75,150	75,000	75,000		
INKIND					
LOCAL	15,000	15,000	15,000		
TOTAL	158,300	158,000	158,000		

AID 1550-11 (6-86)

(See Instructions & OMB Statement on reverse)

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PVO PROJECT REPORTING INFORMATION
ON AID SUPPORTED PVO PROJECTS

OMB No. 0412-0030
Expiration Date: 03/31/89

FOR OFFICIAL USE ONLY

PVO Type	Project Number	
Appropriation	Level	
Country Code	Fund Type	Technical Code
Project Officer	Key 1	Key 2

PROJECT INFORMATION (PRIMARY)

Name of Organization: World Wildlife Fund		Grant/Contract Number: PDC-0268-G-SS-5092-00
Start Date (MM/DD/YY): 9/30/87	End Date (MM/DD/YY): 9/30/93	AID Project Officer's Name: Margarite Potee

AID OBLIGATION BY AID-FY ($000)

FY	AMOUNT	FY	AMOUNT

LOP [redacted]

Activity Description

The Montane Forests of Mt. Oku are unique. The project is working with the Ministry of Agriculture to have the remaining forest area be constituted a protection forest in accordance with current legislation. Boundaries must be demarcated and explained to village leaders with explanations of activities which are allowed or prohibited. All goats and sheep are being removed from the forest to allow for regeneration of forest plant species. Reafforestation and regeneration programs are being developed emphasizing use of native trees, particularly those of socio-economic benefit. Demonstration tree nurseries will be established in surrounding villages to provide advice, training and supervision regarding planting and germination. Forest based industries not in conflict are to be encouraged. Bee keeping and handicraft work would be supported through strengthening existing cooperatives. An extension program is being implemented through existing government agencies to promote public awareness and sustainable land use.

Status

During the last year, the project has embarked on three major programs: the demarcation of a Forest Reserve boundary, the initiation of an environmental extension program and the initiation of tree propagation trials. The public awareness and extension program has been assisted by the publication of the first issue of the project's newsletter FEN which has proved very popular and 450 copies have been distributed. The project successfully negotiated for land to establish an experimental nursery for indigenous tree species. The nursery currently holds 5,200 tree seedlings of 15 species, with a total capacity of 16,000. The current crop should be ready for planting in 1989. The full cooperation and involvement of the traditional authorities and the Administration at all levels have been secured. A Memorandum of Understanding for the project has been prepared with the Government and will be signed early in 1989.

COUNTRY INFORMATION (SECONDARY)

Country: Cameroon	Location in Country (Region, District, Village): W. Division, NW Province, Bui Division, Oku Village
PVO Representative's Name: R. Michael Wright	Local Counterpart/Host Country Agency: MIDENO, Ministry of Agriculture

COUNTRY FUNDING INFORMATION ($000)

YEAR	88-89	89-90	90-91	91-92	
AID $	15,700	14,680	14,000	14,000	
PVO $	23,700	14,680	14,000	14,000	
INKIND					
LOCAL	10,000	10,000	10,000	10,000	
TOTAL	49,400	39,360	38,000	38,000	

AID 1550-11 (5-86)

(See Instructions & OMB Statement on reverse)

PVO PROJECT REPORTING INFORMATION
ON AID SUPPORTED PVO PROJECTS

Expiration Date: 03/31/89

FOR OFFICIAL USE ONLY

PVO Type	Project Number	
Appropriation	Level	
Country Code	Fund Type	Technical Code
Project Officer	Key 1	Key 2

PROJECT INFORMATION (PRIMARY)

Name of Organization: World Wildlife Fund		Grant/Contract Number: PDC-0268-G-SS-5092-00
Start Date (MM/DD/YY): 9/30/87	End Date (MM/DD/YY): 9/30/93	AID Project Officer's Name: Margarite Potee

AID OBLIGATION BY AID-FY ($000)

FY	AMOUNT	FY	AMOUNT
LOP			

Activity Description

The Dzanga-Sangha project seeks to conserve the last remaining undisturbed lowland tropical forest in the CAR (within the proposed Dzanga-Ndoki National Park) and to manage the surrounding area (the proposed Dzanga-Sangha Forest Sanctuary) on a sustainable use basis. The project will develop and implement a management strategy integrating rural development in the proposed Sanctuary, including selective timber harvesting, traditional hunting and fishing, agroforestry, fisheries and health care, with core protected areas of the proposed Park. Such a multiple-use approach represents a major innovation in what has to date been a protection oriented park system in the CAR. WWF is aiding the Government in defining a development and conservation policy for the Sanctuary and Park, laying out a management strategy zoning the region into allowable uses ranging from selective logging and hunting and gathering to integral protection; setting up a feedback system to monitor management in the area; training local inhabitants and Government personnel in management of the area; and, initiation of a rural development program.

Status

In 1988 number of new staff members, have been employed raising the total staff to 27. Some villagers remain in the park and resettlement seems unlikely. A Chiefdom Council has been set up to involve local leaders in park decision making and rural development issues. Trails have been opened in the park, patrol program shave been developed and visitation has increased. Support from the local community has improved with the increased visibility of the park and improved dialogue between staff and the local leadership. Training programs have been implemented and staff equipped with field gear. A number of bridges around the park have been improved allowing better access for villages in the area and to the park. This project is being phased out of WHNP, however, WWF expects to continue support of the project through its Africa program budget.

COUNTRY INFORMATION (SECONDARY)

Country: Central African Republic	Location in Country (Region, District, Village): Sangha Economic Prefecture, Bayanga Village
PVO Representative's Name: R. Michael Wright	Local Counterpart/Host Country Agency: Ministere des Eaux Forets

COUNTRY FUNDING INFORMATION ($000)

YEAR	88-89	89-90	90-91	91-92	
AID $	31,280	47,385	42,300	45,300	
PVO $	45,000	50,000	50,000	45,000	
INKIND					
LOCAL	12,000	12,000	12,000	12,000	
TOTAL	88,280	109,385	104,300	102,300	

AID 1550-11 (6-86)

(See instructions & OMB Statement on reverse)

PVO PROJECT REPORTING INFORMATION
ON AID SUPPORTED PVO PROJECTS

Expiration Date: 03/31/93

FOR OFFICIAL USE ONLY

PVO Type	Project Number	
Appropriation	Level	
Country Code	Fund Type	Technical Code
Project Officer	Key 1	Key 2

PROJECT INFORMATION (PRIMARY)

Name of Organization: World Wildlife Fund		Grant/Contract Number: PDC-0268-G-SS-5092-00
Start Date (MM/DD/YY): 9/30/87	End Date (MM/DD/YY): 9/30/89	AID Project Officer's Name: Margarite Potee

AID OBLIGATION BY AID-FY ($000)

FY	AMOUNT	FY	AMOUNT

L.O.P. [redacted]

Activity Description

The Outamba-Kilimi area of Sierra Leone is characterized by gallery forest and Guinea Savanna along the northwest border of the country. The US Peace Corps currently has one volunteer in the park working with local village leaders to identify and meet some of their rural development needs. He is also responsible for collaborating with park personnel on day-to-day park administration. Expected outputs include: An effective management program for the park; trained staff for the forestry department; improved conservation programs at the national level for the Forestry Department (including conservation education and public awareness programs); and initial design and implementation of rural development projects with local villagers around the park.

Status

During 1988 the project developed a training program for local inhabitants in park protection and management practices. This has resulted in the employment of 20 staff as part guards. The graining program continues to identify candidates for employment. A management infrastructure is being developed to run the program of rural development and conservation. Staff housing is being built and plans are being developed for offices and an improved health facility. A revolving fund is being set up so that funds brought in locally the project are, at least in part, channeled back to the region for rural development and park protection. The project is working with local community leaders to improve nutrition, access to drugs by coordinating transport and upgrading the health facility currently being used. Peace Corps has assigned three volunteers to the project as extension agents in community development, fisheries and environmental awareness and has asked for an assessment by its Office of Training and Program Support (OTAPS) of agroforestry and health needs.

COUNTRY INFORMATION (SECONDARY)

Country: Sierra Leone	Location in Country (Region, District, Village): Tambakha Chiefdom, Northern Sierra Leone
PVO Representative's Name: R. Michael Wright	Local Counterpart/Host Country Agency: Conservation Society of Sierra Leone

COUNTRY FUNDING INFORMATION ($000)

YEAR	88-89	89-90	90-91		
AID $	10,000	–	–		
PVO $	10,000	5,000	5,000		
IN KIND					
LOCAL	5,000	5,000	5,000		
TOTAL	25,000	10,000	10,000		

ID 1553-11 (8/86)

(See Instructions & OMB Statement on reverse)

PVO PROJECT REPORTING INFORMATION
ON AID SUPPORTED PVO PROJECTS

Expiration Date: 03/31/89

FOR OFFICIAL USE ONLY

PVO Type	Project Number	
Appropriation	Level	
Country Code	Fund Type	Technical Code
Project Officer	Key 1	Key 2

PROJECT INFORMATION (PRIMARY)

Name of Organization: World Wildlife Fund		Grant/Contract Number: PDC-0268-G-SS-5092-00
Start Date (MM/DD/YY): 9/30/87	End Date (MM/DD/YY): 9/30/91	AID Project Officer's Name: Margarite Potee

AID OBLIGATION BY AID-FY ($000)

FY	AMOUNT	FY	AMOUNT
LOP			

Activity Description

The Conservation and Development Program for Lake Malawi National Park is a cooperative effort between Malawi's Departments of Parks, Fisheries, and Forestry, the UNESCO World Heritage Fund, the Peace Corps and WWF. The program has two basic complementary components: park development and community extension focused on fisheries and fuelwood. The park development component includes the provision of essential equipment, the construction of interpretive facilities and the development of conservation education programs for park visitors. The extension component addresses local fishermen in the village enclaves adjacent to the park. After assessments of the environmental impact of traditional fisheries and the attitudes of local fishermen, an appropriate program of conservation education will be designed. In addition, environmentally sound development projects such as woodlots, fish farming and beekeeping will be promoted as alternatives to present ecologically damaging activities.

Status

Construction of the interpretive facilities is underway and housing for the centers staff has been completed. A project vehicle was purchased. The project has been coordinating extension work with the Forestry Department and a tree nursery is being constructed to produce 45,000 trees. The nursery incorporates the project's forestry study plot and seedlings will be ready for distribution this year. An education extension program focused on deforestation is being developed to stress anti-wildfire and pro-tree planting. A series of comic book flyers are also being developed. A water skills workshop was held in April 1988 to train park staff in swimming, boat handling and safety, water safety and rescue, etc. The workshop was jointly planned and implemented with Peace Corps and the US National Park Service. WWF expects to continue support for the Lake Malawi project through its Africa program however, in order to facilitate concentration on model projects the next phase will probably not be considered a WHNP project.

COUNTRY INFORMATION (SECONDARY)

Country: Malawi	Location in Country (Region, District, Village): Lake Malawi National Park, Monkey Bay
PVO Representative's Name: R. Michael Wright	Local Counterpart/Host Country Agency: Dept of National Parks and Wildlife Dept of Fisheries, Dept of Forestry

COUNTRY FUNDING INFORMATION ($000)

YEAR	88-89	89-90	90-91		
AID $	15,000				
PVO $	20,000	15,000	10,000		
INKIND	18,276	15,000	15,000		
LOCAL					
TOTAL	53,276	30,000	25,000		

AID 1550-11 (6-86)

(See Instructions & OMB Statement on reverse)

Attachment B

Original Logical Framework

Original Logical Framework
(as revised 1/21/85)

1. Program Goal: Sustainable management of natural resources in wildland areas.

   Measures: improved management practices and institutional capacity so wildlands retain biological values while contributing to human needs and progress.

   Verification:

   - o adoption of management practices, program concepts and policy reformation in specific pilot field projects;
   - o Means: consultants/experts evaluation workshop at end of year 3;
   - o Assumptions: benefits from wildlands can be made relevant to local populations within meaningful time period.

2. Project Purposes:

   - o research techniques for community based approach to integrate management of wildlands into rural development;
   - o develop and implement 6 management plans testing techniques of community benefit and biological maintenance;
   - o strengthen institutional capacity (governmental and private) to manage wildlands for biological, economic and social goals;
   - o heightened awareness of government authorities of the relationship between managed wildlands and human needs;
   - o improved exchange of information between professionals concerned with wildland and development issues;
   - o strengthen and educate local community and resource users to benefits available from wildlands.

   E.O.P. Conditions:

   - o a group of self sustaining wildland areas, at least one operating as a training site, applying techniques of community involvement and providing community benefits;
   - o an informal network of professionals concerned with human focused wildlands

   Verification

   - o annual review of program;
   - o periodic in depth audits of individual wildland projects;
   - o roster of wildland/human needs professionals

Assumptions:

- o Relative political stability in countries where pilot projects are undertaken;
- o successful implementation also requires cooperation and commitment of government agencies and NGO's in countries concerned and by regional organizations (esp. CATIE and ECNAMP) to collaborate with the projects and training.

3. Outputs:

- o potential model field projects identified, by category and geographic area, demonstrating human needs approach to wildland management;
- o specific human needs-oriented management plans for wildland areas completed; 8 management plans completed and a ninth almost finished.
- o pilot and demonstration wildlands to transfer techniques established;
- o regional training program initiated to strengthen professional and institutional capacity to sustainably manage wildlands;
- o on-going community programs involved in wildland management strengthened.

Magnitude:

- o report summarizing potential wildland and human needs projects for Central America, South America, Caribbean and 3-4 countries in Africa;
- o 6 management plans developed over the three year program;
- o 2 demonstration sites with operating programs including on-going training;
- o 1 field based workshop or seminar in year 3;
- o 5 professionals trained annually;
- o community programs underway around 6 priority areas;
- o publication of management plans or case study material on 4 pilot projects;
- o regional and Africa-Latin American exchange of experience through informal professional interchange.

Verification:

- o specific materials (report, inventory, management plans, training materials) by their existence and peer review;
- o projects through site visits based upon baseline data.

Assumptions: availability of inputs.

4. Inputs:

- o funds to support specific field projects, management plans and training;
- o WWF staff to develop and manage program and projects;
- o technical assistance of WWF including
  - research capacity
  - management plan development
  - educational development
- o cooperative institutional infrastructure:
  - IUCN relationship

- other WWF national organizations
- working relationship with other PVO's through past grants
- existing cooperative relationship with countries and indigenous organizations in target countries

o cooperative network with regional conservation/resource organizations - i.e. CATIE and ECNAMP.

Implementation target: $2 million of 2.5 of program funds to be spent on in-country involvement.

Verification: Quarterly progress reports.

Assumptions:

o at least stable financial position at WWF (i.e. not premised on continued growth at level of last five year);

o maintenance of existing or equivalent WWF staff capability.

Attachment C

Project Directors

Sierra de Manantlan Biosphere Reserve, Mexico

Field Advisor/Project Director(s):

Craig MacFarland/Eduardo Santana & Rafael Guzman
Laboratorio Natural Las Joyas
Avenida Hidalgo No. 1417
Apartado Postal 1-3933
Guadalajara, Jalisco
Mexico

Sian Ka'an Biosphere Reserve, Mexico

Field Advisor/Project Director(s):

Arturo Lopez Ornate
Executive Director
Amigos de Sian Ka'an
Apartado Postal 770
Cancun, Quintana Roo
Mexico

The Rio Platano Biosphere Reserve, Honduras

Field Advisor/Project Director(s):

Craig MacFarland/Rigoberto Romero
Executive Director
Honduran Ecological Association
Apartado Postal T-250, Toncontin
Tegucigalpa
Honduras

Gandoca Land Titling and Wildlife Refuge, Costa Rica

Field Advisor/Project Director(s):

Jim Lynch and Alberto Salas
Asociacion de los Nuevos Alquimistas
(ANAI)
Apartado 902
Puerto Limon, 7300
Costa Rica

Land Use of the Cabecar Indians of La Amistad Biosphere Reserve, Costa Rica

Field Advisor/Project Director(s):

Miguel Cifuentes
Wildlands Management Unit
CATIE
Turrialba
Costa Rica

Cuyabeno Wildlife Production Reserve, Ecuador

Field Advisor/Project Director(s):

Jim Nations/Angel Lobato & Flavio Cuello
Areas Naturales
Programa Nacional Forestal
Ministerio de Agricultura y
Ganaderia (MAG)
Quito
Ecuador

Pacaya-Samiria National Reserve, Peru

Field Advisor/Project Director(s):

Luis Moya & Walter Herrera
Region Agraria XXII - Loreto
Ministerio de Agricultura
Pavas 350
Iquitos, Loreto
Peru

Dominica Forestry Project, Dominica

Field Advisor/Project Director(s):

Alden Putney/Eastern Caribbean Natural Areas
Management Program (ECNAMP)
c/o West Indies Lab
Teague Bay, Christiansted
St. Croix, U.S. Virgin Islands 00820

Southeast Coast Management Project, St. Lucia

Field Advisor/Project Director(s):

Yves Renard
Eastern Caribbean Natural Area
Management Program (ECNAMP)
c/o West Indies Lab
Teague Bay, Christiansted
St. Croix, U.S. Virgin Islands 00820

Resource Management Graduate Course/University of the West Indies, Barbados

Field Advisor/Project Director(s):

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Lake Titicaca National Reserve, Peru

Field Advisor/Project Directors
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Awa Ethnic Forest Reserve, Ecuador

Field Advisor/Project Director
Jim Levy/Carlos Vittareal
Dept. de Desarrollo Fronterizo
Ministerio de Relaciones Externas
Av. 10 de Agosto y Carrion
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Lake Malawi National Park, Malawi

Field Advisor/Project Director(s):

Henri Nsanjama
Chief Parks and Wildlife Officer
Department of National Parks and Wildlife
P.O. Box 30131
Lilongwe 3, Malawi

Mr. Boniface Makoko
Chief Fisheries Officer
Department of Fisheries
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Lilongwe, Malawi

Central African Republic

Field Advisor/Project Director(s):

Arthur Green & Doungoubé Gustave
Project du Dzanga-Sangha
B.P. 1053
Bangui, Central African Republic

Cameroon

Field Advisor/Project Director(s):

Heather and John Parrott
Cameroon Montane Forest Program
c/o MIDENO
B.P. 442
Bamenda, NWP, Cameroon

Zambia

Field Advisor/Project Director(s):

Mr. Ackim Mwenya, Acting Deputy Director
Mr. Gilson Kaweche, Chief Wildlife Research Officer
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Sierra Leone

Field Advisor/Project Director(s):

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Freetown, Sierra Leone

U.S. Peace Corps
Sierra Leone
Department of State
Washington, D.C. 20520

Attachment D

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International Institute for Environment
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Attachment E

Articles Referring to WHNP Program or Projects

ST. LUCIA

The Common Property Resource Digest

No. 7 Devoted to community-based resource management June 1988

At Work With Common Property

World Bank & Resources

The World Bank's activities inherently have great impact on natural resources, resource-management systems, and the environment. Some outcomes of these activities have earned the Bank severe criticism. In response, the Bank has initiated a number of measures, including creation of a new environmental unit and placing greater emphasis on social sciences other than economics. Member Scott Guggenheim, a Bank staff member reports on one of these initiatives.

"The World Bank recently inaugurated a series of sociological roundtables on "Agriculture and Natural Resource Management: Sociological Dimensions." Organized by the office of the Sociology Adviser in the Agriculture and Rural Development Department and the Bank's Training Division, the roundtable series provides a forum for scholars who have written or contributed to important recent books on development issues to present their main research findings relevant to Bank activities directly to World Bank specialists. The series facilitates staff access to state-of-the-art sociological knowledge outside the economic and technical mainstream to encourage its adoption in the Bank's development program.

The first book selected for this roundtable series was *Common Property Resource Management*, edited by D. Bromley, E. Ostrom, and P. Peters (Washington D.C., National Academy Press, 1986). The session was held in the World Bank's Washington headquarters. Attendance was excellent, with more than seventy staff, representing all of the Bank's geographic regions, registering for the seminar.

The roundtable was chaired by Mr. Michael Cernea, the Bank's Sociology Adviser. Opening the roundtable, Mr. V. Rajagopalan, World Bank Vice President for Sector Policy and Research, emphasized the strong interest taken by the World Bank in new approaches to natural resource management. The Bank has a growing interest in incorporating new sociological concepts into Bank policies and projects and needs more dialogue with social sciences.

The volume's editors made brief presentations of the main development issues raised by the book. John Cleave, project adviser for Asia, and Katharine Marshall, a Latin American region division chief, commented on the presentations before the floor was opened to a general discussion.

Daniel Bromley summarized the case against the "tragedy of the commons" model used to explain common property resource degradation: it confuses common property with open access. By now there is sufficient documentation to show that common property management systems work effectively in a

In This Issue

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Eastern Caribbean Natural Area Management Programme

"Many of us talk about community-based resource management, but some of us actually practice it. The Eastern Caribbean Natural Area Management Programme (ECNAMP) is a good example of what can be accomplished by linking local users, conservationists, institutions, and development planners.

Aiming for conservation for development which benefits people, ECNAMP takes a "bottom-up", low key, participatory approach that responds, as a matter of priority, to community-level needs. I recently visited St. Lucia, a small island nation in the Caribbean where a five-person ECNAMP group has been operating for several years, mainly with support from the World Wildlife Fund - US. Here is a sampling of their activities.

Mangrove Conservation: A valuable mangrove area threatened by over-cutting by small-scale charcoal producers is conserved by (a) encouraging charcoal producers to institute among themselves good management practices such as rotation cutting, (b) helping producers start an alternative fuelwood plantation to take pressure off the mangrove and (c) encouraging self-help projects and the establishment of a co-operative for general agricultural development in the area. This project is carried out jointly with the Forestry Division.

Coastal Fishery Development: Assistance is provided to a promising group of fishermen to construct landing facilities and to start a cooperative. Coastal resource planning also includes the establishment of a nature reserve, in the Maria Islands, which is within the harvesting area of the group. Carried out jointly with the Fisheries Management Unit, the project raises the prospect of more local responsibility in management.

Mariculture: Low-input, labor-intensive appropriate technology for "seamoss" (Gracilaria) cultivation for food was developed by the Fishery Management Unit with support from Canadaa's International Development Research Centre (IDRC). ECNAMP has been conducting research, helping establish the first "seamoss" farms and organizing a producers' group. Gracilaria culture has great potential to provide income and to supplement a diminishing natural resource base. Capital requirements are minimal and a traditional food market for the product is already present. For "take-off" to occur, however, continuing support is needed from IDRC to disseminate know-how and to provide general encouragement to the growers.

"Sea egg" conservation: The edible sea urchin Tripneustes is a scarce resource in the Caribbean. A study undertaken by ECNAMP biologist, Allan Smith, in collaboration with the Fisheries Management Unit revealed greater populations of the "sea egg" at Laborie where the local community imposes informal conservation measures on collectors, in contrast with two other study sites elsewhere on St. Lucia where the resource is effectively open-access. Encountered almost accidentally, this case provides unique biological documentation of the benefit of community-based conservation. A report on it is being prepared for publication.

Input into government planning and decision making: ECNAMP encourages resource managers and decision makers to consider the benefits of community-based approaches. Through such initiatives as the "Country Environmental Profiles" project, undertaken with US Agency for International Development support for future development planning, ECNAMP has stressed the importance of providing for some communal-property (res communes) management alongside state-property (res publica) management, the dominant CPR regime in St. Lucia as in many other countries.

St. Lucia is unusual in that a general government policy favoring decentralization and public participation in decisionmaking already exists. Look for St. Lucia to show leadership in common-property resource management in coming years."

Dr. Yves Renard is the head of ECNAMP program. The project address is:

ECNAMP
Bergasse Building
Clarke Street
Vieux Fort
St. Lucia, West Indies

(Reported by Fikret Berkes, Brock University, St. Catherines, Ontario, Canada)

BIOLOGICAL CONSERVATION NEWSLETTER

June 1988 No. 63

Smithsonian Institution
Department of Botany, National Museum of Natural History
Editor: Jane Villa-Lobos

GANDOCA/MANZANILLO WILDLIFE REFUGE, COSTA RICA

By William McLarney

The Gandoca/Manzanillo National Wildlife Refuge was formally declared in October, 1985 to protect endangered species and habitats in one of Costa Rica's least studied regions, southern coastal Talamanca canton. The 9,449 hectare refuge is administered by the Servicio de Vida Silvestre, and is being developed as part of a package including a land titling program in the refuge and a surrounding buffer zone, community development projects aimed at involving local residents directly in protection and management of the refuge, and an agroforestry project extending throughout the 3,000 square km canton of Talamanca. ANAI, a small NGO operating exclusively in Talamanca, shares responsibility for these projects with a number of government agencies and with CIDESA (Corporacion de Investigaciones para el Desarrollo Socio-Ambiental), a small indigenous NGO.

Important habitats protected by the refuge include: 1)almost all of Costa Rica's coral reefs existing outside Cahuita National Park (10 km to the north); 2)a 9 km nesting beach used by all four species of sea turtle found in the western Caribbean; 3)an orey swamp, the only example of this association north of Panama; 4)the Rio Gandoca and its estuary, one of the least-disturbed estuaries in Atlantic Costa Rica, including the only major expanse of mangrove forest on the Atlantic coast; and 5)a range of steep, forested hills which extends to the sea as high rock bluffs unique on the Atlantic coast, representing the only protected area of Atlantic hill forest in Costa Rica.

The refuge area has been fairly well surveyed for coral reef and freshwater fishes, by Steve Robinson of the International Marinelife Alliance, and Dr. William McLarney of ANAI, respectively. A start has been made on the botanical survey by Dr. Michael Grayum of the Missouri Botanical Garden and the Museo Nacional de Costa Rica. In brief preliminary surveys Dr. Grayum has identified numerous new country records including a wild white-seeded cacao which may represent a valuable genetic resource for agronomists. In addition to the orey and other plant species, animals of particular conservation interest include: a small cichlid fish endemic to the Rio Sixaola watershed, manatees, crocodiles, sea turtles, three species of monkey, jaguarundi and tapir.

The biota in general has more affinity with Panama than with that of Costa Rica. A much more extensive wildlands area exists directly across the Rio Sixaola in the lowlands of Panama's Bocas del Toro province, and ANAI and CIDESA have been meeting with representatives of IUCN and Panamanian governmental and private organizations in an attempt to define a conservation strategy for the entire area. Creation and effective protection of a parallel reserve in Panama would greatly enhance the effectiveness of what has so far been accomplished in Gandoca/Manzanillo.

There are many conservation activities presently underway in Gandoca/Manzanillo, including control of deforestation, protection of the coral reef and turtle beach, and tarpon studies. However, the primary focus of the project is the linkage of conservation and development. Although important wildlands exist in the area, it is largely settled by small farmers representing three distinct ethnic and cultural groups: Spanish-speaking mestizos from Central America; English-speaking blacks with West Indian roots; and an indigenous population who speak the Bribri language. The canton of Talamanca is one of Costa Rica's least developed areas, and all three groups have in common a lack of services, very low income and direct dependence on local resources. At the time the project was initiated, with support from World Wildlife Fund-US, the Jessie Smith Noyes Foundation and numerous other donors, the region was experiencing increased pressure on natural

resources, especially forests. Some of the pressure was a result of population growth. The problem was exacerbated around 1980 by the loss of the region's only cash crop, cacao, to a fungal disease. This led to increased slash- and-burn cultivation of basic food crops on fragile soils ill- suited to the practice. There was an awareness locally of the need to stabilize the situation, but little idea of how to proceed.

ANAI began by helping establish the refuge, but also by attacking one of the local people's most often expressed problems - lack of land tenure security. Almost no one in the Gandoca/Manzanillo area held title to their lands. Under Costa Rican law, this meant that possession had to be demonstrated by "improvement" - tantamount to a mandate to deforest. It quickly became clear that not only was land titling desirable for economic, legal and social reasons; but that it could function as a conservation measure. Farmers with title to their lands would have an incentive to invest in long-term perennial crops, and would be empowered to defend their property against squatters or loggers. This would not only tend to limit subdivision but enable farmers to elect to leave certain lands under forest cover without fear of losing them. In addition, land tax exemptions were secured for farmers participating in a forest management plan.

In a project which ultimately involved major efforts not only on the part of ANAI and the local communities, but by four government agencies, aerial photography techniques were used to survey all lands lying within the refuge and in a buffer zone. Participating landholders were assessed a modest quota and ANAI secured the rest of the funds for a project which will culminate this year with eventual awarding of titles to around 500 landholders.

In the process, a few properties, including the orey swamp, with little aptitude for agriculture but high conservation value, were found to be unclaimed. In at least two instances, absentee landholders have offered to donate land to the refuge. These lands comprise core conservation areas, administration of which will eventually be turned over to a community land trust or some similar organization.

More immediate linkages between conservation and development are being made through three ongoing projects. ANAI's agroforestry diversification project, supported by ACORDE, the Inter-American Foundation, the Embassy of the Netherlands and several other institutions, presently serves two communities in the Gandoca/Manzanillo (Cocles and San Miguel). CIDESA has established community tree nurseries based on the same concept in the communities of Gandoca and Bonife. In addition to promoting economic development, the project seeks to promote intensive permanent agriculture, using primarily tree crops, as an alternative to extensive cultivation of field crops.

In Gandoca, ANAI has entered into a consortium with the local Community Development Association and the Fundacion Neotropica to manage a 70 hectare farm, whose proceeds will be reinvested in community projects. The farm is strategically located to control access to both the turtle nesting beach and the Rio Gandoca, and includes the future site of a refuge headquarters building. Development projects on the farm will include agriculture based on the ANAI agroforestry concept and ecological tourism.

In the community of San Miguel, and in the Cocles Indian Reserve (Kekoldi to the inhabitants) bordering on the refuge, ANAI and CIDESA, with support from IUCN/CDC, have initiated iguana culture projects under the direction of Sr. Julio Barquero. Involvement in Kekoldi by the agencies working in Gandoca/Manzanillo grew out of an oral history project sponsored by ANAI, funded by Cultural Survival. The immediate result of the study was a booklet on Bribri culture soon to be published by the University of Costa Rica. Subsequently the people of Kekoldi asked for assistance in controlling illegal hunting on their lands, and the Servicio de Vida Silvestre provided training for four Indians who now serve as ad honorem wildlife guards. Effectively, the 3,500 hectare Cocles Reserve has become a de facto extension of the Gandoca/Manzanillo refuge.

Although not conceived as such at the start, what has evolved in Gandoca/Manzanillo is very reminiscent of the Biosphere Reserve concept - a core of wildlands ringed by areas accomodating various degrees of human activity and management, with human communities integrated into the conservation strategy. An important future goal is formalization of this through elaboration of a management plan.

For further information, contact ANAI's U.S. office at 1176 Bryson City Road, Franklin, North Carolina 28734.

TOP TWELVE THREATENED SPECIES AND PARKS

The Species Survival Commission (SSC) is IUCN's primary source of the scientific and technical information required for the mainte-

nance of biological diversity through the conservation of endangered and vulnerable species of fauna and flora. It also recommends and promotes measures for species conservation through its volunteer network of over 2,000 individuals, most of whom are members of at least one of the 84 Specialist Groups.

During the IUCN General Assembly in Costa Rica, the Species Survival Commission announced its list of the top twelve critically endangered species in order to highlight the serious need for conservation. The top twelve are: black rhino, kouprey, greater bamboo lemur, highland guan, Philippine eagle, salmon- crested cockatoo, big-leaf palm, homerus swallowtail butterfly, Chiapas slipper orchid, green pitcher plant, river terrapin and far nortnern flax snail.

The Commission on National Parks and Protected Areas also announced at the General Assembly its list of twelve parks and reserves it has added to the IUCN Register of Threatened Protected Areas. The total list, which is updated annually, now comprises 85 parks and reserves in 53 countries. Forty-three national parks and nature reserves have been added to the threatened list since the initial 12 were announced at the 1984 General Assembly; 16 of these have now been withdrawn, as threats to them have been removed.

The twelve areas added to the list in the past year are: Pallas-Ounastunturi National Park (Finland); Shedegan Marsh Ramsar Site (Iran); Lake Hamoun Ramsar Site (Iran); Mt. Meron Nature Reserve (Israel); Mikra Prespa National Park (Greece); Pindos National Park (Greece); Fu Tien and Mai Po Nature Reserve (Hong Kong/China); Kaziranga World Heritage Site and National Park (India); Gunung Niut Nature Reserve (Indonesia); Paramillo National Park (Colombia); Yasuni National Park (Ecuador); and Huascaran National Park and World Heritage Site (Peru).

NEW PUBLICATIONS

The red data book on Finnish endangered animals and plants contains descriptions of every endangered or threatened animal and plant, including a brief description of its habitat; world distribution; faunistics; conservation status in Finland and neighboring countries; references; and some line drawings. Present and past protective measures are discussed and, when needed, new ones suggested. The three volumes contain 69 vertebrates, 402 invertebrates, 182 higher plants, 117 mosses, 14 algae, 188 mushrooms, and 79 lichens. This report was compiled by a commission which was appointed in 1983 by the Finnish Government. Written in Finnish, each volume has a one-page summary in Swedish; an English summary is in preparation. It can be obtained by writing: Government Printing Centre, POB 516, SF-00202, Helsinki, Finland.

FUTURE MEETINGS

June 27-28. "The Future of the Tropical Rain Forest", sponsored by the Oxford Forestry Institute, will be held at St. Catherine's College, Oxford, England. The conference will address the causes and consequences of tropical rain forest destruction by bringing together a broad spectrum of opinion to discuss the issues central to the future of the rain forests, and in particular, the role that Britain can play. For further information, contact: Rain Forest Conference Coordinator, Oxford Forestry Institute, South Parks Road Oxford, OX1 3RB UK.

July 19-24. The First International Congress of Ethnobiology, sponsored by the Nucleo de Etnobiologia of the Museu Paraense Emilio Goeldi, will be held in the Amazonian capital of Belem, Para, Brazil. For more information, write: Dr. Darrell Addison Posey, Nucleo de Etnobiologia, Museu Paraense Emilio Goeldi-CNPq, Caixa Postal 399, 66.040 Belem, Para, Brazil.

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Conservation of Traditional Agroecosystems

Can age-old farming practices effectively conserve crop genetic resources?

Margery L. Oldfield and Janis B. Alcorn

Much of the world's biological diversity is in the custody of farmers who follow age-old farming and land use practices. These ecologically complex agricultural systems associated with centers of crop genetic diversity include not only the traditional cultivars or "landraces" that constitute an essential part of our world crop genetic heritage, but also wild plant and animal species that serve humanity as biological resources.

To maintain the dynamic evolutionary processes involved in plant-human interactions, conservation of landrace varieties within their native agricultural landscapes, i.e., *in situ* conservation of traditional agroecosystems, has been proposed but it is controversial. Crop genetic conservationists, who are keenly aware of the rapid and comparatively recent loss of traditional cultivars, usually consider such conservation programs to be impractical or impossible. At the same time, some wildlife conservationists consider traditional agriculture to be incompatible with *in situ* conservation of natural environments and wild taxa.

Conservation of landrace varieties within their native agricultural landscapes is controversial

Both perspectives have influenced prevailing attitudes about conservation of biological diversity and traditional management of biological resources. Nevertheless, conservation efforts in the developing nations will ultimately fail if they are not integrated with the development needs of the people and prevailing land use practices.[1] We contend that both the human cultural resources, i.e., applied traditional knowledge, and the cultivated and wild biotic resources sustained within traditional agroecosystems are worthy of *in situ* conservation. In addition, the ecological-evolutionary role that traditional agriculturalists play in creating, maintaining, and enhancing crop genetic diversity should be acknowledged and incorporated within *in situ* conservation projects.

In situ conservation of ecosystems, with their indigenous species and genetic materials kept intact, has been termed the ideal (Frankel 1970) or preferred (IUCN-UNEP-WWF 1980) conservation strategy. Scientists and organizations have acknowledged the need for *in situ* conservation of crop genetic resources within traditional agroecosystems (Brush 1977, Halffter 1985, Nabhan 1985, Oldfield 1976, 1984, Ugent 1970, UNESCO-MAB 1974, 1984, Wilkes and Wilkes 1972). The Committee on Germplasm Resources of the US National Academy of Sciences has recommended that the United States adopt a policy to facilitate maintenance of traditional agroecosystems to conserve *in situ* the germplasm resources of major US crops (NAS 1978).

In contrast, conservation of traditional agroecosystems has been considered impractical or unacceptable by some researchers (Frankel 1974, Ingram and Williams 1984, Prescott-Allen and Prescott-Allen 1982). The World Conservation Strategy (WCS), a proposal to link biological resource conservation with sustainable economic development, considers on site preservation impossible for domesticated species (IUCN-UNEP-WWF 1980, see WCS sec. 6.5). Frankel[2] contends that preservation of traditional agricultural systems with their indigenous crop varieties intact is socially and economically impossible in the face of rapid technological advancements, especially within the developing nations. This view was ech-

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[1]See Government of India, 1982, and also comments of Russell E. Train in *BioScience* 36: 59 (1986).

[2]O. H. Frankel, 1983, personal communication. Division of Plant Industry, Commonwealth Scientific and Industrial Research Organization (CSIRO), Canberra City, Australia.

Traditional farmers manage *in situ* reserves of genetic diversity within their polycultural fields, where crops continue to evolve in response to natural and artificial selection pressures. In this photograph, a Mexican Huastec Indian woman stands in a typical field, containing numerous species of wild and cultivated plants. Photo: Janis Alcorn, Tulane University.

oed by the International Board for Plant Genetic Resources (IBPGR), which recommends *in situ* conservation primarily for wild crop relatives because "the interventions . . . required for the surv[illegible] of landraces in agricultural landscapes would be too extensive to be considered" (IBPGR 1985).

The controversy over *in situ* conservation of traditional agroecosystems can be resolved only by examining carefully whether extant conservation policies and programs have achieved their goals; evaluating the oft-mentioned potential problems; and determining whether *in situ* conservation programs should be given the chance to demonstrate their feasibility and merits. In this paper we will address the following questions: What is the current conservation status of crop genetic resources? What can conservation of traditional agroecosystems achieve that *ex situ* methodologies cannot? What is the actual record of policy and program efforts in conservation of traditional agricultural systems? What considerations must guide the choice and maintenance of such *in situ* reserves, and what research efforts are needed for successful design and implemention of these conservation programs? Finally, what mechanisms are available for achieving traditional agroecosystem conservation?

Status of crop genetic resources

Genetic erosion—the extinction or depletion of traditional cultivars and distinct populations or species of wild crop relatives—has accelerated over the last half century. Despite decades of collecting activities (Hawkes 1983), much of the world's crop genetic heritage remains unsampled for *ex situ* conservation (Frankel and Soulé 1981, Lyman 1984). The remaining traditional agroecosystems serve, by default, as *in situ* genetic reservoirs for these unsampled crop genetic resources. The principal cause of genetic erosion has been the widespread adoption of modern crop cultivars within areas of ancient agriculture (Frankel 1974, Harlan 1975, Miller 1973, Oldfield 1984). But acculturation, replacement of mixed-crop subsistence farming by commercial agriculture, urbanization and industry, irrigation and drainage projects, tourism, and war have also contributed to genetic erosion (Brush 1977, Johannessen 1982, Miller 1973, Nabhan 1985, Oldfield 1984, Wilkes and Wilkes 1972).

The International Board for Plant Genetic Resources (IBPGR) was established 13 years ago when the widespread loss of valuable crop genetic resources became so alarming that crop plant collectors, breeders, and conservationists recognized the need for an international network of *ex situ* crop germplasm repositories. The IBPGR organizes and funds cooperative collection expeditions with countries harboring major crop gene centers to facilitate *ex situ* conservation both within the country of origin and in specific facilities that form the

IBPGR network of gene banks. This network provides plant breeders with the genetic resources necessary for the development of higher-yielding crop varieties that are more resistant to or tolerant of diseases, insects, herbicides, infertile and saline soils, drought, and temperature extremes (Hawkes 1983, IBPGR 1975, Plucknett et al. 1983). The IBPGR also designates priority crops and regions urgently in need of collection of crop germplasm resources (IBPGR 1976, 1981). However, present IBPGR policy dictates that future collecting expeditions will be limited to rescue operations urgently required for specific crop genetic resources (Holden 1984).

This restriction is unfortunate since so much of the world's crop genetic diversity is not well represented in *ex situ* reservoirs. The unsampled species include most of the endangered traditional cultivars and threatened wild relatives of wheat, sorghum, millets, potato, common bean, runner bean, cowpea, mungbean, Bambara groundnut, peanut, chickpea, and lupin (Lyman 1984). Half or more of the primitive cultivars of sweet potato, yams, finger and kodo millet, common bean, runner bean, Bambara groundnut, faba bean, and lupin have yet to be collected systematically. Moreover, significant proportions of the wild gene pool resources of many world crops, particularly wild rices, barley, millets, sorghum, sweet potato, cassava, yams, and most grain legumes, also remain uncollected; most of these wild species are important vegetational components associated with traditional agroecosystems.

Advantages of agroecosystem conservation

The primary advantage of *in situ* conservation of traditional agroecosystems is that crop populations continue to be influenced by the evolutionary processes that created and maintained the genetic resources now frozen in *ex situ* gene banks. Maintenance of crop plant-pest coevolutionary interactions, in particular, is a major objective, because traditional cultivars and their wild and weedy relatives continue to provide essential sources of genotypic resistance to disease pathogens, nematodes, insects, and other crop pests (Oldfield 1984). In many instances, genetic resistance has proved to be the only effective or applicable method of pest control (Leppik 1970). Moreover, studies of crop-pathogen interactions in traditional agroecosystems have facilitated our understanding of phytopathology, providing knowledge that has been beneficial to modern agriculture (Browning 1981, Glass and Thurston 1978).

Another advantage of *in situ* conservation of traditional agriculture is that it maintains the weeds and wild crop relatives associated with the cultivated species. These crop relatives have contributed to the rapid evolution of the cultivated species (de Wet and Harlan 1975, Harlan 1969). Weedy relatives also are one of the most significant reservoirs of germplasm for use both in maintaining primitive cultivars *in situ* and in improving modern cultivars (Harlan 1965, Ladizinsky 1985). In fact, traditional cultivators' potential for creating and maintaining genetic diversity within crop-weed complexes may be as significant for genetic resource conservation as their role in maintaining traditional cultivars.

The cultural and ecological diversity within traditional farming systems of the ancient agricultural regions has shaped the genetic variation within traditional crop varieties (Harlan 1975). Genetic diversity is maintained in traditional agroecosystems by cultural intervention as well as by natural selection. Cultural and socioeconomic factors that influence evolutionary processes include terracing, fallowing, run-off channeling, soil mounding, mulching, use of fire, selective weeding, interplanting, trapping of particular crop predators, attention to individual plants, pollarding of selected wild trees in agricultural fields, and management of secondary successional vegetation.

Unlike modern US farmers who do not use the harvest from their fields for seed, traditional farmers are both seed stock producers and crop breeders. Seed selection and dispersal patterns, weeding regimes, harvest procedures, and storage practices create selection pressures. Because traditional farm management strategies often integrate livestock and wildlife production with crop cultivation, the farmers use complex production schedules. They also place the crops to create a patchy distribution of cultivated fields, different human-modified vegetation zones, and natural resource zones. Fallows, pastures, savannahs, riverbanks, forests, and rocky desert outcrops are included in traditional agroecosystems. This habitat diversity influences the organisms (e.g., insects and weeds) that enter the fields and interact with the crop plants.

The ecological complexity of traditional farms may seem surprising to those accustomed to modern temperate zone farms. The complexity maintains high genetic variation due to temporal and spatial variation in selection pressures, intergenotypic and interspecific competition, and interactions with pests and pathogens.

Traditional farmers' fields are spatially heterogenous; each field contains multiple microhabitats created by the varying slopes and soils and different patches of intercropped cultivars and wild vegetation. There is also temporal variation, which may be cyclical, as when crops are regularly planted two or three times during the year and therefore are subjected to different climatic regimes. The temporal variation also may be unpredictable, as when individual farmers plant at different times each year (Alcorn 1984). Individual farmers are also likely to use slightly different farming methods or choice of seeds in one of several field types in any given year.

Some of the anthropogenic component of the spatial and temporal heterogeneity is deliberate; traditional farmers commonly use microclimate management as an agricultural tool. But some of the heterogeneity is simply a by-product of activities employed to another end. Different cultivars may be intentionally placed in specific niches within cultivated fields or genotypes of one cultivar population may be scattered randomly throughout different niches, so that individuals in such populations are subjected to entirely different selection pressures.

Crop plants are also involved in competition with individuals of the same species and in competition with neighboring weeds or with other crops cultivated in the same field.

The effects of intergenotypic and interspecific competition vary according to microenvironmental factors and the densities of the interacting populations—factors that are influenced by site preparation, planting mechanics, and various other cultural practices.

A further source of heterogeneity is the individual variation and experimentation that are cultural aspects of traditional agricultural systems (Alcorn 1984, Johannessen 1982, Johnson 1972). Traditional farmers follow "scripts" of a general agricultural plan passed down from their ancestors, but these age-old patterns of land use change as each individual farmer chooses how to manage her or his land within the common cultural context.

Heterogeneous environments created within traditional agroecosystems not only provide a variety of selection pressures, but they also afford some crop plants protection from environmental stresses. Such protection is not provided by modern agroecosystems. For example, polyculture and other methods that use genetic diversity to create patchy environments affect crop plant-pest interactions (Browning 1981, Glass and Thurston 1978, Janzen 1973). Additionally, farmers may alter the community with which crop plants interact by protecting agronomically desirable, but weak, crop plants, cultivars, or useful wild vegetation. The protected elements differ from culture to culture, again creating different plant communities in different areas, thus enhancing overall crop genetic diversity.

The traditional farmers of Peru raise a wide range of native potato varieties. Photo: Deborah Rabinowitz, Cornell University.

Overlaid upon these effects is the diversity-enhancing influence of trade. Complex histories of trading networks among traditional farming cultures are believed to have played a major role in the crop evolution process (e.g., Brush et al. 1981, Harlan 1975, Johannessen 1982). While there is often strong selection for seed adapted to the conditions of a particular farmer's set of fields, opportunities also exist for introduction of lines from other local fields or more distant regions. The trading of seeds or other propagules permits gene exchange via hybridization among genetically distinct varieties, thus further enhancing the accumulated wealth of crop genetic resources (de Wet and Harlan 1975, Harlan 1969).

Another distinct advantage of agroecosystem conservation is that processes essential for the continuing evolution and maintenance of crop genetic resources can be conserved despite our present ignorance of these processes or their complex functions. It is currently difficult to make generalizations about how particular human activities or environmental conditions have influenced crop genetic diversity. The biology, breeding system, range of variability, genetics, and cytogenetics of a taxon influence the ways that cultural practices and ecological conditions affect evolutionary processes. In addition, there are tremendous differences among traditional agroecosystems around the world (Klee 1980); even within a nation there is often variation among agroecosystems supporting the same crop.

As traditional farmers abandon their landraces in favor of modern high-yielding varieties, they often discard or fail to maintain the seed stocks of their native cultivars. From a socioeconomic perspective, *in situ* conservation of traditional agroecosystems ensures that seeds of native crop varieties will be readily available in the event that subsistence farmers now growing modern cultivars need to rely upon their more traditional crops in the future.

Local varieties will yield a harvest dependably despite adverse agricultural or socioeconomic conditions. Because most peasant farmers live under unstable political and socioeconomic conditions, they are particularly vulnerable to disruption of the research, production, and trade networks that supply seeds of new improved cultivars (Plucknett and Smith 1986) and the mechanical and chemical inputs often necessary for these modern cultivars to produce an acceptable yield. If access to these networks is disrupted, if modern cash crops fail to produce dependable subsistence, or if use of genetically susceptible modern varieties results in widespread crop failures (Chang 1984), farmers may wish again to cultivate their traditional food cultivars. In such situations, seed stocks of traditional cultivars stored in distant institutions are not readily available to traditional or subsistence farmers.

Finally, maintenance of traditional knowledge of plant resources and farming practices within traditional agroecosystems ensures the conservation of a much greater variety of genetic resources than can possibly be conserved by conventional *ex situ* methods. Traditional farmers typically employ practices that enhance intraspecific, and in some cases interspecific, crop genetic diversity. Furthermore, they practice polyculture, cultivate minor crops, and maintain wild edible, medicinal, or industrially important plant species (Alcorn 1981, Glass and Thurston 1978, Oldfield 1984, Ugent 1970).

History of conservation programs

International programs for *in situ* conservation of traditional agroecosystems began more than a decade ago. In 1971, the UNESCO Man and the Biosphere (MAB) program established the biosphere reserve plan, under a project entitled "Conservation

of natural areas and of the genetic materials they contain" (Gregg and McGean 1985, UNESCO-MAB 1974). The project's expert panel initially recommended that "samples of varied and harmonious landscapes resulting from long-established land use patterns should be maintained" in a manner that will conserve the ecological and cultural integrity and genetic diversity within these man-modified ecosystems.

The biosphere reserve management plan is unique among park plans in that it integrates wilderness conservation with rural development (von Droste zu Hulshoff and Gregg 1985). The biosphere reserves include resident humans as an integral component. Therefore the biosphere reserve program is, potentially, an important vehicle for international conservation of traditional agroecosystems and the adjacent natural environments with which they interact (Halffter 1985, Oldfield 1984, von Droste zu Hulshoff and Gregg 1985). Reserve areas are planned and administered by national agencies, which modify UNESCO-MAB guidelines to fit the social and ecological contexts of specific countries[3] (Cifuentes et al. 1984, Halffter 1985).

The strategy of conserving traditional farming cultures and cultivars has been stressed only recently, although *in situ* conservation of wild crop relatives and a commitment to integrated rural development projects that use traditional knowledge and land use practices have long been objectives of this UNESCO-MAB project (Halffter 1985, UNESCO-MAB 1984). New biosphere reserves with potential for *in situ* conservation of traditional agroecosystems have been proposed or created in India (Government of India 1982), Costa Rica, and Mexico.[4] To date, however, no model reserves in developing countries fully demonstrate the concept of a biosphere reserve (Gómez-Pompa 1984).

A Kuna medicinal specialist shows his wife and son newly gathered plants. Biosphere reserves, such as the one under consideration by the Kuna of Panama, offer an opportunity to preserve ethnobotanical knowledge that is passed from one generation to the next. Photo: Joel Sherzer, *Kuna Ways of Speaking*, University of Texas Press, 1983.

A major step in this direction is the current effort to incorporate the Kuna Yala Indigenous Reserve within the MAB biosphere reserve system (Houseal et al. 1985). The project provides a useful model for establishing *in situ* reserves containing indigenous agroecosystems. The Kuna Yala Indigenous Reserve, located on the northeastern coast of Panama, includes 60,000 hectares of tropical forests. The Kuna are applying ecologically sound resource management strategies and cultural development objectives consonant with those of the UNESCO-MAB biosphere reserve program (Houseal et al. 1985, Wright et al. 1985). The Centro Agronomico Tropical de Investigación y Enseñanza (CATIE) has advised the Kuna on economic development in the context of a park project. Funds for the project have been provided by a wide variety of contributors including the US Agency for International Development (AID), the World Wildlife Fund, the Inter-American Foundation, the Smithsonian Tropical Research Institute, and the Kuna community. CATIE and the Smithsonian Institution also have provided a technical and scientific advisory group.

A 20-person Kuna staff is being trained in modern techniques to complement traditional methods for management and protection of Kuna natural resources. CATIE and Smithsonian scientists are in turn docu-

[3]H. Torres, 1986, personal communication. Asesor, Proyecto Parque Internacional La Amistad, Centro Agronomico Tropical de Investigaciones y Ensenanza (CATIE), Turrialba, Costa Rica.

[4]J. Barborak, 1986, personal communication. Wildlands Program, Centro Agronomico Tropical de Investigaciones y Ensenanza (CATIE), Turrialba, Costa Rica.

menting Kuna ethnobotanical knowledge, agricultural techniques, and silvicultural management strategies to increase their understanding of the tropical forest ecosystem and its indigenous resources. The Kuna community is currently considering the option of biosphere reserve designation[5] and will make the final decision to accept or reject that option (Wright et al. 1985). If the Kuna accept the biosphere reserve designation, it means that they intend to follow the MAB guidelines and action plan—the "recipe"—for a biosphere reserve.[6] Acceptance does not guarantee the Kuna economic or technical aid for developing their reserve, but it will give them the status to apply for such aid (Gregg and McGean 1985).

The US government's involvement with *in situ* conservation of crop genetic resources and traditional agroecosystems followed a report by the Committee on Germplasm Resources of the National Academy of Sciences (NAS 1978). In November 1981, a three-day Strategy Conference on Biological Diversity was held at the State Department in Washington, DC. This conference concluded that all countries should endeavor to maintain maximal genetic diversity of their indigenous biotic resources by both *in situ* and *ex situ* means and that national inventories of genetic resources should be conducted in areas of traditional cultivation as well as in protected natural areas and gene banks (US Department of State 1982). In November 1983, the US Congress amended the Foreign Assistance Act of 1961 to direct AID to collaborate with other national agencies to develop a national strategy for conserving biological diversity within developing countries. In compliance with this directive, AID organized the Interagency Task Force on Biological Diversity (ITFBD).

The task force's report to Congress (ITFBD 1985) noted a variety of US government activities. The Departments of State, Interior, Agriculture, and Commerce, and the Environmental Protection Agency are participating in the UNESCO-MAB biosphere reserve program. AID provides substantial financial support to the IBPGR (IBPGR 1985). The Department of Agriculture has increased its interest in relatives of wild crops as sources of novel genes for breeding programs and is currently developing criteria for selection of natural areas for *in situ* conservation of crop species and their wild relatives. The Division of Biotic Systems and Resources of the National Science Foundation has designated characterization of the genetic and biological diversity of cultivated plants as one of its high priority areas for increased research support. And the Peace Corps has expanded its efforts in natural resources conservation and provided volunteer assistance for reserves and parks in developing nations.

The ITFBD also issued recommendations. When planning new agricultural projects, AID should encourage host governments (and provide the requisite funding) to evaluate the comparative potential of extant traditional agroecosystem production systems and more intensively managed, modern agroecosystem alternatives. The US government, via AID, should provide continuous support for ongoing training efforts in developing nations for *in situ* germplasm protection. The US government, through AID, various UN programs, and multilateral donor banks, should provide additional long-term support for the growth in the developing nations of research capabilities to create highly productive, sustainable agricultural systems that include localized subsistence economies and use of indigenous species. According to the recommendations, the US government also should develop or strengthen the institutions concerned with both *in situ* and *ex situ* crop germplasm protection to assist the developing nations in preserving their indigenous plant species for possible agricultural uses (ITFBD 1985).

Government agencies of other nations have also made an effort to link rural development with traditional agriculture and *in situ* conservation projects. In Mexico, for example, the National Research Institute for Biotic Resources (INIREB) has numerous programs aimed at integrating research, biological reserves, and development of sustainable agroecosystems based on traditional management techniques (Gómez-Pompa and Giddings 1986). In Ecuador, the World Wildlife Fund is sponsoring a project that links conservation with development of traditional agriculture among the Siona Secoya people in the Ecuadorian national park Cuya Bano Reserve.[7] The framework of these projects contains elements necessary to support *in situ* conservation of crop genetic resources, although it is not an explicit goal.

Aside from reserves administered by national and international organizations, few other avenues have been proposed for conserving traditional agroecosystems. Some proponents of dynamic *ex situ* conservation recommend developing a system of village-level landrace custodians, e.g., to cultivate limited samples of endangered landraces native to a given region (Frankel and Soulé 1981). Iltis (1974) suggested "freezing the genetic landscape" by subsidizing farmers to continue traditional agriculture in selected zones from which agricultural and economic development would be deliberately excluded. Wilkes and Wilkes (1972) suggested setting aside 100 carefully chosen, sizeable (5 km × 20 km) strips of land under traditional agriculture around the world.

A few nonprofit citizen action groups have also attempted to promote *in situ* conservation of genetic resources. The US organization Native Seeds/SEARCH based in Tucson, Arizona, for example, has complemented its *ex situ* conservation efforts by encouraging farmers to grow traditional crop cultivars. The organization provides the farmers with seed of varieties they have lost, and then purchases the farmers' excess production.[8] This organization has also promoted use of the tribal elders' knowledge of seed selection, seed storage, and traditional crop cultivation in local agricultural improvement programs (Nabhan 1985).

[5]W. P. Gregg, 1985, personal communication. US UNESCO-MAB Secretariat, National Park Service, US Department of the Interior, Washington, DC.

[6]J. Barborak, 1986, personal communication. Wildlands Program, Centro Agronomico Tropical de Investigaciones y Ensenanza, (CATIE), Turrialba, Costa Rica.

[7]D. Glick, 1986, personal communication. Wildlands and Rural Development, World Wildlife Fund, Washington, DC.

[8]G. Nabhan, 1986, personal communication. Native Seeds/SEARCH, Tucson, AZ.

Siting and maintaining reserves

The process of establishing and managing *in situ* reserves is influenced by biological, logistic, socioeconomic, and political considerations. Policy makers need biological information to establish guidelines for requisite size, optimal boundary buffer zones, degree of isolation, proper genetic constitution of target crop plant populations, and maintenance procedures of *in situ* reserves. But biologists know little about the genetic makeup, demography, or population dynamics of local cultivar populations (Frankel and Soulé 1981).

This problem can be rigorously solved only by study of selected populations of the cultivars targeted for conservation; but most developing countries lack the strong scientific community necessary for undertaking such research projects (Gómez-Pompa 1984, Gómez-Pompa and Giddings 1986). However, with data on a particular crop and the traditional regimes under which it has been cultivated, informed choices can be made regarding which of the agroecosystem's principal elements should be retained within potential reserves.

One important biological consideration affecting siting and maintenance has been identified by Frankel: coadapted gene complexes must not be disrupted. Frankel (1970) has criticized proposals for scientifically controlled *in situ* reservoirs, i.e., maintenance of crop populations in experiment stations or substations located within the original environment. He contends that ". . .drastic changes in the environment and/or extensive introgression from alien cultivars may disrupt the genetic system [the cultivars] have acquired" (p. 487). Coadapted gene complexes within traditional cultivars could be broken apart by interbreeding with other varieties held in the same reserve, or with alien cultivars maintained in contiguous areas. Guidelines for selecting and maintaining *in situ* sites should include provisions for predicting the likelihood of radical changes in traditional farming practices within the potential site and for evaluating agricultural practices in bordering regions.

Achieving sufficient representation of diverse genetic resources is another consideration. There are biological and logistic problems in the process of sampling and maintenance of samples. Choices will have to be made on a country-by-country basis as to whether *in situ* conservation will focus on specific crops; on diversified traditional agroecosystems, and thereby on the array of crops found within them; or on both specific crops and a traditional agroecosystem. While it may be impossible to maintain all or even most crop genetic resources within an extensive network of small, isolated *in situ* reserves (Frankel 1970),[9] *ex situ* reserves are similarly plagued by problems of coverage.

The representation of crop genetic resources within *ex situ* reserves is limited by problems inherent in collection and conservation processes, rather than by site location problems. Among the greatest difficulties are maintenance of vegetatively propagated stocks and "recalcitrant" seeds that are not suited to conventional *ex situ* cold storage methods. Conservation of these resources typically requires living collections *ex situ*, which are very expensive in terms of labor and space, in part because they are often attacked by pathogens. Therefore, conserved stocks of recalcitrant seed, especially of many important tropical species (IBPGR 1985), and vegetatively propagated crops must be significantly smaller than those of other crops and are more endangered in storage (Frankel 1978, Lyman 1984). Yet more than one-fourth of the people living in the tropics rely on vegetatively propagated crops for their staple food (Coursey 1974). By focusing on recalcitrant seeds and vegetatively propagated crops, *in situ* conservation efforts could contribute more than *ex situ* reservoirs toward coverage of many tropical crop genetic resources.

Another problem with *ex situ* conservation is that the genetic integrity of all seed stocks deteriorates with time due to genetic drift and artificial selection pressures, such as those related to cold storage. Crop seeds are routinely withdrawn from cold storage for regeneration. During crop regeneration cycles, seed of particular crop cultivars is transported to a suitable agricultural environment, often in a tropical or subtropical climate, to be cultivated for purposes of stock maintenance. In these situations, unintentional outcrosses between distinct accessions can alter stock purity. Entire stocks have also been lost due to climatic conditions, natural hazards, and human error (Oldfield 1976, 1984, Roos 1984). Thus while in theory *ex situ* methodologies could achieve maximal coverage, in fact only limited samples of crop genetic diversity are being successfully maintained.

A difficult problem facing *in situ* conservation is the lack of national inventories of traditional cultivars and agricultural sites (US Congress [OTA] 1986). Site selection requires analysis of data on sizes and distribution of cultivar populations; the number and proportion of indigenous cultivars, as opposed to introduced modern varieties, being cultivated in an individual farmer's fields in specific localities; how the cultivation of indigenous varieties is integrated with the cultivation of improved varieties; the specific kinds of traditional agriculture carried out in a given country; and how traditional cultivators are integrated into the national economy.

Many critics of *in situ* conservation projects emphasize socioeconomic problems. Frankel (1974) has maintained that *in situ* conservation of landraces is "an economic and social impossibility." How can policy makers encourage farmers to maintain viable populations of traditional cultivars or crop-weed complexes despite pressures to follow other agricultural paths? Conservation of traditional agroecosystems in the midst of agricultural modernization efforts in Third World countries is not only technically and scientifically complicated, but is also politically sensitive. Policy makers must establish that they are not attempting to freeze the peasantry in what may be perceived to be a backward way of life. Indigenous groups striving to maintain their cultural integrity are excellent candidates for inclusion in agroecosystem conservation programs.

[9] O. H. Frankel, 1983, personal communication. Division of Plant Industry, Commonwealth Scientific and Industrial Research Organization (CSIRO), Canberra City, Australia.

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A basic economic problem is that the production of staples does not usually offer great economic rewards; given the opportunity, farmers will cultivate cash crops when their subsistence needs have been met (e.g., Alvarez 1977, Barlett 1977, Brush et al. 1981). When any *in situ* conservation program limits or reduces perceived opportunities for cultivating cash crops, financial subsidies will be necessary. Incentives would have to be dependable and strong enough to ensure long-term farmer participation in the conservation project.

However, introduction of subsidies may build unrealistic expectations and hasten socioeconomic change. The sudden infusion of money from outside sources unlinked to existing socio-political frameworks can have a dramatic effect on the social structure and farming decisions of relatively closed local economic systems. Can *in situ* conservation programs based upon community participation allow the continued social, cultural, and economic evolution of the community while ensuring conservation of traditional cultivars?

Another socioeconomic problem involves changes in land tenure. A program could lose its participants if land to be included in an *in situ* reserve shifts ownership from subsistence farmers to large-scale, commercial agriculturists. However, this problem is not likely to occur in marginal areas.

Political problems are interwoven with the socioeconomic problems. Site and maintenance decisions must reflect extraneous factors that affect successful implementation of any government-sponsored program (Grindle 1980). Social cohesion and a well-organized local political structure would be advantageous, perhaps necessary, for a farming community's participation in an agroecosystem conservation program. Because indigenous people can gain legal knowledge and political clout by cooperating with international conservation efforts (Brownrigg 1981), they may regard participation as politically advantageous. But national governments, may, for their own political and economic interests, oppose strengthened indigenous political clout, and may therefore resist the projects.

Until recently, conservation has been perceived as the domain of natural scientists. But the challenge of traditional agroecosystem conservation requires that policy makers include social scientists and area specialists among their advisors.

A proposal of future directions

What can be done to maintain optimally our genetic resources? We suggest a three-pronged approach consisting of *in situ* conservation linked with economic development efforts; *in situ* conservation and research centers; and *ex situ* reserves. We will always need *ex situ* genetic reservoirs as repositories for samples of the world's genetic resources, and research should continue on ways to upgrade *ex situ* methodologies (e.g., cryopreservation of meristem cultures). Nevertheless, *in situ* conservation programs could offset some of the major deficiencies of the *ex situ* approach (IBPGR 1985). These alternative *in situ* programs would seek to complement the *ex situ* reservoirs.

Modern crop breeders working in developed countries have shaped the prevailing view (Frankel and Soulé 1981) that traditional cultivars have two values for which they need to be conserved: as a bank of genes for insertion into modern cultivars and as a bank of gene complexes—adapted to specific environmental conditions—that could be improved by insertion of genes from other stocks. However, traditional cultivars have a third, more critical value for people in the developing nations. Locally adapted varieties of traditional crops provide dependable subsistence for many people in large areas where modern crop varieties attuned to local conditions are not available. Approaches linking *in situ* conservation with rural development efforts reflect a concern for all three of these values.

Efforts to integrate *in situ* conservation with rural development would probably be incapable of conserving landraces under traditional conditions. Development involves change. However, traditional farming has never been unchanging. The natural and cultural elements of the agroecosystem in which cultivars evolve have changed and will continue to change over time. But the new cultivar populations that develop would retain many of the adaptive complexes that are the mark of today's landraces. In addition, they would include many different genotypic combinations in dynamic interaction with evolving populations of pests and pathogens, unlike seed stocks conserved in *ex situ* reservoirs.

In situ reserves thus envisioned would contribute to Third World development in other ways. Modern cultivars created for use under ideal field conditions often have not met peasants' needs for predictable success when grown under the less than optimal conditions of peasants' fields. Furthermore, use of modern crop varieties that are not genetically resistant to or tolerant of specialized pathogens, parasites, or insects and other herbivores, has increased the vulnerability of agricultural production systems to major epidemics. (Browning 1981, Brush et al. 1981, Chang 1984, Johannessen 1982, NAS 1972, Wilkes and Wilkes 1972). In contrast, the landraces propagated in conservation-development programs would be adapted to local conditions and therefore yield predictable subsistence.

Conservation-development programs could include research that may lead to scientifically based agricultural programs for the different natural and social conditions characteristic of tropical lands. However, the *in situ* conservation sites should not be constructed as "cages," holding "primitive" farmers, crops, and agroecosytems for study by outside scientists. The participation of farmers educated in the goals and methods of the program would be necessary for its success (Gladwin and Murtaugh 1980, IPC 1984). The expertise of interdisciplinary research teams who have participated in small farmer development projects could also contribute to the success of such an approach.

The second approach would involve *in situ* conservation-research stations independent of private farmers. These research centers would both emulate the evolutionary processes occurring in farmers' fields and study evolution in traditional agroecosystems of the surrounding region. This approach has the advantage that it does not rely on freezing natural

and social processes in traditional agricultural communities.

Any successful *in situ* research at the conservation stations will have to be based on careful studies of processes occurring in traditional agroecosystems. Such *in situ* research-conservation facilities will evolve as their operators learn their requisite roles and activities. From an emphasis on research about what needs to be done, there will be a transition period to the station's actual maintenance of genetic resources.

This approach also fulfills a conservation goal not being met by *ex situ* reservoirs. Intensive research on cultivar populations carried out at these stations could provide information on genetic differentiation and evolution of crop species (Frankel and Soulé 1981). Few *ex situ* collections can be used as sources of data to study evolutionary processes because some landraces are not represented or have been unevenly sampled; sampling procedures are not standardized and are often poorly documented; diversity in a given sample has been reduced by selecting a few individuals for preservation, while discarding others; the genetic integrity of the population's record has been altered by selection, hybridization, and genetic drift during reproduction for maintenance; information is lacking as to the collection's precise geographic origin; and the possible impact of modernization on the population at the time of collection was not recorded (Frankel and Soulé 1981).

Research-conservation stations ideally should be linked to a network of conservation-development program sites. Data gathered by one could be used by the other. In many ways, proposed MAB projects unite the two approaches. The program's initial indigenous culture biosphere reserves will reveal strengths and weaknesses of *in situ* conservation efforts. In conjunction with the United Nations Environment Programme (UNEP), UNESCO-MAB is now encouraging national governments to nominate specific sites as pilot rural development projects based upon indigenous knowledge. Emphasis is placed on integration of traditional and scientific knowledge of plant resources to further traditional uses.

With the involvement and encouragement of ethnobotanists, genetic conservationists, biologists, geographers, and anthropologists, *in situ* conservation of traditional agroecosystems in biosphere reserves may soon be realized. Researchers who have studied traditional cultivars, cultivators, and agroecosystems are urged to contact national MAB committees to provide information relevant to conservation of areas characterized by long-standing traditional land use and management practices.[10] They should also nominate for biosphere reserve status promising areas for which sufficient information is available.

Any network of *in situ* conservation-development project sites and research-conservation stations will probably start out on so small a scale that some might say they would make an insignificant contribution toward solving the genetic resource conservation crisis. But during this stage, problems can be identified, and the programs can respond to these problems. Information from ongoing research will also contribute to the evolution of these programs. Today only speculations and opinions inform policy analysts and decision makers considering traditional agroecosystem conservation. Therefore, even data from early pilot programs will aid discussions about the feasibility of traditional agroecosystem conservation projects aimed at salvaging our crop genetic heritage.

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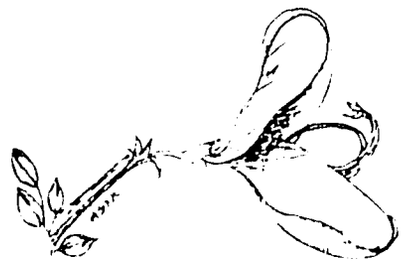

ZAMBIA

World Wildlife Fund Letter

1988, No. 1

Debt-for-Nature Swaps: A New Conservation Tool

IN THIS ISSUE: As they seek the rewards of development, many deeply indebted nations have seen little choice but to continue destroying some of the world's most important natural assets, particularly its tropical forests. As one response to this predicament, conservationists have developed a novel technique called debt-for-nature swapping. It is designed with a twofold purpose: to help reduce environmental problems such as tropical deforestation and at the same time to help relieve the developing nations' debt burden. Swap agreements have already been reached in Bolivia, Costa Rica, and Ecuador. While interest is spreading, the opportunity for swaps may not last for long, and conservationists are therefore trying to act quickly. This issue reviews debt-for-nature swapping to date and examines its potential as a link between conservation and development.

In Latin America and elsewhere, major efforts to develop large-scale modern agriculture, new roads, dams, and industries have suffered or stalled, leaving local economies moribund and pressing social needs unmet. Having borrowed heavily, in part to finance economic growth, many developing countries are now deeply in debt with few means to meet their obligations to private and governmental lenders—let alone to continue the process of development.

Many of these countries are richly endowed with some of the earth's most important natural treasures. For example, Brazil—the leading debtor among developing countries, with nearly $111 billion in foreign loans in 1986—holds 30 percent of the world's tropical forest.

Tropical forests are important not only for the rich diversity of plant and animal life they contain but also for their contribution to human welfare. The rural population in tropical developing countries depends on these forests for food, fuel, building materials, and fodder for livestock. In the developed world, people rely on many foods, medicines, and industrial products that originated in tropical forests. Unfortunately, however, much of the limited economic progress in the tropics has come at the expense of these forests, as countries intent on increasing production and boosting exports clear them for farmland, pastureland, mining, and timber.

At the present rate of conversion, experts estimate that in 30 years the world's tropical forests may be completely decimated. And, as long as the debt burden remains severe, the developing nations in which these forests exist will be hard pressed to allocate money for conserving them.

To achieve lasting economic progress in these countries, ways must be found to relax debt's stranglehold on development and to reverse the unsustainable use of natural resources such as tropical forests. As an important first step, conservationists have developed an innovative means to help curb deforestation and other environmental problems, and, at the same time, contribute to easing the developing nations' debt burden. The technique, called "debt-for-nature swapping," involves the acquisition of debt by conservation organizations, at a discount, and its

This is the inaugural issue of *World Wildlife Fund Letter*, a new publication that will provide a critical look at conservation issues around the world and World Wildlife Fund's efforts to address them. Each issue will feature an in-depth article on problems, progress, and new techniques in conservation and sustainable economic development, as well as updates and highlights of research and other activities of WWF.

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first year. The mechanism, which was designed taking into consideration the projected inflation rate, ties the bonds' future interest rate to the average of certain interest rates paid by Ecuador's five largest banks.

6. Bills to amend the Internal Revenue Code to provide the face-value deduction were introduced in both houses of Congress in 1987. Sens. John Chafee (R-R.I.), George Mitchell (D-Maine), and David Boren (D-Okla.) were the primary cosponsors of S. 1781. In the House, Reps. Donald Pease (D-Ohio), Jim Cooper (D-Tenn.), and John Porter (R-Ill.) were the primary cosponsors of H.R. 3466. The legislation was supported by the Environmental Defense Fund, Natural Resources Defense Council, International Institute for Environment and Development, The Nature Conservancy, National Audubon Society, New York Zoological Society, National Wildlife Federation, Sierra Club, and Conservation International.

7. "What Do Monkeys in Bolivia Have to Do with the Debt Crisis?" *Wall Street Journal*, January 20, 1988.

WWF News and Notes

Innovative Zambia Project Expanded

As part of a new approach to wildlife conservation being tried in parts of Africa, WWF has moved to expand a project in Zambia to help local communities derive direct economic benefits from wildlife.

With partial funding from the U.S. Agency for International Development, WWF will provide technical assistance and $124,000 in financial support to Zambia's National Parks and Wildlife Service (NPWS) for the Zambia Wildlands and Human Needs Project. The funds will help extend to four additional protected areas a new wildlife management system developed in Zambia's experimental Lupande Development Project, which began in 1981 in the Lupande Game Management Area with support from the New York Zoological Society.

The Lupande Game Management Area (GMA) is one of 32 GMAs in Zambia which serve as multiple-use buffer zones adjacent to the country's 19 national parks. Unlike in Zambia's parks, local populations continue to live and farm within the GMAs; however, their use of wildlife is still severely restricted. Particularly in GMAs where tsetse fly infestation effectively prevents raising cattle, this has resulted in serious protein deficiencies as well as crop depredations from free-ranging wildlife. Zambia's existing safari companies traditionally have provided few local residents with employment, which might otherwise help compensate for these problems. With weak local economies and no vested interest in wildlife conservation, these residents sometimes encourage poachers in exchange for meat.

The Lupande project is based on the premise that revenue generated from wildlife can help to meet the wildlife conservation objectives of the NPWS, which constantly faces inadequate budgets, and also contribute to local economies.

As part of the project, for example, safari companies now must hire a minimum number of local residents. Safari concession fees are paid into an innovative revolving fund established by NPWS. Through this fund, the fees are shared between the NPWS, which uses them for conservation in the GMA, and a committee of local chiefs that uses the funds for local development projects. To guard against poachers, the project has provided additional employment to residents who serve as village scouts (for whom protecting local wildlife has now become a matter of self-interest). Results of the Lupande pilot project have been promising, with a decline in poaching of elephant and the endangered black rhinoceros.

"Extending the techniques developed at Lupande to four additional sites is the crucial next step toward developing a nationwide program to make GMAs self supporting units," says R. Michael Wright, vice-president of international development for WWF. "Especially critical to the Zambian approach has been establishment of the revolving fund mechanism and the willingness of NPWS to actively share decision making with local people living in the GMAs."

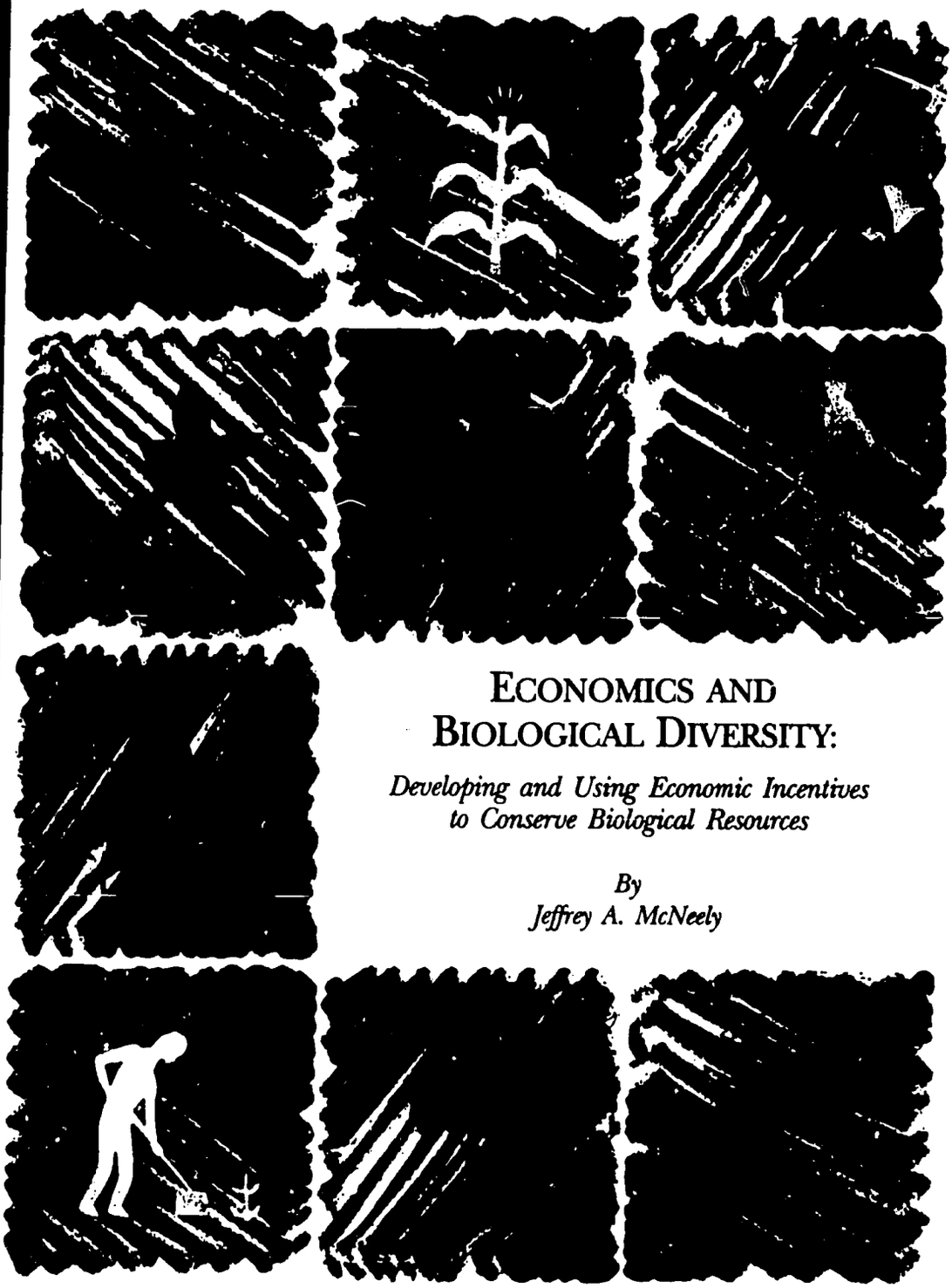
WWF Aids World Bank in Developing Conservation Measures

At the request of the World Bank, WWF is assisting in a task force on critical ecosystems and biological diversity that will aid the Bank in incorporating conservation components into its planning activities. The task force will identify critical ecosystems and high-priority countries for conservation, and point out ways that the Bank can protect biodiversity in countries in which it is active.

WWF Vice-President for Science Dr. Russell A. Mittermeier is serving as a coordinator of the task force, which is composed of Bank officials and outside conservation experts. Other WWF staff will assist in workshops held by the task force for Bank personnel on protecting biodiversity in Asia and other developing regions.

"This task force represents a positive step on the Bank's part," says Mittermeier. "It shows that Bank leaders recognize that sound development depends on maintaining the global biological resource base."

ZAMBIA



ECONOMICS AND BIOLOGICAL DIVERSITY:

Developing and Using Economic Incentives to Conserve Biological Resources

By
Jeffrey A. McNeely

INTERNATIONAL UNION FOR CONSERVATION OF NATURE AND NATURAL RESOURCES

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CASE STUDY 20: CREATING A REVOLVING FUND FOR SUPPORTING WILDLIFE MANAGEMENT IN ZAMBIA

The Luangwa Valley of Zambia is one of the richest wildlife areas in the country, containing four national parks which cover about 20 percent and game management areas which cover about 60 percent of the valley. The game management areas differ from parks in that they are zoned for wildlife utilization and allow human occupation. However, legally all wildlife is the property of the State, and to harvest the animals in game management areas requires licenses that are often prohibitively expensive to residents.

The wildlife resources of the Lupanda region of the Valley has supported safari hunting which yields about $350,000 per year; but less than one percent of the safari hunting revenue was returned to support local village economies and a negligible amount went toward wildlife management costs. As a result, local support for conservation has been very low, and illegal hunting of wildlife, especially elephants and rhinos, reached such high levels that extirpation of some species was a real possibility. Despite strengthened law enforcement, villagers welcomed poachers from distant parts of the country, as long as they shared some of the harvested meat with the community.

Based on the premise that at least part of the revenues earned from wildlife should be returned to the National Parks and Wildlife Service (NPWS) to management the wildlife resource, a Wildlife Conservation Revolving Fund was established in 1983. This Fund also enabled the NPWS to employ additional staff beyond the Government approved civil servants.

Wildlife Sub-Committees were established in each Chiefdom, administered by a Unit Leader from the NPWS, and a village scout program was initiated. The scouts were given a training course of six months, officially designated as wildlife officers, and employed throughout the year in their respective chiefdoms as the local "custodians" of their village's wildlife resources. Additional manpower was also recruited from the local community on a seasonal basis to assist with other management needs, including building maintenance and construction.

Income to the Wildlife Revolving Fund came from the harvest of hippos, and from auctions among safari hunting companies for the rights to hunt in the Lower Lupande Game Management Area, with

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Results have been remarkable. Manpower increased from 11 to 26 from 1985 to 1987, and the number of field-days by staff increased from 176 to 717 man-days. Annual mortality of elephant and black rhino, expressed as the number of poached carcasses found per year per square kilometer, decreased by 90 percent in the same period. In 1987, the total earnings for the Revolving Fund were $48,620, of which $14,840 was devoted to wildlife management, including $4,410 for the village scout program. Overall recurrent costs of wildlife management for the year was $9,870, considerably less than was earned by the Revolving Fund. Villagers started supporting the NPWS wildlife management effort, and local headmen established security committees to prevent poachers from entering their areas.

Once economic benefits started to flow to the local villages, the reduced poaching of elephants has led to an increase of their populations to the level where sustainable harvests would far exceed the total costs of effective management programs. In addition, about half the costs of supporting the village scouts was equivalent to the total sums derived from revenue earned by ivory collected by scouts from elephants which died naturally. While this source of revenue did not go back into the Revolving Fund, it did illustrate to the government the magnitude of funds which could be recovered by this form of local involvement in wildlife management.

In summary, the Wildlife Fund acts as a legal mechanism for charging concession fees, selling wildlife products, and engaging in commercial ventures related to wildlife development. The Fund can then direct the income into appropriate channels to serve the interests of managing the biological resources of the area, as well as the interests of local communities co-existing with the wildlife. It therefore reduces the need to depend on Central Treasury for funds, which in recent years has been unable to meet the growing cost of conservation. A central factor in the success of the Fund was its establishment within NPWD. Using another agency or government body would have diluted the impact of the Fund, particularly its ability to employ local residents as legally-authorized wildlife officers.

(Source: Lewis, Kaweche, and Mwenya, 1987)

WILDLANDS & HUMAN NEEDS PROGRAM

Beyond national parks

Conservationists increasingly see a need for new and innovative approaches to wildlands protection

Since the birth of Yellowstone National Park in 1872, the national park concept has spread around the globe. In country after country, miracles of natural creation have been set aside as wellsprings of national pride and spiritual renewal. Their power to inspire the heart and humble the mind continues to motivate legions of people to help perpetuate these unique symbols of regard for the natural world and human posterity.

—William P. Gregg, Jr., and Betsy Ann McGean
Orion 4(3): 41

Today there are over 1000 national parks in more than 120 countries worldwide. The number of parks has grown dramatically in recent years. According to Kenton R. Miller of the International Union for Conservation of Nature and Natural Resources (Gland, Switzerland), between 1972 and 1982 the number of parks and other protected areas increased 47%; the amount of land covered by parks increased 82%.

Sources of inspiration and national pride, these parks also have played a key role in the global conservation movement. But parks around the world are increasingly threatened. Even in developed countries, which generally have strong resource protection laws and constituencies, parks have begun to suffer from outside pressures. A 1980 US National Park Service report identified 73 categories of threats to US parks, including industrial development, urban encroachment, air and water pollution, roads, and invasion by exotic species (*BioScience* 36: 301–304).

by Laura Tangley

In developing countries, the problems are even worse. Encroachment by local people who desperately need wood, land, and other resources is common and has been recognized as a serious problem for many years. Park services in these countries often lack the budgets and staff necessary to fight this encroachment, either through enforcement or public education programs.

"I could tell you any number of horror stories about parks and preserves in developing countries," says F. William Burley of the World Resources Institute in Washington, DC. In Belize, he says, there are 16 forest reserves covering 28% of the nation's land. "This may look good on paper," says Burley, "but many of these reserves have people moving into or farming on them." Burley is about to spend two years in Belize working with the government on forestry and conservation policy.

Even in Costa Rica, whose park system is considered to be the best in the neotropics and one of the best in the world, economic problems have put pressure on national parks (*BioScience* 36: 296–300). A few years ago, for example, more than 1000 gold miners began working inside Corcovado National Park after banana plantation owners pulled out of the region and created a serious unemployment problem. Mining activities have severely damaged some of the park's terrestrial and, especially, aquatic ecosystems (see photos, opposite).

"I am convinced that you can't go into a developing country and set up only a system of strictly protected parks," says Burley. "The way to protect [wildlands] is through large-scale sustainable use and management plans." Integrated management of large land areas—with conservation being one but not the only goal—would help combat another problem facing parks, Burley says. In recent years there has been a growing recognition that parks in both developing and developed countries are too small, or have the wrong shape, to ensure long-term protection of many, particularly larger, species.

A 1985 study, described by the publisher as "the first systematic, international study of the pressures [parks] face," presents data confirming anecdotal evidence of park problems.[1] Authors Gary E. Machlis and David L. Tichnell surveyed park managers worldwide, attempting to include representatives of as many of the world's major biomes as possible. Personnel from 100 parks in 49 countries responded to the questionnaire.

Respondents identified a total of 1611 threats to resources in their parks; only three managers reported no threats. "The study demonstrates that park managers around the world perceive significant and wide-ranging threats to the natural resources of national parks," say the authors. The most frequently reported problems include poaching, illegal removal of vegetation, inadequate staff, and local attitudes toward the parks.

As a partial solution to these problems, Machlis and Tichnell recommend a new approach to national parks, one that encourages greater integration of conservation and development. They say, "the romantic vision of parks as protected paradises is

[1] Gary E. Machlis and David L. Tichnell, 1985. *The State of the World's Parks: An International Assessment for Resource Management, Policy, and Research.* Westview Press, Boulder, Colorado.

widespread and, ironically, may threaten the permanence of national parks. This purely preservationist approach, where parks are considered fortresses under seige, invincible or soon eradicated, carries great political risks. It requires an essentially militaristic defense strategy and will almost always heighten conflict."

A growing number of conservationists have adopted this broader perspective on national parks. It mirrors a change—many would say a maturation—in the conservation movement. "Integrating conservation and development" have become buzz words within many environmental organizations today. They reflect a recognition that meeting human needs is essential, not only to reach conservation goals but also as an objective in its own right.

This perspective on parks and conservation does not mean that the traditional national park is obsolete. Strictly protected parks meet important national needs and are the economic mainstay of many regions. "National parks are great," says Dennis Glick of the World Wildlife Fund in Washington, DC. "They can work well even in developing countries, just not in all situations." Glick, who has worked on international conservation issues for more than a decade, adds: "the ideal wildlands system is made up of several different management categories ranging from national parks that are strictly protected to entities like biosphere reserves that allow human use of natural resources."

On the following pages are two stories about alternatives to the traditional national park model. The author of each article has visited the project discussed. The first story (p. 148) describes Unesco's biosphere reserve network, focusing on Sian Ka'an reserve in Mexico. The focus on Sian Ka'an does not imply that it is the only promising reserve, simply that the project illustrates recent changes in the reserve program. The second story (p. 156) describes an innovative project, spearheaded by biologist Daniel H. Janzen, to restore a large, dry tropical forest in Costa Rica. Janzen plans to make this proposed protected area, Guanacaste National Park, an integral component of local culture to improve the park's chances for long-term success.

Miners in Costa Rica's Corcovado National Park have severely damaged many of the park's rivers and streams by releasing large amounts of sediment into the water. Although the crisis in Corcovado has now been resolved, Costa Rica and other countries worldwide are facing mounting threats to their national parks. Photos: Daniel H. Janzen, courtesy World Wildlife Fund.

AWA / LA PLANADA - ECUADOR / COLOMBIA

Biosphere reserves, buffers, and boundaries

For a long time it has been said that economic development must lead to sustainable ways of life. For an equally long time it has been agreed that nature conservation cannot succeed unless the needs of people are taken into account; you cannot have lasting conservation in the midst of human poverty and suffering. Similarly, it has been agreed that conservation and development must go forward together; development will not lead to a sustainable way of life if conservation principles are ignored.

General agreement on these matters dates back at least to the United Nations Conference on the Human Environment in 1972. Nevertheless, the effect of this agreement resembles that of the general agreement that nuclear war should be prevented. Most people are for conservation and against nuclear war, but they disagree on how one should be achieved and the other prevented. Meanwhile, we go on building missiles and bombers, dams and highways, with minimal awareness of the long-term effects.

We should all be familiar with the effects of past development practices. In 1968 a conference held at Airlie House in Warrenton, Virginia, examined the ecological consequences of major international development projects (Farvar and Milton 1972). How much this conference accomplished is open to question, but at least the US National Environmental Policy Act was passed soon thereafter, and the World Bank hired its first ecologist.

Most people are for conservation and against nuclear war, but . . . we go on building missiles and bombers, dams and highways

Indigenous people displaced

There have been many studies also of the consequences of establishing nature reserves without consideration for local indigenous people, who were often themselves effective guardians of the areas now to be protected through official status. Colin Turnbull's (1972) *The Mountain People* described the cultural and personal disintegration of one African tribe displaced from their homeland by the creation of Kidepo National Park in Uganda. Still earlier, the establishment of Tsavo National Park in Kenya resulted in the cultural breakdown of the Waliangulu people, the traditional elephant hunters who had occupied that area (Murrey 1967). Such cultural consequences of otherwise admirable conservation efforts have taken place in Amazonia, Indonesia, and other areas of the world. Although the International Union for Conservation of Nature and Natural Resources (IUCN) and the World Bank (Goodland 1982) have taken a stand against such displacements, they still continue.

Most recently, the Veddas, a traditional hunting-gathering people in Sri Lanka, have been displaced from their homelands. This displacement was partly a result of the Mahaweli Development Project, intended to greatly expand the irrigated rice lands in Sri Lanka. The final blow, however, came from the establishment of Madura Oya National Park, intended to partly mitigate the adverse consequences on wildlife of the dams and irrigation developments. Admittedly, the Veddas have been settled in a new village and provided with lands where they can grow paddy rice. They are, however, hunter-gatherers who have not in 2000 years of rice cultivation in their country shown the slightest inclination to take it up as a way of life. With the breakup of Vedda society will come the loss of their traditional knowledge of how to live in a tropical forest without destroying it or its wildlife (Burgess 1986).

Working with local people

Fortunately, there are a growing number of examples that illustrate ways and means of working with local people to achieve mutually agreed upon conservation goals. Neville Gare has written of the problems encountered when he and Sylvanus Gorio sought to protect and develop the Varirata National Park in Papua, New Guinea. Although the Varirata area had been proclaimed a national park in 1963, it was not until 1970 that anything was done to provide the protection and the facilities for visitors that would make it really a national park. By working slowly and patiently with the Koiari people who claimed the area as their own, Gare, Gorio, and their associates built a level of understanding and trust that resulted in enthusiastic acceptance of the national park idea by the time the park officially opened in 1973 (Gare 1987).

Other examples are taken from projects approved for funding by the World Wildlife Fund-United States (WWF-US). One project, located on the western slopes of the Andes in Colombia, is in an unusually rich and diverse tropical forest region. In 1982, the WWF-US in cooperation with the Colombian Foundation for Higher Education was able to buy a

by Raymond F. Dasmann

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1600-hectare ranch known as La Planada. This ranch occupied a forested plateau that had been carefully protected by its owner. However, both WWF-US and the Foundation recognized that the La Planada reserve would not be secure if the area surrounding it was to experience the usual pattern of Andean colonization—deforestation followed by land degradation.

The area south of the reserve, toward Ecuador, was inhabited by the Awa/Cuayquer Indians, whose previous land-use practices had preserved the region's biological richness. Working with local people and the Colombian government, WWF-US and the foundation came up with a plan for the region patterned on the Unesco-Man and the Biosphere Program (MAB) biosphere reserve concept (Unesco 1974). Protected zones, manipulative zones, administrative zones, and zones of influence were described, with their appropriate uses to be worked out through joint consultation. New schools were developed in the Awa/Cuayquer area with an approach to education based on local needs: nutrition and health, resource use, and agroecology. In 1986 there appeared to be solid community support for both the conservation and development aspects of the endeavor. Plans were being developed to establish an official biosphere reserve encompassing La Planada and the Awa/Cuayquer territory.

During the same period, on the Ecuadorian side of the border other moves were being taken to protect, not the natural environment as such, but the Awa/Cuayquer Indians, whose lands were being threatened by road development and encroachment from more densely populated regions. The national Indian organization (CONACNIE), the Ecuadorian government, and the international organization known as Cultural Survival all worked together to demarcate and award title to 80,000 hectares of tribal land and to establish citizenship and tribal rights for the Indians. By 1986 the Indians had elected a governing council, had affiliated with the national Indian organization, and had proposed that a biosphere reserve be established in their territory, contiguous with the Colombian reserve and as part of an international biosphere reserve (Chapin 1986).

In another rainforest region, in Panama, a similar effort has been underway. The area lies between the Panama Canal and the Colombian border and extends from the crest of the cordillera to the Caribbean Sea. It is the home of Kuna Indians, Kuna Yala, most of whom dwell on the San Blas islands, coral islands within easy reach of the mainland coast. The mainland supports a largely undisturbed tropical forest, believed to be unusually rich in fauna and flora.

Unlike the Awa/Cuayquer, the San Blas inhabitants have long been in touch with European cultures and know the ways of their government. They have achieved legal title to their lands. Nevertheless, they are threatened with encroachment from other parts of Panama.

The situation became critical when a road was built from the Pan American highway to the Kuna reserve. Deforestation and land settlement accompanied the road. The Kuna realized that they would have to take steps to protect their rain forest, and they sought help from CATIE, the center for tropical agronomic research in Turrialba, Costa Rica. Funds were obtained from a variety of sources, including WWF-US, to create a tribal nature reserve as a barrier to further encroachment. The Kuna are putting their own money and human resources into the establishment of this reserve as a center for research, environmental education, and scientific tourism. Studies have begun to determine appropriate, nondestructive uses for the Kuna lands in order to both enhance Kuna socioeconomic well-being and protect the plants and animals of the area.

Wildlife's economic value

In Zimbabwe, a different approach has been taken, one that emphasizes the economic value of wildlife. It was derived from the early attempts at game ranching in that country, but it now has the benefit of more than 25 years of managing wildlife on privately owned land for sustainable economic returns.

Zimbabwe has a policy of local control and local benefits from the use of wildlife. Local conservation councils, now numbering more than 200, make decisions about wildlife use on private lands. The government maintains an oversight role to ensure that endangered species are protected and that other species are not endangered. The local community, however, obtains the benefits from sale of wildlife meat or other products, and particularly from the sale of hunting privileges. The income from the latter may be considerable since hunting privileges are open to competitive bidding, and up to 24,000 Zimbabwe dollars ($14,400 US dollars) has been bid for the privilege of stalking, shooting, and carrying away the tusks from one trophy bull elephant. Incentives to protect the large predators derive from the greater value assigned to areas with "dangerous game."

For communal lands, the Zimbabwe Department of Wildlife and National Parks plays a more active role and may direct the removal of excess numbers of some species and the cropping of others. The local community still shares in the economic benefits, which reportedly makes their attitudes much more favorable to wildlife. Poaching becomes less of a problem when local people take on the responsibility for protecting what they regard as their own wildlife.

The government has direct control over the national lands, which include the national parks and the safari hunting areas. In both of these areas, wildlife and other natural resources are protected, but in the safari areas controlled hunting is allowed. In one safari area, Hirungwe, the pattern of hunting and the level of off-take have remained much the same since the 1960s. However, income to the government from safari hunting in this area increased eightfold between 1973 and 1984 (Child 1984, Child and Nduku 1986). In 1987 the WWF-US and WWF-International approved a proposal (Cummings 1987) that would provide one million Zimbabwe dollars for a field project that "will critically examine, test, and develop multispecies wildlife utilization as an ecologically and economically viable option for land use in Africa."

During 1984–1985, I was part of a National Park Service team assisting the Department of Wildlife Conservation of Sri Lanka in establishing four new national parks. My particular

concern was with integrating land use and conservation practices between parks and surrounding lands. In lands adjacent to Yala National Park in southern Sri Lanka, we found attitudes of local people toward the park to vary from indifference, on the part of those not exposed to marauding wildlife, to hostility, on the part of those who regularly experienced invasions by elephants, wild hogs, or other crop destroyers. Even though the wildlife of Sri Lanka is both diverse and abundant and almost the equivalent of that of India or Africa, I cannot foresee that safari hunting or commercial cropping will be acceptable in this predominantly Buddhist culture. Nevertheless, ways and means must be found for the people living in areas surrounding the nature reserves to share in the economic benefits that can be derived from protected areas.

At present, tourism is not encouraged. Parks tend to be regarded as fortresses to be defended against the surrounding population, and even legitimate park visitors experience severe restrictions. However, if the protected areas are to survive in the long run, they must have local support or at least acceptance. It is likely that tourism can enhance the local income and permit nondestructive uses of national park resources.

Nature reserve boundaries

Although many questions remain to be answered on how best to manage for biological diversity within nature reserves, the greatest problems that face these reserves now lie on their boundaries. Some boundaries represent only legal demarcations, with similar vegetation and animal life on both sides. But increasingly boundaries are becoming lines separating rice paddies or other intensively used land from strictly protected natural areas. There is an obvious need for buffer zones, as called for in the MAB biosphere reserve model (Unesco 1974), but we still must learn how such buffer zones are to be managed if they are to provide benefits to the surrounding population as well as protection for the core reserve. An approach to boundary research that shows much promise has been provided by Schonewald-Cox (page 480 this issue). Such research is long overdue.

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Bruce Bernbaum

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WILDLANDS & HUMAN NEEDS PROGRAM

WORLDWIDE SUSTAINABLE DEVELOPMENT NEEDED TO PROTECT ENVIRONMENT, PROMOTE ECONOMY

International environmentalists now realize that a positive environmental impact statement is not sufficient to ensure that a project will be beneficial to a developing nation. It is important to alleviate poverty, "which, more than anything else, leads to environmental degradation." With these words, William K. Reilly, president of World Wildlife Fund and the Conservation Foundation, opened a May 12 WWF/CF-sponsored seminar on sustainable development.

Poverty is both the cause and consequence of environmental degradation, Reilly maintained. WWF/CF has about 24-30 projects in the works -- most of these are in Central and South America, but there are also several in Africa and a few in Asia -- seeking ways to promote economic development with conservation. But these are "experimental and very young. They represent our best ideas, but they are as yet unproved," Reilly warned. He even speculated about whether it will be possible to achieve even moderate economic development along side of environmental protection. "The verdict is still out." However, he made clear that the alternative of uncaring development will only make the situation worse.

R. Michael Wright, WWF vice president, justified the group's interest in economic development in the Third World. "Protection of biological diversity is essential to meeting human needs." If there is no protection, "the poor are forced to use resources that would be renewable otherwise." However, WWF/CF still believes that the "community development approach is not a substitute for parks" in protecting some particularly vital and fragile areas. Many of the WWF/CF projects, in fact, are in what they call "influence zones" adjacent to parks, where environmental degradation threatens to spill over into the park.

The core of WWF activities was a 1985 offer by the U.S. Agency for International Development to provide a matching grant for sustainable development projects. Three kinds of projects are supported. Long-term model projects that link natural resource and human development needs are focused on Mexico, Costa Rica, Peru, St. Lucia, Dominica, Zambia, Cameroon, Central African Republic, Madagascar, Nepal, Thailand and Indonesia. Shorter-term innovative projects in secondary countries explore "new approaches to conservation and development or provide opportunities" for public/private cooperation. Finally, WWF/CF aims to train resource managers and local community leaders to continue the work.

Speaker after speaker stressed that local participation from the inception of the project idea is essential to its survival. Further, "no element is more crucial" to the success of the project than local leadership, according to Wright. However, local commitment is not always an assurance of benefit, H. Jeffrey Leonard of CF told the group. If there is no market for a product, its safe and successful production will not aid the economy.

TOP U.S., U.S.S.R. SCIENTISTS CONFER VIA COMPUTER ON 'GREENHOUSE' EFFECT

Space age technology is becoming increasingly important in environmental protection. Just yesterday, May 11, a year-long Soviet-American computer-based teleconference on global warming was initiated. Twenty-four participants and three invited observers from Europe will be looking at the implications of the "greenhouse" warming. The scientists will be "talking" computer-to-computer, and the program has been designed for privacy so they can confer freely. The first task of the scientists will be to develop a plausible hypothetical future climate scenario on what to expect in the year 2050 as a result of the warming trend, including the geographic regions most likely to be affected, the amounts of change in rainfall, temperature and winds and the rates of onset of change.

ASIA PROJECTS USING WILDLANDS & HUMAN NEEDS APROACH

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POPULI

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Population-Environment Linkages and Sustainable Development

by Richard Elliot Benedick

Both population and environmental policies would benefit from closer integration, because the problems of poverty, population, natural resources and the environment are so closely intertwined. Several international conferences have reached this conclusion, but unfortunately the concept is still not commonly accepted by officials and planners.

Population and environmental policies should be integrated because the problems of poverty, population, natural resources and the environment are closely related. Several international conferences have reached this conclusion. Unfortunately the "message" does not seem to have gotten through to officials and planners.

Resolutions and debate at the 1972 Stockholm Conference on the Human Environment, at the 1984 Mexico City International Conference on Population, and at assemblies of such organizations as the International Planned Parenthood Federation (IPPF) and the International Union for the Conservation of Nature and Natural Resources (IUCN) have all stressed the interrelationship between people and their environment, and have recommended integration of population and environment policies.

The recent report of the World Commission on Environment and Development (Brundtland Commission) also highlights a holistic approach.

In practice, however, the realization of this interdependence in actual programmes and in collaboration among individuals and organizations working in the respective fields has proven elusive.

Earlier this year, the Conservation Foundation and the United Nations Population Fund jointly convened a meeting in Washington of experienced leaders in the fields of population and environment. The purpose was to

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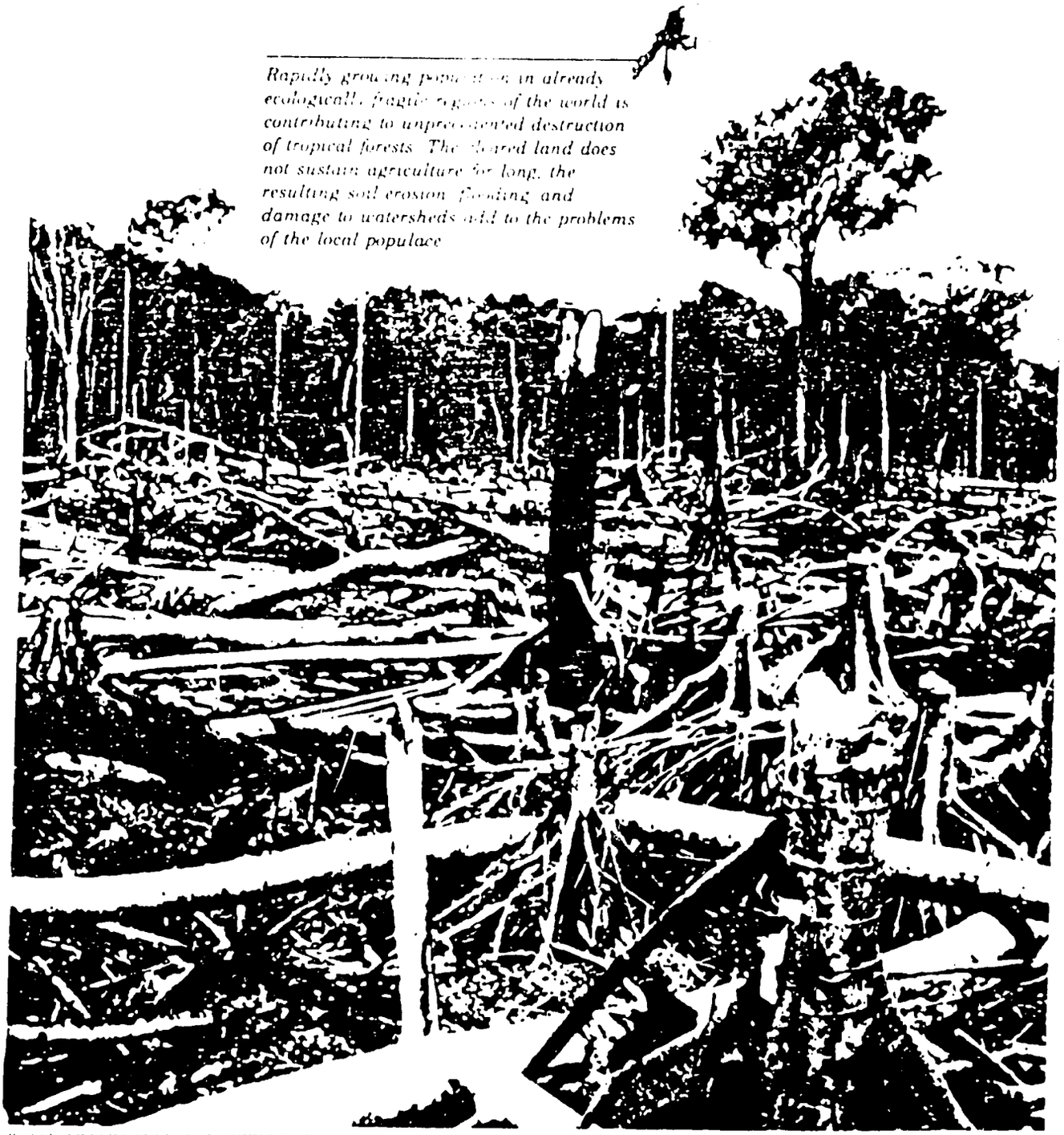
Rapidly growing population in already ecologically fragile regions of the world is contributing to unprecedented destruction of tropical forests. The cleared land does not sustain agriculture for long, the resulting soil erosion, flooding, and damage to watersheds add to the problems of the local populace.



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responsible stewardship of the planet, aimed at efficient and sustainable relationships between people and resources.

Relationships between people and environment are reciprocal. On the one hand, the demands and needs of a growing population will affect environmental quality and the resource base. On the other hand, changes in resource availability and environmental quality affect the lives of people, their health,

children – is still growing rapidly.

This phenomenon of demographic momentum will propel the population of many countries to a further doubling, tripling, or even greater increase over current levels before it eventually stabilizes.

Just a few examples, based on current age structures and UN projections of declining birth rates, illustrate the potency of demographic momentum: between 1987 and 2025, the population of Kenya will grow from 22 million to 83 million, with further increases expected; Tanzania will grow from 24 million to 84 million; Jordan from 4 to 14 million; Iran from 47 to 97 million; Peru from 21

Continuance of current trends in population growth and ecological damage is likely to increase the danger of national conflict, for example, over scarce water from river systems.

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to 41 million; and Ethiopia from 46 to 120 million.

Numbers of such magnitudes in these regions have no precedent in human history. Accompanying these trends is a tidal wave of urbanization which is creating mega-cities in areas which never before supported such huge concentrations of people.

With respect to the environment, there is clear evidence of serious and growing loss of woodlands, increasing soil erosion, desertification, and mounting problems of atmospheric and water pollution. In this connection, the 1988 State of World Population Report, published by the United Nations Population Fund, has some sobering statistics. Tropical forests, it points out, are shrinking by 11 million hectares a year, topsoil is being lost at the rate of 26 billion tons annually and new deserts are appearing at the rate of 6 million hectares a year.

Of particular concern is the fact that population is often growing fastest in areas where the ecological and natural resource base is most fragile and already deteriorating. Environmental degradation is influenced, moreover, not only by population pressures and poverty, but also by industrialized countries' consumption patterns and policies on trade, energy, agriculture and debt.

Since the greatest population increases in terms of absolute numbers lie ahead for many countries, many observers feel an acute sense of urgency for concerted global and national efforts. But action based on inadequate data carries the risk of failure, which could prove costly, not only financially but also in terms of maintaining public and political support.

This underscores the importance of setting priorities both for actions and for research; enough is known in some areas to justify new or expanded programmes, while in other areas further research is a precondition to sensible action.

Continuance of current trends in population growth and ecological damage is likely to increase dangers of social unrest and national conflicts, e.g., over scarce water supplies.

Sustainable development is, therefore, a necessary component of national and international security – and this leads naturally to the question of financial resources. The enormous and disproportionate amounts devoted to armaments in both industrialized and developing countries were noted with concern in Washington. It was stressed that if even a small percentage of these resources could be diverted to sustainable development objectives, it would make a meaningful contribution to national and global security.

Against this background, the Washington discussions centred around three related levels: analytical, policy and operational.

Analytical and research considerations

Physical data

Monitoring and analyzing environmental change, including such key factors as deforestation, erosion, groundwater levels, and desertification, are essential prerequisites for political and public awareness of environmental deterioration and for well-conceived policy and programme responses.

Satellite and advanced computer and modeling technology are important elements in modern environmental research. Considerable work is going on in this area by such international organizations as the United Nations Environment Programme's Global Environmental Monitoring System and Global Resource Information Database, the World Meteorological Organization, and the United Nations Food and Agriculture Organization, as well as by scientific organizations and national databases.

The *World Resources Report*, published annually by the International Institute for Environment and Development and the World Resources Institute, represents a formidable effort at compiling and analyzing a broad range of environmentally relevant data.

There was a strong sense among conference participants that ongoing work could be better co-ordinated, in order to

ascertain the full extent of data that is already available and to determine what more must be done to establish credible and comparable baseline and trend data. It was also felt that more attention should be directed at the dissemination of data to national decision makers and to organizations concerned with the environment.

Research on population-environment linkages

Both environmental and population policies can benefit from a better understanding of interrelationships between population growth and environmental stresses, in particular ecological systems.

For individual countries, or parts of countries, linkages between population pressures and deforestation, biological diversity, water supply, soil erosion, or urban pollution may well be relevant to national policy makers and development planners.

Here again, some work already exists, but there is a need to take stock and examine needs for policy-relevant and country-specific new research.

Operations research

There appears to be an untapped potential for collaborative or complementary population-environment projects on the local level – rural and urban. Analyses of successful existing projects, as well as innovative pilot projects, could prove useful in developing guidelines for future actions.

Economic calculus

Participants agreed that the traditional national accounting system is seriously flawed in that environmental costs and depletion of natural resources (e.g., export of lumber without compensatory reforestation) are not reflected. This can lead to fateful miscalculations by government policy-makers and by development lending agencies and banks.

There is a clear need to develop and gain acceptance for an accounting system that will realistically reflect long-term costs to economic welfare of ecologically unsound short-term policies.

Policy level

Multilateral and international organizations

The sustainable development concept implies an even greater co-ordination among UN bodies and other agencies concerned with Third World development.

Although there are practical difficulties involved, there are important benefits to be gained from breaking through vertical sector approaches and designing aid and lending programmes which are mutually reinforcing.

The Tropical Forestry Action Plan was cited as a possible model for collaboration among UN agencies, nongovernmental organizations, and national ministries.

In the context of the Brundtland Commission recommendations, further thought should be given to the feasibility of consultative mechanisms among parts of the UN system (UNDP, UNFPA, UNEP, World Bank and FAO) with the aim of more effectively achieving sustainable development through complementary policies. Such co-ordination could extend beyond data monitoring, and could cover actual operating programmes in the field.

National government

At the national level, it is essential that top political leadership become aware of the urgency for promoting truly sustainable development and of the consequences of ignoring population, environmental and natural resource factors. A particular problem here is the relatively short horizon of some politicians, and the tendency to focus on immediate crises and on policies that yield

Relationships between people and environment are reciprocal. Population growth affects environmental quality and resources. Diminished resources and environmental quality affect the lives of people.

visible short-run results. UN agencies and nongovernmental organizations have a responsibility to bring the longer term perspective to the attention of political leaders.

The success of the Futures Group in presenting population issues to national leaders through a computer-based visual programme, and a new, similar programme tracking population-environment linkages, represents promising approaches.

If sustainable development is to be more than a slogan, the objective must be full integration of population, environment and natural resource policies into national development strategies. This implies political commitment at the top – president or prime minister – paralleled by co-ordination among relevant operating agencies to determine priorities, promote complementary programmes, and evaluate the inevitable tradeoffs.

Policy-makers also need to become more aware of the impact on population and environment of policies in other sectors, e.g., agricultural subsidies, land tenure, urbanization bias, trade policies, and how well-intentioned policies in one area can cancel out activities in another. Greater interministerial co-ordination is also essential to develop national data and foresight capabilities as an element of rational planning.

The importance of an enlightened public opinion as a buttress – and stimulus – to governmental action was also emphasized in Washington. National legislatures can play a significant role and governments can encourage the work of nongovernmental organizations, universities and research institutes to contribute to an educated citizenry on these subjects.

Nongovernmental organizations

The growing importance around the world of these organizations, as reflections of informed and concerned public opinion, is a promising new development. In industrialized and developing countries alike, citizens' groups can be vitally important in promoting the objectives of sustainable development.

In the past, environment and population groups have been to a large extent separated in their donor base, constituencies, and programme content. However, it was noted that barriers to collaboration have been coming down.

The 1984 Mexico City International Population Conference demonstrated that developing countries overwhelmingly support policies to promote family planning and limit population growth, thus considerably lessening the sensitivity that has been associated with this subject in the past.

Thus, at a time when the holistic concept of sustainable development is gaining currency in UN agencies and national governments, it is important that this be appropriately reflected in the nongovernmental community. The Global Tomorrow Coalition represents a new dimension of co-operation among environment, population and development organizations in the United States, which could serve as a model for such coalitions in other countries. In a similar example of bridging hitherto separate channels, the National Audubon Society is integrating population and environ-

ment in its own educational and outreach programmes.

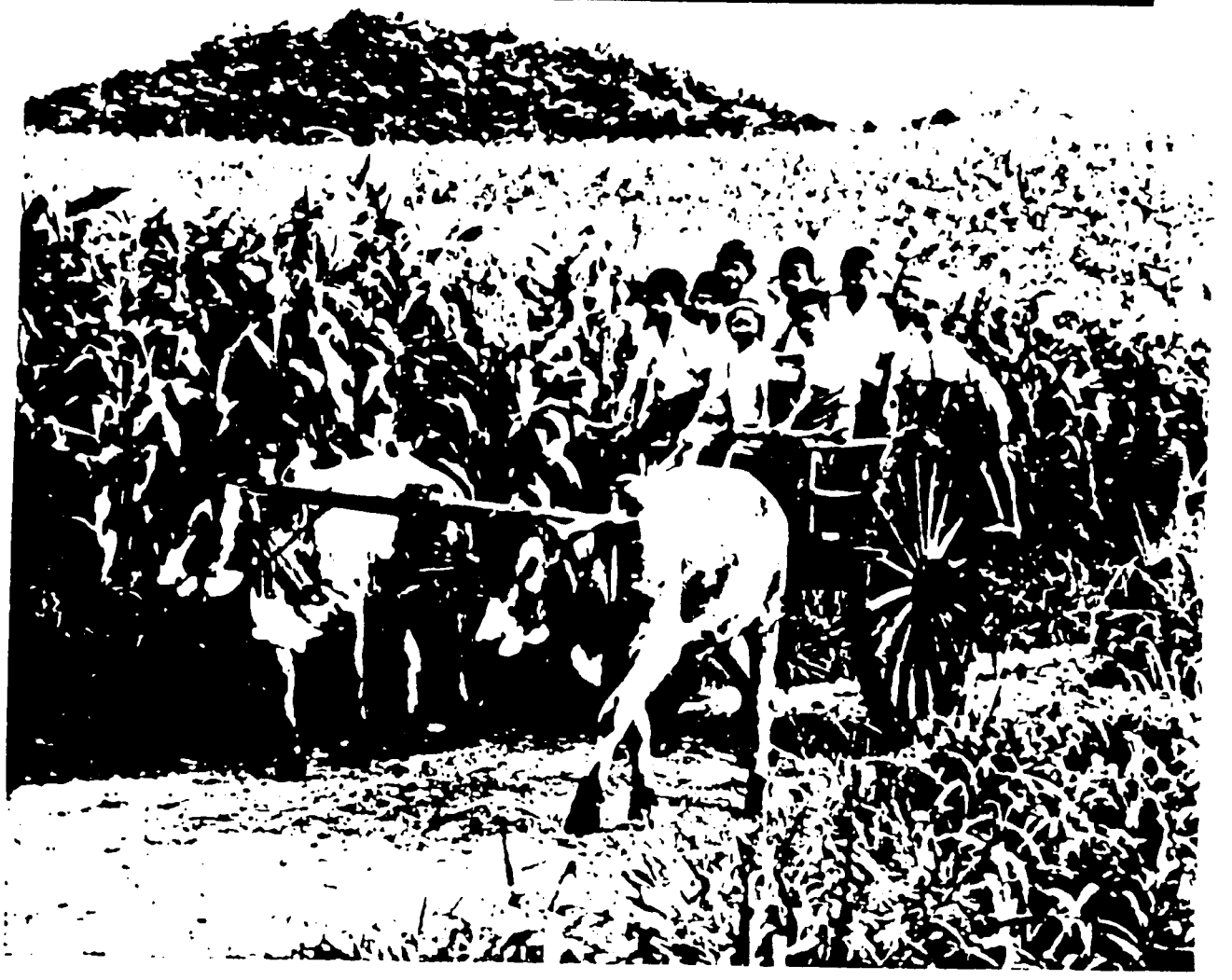
The building of relationships between population and environment citizens' organizations not only reflects the realities, it could also serve to strengthen the effectiveness of their missions. Establishment of common agendas, development of mutually reinforcing constituencies, co-operation in public education and in relations with government and multilateral bodies all offer opportunities for enhanced effectiveness of activities in support of sustainable development.

Joint or co-ordinated activities could include management training, especially for women; conferences, use of public media, films and television; publications, and testimony for national legislatures.

Local-level activities

A third major area of concern at the symposium was the importance of well-conceived population and environment programmes at the rural-village or urban-neighbourhood level. It is here that the results of research, and the policies of multilateral organizations, national agencies, and citizens' groups converge into concrete actions. This is

Children of the Sup Tai village in northeast Thailand ride a bullock cart. This is an area where World Wildlife Fund–US is co-operating with local population and environmental groups in an innovative pilot project combining family planning, conservation education, and rural development.



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where the theories and the policies are translated into communities, household, and individuals (particularly women) becoming instruments for change and progress.

Symposium participants observed that a central purpose of local activities must be alleviation of poverty and a change in attitudes and prospects to give people a sense of having a stake in the future and hence a motivation for conservation and rational use of resources.

If sustainable development is to be more than a slogan, the objective must be full integration of population, environment and natural resource policies into national development strategies.

Local projects could cover a range of specific activities, including family health birth spacing, agroforestry, nutrition, natural resource management, education and employment of women, development of alternative income sources and water supply.

It was agreed that projects should be responsive to local needs and therefore be developed in consultation with local communities. Local efforts have made large contributions to successful strategies in confronting population and resource crises. According to the State of World Population Report, "in nearly all of the success stories, local communities or interest groups were given some power to control crucial decisions affecting livelihoods."

The Report cited Kenya's national soil conservation programme, which has had a sizeable participation by women. The programme has resulted in the terracing of more than 360,000 farms – 40 per cent of the nation's total. In Zimbabwe, the "maize miracle" to build up the productivity of small farmers was a grassroots success.

Nongovernmental organizations, the symposium agreed, can also play a particularly important role at this level because of their flexibility and capacity for innovation.

Above all, it was felt important to avoid preconceptions and to be able to respond pragmatically to particular conditions. For example, environment and population agencies, although different in their expertise, and in their donor structure and interests, could seek opportunities for complementary activities which capitalize on their particular specialization.

For instance, the World Wildlife Fund-US, traditionally concerned with species and habitat, is developing innovative joint projects with family planning groups in Thailand and Nepal under its new Wildlands and Human Needs Programme.

In conclusion, the Washington symposium clearly indicated that those concerned with population and environment issues have a great deal in common and a great potential for working together to achieve shared objectives: To abolish poverty, to improve health, especially of women and children, to conserve this beautiful and patient planet, and thereby to contribute to a better life for the generations that will follow us.□

BAN SUP TAI, THAILAND
ASIA PILOT (NOT PART OF
MATCH) FOR WILDLANDS &
HUMAN NEEDS

The Conservation Foundation Letter

1988, No. 3

Population and Environment Experts Explore Linkages

IN THIS ISSUE: Those who seek to solve the twin problems of population growth and environmental degradation must pay careful attention to the relationships between the two. They must work together and design mutually reinforcing programs to meet the shared goals of eliminating poverty and improving human health. Opportunities for cooperation were explored at a recent conference sponsored by The Conservation Foundation and the United Nations Population Fund. Among other things, the participants stressed the importance of building better rapport between citizen organizations devoted to populations problems and those working on the environment. Another topic of concern was the need for well-conceived population-environment programs at the level of rural villages and urban neighborhoods

This issue of the *Letter* was written by Lane Krahl and Margaret E. Cook of CF's International Development Program staff.

In an age of dramatic population growth and widespread environmental deterioration, one must ask, are the two inevitably and inextricably linked? This question has been debated since 1798, when Thomas Malthus, an English economist, hypothesized in *An Essay on Population* that population growth would outstrip agricultural production and result in "misery and vice" and, ultimately, "premature death." The debate has made it clear that population growth and environmental damage are interrelated. But it has not produced agreement on many aspects of causality, or on the magnitude of environmental impacts caused by population. Experts agree, however, that both population growth and the environment are closely tied to development, and both must be managed wisely as we try to move towards a sustainable future.

The debate on the relationship of population and environment has centered around the importance of population growth as a cause of environmental deterioration and has been fueled by a conflict between the clear logic of Malthus' argument and the seeming fallacy of his prediction that the quality of life would decline.

The world has seen rapid population growth since Malthus's day, but it has also experienced even more rapid economic growth. The economic growth has relied on conversions of natural systems to human uses and on industrial development that has degraded air and water quality. However, the precise role of population growth in environmental deterioration is not clear. Commercialization, land tenure, and national macroeconomic policies can significantly degrade the environment, even without population growth. Similarly, consumption, the physical link between humans and their environment, is not necessarily related to population size.

Clearly, population growth cannot be blamed for all the environmental deterioration that we have seen in recent decades. But while factors other than population growth affect the environment, population growth compounds these effects. One analysis found that although easy access to natural resources had a significantly greater impact on resource depletion than population growth had, the combination of easy access and population growth nearly doubled the impact of access alone.[1]

On the issue of quality of life, it is true that many measures of quality of life have shown improvement during periods of rapid population growth. Since 1890, as the world population tripled, real per-capita income has increased seven-fold.[2] Other indicators of quality of life, such as food per capita, life expectancy, infant mortality, and school enrollment have shown marked improvement even since 1960, the beginning of the population explosion.[3]

But global measurements of the quality of life can mask far different conditions at the local level, where impacts of population growth are most dramatic. For example, in sub-Saharan

tion can be gauged by the fact that total energy use for worldwide agricultural production increased nearly sevenfold between 1950 and 1985.[2] This type of farming can result in loss of productivity due to soil erosion and salinization. In addition, soil erosion, irrigation, and agricultural chemicals can pollute ground and surface water. Global atmospheric consequences may even result from some agricultural activities.

Soil erosion is a worldwide problem. In response to the growing demand for food, cultivation has extended to increasingly marginal lands that are more susceptible to erosion. For example, in the United States, 3 percent of the cropland (much of it marginal or intensively farmed) accounts for nearly 33 percent of the total erosion.[6] In their drive to keep production up with demand, farmers also have shortened fallow seasons, thereby exposing the land to more frequent mechanical disturbance and increasing the potential for erosion.[3]

The impacts of erosion can be seen both on and off the farm. Loss of production due to soil erosion is a major cause of declining crop yields in Nigeria, Mozambique, Tanzania, and Sudan.[2] In India, 80 million hectares of cropland are seriously affected by erosion,[7] and Guatemala has lost 40 percent of its food production capacity.[3] The FAO projects that, if current practices continue, developing countries overall could lose up to 20 percent of their potential food production capacity, by the end of this century. Off-site, eroded soil from croplands contributes to sedimentation of dams and waterways and contamination of surface water with nutrients and pesticides.

Since 1950, large areas of formerly unproductive land have become prime farmland as a result of irrigation. The spectacular yields associated with irrigation, however, have not always proved to be sustainable. By some estimates, salinization has caused decreasing yields on half of the world's irrigated cropland.[3] In addition, crop irrigation can cause contamination of underlying aquifers with nutrients and pesticides.

Increased use of chemical fertilizers and pesticides also poses environmental problems. In 1986, we used three-and-one-half times more fertilizer to produce a ton of grain than we did in 1950.[2] The use of pesticides has grown in a similar fashion. Not surprisingly, agricultural chemical contamination of surface and groundwater, as well as health impacts for applicators and downstream water users, is a growing concern in developing countries. Worldwide estimates of annual pesticide poisonings range from 0.8 to 1.5 million; deaths by poisoning are estimated at 3,000 to 20,000. Although developing countries use at most only 25 percent of the pesticides produced, they may incur half of the poisoning cases and nearly all of the deaths.

Intensive use of pastureland also creates problems. Over 60 percent of the world's rangelands have been damaged by overgrazing; in some areas of Africa, Asia, and the Middle East, the figure is more than 80 percent. Overgrazing reduces the carrying capacity of the land and increases erosion. In extreme cases, it may result in desertification, as has been the case with at least 65 million hectares of rangeland in northern Africa.[3]

It now appears that the increased demand for rice, meat, and dairy products may also be contributing to global warming.[9] Methane, one of the greenhouse gases contributing to this warming, has been increasing in the

'I NO LONGER NEED VENTURE INTO THE FOREST'

Sup Tai, a small agricultural village of 600 people in northeast Thailand, lies on the perimeter of Khao Yai National Park. Almost all the families of Sup Tai are poor farmers growing corn and soybeans and supplementing their income by hiring out as day laborers.

In recent years, the farmers' crop yields have declined. With little knowledge of improved agricultural techniques and with limited access to needed capital (local middlemen charge at least 5 percent per month on loans), the villagers have increasingly turned to park resources for subsistence. By 1984, 10 percent of the families in Sup Tai were farming illegally on park land.

In response to this situation, Wildlife Fund Thailand (WFT), in cooperation with the private agency Population and Community Development Association (PDA), began a two-year pilot project that integrates population, environment, and development activities. WFT, supported in part by World Wildlife Fund, was founded in 1983 as a nonprofit private organization focusing on the sustainable use of natural resources in Thailand. Recognizing that conservation organizations tend to lack skills in rural development, and vice versa, WFT and PDA pooled their resources and talents for the Sup Tai project.

It was felt that, if conservation education and family planning were combined with economic alternatives to park abuse, the villagers would become convinced that long-term protection of the park is more economically beneficial than short-term gains from park degradation. In the past, punitive measures and sporadic educational campaigns to reduce such degradation had failed.

Most of the new project's activities are provided by the Environmental Protection Society (EPS), the Sup Tai villagers' first community-wide organization. Membership is open to all villagers who possess formal land title and who pledge not to break park laws. The EPS offers the villagers training programs and lectures on family planning, health, agriculture, forestry, and other conservation issues. It also provides low-interest loans (1 percent per month) for activities that are environmentally sound and that will generate income for repayment into the fund.

earth's atmosphere by about 1 percent per year since 1951. Three-quarters of the methane in the atmosphere is of recent biological origin, and major sources of it are rice paddies and the digestive systems of sheep and cattle.

Many of the environmental problems caused by agriculture can be addressed through better management. However, the need to increase food production in response to population growth has often led to an emphasis on short-term yields at the expense of long-term concerns for conservation. This, in turn, has compounded the effects of poor management.

Forests

A growing population needs more space for food and to live, more timber to build shelter, and more firewood to cook and heat. Since 1850, as the world's population has doubled twice, nearly a billion hectares of forest have been converted to cropland and pasture. Most of the deforestation since World War II has occurred in the tropics, the area with the most rapid population growth. FAO estimates that during the 1980s, 11 million hectares per year will be deforested in the tropics.[9]

Deforestation is caused by a number of factors, including mismanagement of timber land and government subsidies that encourage inappropriate conversions to pasture and cropland. But population growth also puts a direct demand on forest resources. This demand can be seen most clearly in the case of fuelwood.

Of all the wood consumed in developing countries, 82 percent is used for fuelwood or charcoal. Two billion people, nearly all living in developing countries, rely on fuelwood as their primary source of energy, and nearly three-quarters of these people (28 percent of the world's population) are cutting fuelwood faster than it can be grown. By the year 2000, the number of people cutting fuelwood faster than it can be replaced could reach three billion, or one-half of the world's population.[10]

Deforestation for fuelwood has often been viewed as a rural problem

Children of the Sup Tai village (Bowdin Musor).

The project has initiated a park trekking program in which tourists can experience rural Thai life and hike in Khao Yai forest. The villagers earn money as guides and porters, and donations are made to the EPS after each trek. Community-wide activities—such as conservation festivals, tree planting campaigns, and road grading—contribute to the villagers' interest.

An evaluation conducted after only one year of project operation noted several improvements. The number of park violations had decreased significantly. Due to improved agricultural production and income earned from other project activities, temporary migration by villagers to work as laborers had fallen. While corn production had not increased significantly, soybean production had nearly doubled. The villagers were growing a greater mix of crops.

Also, the contraceptive prevalence rate had increased from 67 percent to 77 percent. The combination of increased production from existing land and greater participation in family planning had lessened the villagers' need to shift cultivation, thus relieving pressure on the park. Park violations also decreased because the villagers were cognizant of the newly respected park boundaries as well as the importance of conservation issues. As one villager responded, "We don't want to kill animals because the next generation should see all kinds of animals."

Equally important is the fact that the inhabitants of Sup Tai consider the project a success. It has improved the village environment and given the people a sense of pride in their accomplishments. "As long as I can remember", says one, "people have been leaving Sup Tai to find a future outside the village. Now that has nearly stopped, and instead we've had a few people from outside moving to Sup Tai!" Another villager comments that there is little need for him to continue poaching in Khao Yai Park since "now I have more work to do at home and I no longer need venture into the forest where it is uncomfortable and where there are a lot of snakes."

In 1987 funding was extended for two more years, at which time the villagers are expected to be able to administer the EPS on their own.

BOLETIN INFORMATIVO

PROGRAMA AREAS SILVESTRES Y NECESIDADES HUMANAS

WWF

NUMERO 1, 1988

Fondo Mundial para la Naturaleza (WWF)

EN ESTA EDICION:

Esta es la edición inicial del boletín Programa Areas Silvestres Y Necesidades Humanas, una nueva publicación del Fondo Mundial para la Naturaleza (WWF), cuyo propósito es poner al tanto y crear una red informativa entre el personal de proyectos de dicho Programa.

En esta primera edición, se da una reseña histórica y estructural del Programa. Se indican sus metas y objetivos, y se presenta un resumen sobre cada uno de sus proyectos, que tratan con esfuerzos de ecodesarrollo dingidos hacia comunidades rurales en paises en vía de desarrollo.

La relación intrínseca entre el sostenimiento de recursos naturales vivos y el desarrollo de la población humana se percibe notoriamente en estos países. Es aquí donde la población, por falta de alternativas viables, es forzada a explotar perjudicialmente recursos silvestres para satisfacer sus necesidades de desarrollo o simplemente para poder subsistir.

Este boletín fue escrito por Fernando Potass y Dennis Glick, y revisado por personal del WWF, entre ellos; Michael Wright, Curtis Freese, y Mario Ramos. La información contenida en éste se obtuvo de las siguientes fuentes; Mid-Course Report on the Matching Grant for a Program in Wildlands and Human Needs (WWF, 1988), Wildlands and Human Needs: A Program Evaluation (McCaffrey y Landázuri, 1987), y propuestas o informes sobre los proyectos en cuestión.

EL PROGRAMA AREAS SILVESTRES Y NECESIDADES HUMANAS

En septiembre de 1985 la Agencia para el Desarrollo Internacional de los Estados Unidos (USAID) otorgó al Fondo Mundial para la Naturaleza (WWF) el primer apoyo económico para iniciar su Programa Areas Silvestres y Necesidades Humanas (PASNH). Estos recursos, conjuntamente con aquellos provenientes del WWF, proporcionaron medios necesarios para establecer un programa innovador en varios países en desarrollo.

El Programa vincula los intereses locales de conservación y preservación de recursos biológicos con las necesidades de las comunidades rurales. El Fondo lanzó el Programa en respuesta a la urgente necesidad de incorporar criterios de protección de recursos silvestres con proyectos y planes de desarrollo rural, especialmente en áreas biológica y culturalmente valiosas que son afectadas por necesidades de subsistencia y desarrollo humano.

Los directores y planificadores de áreas silvestres protegidas tratan de vincular cada vez más el desarrollo sostenido de comunidades rurales con la conservación de ecosistemas naturales. Han comprendido que al conservar los recursos naturales en forma viable, además de que éstos reciben protección, pueden ofrecer alternativas en su manejo que satisfagan las necesidades humanas (tales como leña, plantas medicinales, materiales de construcción, pesca, caza, recreación y turismo, y en varios casos inspiración espiritual y religiosa).

Por ésto los directores de proyectos han diseñado planes de manejo y conservación que satisfacen necesidades de desarrollo para comunidades locales.

Los conservacionistas y planificadores de proyectos se han dado cuenta que al mejorar el nivel de vida en comunidades rurales (ofreciendo títulos de propiedad, oportunidades para la mujer, educación, y salubridad entre otros) éstas tienden a estabilizarse en forma más permanente. Este es un proceso que ayuda a aminorar las presiones que la explotación incontrolada ejerce sobre los recursos naturales de los cuales dependen la mayoría de las comunidades rurales.

El Programa se basa en la premisa que los recursos biológicos de mayor interés para conservacionistas son aquellos que generalmente están en peligro por la incapacidad de las comunidades rurales de poder satisfacer, en forma sostenible, sus requerimientos de subsistencia y desarrollo, de éstas y otras áreas cercanas. Este también sostiene que la destrucción de recursos naturales disminuirá las condiciones de vida de aquellas comunidades que dependen de ellos a largo plazo.

El punto de enfoque del Programa es el del manejo y protección de ecosistemas naturales de gran importancia biológica. También se propone beneficiar a comunidades rurales al realizar una variedad de proyectos tales como la caza y pesca en forma sostenida, la generación de in-

continúa pág. 3

NOTA EDITORIAL

Esta primera edición del boletín comenta sobre el avance del Programa Areas Silvestres y Necesidades Humanas (PASNH), desde su creación en 1985. La idea de crear esta publicación, la cual esperamos salga periódicamente, surgió del hecho de haber recibido solicitudes de conservacionistas latinoamericanos pidiendo información sobre el Programa y el tema de ecodesarrollo. Esperamos que este boletín sirva como catalizador para incrementar la red informativa entre el personal administrativo de proyectos en el Programa y aquellos interesados en el tema de ecodesarrollo en los trópicos.

Aquellos que han tenido el privilegio de visitar proyectos que integran la conservación de recursos naturales con el desarrollo de comunidades humanas, se han sorprendido por las similitudes entre éstos y por las actividades innovadoras que sus directores han creado para satisfacer elementos de desarrollo y de conservación. Siendo ésta una nueva orientación hacia las actividades de conservación, continuamos buscando técnicas y estrategias que sean apropiadas para realizar la difícil tarea de alcanzar un desarrollo sostenible por medio del manejo adecuado de los recursos naturales renovables. Hay muchos conocimientos que aprender y compartir. Para diseminar y compartir éstos, cualesquier forma de comunicación es, de por sí, el medio más poderoso. Por lo tanto, esperamos que este boletín sirva como un medio básico para establecer líneas de comunicación.

El boletín incluirá artículos e información relacionada con el Programa (PASNH) del Fondo Mundial para la Naturaleza (WWF) y la Agencia para el Desarrollo Internacional de los Estados Unidos (USAID), así como noticias sobre proyectos y actividades que tengan que ver con el tema principal de éste. La primera edición da un resumen perspectivo sobre el Programa y cada uno de los proyectos que lo integran. Nosotros escribimos estos primeros artículos; pero esperamos que en un futuro ustedes, los directores de proyectos, participen en el desarrollo de esta publicación al someter artículos o información sobre publicaciones, temas, sucesos, etc., que estén relacionados con el tema general del boletín. Este se publicará una vez que tengamos la cantidad suficiente de artículos o información que justifique su publicación. En vista de ésto, pensamos que el personal administrativo de proyectos desempeña un papel clave para garantizar que la calidad y cantidad de publicaciones del boletín se mantenga en el futuro. Envíennos sus artículos, reflexiones, anuncios, citas o caricaturas que quieran compartir con sus colegas conservacionistas latinoamericanos. Esperamos que las publicaciones subsiguientes del boletín enfoquen temas específicos tales como el papel de la mujer en el desarrollo, identificación de necesidades para el desarrollo en las comunidades rurales, evaluación de proyectos, puntos de importancia para lograr éxito en programas de educación y extensión rural, mantenimiento económico y creatividad financiera para proyectos de conservación y desarrollo, cooperación institucional, comunidades nativas y conservación de recursos naturales, usos racionales de la fauna y bosque, ecoturismo, intercambio de información, y otros más. Pero, una vez más, queremos enfatizar que estos artículos deberán ser escritos por ustedes.

Los materiales remitidos para publicación deben ser concisos (abarcando seis páginas mecanografiadas como máximo). Como ésta publicación no es científica sino de foro, los artículos deben demostrar experiencia en el área de campo y reflexiones constructivas sobre los temas discutidos. Revisaremos y editaremos la información para su publicación. Deseamos recibir artículos que indiquen tanto éxitos como fracasos y problemas de los cuales podamos aprender. Esperamos que los lectores respondan en forma constructiva a los temas presentados.

Estamos entusiasmados con el inicio y publicación del boletín. Pensamos que no existe otro boletín que enfoque exclusivamente al tema de la integración del desarrollo de comunidades rurales con la conservación de recursos naturales. Con su colaboración, éste proveerá un respaldo técnico para el Programa Areas Silvestres y Necesidades Humanas, y para los esfuerzos internacionales que traten con la conservación de recursos naturales renovables.

Los materiales y artículos para publicación en el boletín deberán ser enviados a:

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gresos familiares, la obtención y el otorgamiento de títulos de propiedad, el mayor acceso a recursos naturales, y otras actividades que fomenten un desarrollo comunal planificado.

El Programa ha concluido sus tres primeros años. Actualmente sus proyectos de ecodesarrollo se realizan en el Caribe, América Latina y Africa, y algunas iniciativas se desarrollan en Asia. En estos momentos se inicia la segunda etapa del Programa. Para ésta, un tercio de los fondos provienen de AID y dos tercios son aportados por WWF, en su fase actual de cinco años que comenzó a mediados de 1988.

El Programa se basa en tres componentes esenciales que incluye: proyectos a largo plazo, a corto plazo y de entrenamiento.

Los proyectos piloto a largo plazo combinan el manejo de áreas naturales protegidas con las necesidades para el desarrollo comunal, principalmente en nueve países (México, Costa Rica, Perú, Saint Lucia, Dominica, Zambia, El Camerón, La República del Africa Central, y Madagascar).

Los proyectos cortos, de menor escala, se realizan en países que desempeñan actividades innovadoras para explorar medios de conservación y desarrollo, o que proveen oportunidades para trabajar en proyectos conjuntamente con Organizaciones Privadas Voluntarias (OPV)s.

Los programas de entrenamiento se desarrollan para los administradores locales que trabajan en el manejo de recursos naturales, líderes de comunidades rurales, entidades no gubernamentales y OPVs que estén involucradas en la realización de los proyectos.

Se reconoce que hay una conexión esencial entre el mejoramiento del nivel de vida de las poblaciones rurales y el futuro de la diversidad biológica del planeta. Entonces se deben crear alternativas de desarrollo para comunidades locales con el fin de que éstas no detruyan la base de sus recursos naturales que garantizan su subsistencia.

Se deben crear condiciones necesarias para que la población rural pueda sobrevivir sostenidamente e invierta su esfuerzo en el uso sostenido de recursos a largo plazo en lugar de prácticas inadecuadas de corto alcance.

OBJETIVOS

El **objetivo primordial** del Programa es el de crear una conciencia conservacionista y mejorar el manejo de áreas silvestres para garantizar el desarrollo sostenido de las comunidades rurales que utilizan estos recursos naturales.

El Programa se basa en el hecho de que ecosistemas tales como bosques tropicales, sabanas, manglares, estuarios, y zonas costeras ofrecen recursos necesarios para el desarrollo humano, pero muchos de éstos son frágiles y están sujetos a un deterioro si su manejo es inadecuado.

Los proyectos apoyados por el Programa intentan averiguar, y en varios casos demostrar, que en realidad los recursos naturales de áreas silvestres pueden ser protegidos y aun satisfacer las necesidades para el desarrollo de las comunidades locales.

Otros objetivos del Programa:

*Fortalecer la capacidad institucional de entidades privadas y gubernamentales, de países colaboradores, para el manejo apropiado de áreas silvestres en aspectos biológicos, sociales y económicos. Además, éste busca incrementar el conocimiento de estas organizaciones sobre las relaciones que existen entre el manejo de áreas silvestres y el desarrollo de las poblaciones rurales.

*Definir técnicas que ayuden a los explotadores de recursos naturales en el manejo racional de éstos, y mostrar los

SITIOS DE PROYECTOS DEL PROGRAMA PASNH

1. Manantlán, México
2. Sian Ka'an, México
3. Río Plátano, Honduras
4. Monterrico, Guatemala
5. Gandoca, Costa Rica
6. Indígenas Cabecar, Costa Rica
7. Proyecto Forestal, Dominica
8. Manejo de Recursos, Saint Lucia
9. Curso para Graduados, Barbados
10. Reserva Awá, Ecuador
11. Cuyabeno, Ecuador
12. Pacaya-Samiria, Perú
13. Lago Titicaca, Perú
14. Beni, Bolivia
15. Lago Malawi, Malawi
16. Manejo Silvestre, Zambia
17. Montaña Oku, El Camerón
18. Outamba Kilimi, Sierra Leona
19. Beza Mahafaly y Andohahela, Madagascar
20. Dzanga-Sangha, Rep. Africa Central

beneficios que tales técnicas generan a las comunidades locales.

*Incrementar el intercambio de información entre profesionales involucrados e interesados en la protección de áreas silvestres y el desarrollo social de países en vía de desarrollo.

*Definir estrategias administrativas exitosas, generadas en las actividades de proyectos, para duplicarlas en otros países del mundo una vez determinada su factibilidad de aplicación.

ESTRUCTURA DEL PROGRAMA

El Programa es un esfuerzo de campo en determinadas regiones del Caribe, América Latina y Africa. Además de estas regiones, varios proyectos están siendo desarrollados por WWF en el Asia, aún cuando no son específicamente parte integral pero cumplen los criterios del Programa.

El Programa se enfoca en los proyectos modelo (proyectos piloto a largo plazo). Estos se llevarán a cabo en varias (siete a diez) regiones de interés conservacionista, y se preveen como proyectos piloto comprensivos que incluirán, junto con otros componentes, la valoración de necesidades para la administración de recursos y su relación con el ambiente natural y la población local, la preparación de planes de manejo de áreas silvestres, la realización de las actividades propuestas para el proyecto, el entrenamiento de organizaciones locales y los usuarios de recursos, y la evaluación de proyectos.

Las actividades de los proyectos secundarios (proyectos cortos de menor escala y a corto plazo) serán desarrolladas más ampliamente (en 10 ó 15 áreas) e incluirán actividades innovadoras, experimentales o que formen parte integral de los proyectos piloto. También pueden incluir entrenamiento, establecimiento de redes de comunicación e información entre proyectos, o publicaciones que estén relacionadas con recursos naturales. Uno de los propósitos de estos proyectos es el de ampliar el campo operativo del Programa al examinar y documentar los diferentes medios de acción en diferentes circunstancias. Este último aspecto del Programa tiene el fin de dar ocasión a WWF de responder circunstancialmente a las posibilidades de integrar el desarrollo con la protección de recursos naturales.

CRITERIOS DEL PROGRAMA PARA LA SELECCION DE PROYECTOS

El WWF ha establecido los siguientes criterios para la selección de proyectos en el PASNH.

*Deberán demostrar un vínculo entre el mejoramiento en la calidad de vida en las comunidades locales y el mantenimiento de áreas silvestres o ecosistemas vitales (bosques, lagunas, ríos, regiones costeras y coralinas, etc.). El Programa da énfasis a aquellas áreas ya protegidas (parques nacionales, reservas forestales, reservas indígenas, áreas de uso múltiple, reservas de la biósfera, áreas de manejo silvestre) y en todos los casos requiere que los ecosistemas mantengan un cierto grado de naturalidad.

*Podrán basarse en esfuerzos ya en marcha o podrán ser iniciativas nuevas, pero en cualquier caso deberán incluir la participación de personas locales en sus planes operacionales o de desarrollo.

* Deberán representar un esfuerzo conservacionista comprensivo o diversificado que vincule el desarrollo con la conservación.

*Deberán llevarse a cabo en países donde la misión AID esté activa y apruebe las actividades del Programa. Se intenta prestar la mayor atención a aquellos proyectos que se desarrollan en áreas de reconocida importancia biológica y sociocultural.

*Deberán ser respaldados por una organización o institución relacionada con asuntos de con-

Residentes del sureste de Costa Rica trabajando en un vivero comunal, parte del refugio para vida silvestre y proyecto de ecodesarrollo rural Gandoca. (Foto, D. Glick)

El Programa sostiene que los objetivos conservacionistas en países en desarrollo pueden ser logrados a través del desarrollo de comunidades que viven cerca o dentro de áreas protegidas. Esta premisa se basa en las siguientes observaciones realizadas en estas áreas de protección.

• La conservación de habitat es generalmente el medio empleado para lograr objetivos específicos de conservación (por ejemplo, para la protección de una especie en particular o para mantener la diversidad biológica).

• En muchos casos, el mismo habitat que requiere protección provee recursos o beneficios para comunidades rurales; así que al proteger el habitat también se logra un mejor bienestar de vida localmente.

• Los métodos que actualmente se utilizan en comunidades rurales en muchos casos no son compatibles con los esfuerzos de conservación, y métodos tradicionales de protección estricta comúnmente privan a las comunidades locales de los recursos necesarios para su desarrollo, sin ofrecerles alternativas viables. Pero generalmente existen métodos alternos compatibles y utilizables para lograr un desarrollo rural sostenido en estas comunidades.

servación en su país, aunque no tienen que ser necesariamente respaldados por su gobierno.

•Los proyectos recibirán el apoyo técnico y económico del Programa únicamente después de la aprobación de una propuesta sometida en el formato de WWF, explicando sus objetivos y necesidades.

•Podrán ser desempeñados a corto o largo plazo. Sin embargo, los proyectos a largo plazo deberán demostrar no depender del apoyo continuo del WWF.

De esta manera, la selección de los proyectos y países donde éstos van a ser realizados depende de una combinación de criterios biológicos, humanos e institucionales. Ecológicamente, el WWF ha identificado varios países prioritarios en términos de diversidad biológica. Los proyectos que actualmente se llevan a cabo en estos países incluyen intereses tanto de conservación como de desarrollo en los diferentes ecosistemas, aunque los bosques tropicales son el principal foco de atención. Para mantener elementos socioculturales dentro de los planes operativos de cada proyecto del Programa, el WWF se asegura de que todos los proyectos en curso mantengan elementos de ecodesarrollo (un vínculo entre el mejoramiento de la calidad de vida humana a nivel local y la conservación de las áreas naturales en la vecindad). Tales situaciones incluyen áreas silvestres en las que la principal meta administrativa es la de lograr el uso racional y sostenido de sus recursos naturales, particularmente en las relaciones que éstos recursos tienen con las comunidades locales que dependen de ellos.

Finalmente, el Programa satisface los intereses políticos e institucionales de los proyectos al formar enlaces interinstitucionales, mediante la creación de una comisión consultiva entre las diferentes organizaciones privadas internacionales que tienen intereses en el desarrollo rural y en el Programa.

Hasta la fecha, el Programa ha apoyado quince proyectos en América Latina y El Caribe, y seis en Africa. Conforme éste avanza hacia su tercer año de existencia se comprende que aún quedan muchos detalles que consolidar y reforzar. Pero aún así, los proyectos han progresado significativamente.

Hasta ahora el WWF ha estado indeciso en divulgar los resultados del Programa, especialmente durante esta primera fase de su desarrollo, pero en vista de la cantidad de solicitudes de información sobre éste y sus proyectos, se ha decidido publicar su información y dar a conocer detalles al respecto. En el pasado mes de mayo se realizó una conferencia de prensa en Washington con el fin de presentar una perspectiva de las actividades y objetivos del Programa a miembros de entidades conservacionistas internacionales. Durante ésta, Arturo López --quien fué director ejecutivo de Amigos de Sian Ka'an-- presentó un resumen de las actividades del proyecto en la Reserva de la Biósfera de Sian Ka'an. La audiencia reaccionó en forma entusiasta, por lo que se piensa que la publicidad hacia los proyectos en general aumentará en un futuro próximo.

El Programa continuará avanzando y creciendo con el tiempo, sin embargo el número de proyectos dentro de éste se incrementará únicamente a medida que los fondos necesarios para cada proyecto existente disminuyan. Esta estrategia está ligada con uno de los objetivos de largo plazo de WWF, el de ayudar a los esfuerzos conservacionistas para que sistemáticamente lleguen a ser económicamente autosuficientes. Actualmente estamos prestando ayuda técnica a proyectos de campo especialmente en cuestiones relacionadas con actividades de ecodesarrollo.

Además de dirigir el personal del Programa hacia problemas relacionados con cuestiones de desarrollo comunal, se están consiguiendo materiales y libros con temas relacionados a este tópico para enviar a los proyectos del Programa. También se está organizando un taller con enfoque en cuestiones de ecodesarrollo que será dirigido, más que todo, hacia los representantes de proyectos latinoamericanos. El taller será enfocado a dar una perspectiva general sobre los elementos, conceptos y habilidades claves para el desarrollo rural, y será conducido en una de las regiones donde se esté realizando algún proyecto dentro del Programa.

Niños residentes de la Reserva Etnica Forestal Awá (Ecuador) que proximamente formará una unidad de conservación binacional, al unirse con una reserva similar en Colombia. (Foto, D. Glick)

También se están recopilando detalles sobre proyectos para seleccionar buenos ejemplos. Datos sobre éstos serán escritos por Roger Stone (autor reconocido y miembro de WWF) en colaboración con miembros de proyectos, y dados a conocer posiblemente en este boletín. Toda la información será actualizada a medida que cambie, en boletines subsiguientes. Por ahora, además de lo descrito anteriormente, el WWF visita cada uno de los proyectos del Programa una vez por año como mínimo. Se piensa incrementar el apoyo para los intercambios de información de colegas en los países en desarrollo y se continuará financiando a los directores de proyecto que participen en conferencias o entrenamientos relacionados con el propósito general de su proyecto.

ESTADO ACTUAL DEL PROGRAMA

En diciembre de 1987, se sometió una propuesta a AID para continuar apoyando el Programa Areas Silvestres y Necesidades humanas por cinco años más (comenzando en octubre de 1988).

La propuesta (que está a su disposición en forma abreviada), propuso que el Programa fuese expandido en América Latina, El Caribe y Africa, y que algunos proyectos piloto fuesen iniciados en Asia. También se solicitó apoyo financiero para incrementar el personal del Programa, paticularmente para contratar una socióloga –Katrina Eadie– quien proveerá y aumentará el respaldo técnico y científico en cuestiones de ecodesarrollo en los proyectos.

Una versión modificada de la propuesta inicial fue aprobada por AID. Aunque el presupuesto no se aumentará en forma significativa y los fondos que se pidieron para los programas asiaticos no fueron aprobados, los fondos básicos que el Programa requiere fueron aprobados por los siguientes cinco años, lo cual nos da un cierto grado de seguridad económica. Pero WWF está actualmente financiando el Programa con casi el doble de los fondos proporcionados por AID, lo cual indica que el apoyo a los proyectos dentro de éste depende en gran parte de los esfuerzos y éxitos del WWF en adquirir apoyo financiero por medio de campañas.

PROYECTOS DEL PROGRAMA AREAS SILVESTRES Y NECESIDADES HUMANAS

En esta sección se describirán brevemente los diversos proyectos dentro del Programa. En cada descripción se destacará tanto la importancia del área de proyecto para los esfuerzos conservacionistas como los programas de ecodesarrollo que se estén realizando en éste.

AMERICA DEL NORTE

MEXICO

Reserva de la Biósfera Sian Ka'an

Establecida en 1986, La Reserva de la Biósfera Sian Ka'an está localizada en la costa oriental de la Península de Yucatán, en el estado mexicano de Quintana Roo. La reserva, con 528,000 Ha., protege un mosaico de bosques tropicales, áreas pantanosas, manglares, lagunas costeras, y arrecifes de coral. Además del gran valor científico que guarda, la región posee cuantiosos recursos arqueológicos y antropológicos. Hay un número significativo de ruinas mayas dispersas por todo Sian Ka'an.

Muchos descendientes de esta cultura viven en la región y mantienen varias de sus tradiciones y costumbres ancestrales, pero muy pocos viven dentro de los límites de la reserva. La gran mayoría de residentes (aproximadamente 1,000) viven en pequeñas aldeas pesqueras en áreas costeras. La mayor parte de estas comunidades satisfacen sus necesidades de subsistencia por medio de la pesca de langosta o el cultivo de palmas de coco, para la producción de copra. Además de estas comunidades, hay un creciente número de agricultores mayas que están colonizando los bordes de la reserva y generalmente practican una agricultura de subsistencia.

En los bosques de Sian Ka'an actualmente se ejerce la tala selectiva, generalmente para producir durmientes de ferrocarril. Pero la mayoría de la tala destructiva ocurre cerca de la carretera principal a consecuencia de la construcción de vías de acceso y el establecimiento de colonos que practican la agricultura o la ganadería.

Los esfuerzos administrativos de la reserva se han enfocado tanto a proteger sus recursos silvestres como a lograr un desarrollo sostenido para las comunidades rurales que viven dentro o cerca de ella.

Para alcanzar este fin, varias actividades educativas y programas de extensión están siendo conducidos en las zonas de amortiguación de la reserva. Algunos de los proyectos de ecodesarrollo en la reserva incluyen: un programa para la administración de la pesca de langosta, siendo apoyado por los pescadores locales; un proyecto de horticultura sostenida que provee medios de subsistencia para los agricultores en la región; y, una investigación que tiene como propósito idear un sistema para el cultivo y explotación sostenible de palmas. También, en los límites de la reserva, se están llevando a cabo varios experimentos agropecuarios con el fin de desarrollar técnicas para incrementar niveles de producción ganadera, sin perturbar los sistemas ecológicos de la región.

Pescadores de langosta residentes en la Reserva de la Biósfera Sian Ka'an (México) colaboran con investigaciones sobre la dinámica de las poblaciones de langosta. (Foto, C. Freese)

La reserva está actualmente administrada por la Secretaría de Desarrollo Urbano y Ecología (SEDUE) en México. Una entidad no gubernamental, Amigos de Sian Ka'an, dirige la mayoría de los proyectos apoyados por

el Programa. Esta organización publica varios libros y materiales educativos, y da a conocer las actividades de la reserva y sus atractivos por medio de la distribución de folletos descriptivos.

Director de Proyecto

Juan Bezaury
Director Ejecutivo
Amigos de Sian Ka'an
Apartado Postal 770
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77500, México

Reserva de la Biósfera Sierra de Manantlán

La Reserva de la Biósfera Sierra de Manantlán (establecida en 1987) tiene un área de 140,000 Ha. y está localizada en los estados de Jalisco y Colima, en el suroccidente de México.

Esta área ha recibido gran importancia internacional por el reciente descubrimiento de una especie primitiva de maíz perenne (Zea diploperennis). Además de albergar a ésta planta de gran valor científico, genético y agrícola, la reserva protege 20,000 Ha. de bosques mesófilos que incluyen una combinación de especies tropicales y templadas.

Cerca de 1,500 personas viven en ejidos y territorios comunales en la región de Manantlán. La presencia de estas comunidades en la localidad representa una excelente oportunidad para realizar un proyecto modelo de ecodesarrollo en la reserva.

La población rural se beneficia de los recursos de la reserva con regularidad al recolectar leña, cazar animales y adquinr materiales para construcción mediante la cosecha de sus bosques.

La agricultura se practica en las mejores tierras de la region. Estas se encuentran en su mayoría en áreas planas de altitud intermedia donde predomina el cultivo del maíz y la caña de azúcar. La siembra de hortalizas también es común en fincas pequeñas, especialmente en aquellas que se encuentran en las laderas montañosas. La ganadería es bastante común en la región y en algunos casos se practica con más frecuencia que la agricultura.

La tala de bosques ha sido intensiva en la región. El bosque mesófilo, que en el pasado cubría más de 1.5 millones Ha., ha sido reducido por la explotación maderera y por la agricultura de roza, tumba y quema. Una gran parte de los bosques de la Sierra han sido cortados por madereros para extraer pinos, robles y magnolias. En muchos de estos sitios el bosque ha logrado regenerar, pero las cicatrices de los caminos madereros persisten y se agrandan al erosionarse con las lluvias torrenciales de la región (de 900mm a 1,800mm —incrementándose con la altitud del terreno).

La frecuencia de fuegos forestales es un problema grave que está aumentando. Aunque los fuegos por causas naturales occurren de vez en cuando, aquellos ocasionados por la acción humana están occurriendo con más regularidad cada día. Los fuegos forestales de quema lenta han demostrado ser los más dañinos para la vegetación boscosa. Los efectos de éstos son más notables en regiones donde predomina el pino porque es aquí donde estos fuegos han quemado y destruido grandes extensiones de vegetación natural.

El Laboratorio Natural Las Joyas de la Universidad de Guadalajara tiene un personal de más de 100 personas para enfrentar problemas en cuestiones de conservación y desarrollo y está realizando varios proyectos en el área. Por ejemplo, se están desarrollando pogramas de educación y extensión rural. Estos programas se enfocan a elevar el nivel de vida de la población local y al mismo tiempo tratan de reducir los impactos negativos de la explotación de recursos por estas comunidades.

El programa de educación ambiental, que se dirige actualmente, es una de las fases esenciales en el proyecto de ecodesarrollo que se ha propuesto para la reserva. Además, estudios de investigación dentro y fuera de la reserva tratan de identificar prácticas agrícolas que demuestren ser adecuadas para la región. Estos estudios finalmente ayudarán a que se realicen los planes de ecodesarrollo que se han incluido entre los objetivos a largo plazo del proyecto.

El plan de manejo para la reserva fue definido durante el desa-

El éxito fundamental del Programa depende de la colaboración y el respaldo continuo de las comunidades locales en los países anfitriones, de una administración efectiva de los proyectos y del respaldo de entidades del gobierno o de organizaciones no gubernamentales a nivel local. Pero si este Programa ha de funcionar apropiadamente y servir para lograr un desarrollo comunal a través de la conservación de los recursos naturales, es de suma importancia que tanto el área silvestre a ser protegida como la comunidad rural que utiliza sus recursos, tengan las siguientes características:

- *Que el área protegida sea importante, en términos de conservación, por tener una alta diversidad biológica, especies o habitat de interés científico o social a nivel nacional o internacional.*
- *Que el área esté sometida a presiones por el desarrollo de comunidades rurales; y que tanto estas comunidades como entidades fuera de la localidad, actualmente o en un futuro, exploten estos recursos más allá de sus capacidades de producción.*
- *Que el área tenga la capacidad de facilitar un desarrollo sostenido y que actualmente sus recursos no estén siendo adecuadamente aprovechados o su aprovechamiento actual pueda ser mejorado.*
- *Que se pueda obtener suficiente información del área para hacer un inventario de sus recursos y de su potencial para el desarrollo rural.*
- *Que las comunidades locales tengan la capacidad de llevar a cabo diversas actividades económicas, como la utilización de una variedad de recursos en vez de depender de uno solo.*
- *Que la gente local tenga la posibilidad de obtener derechos de propiedad rural o de recursos locales. Esto permitirá que la población rural pueda invertir en actividades a largo plazo porque sus derechos de propiedad garantizarán el beneficio y retorno de su inversión.*
- *Que las poblaciones locales puedan tomar sus decisiones y tengan la posibilidad de llevarlas a cabo al definir debidamente los medios para satisfacer sus necesidades que dependen directamente de los recursos naturales comunales.*

rrollo de un taller --en el cual se plantearon los objetivos y metas de ésta, y cada año éste plan de manejo es actualizado por medio de un plan operativo

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tribus Paya y Miskito que viven dentro de su área de protección Aquí, ellos cazan y pescan para suplementar su dieta de maíz, frijoles, arroz, yuca plátano, y otros cultivos pequeños que generalmente se cultivan en los embalses del río Esta región también contiene riquezas arqueológicas, incluyendo varias muestras pictográficas en rocas a orillas del Río Plátano

El transporte de maderas en el centro de protección de la Reserva de la Biósfera Río Plátano (Honduras) amenaza el futuro de esta área silvestre (Foto D Glick)

AMERICA CENTRAL

HONDURAS

Reserva de la Biósfera Río Plátano

La Reserva de la Biósfera Río Plátano (establecida en 1980) protege cerca de 300,000 Ha. de bosques tropicales húmedos en Honduras. Esta contiene diversos ecosistemas característicos de la región Mosquitia de Nicaragua y Honduras y protege una variedad de comunidades biológicas complejas que albergan elementos florísticos y faunísticos de la región. Entre las zonas de vida comprendidas en la reserva están los bosques tropicales húmedos, y los subtropicales húmedos y muy húmedos. Estos contienen áreas tales como sabanas, bosques de pino, bosques tropicales húmedos con vegetación decidua, lagunas costeras, manglares, y estuarios.

Además de su riqueza biológica, la reserva salvaguada a cientos de indígenas pertenecientes a las

La comunidad rural que habita el área, fuera de la población indígena, incluye aproximadamente 9,000 campesinos que han invadido y colonizado la zona de amortiguamiento de la reserva, y actualmente explotan los recursos de ésta por medio de la pesca, la caza, y la extracción de leña y madera (generalmente por intermedio de las compañías madereras).

Esta reserva ha sido declarada como un Sitio Natural de Patrimonio Mundial por la UNESCO, en reconocimiento a la importante combinación de atributos naturales y culturales que posee. Pero a pesar de ésto, hay una serie de actividades humanas que recientemente han puesto en peligro muchos de sus recursos. Tales actividades incluyen la explotación ilegal de madera por compañías madereras hondureñas, la minería de oro, la colonización de Miskitos hondureños en busca de zonas de refugio en las áreas límite de la reserva, y a la invasión de campesinos provenientes de las zonas ecológicamente desvastadas del sur de Honduras, hacia áreas dentro de la zona de amor-

cuencas fluviales La reserva es ac- dirigida por el Departamento de Recursos Naturales de Honduras (RENARE) en colaboración con la Asociación Hondureña de Ecología (AHE), una organización privada

Recientemente (1987), el Programa apoyó el desarrollo de un plan operativo para la reserva Este plan, después de evaluar los programas directivos de la reserva, reconoció la necesidad de proteger los recursos de ésta e iniciar actividades de ecodesarrollo en sus zonas culturales y de amortiguamiento.

La estrategia que se ha ideado para la reserva incluye una variedad de proyectos, a través de la cooperación institucional (RENARE/AHE/PASNH), tales como la educación y extensión a nivel rural, y el manejo y protección intensiva de los bosques regionales. Aún así, el elemento clave de su estrategia administrativa está constituído en la creación y el fomento de alternativas económicamente viables, que reduzcan la capacidad destructiva de las formas actuales de explotación de recursos. Algunas de estas alternativas están siendo dirigidas hacia la población de miskitos que viven en el interior de la reserva. Pero la mayoría de estos esfuerzos están enfocados hacia aquellos campesinos que han colonizado recientemente la zona de amortiguamiento.

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GUATEMALA

Manejo y Administración de la Zona Costera de Monterrico

La Reserva del Biotopo de Monterrico está localizada en una de las áreas más diversas e importantes de la costa pacífica de Guatemala. Sus 4,000 Ha., contienen pantanos y manglares que sirven como habitat a una enorme variedad de animales silvestres.

El Biotopo es una de las regiones naturales más visitadas y atractivas del país. Cerca de 3,000 personas dependen de los recursos de la reserva (2,000

dentro de la reserva y 1,000 fuera de ella) y en muchos casos los utilizan inadecuadamente con graves repercusiones. Además de las comunidades locales, ésta es visitada anualmente por aproximadamente 30,000 personas, generalmente guatemaltecos en busca de playas. Por esta razón, los directores de la reserva consideran que tanto la educación como la interpretación ambiental son elementos intrínsecos para la administración de la zona.

Los administradores de la zona costera de Montemico (Guatemala) trabajan con los pescadores locales para asegurar la sostenibilidad de mariscos en los manglares (Foto, D. Glick)

El Biotopo es administrado por el Centro de Estudios Conservacionistas (CECON), un departamento de la Universidad de San Carlos. Esta institución tiene experiencia en actividades de educación ambiental, y recientemente comenzó un proyecto para la conservación y el manejo de los recursos naturales de la región. CECON, junto con las cuatro municipalidades adyacentes, está terminando un inventario general de los recursos naturales del área, y a la vez elabora un programa de educación ambiental y un plan de manejo. Su plan de manejo, además de proteger los ecosistemas costeros de alta diversidad biológica, destacará programas de educación y extensión ambiental, y actividades de ecodesarrollo (tales como el criar iguanas como fuente de alimentación) para mejorar los niveles de vida de las comunidades locales.

El Programa además de dar apoyo financiero para completar el inventario local de recursos naturales, prestará apoyo para una campaña educacional conservacionista para las comunidades locales. Este también apoya el entrenamiento de guardabosques y directores de la reserva en el manejo de áreas silvestres, proporciona información y entrena a gente de aldeas locales en técnicas de manejo de animales silvestres.

Este proyecto es uno entre el creciente número de esfuerzos en Guatemala que incluyen actividades enfocadas a integrar la protección de áreas naturales con las necesidades para el desarrollo de las comunidades locales. Es de esperar que éste sirva como modelo para iniciar otros programas de ecodesarrollo en el país.

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COSTA RICA

Programa de Titulación y Refugio para Vida Silvestre Gandoca

El proyecto Gandoca se encuentra al sur de Costa Rica en la costa del Mar Caribe y comprende una franja de bosques húmedos con ecosistemas costeros. El área contiene diversos ecosistemas como arrecifes de coral, llanuras costeras, cuencas de ríos y arroyos, terrazas, pantanos de agua dulce y salobre, y bosques de altiplanos interiores.

Hay tres grupos étnicos que forman la mayoría de la población del área. Uno es la comunidad de negros de habla inglesa que vive en áreas costeras. En su mayoría estos trabajaron en un tiempo con las plantaciones bananeras de la región, pero una vez que éstas comenzaron a disminuír su producción, dichas comunidades emprendieron actividades agrícolas de subsistencia, a explotar bosques para extraer madera, cazar, pescar en el área, y a elaborar pequeñas industrias extractivas. La comunidad mestiza, que en un tiempo también fue en su mayoría empleada por las compañías bananeras, está ahora más que todo dedicada a la ganadería y al cultivo de pequeñas parcelas familiares con cacao, plátano, y banano.

La población indígena de la región sobrevive esencialmente por medio de la caza, pesca y, en algunos casos, de la agricultura en pequeña escala.

La apertura de carreteras en la región Gandoca de Costa Rica aumentó considerablemente la tala de bosques. La titulación de tierras y actividades agroforestales está disminuyendo tal destrucción. (Foto, D. Glick)

En esta región la construcción de carreteras y vías de acceso ha resultado en un incremento en el número de compañías madereras y en una mayor demanda de tierras por un creciente flujo de campesinos. Estos dos factores han creado una serie de impactos perjudiciales para las riquezas biológicas y culturales de la región.

La Asociación de los Nuevos Alquimistas (ANAI), es una entidad sin fines de lucro, que desarrolla un programa basado en la distribución de títulos de propiedad de tierra a personas que hayan residido largo tiempo en el área. La organización indica que al dar títulos de tierras agrícolas a la población local, ésta disminuirá sus índices de deforestación en la región. ANAI ha comenzado una serie de programas de ecodesarrollo tales como el establecimiento de más de 25 viveros administrados por una cooperativa agroforestal local y la creación de un refugio para animales silvestres dentro del área del proyecto. Pero además de conducir programas de educación y extensión agroforestal, esta organización está estudiando la posibilidad para la comercialización de productos de sus proyectos agroforestales; y contempla la creación de otros proyectos de ecodesarrollo tales como acuacultura, cosecha sostenida de vida silvestre de bosques y arrecifes coralinos, ecoturismo, y un plan para el manejo y explotación sostenida de la iguana verde (Iguana iguana). La asociación trabaja conjuntamente con varias entidades gubernamentales y privadas especialmente en sus esfuerzos para la titulación de tierras, en el refugio de animales silvestres, y en los programas de viveros agroforestales.

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Uso de Tierra por los Indígenas Cabecar, Reserva de la Biósfera La Amistad *(concluído)*

Los Cabecar de la Reserva Indígena Telire, es una de las pocas comunidades indígenas que sobrevive en la región de Talamanca, en Costa Rica.

Esta región montañosa está cubierta de árboles de hoja ancha, excepto en aquellas áreas donde se practica la tala y quema de bosques para preparar terreno agrícola, y forma parte de las 500,000 Ha. del complejo de zonas de protección incluidas dentro de la Reserva de la Biósfera La Amistad (en el centro sur de la frontera de Costa Rica con Panamá). La comunidad indígena del Telire está compuesta por aproximadamente 200 personas comprendidas en 36 familias. Estas viven a los lados del Río Telire, en un área de aproximadamente 9,000 Ha., y mantienen tradiciones de caza, pesca, y recolección de recursos forestales para satisfacer sus necesidades de subsistencia.

La Unidad de Areas Silvestres del Centro de Agricultura Tropical de Investigación y Enseñanza (CATIE) ayudó al Servicio Nacional de Parques de Costa Rica en el desarrollo y realización de un plan administrativo para la reserva. En él están incluídos el llevar a cabo inventarios de los recursos biológicos y culturales del área así como un estudio antropológico de las comunidades indígenas que la habitan.

El Programa apoyó una investigación antropológica con enfoque al estudio de tierras y recursos de los cuales dependen los indígenas Cabecar. El objetivo principal de este estudio fue el de crear un modelo cualitativo para dar a conocer el uso actual de los recursos de la reserva y evaluar su impacto ecológico. Una vez medida la utilización actual de estos recursos, tal información podría ayudar a estimar la capacidad de carga de la reserva y apoyar la utilización de estos por sus habitantes indígenas. La información obtenida fue incorporada en los planes de manejo de la reserva, los cuales se enfocan a proteger sus recursos y a proveer a sus residentes con recursos silvestres a largo plazo. Gracias a este proyecto, los programas administrativos de la reserva están siendo diseñados para asegurar que los indígenas Cabecar puedan continuar viviendo con sus sistemas de vida tradicionales, sin peligro de agotar los recursos naturales de los cuales dependen.

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Vida silvestre, como esta iguana, constituye una importante fuente alimenticia para la población nativa y campesina dentro y fuera de la Reserva Cuyabeno (Ecuador). (Foto, D. Glick)

AMERICA DEL SUR

ECUADOR

Reserva de Producción Faunística Cuyabeno

La Reserva de Producción Faunística Cuyabeno, en la Amazonía ecuatoriana, contiene un área con aproximadamente 254,760 Ha. de bosques húmedos tropicales y bosques pantanosos que son periódicamente inundados. Esta reserva se encuentra en el límite oriental de un refugio biótico pleistocénico. La reserva está bañada por un sistema fluvial comprendido por tributarios del Río Amazonas y 14 lagunas meándricas. Dentro de sus límites de protección hay una variedad de ecosistemas

que albergan importantes poblaciones de delfines de agua dulce, manatíes, tapires, armadillos gigantes, varias especies de felinos, y una innumerable cantidad de aves y anfibios.

Además de su riqueza biológica, la reserva alberga aproximadamente 400 indígenas de la tribu Siona-Secoya. Los recursos necesarios para la subsistencia de esta comunidad son extraídos en su gran mayoría de la reserva (caza, pesca, y recolección). Pero la comunidad también practica el cultivo no intensivo de productos tales como la mandioca, el plátano y banano, el maíz y las palmas.

Ultimamente la integridad de la reserva ha sido puesta en peligro a causa de las actividades de exploraciones petroleras, la expansión de los cultivos de palma africana, la invasión ilegal de colonos, y el avance de tribus foráneas dentro de la región. Cerca de un tercio de la reserva ha sido colonizada por estos dos tipos de comunidades.

El objetivo de la reserva a largo plazo es el de preservar la integridad biológica y cultural de la región y, al mismo tiempo, proveer a las comunidades locales con un manejo sostenido de productos forestales. Además existen indicios de que el ecoturismo esté dando resultados favorables, y se estima que esta práctica traiga un creciente número de beneficios económicos para la reserva y la tribu Siona-Secoya. Individuos de esta tribu ayudan a controlar el turismo en la región y a servir de guías para visitantes. En vista de ésto, la reserva espera que la participación de estas comunidades indígenas en la creación y desarrollo de sus planes administrativos ayuden a minimizar los impactos dañinos a los recursos locales de la región, y finalmente ayuden a que sus programas de ecodesarrollo tengan éxito.

El Ministerio de Agricultura y Ganadería del Ecuador fue apoyado por el Programa para el desarrollo de un plan de emergencia con enfoque en los problemas de administración de recursos enfrentados por la reserva. Este plan actualmente abarca tanto planes de corto y largo plazo como actividades para el desarrollo rural. Algunas actividades de educación y extensión están siendo realizadas en la zona de amortiguamiento en la reserva, y se está diseñando una estrategia para la cosecha sostenida de especies silvestres, tales como tortugas de río, capibaras, etc. Además, se han conducido varias negociaciones con las compañías petroleras operando en la región y se ha logrado que éstas apoyen algunas de las actividades de conservación planificadas.

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esfuerzos para proteger a esta población, sus áreas silvestres, y futuras oportunidades para el desarrollo. Los elementos anteriores fueron estudiados para el establecimiento de la reserva e integrados dentro de su plan operativo.

Cultural Survival --una de las entidades miembros de la Comisión de Consejo del Programa, ha apoyado actividades de titulación en el área y en varios proyectos para el desarrollo de comunidades rurales de la región. Además, con el apoyo y asistencia técnica del Programa se ha logrado formar un grupo administrativo para la reserva.

La Reserva Etnica Forestal Awá en Ecuador, protege uno de los bosques biológicamente más ricos en América Latina y ofrece esperanzas de subsistencia para los indígenas Awá. (Foto, D. Glick)

Reserva Etnica Forestal Awá

El grupo amerindio Awá-Kwaiker tradicionalmente ocupaba regiones en Ecuador y Colombia, con un área aproximada de 100,000 y 400,000 Ha. respectivamente, y actualmente habitan colonias en las regiones boscosas montañosas al noroeste del Ecuador. Además de contener la riqueza cultural de los Awá, esta región corresponde a un refugio del Pleistoceno que contiene una tremenda divesidad biológica y endemismo.

Los Awá dependen intensivamente de los recursos forestales para adquirir productos medicinales, alimentos, y materiales de construcción. Su fuente principal de proteína es la caza, pesca, y agricultura en pequeña escala. La unión integral formada por la cultura y socioeconomía de los Awá con el equilibrio ecológico de la región es un elemento esencial en los

Este incluye a administradores de recursos naturales, biólogos, especialistas en el desarrollo de comunidades rurales, y a representantes de la Confederación de Nacionalidades Indígenas del Ecuador (CONAIE) y de la población Awá. Este grupo está formando una base de información que posteriormente será la fuente básica de datos para los programas de manejo de recursos en la región.

Uno de los objetivos a largo plazo en esta área es el de crear una reserva de la biósfera binacional que incluya los bosques húmedos de los Awá en Colombia y en Ecuador (aproximadamente 700,000 Ha.) y por lo tanto proteja las riquezas naturales y culturales de la región.

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PERU

Reserva Nacional Pacaya-Samiria

La Reserva Nacional Pacaya-Samiria (establecida en 1940) contiene cerca de 2'080,000 Ha de Amazonía peruana y es en tamaño una de las más grandes unidades de conservación en América Latina. Esta reserva contiene, en su totalidad, las cuencas de los ríos Pacaya y Samiria y una vasta extensión de bosques inundables y ríos. La reserva es de gran importancia para instituciones conservacionistas, locales, nacionales e internacionales interesadas en el manejo de recursos amazónicos, puesto que ésta es una de las pocas unidades de conservación en la Amazonía que tiene como objetivo principal la conservación y utilización sostenida de sus recursos naturales especialmente pesquerías.

Cerca de 50,000 personas viven en decenas de comunidades pequeñas situadas en los alrededores de la reserva. Estas comunidades rurales frecuentemente utilizan y dependen de los recursos de la reserva (pesca, caza, recursos forestales, y otros recursos con beneficios potenciales económicos). Aunque las leyes peruanas permiten la caza controlada de ciertas especies silvestres, la caza no autorizada de éstas ocurre con regularidad por la falta de alternativas para el desarrollo, por falta de personal y equipos para ejercer el control de la caza y protección, y por los sistemas tradicionales locales. Sin embargo, los esfuerzos conservacionistas dentro de la reserva han logrado proteger los recursos dentro de ésta, y actualmente éstos se encuentran en considerablemente mejores condiciones que aquellos fuera de ella.

La administración de la reserva está desarrollando programas de extensión y asistencia técnica para personas ubicadas dentro o cerca de sus límites. Las actividades agrícolas son preferidas en este caso porque la administración de la reserva sostiene que éstas desvían las presiones originalmente dirigidas hacia los recursos de la reserva, así como mejoran la capacidad para el desarrollo económico local. Los directores de la reserva han incluido en sus planes administrativos el fomento de otras actividades que puedan servir como fuentes de ingreso, tales como la divesificación de pesca y la producción de artesanías.

Actualmente se están conduciendo en la reserva varios estudios de especies de importancia biológica y económica. Los proyectos en desarrollo se agrupan en varios rubros; estudios de especies en peligro de extinción o aquellas de importancia económica, estudios que evalúan las consecuencias de la contaminación como resultado de la extracción de petroleo, inventarios de fauna y flora, y análisis socioeconómico de las poblaciones humanas de la región.

El plan de manejo integral para la reserva fue realizado por una comisión interinstitucional de 10 instituciones con apoyo y asistencia técnica del Programa. El plan incluye un reconocimiento e inventario detallado de los recursos naturales y culturales de la reserva. Este también incorpora en sus planes; conceptos de ecodesarrollo, programas de educación ambiental, y proyectos para lograr un desarrollo rural en forma sostenida. Su contenido primordial lo constituye una lista completa de actividades administrativas para lograr sus objetivos conservacionistas.

Básicamente, el plan administrativo se propone a asegurar la protección permanente de los ecosistemas de la región y al mismo tiempo satisfacer los requerimentos de manejo de recursos por las comunidades locales.

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Varios planificadores de parques de COREPASA discuten el plan operativo desarrollado para la Reserva Pacaya-Samiria de la amazonia peruana. (Foto, COREPASA)

Reserva Nacional del Lago Titicaca

La Reserva Nacional del Lago Titicaca protege alrededor de 35,000 Ha. de ecosistemas alto andinos de agua dulce, y abarca dos unidades de manejo que incluyen extensos humedales. Estos humedales con juncos o totora (Gynus thypha), además de albergar cuantiosa vida animal, ofrecen una multiplicidad de productos para los indígenas Uros de la región. Los juncos no solo suministran vivienda para los Uros (quienes habitan aproximadamente 40 islas flotantes de junco) sino que también les ofrece materiales de construcción, forraje, leña, y una variedad de usos utilitarios.

El pescado es uno de los alimentos básicos para cerca de un millón de personas que viven en poblaciones adyacentes al lago, como la ciudad de Puno. La cosecha incontrolada de juncos, la pesca excesiva, la caza y colección de huevos de pato, la contaminación por actividades domésticas y agrícolas, y la sedimentación y cambio de niveles de agua en el lago amenazan sus recursos y por lo tanto los sistemas de vida de los Uros y otras poblaciones que dependen de la laguna para sobrevivir.

El Programa prestó apoyo para el entrenamiento del personal de la reserva y para dar comienzo a un nuevo plan de manejo en ella. El objetivo inmediato del proyecto es el de mejorar la protección de los recursos de la reserva

y al mismo tiempo mantener la calidad de vida de los Uros. La estrategia del plan de manejo consiste en iniciar una utilización sostenida de los recursos de la reserva y en integrar proyectos de desarrollo regional entre sus planes de conservación.

Es claro que el éxito del proyecto depende de la cooperación de los Uros. Por lo tanto, el plan de manejo para la reserva pone gran énfasis en la educación y extensión rural, y en programas de ecodesarrollo.

El objetivo a largo plazo del proyecto consiste en fomentar un apoyo regional para las actividades de manejo de los recursos del lago, y establecer una reserva de la biósfera que conserve el ecosistema del lago Titicaca y las áreas terrestres que lo rodean.

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966,000 Ha. de la reserva corresponden a zonas de amortiguación que se han añadido a través de la compra de una porción de deuda boliviana por Conservation International). Esta reserva abarca vastos habitat de bosques y sabanas en las planicies noroccidentales de las provincias Baliván y Yacuma. Biológicamente, la región es rica en especies endémicas puesto que contiene fauna y flora de las regiones del Chaco, Cerrado, y Amazonas. Algunos de los objetivos primordiales de la reserva es proteger la riqueza florística y faunística de la región, sus sistemas hidrológicos, y sus culturas indígenas –tales como la de los Chimane. Esta también realiza proyectos de investigación científica y reconoce la importancia que trae la educación de la comunidad rural y la extensión de programas de desarrollo en las comunidades locales (efectuadas mayormente para los Chimane y los colonos de la región).

Cerca de 40 islas flotantes de totora son ocupadas por indígenas Uros en la Reserva Nacional del Lago Titicaca, Perú. Estos cosechan el valioso junco para una variedad de usos utilitarios. (Foto, L. West)

BOLIVIA

Proyecto de Educación Ambiental para la Reserva de la Biósfera del Beni

La Reserva de la Biósfera del Beni (establecida en 1985) es un proyecto boliviano que ofrece gran potencial para proteger fauna y flora neotropical de esta nación. La reserva recientemente se ha expandido de 135,000 a 1'101,000 Ha. (aproximadamente

Los planes operativos de la reserva hacen énfasis en integrar los intereses de las comunidades locales en sus planes de protección. Por esa razón se considera de vital importancia para la viabilidad de sus programas de protección el conducir proyectos de educación y extensión para estas comunidades. La reserva, como muchas otras, sostiene que los esfuezos para la conservación se facilitan y pueden realizarse sólo si se logra enseñar y fomentar una ética conservacionista entre las comunidades locales.

El proyecto actual, que comprende cinco fases, tiene la intención de crear una conciencia sobre los recursos naturales entre las comunidades que viven cerca de la reserva. La primera fase, que ya ha sido concluída, evaluó el estado socioeducacional de la población escolar y adulta en el área, con el fin de facilitar un curriculum de educación para la región. La segunda fase, en desarrollo actualmente , llevará a cabo un programa educacional para los profesores locales. En esta fase el proyecto está enfocado a difundir la educación ambiental entre las escuelas locales y a crear materiales educativos para ayudar en ésta labor. La tercera fase será diseñada para desarrollar habilidades conservacionistas entre organizaciones y otros grupos sociales de la región. La cuarta fase diseñará y llevará a cabo programas de extensión a nivel regional y nacional con el fin de divulgar estrategias, objetivos generales, y resultados del proyecto. Finalmente, la quinta y última fase del proyecto incluirá una evaluación de éste y de sus logros.

La Reserva de la Biósfera del Beni está bajo la dirección de Conservation International-Bolivia, la Academia Boliviana de Ciencias la la Corporación de Desarrollo del Beni. El proyecto educacional está siendo dirigido por el Centro Interdiciplinario de Estudios Comunitarios (CIEC) de Bolivia quien trabaja en conexión con la Academia Boliviana de Ciencias y las siguientes organizaciones del Departamento del Beni: el Comité Cívico, la Corporación Autónoma para el Desarrollo, y la Universidad Nacional. Estas son instituciones locales que también apoyan técnica y económicamente a la reserva. CIEC ha estado previamente involucrado con proyectos comunales de educación y salubridad, y ha producido varios materiales con temas de desarrollo y conservación ambiental.

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EL CARIBE

DOMINICA

Proyecto Forestal en Dominica

Dominica es la mayor isla de barlovento en el Caribe. Aproximadamente 65% de los bosques nativos de la isla permanecen en sus 754 Ha. de terrenos montañosos. Estos bosques húmedos, además de contener un gran endemismo florístico y faunístico proveen habitat importante para una variedad de aves migratorias. Esta nación ecológicamente rica, es sin embargo, probablemente la más pobre económicamente en la región. Su disminución económica ha sido exacerbada por varios fenómenos naturales (huracanes devastadores).

Los estudios dirigidos a evaluar la capacidad de producción forestal han demostrado que la extracción de maderas en gran escala no es una actividad factible en Dominica (debido a la topografía accidentada de la isla, sus altos niveles de precipitación, y por la falta de vías de acceso). Además, actividades forestales previas no han dado mayores beneficios económicos y han generado daños ambientales significativos. Aún así, los bosques de la isla son vitales para el desarrollo económico de la nación. Se han conducido estudios que demuestran como estrategias para la explotación forestal en pequeña escala, ecológicamente viable, pueden proveer alternativas viables para los valiosos ecosistemas del país. Tal estrategia se basa en una técnica forestal de labor intensiva que minimiza el daño tanto a los suelos como a la vegetación residual y crea una abundancia de empleos que fomenta el desarrollo entre las comunidades rurales.

El proyecto de ecodesarrollo en Dominica se inició y fue coordinado por el Eastern Caribbean Natural Area Management Program (ECNAMP), una institución no gubernamental del Caribe, y financiado por el Programa PASNH.

La estrategia del proyecto está basada en dar incentivos a los aserraderos (para asegurarse que utilizen métodos ecológicamente viables, practiquen la reforestación, y aprecien las áreas de protección); en aumentar los valores de la materia prima, para promover el establecimiento de industrias locales (manufactura de muebles y artículos de madera) que aumentan los ingresos rurales y disminuyan las demandas de recursos forestales; y, en dar la oportunidad de que las comunidades locales ejerzan la utilización de recursos en la forma más conveniente (para así crear un interés local para la protección de dichos recursos). Este innovador enfoque empresarial en los esfuerzos conservacionistas está diseñado para demostrar que la conservación y el desarrollo pueden ser integrados dentro del sector privado rural. La estrategia del plan se basa en lograr la conservación de recursos mediante la creación y el mejoramiento de prácticas empresariales. El proyecto intenta fortalecer los valores de los recursos forestales y reducir el desperdicio, mantener la productividad forestal, obtener el mayor beneficio posible de su materia prima, y aumentar la oportunidad de empleo y salario para las comunidades rurales pobres.

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SAINT LUCIA

Proyecto de Manejo de Recursos en el Sureste de Saint Lucia

Saint Lucia es una isla montañosa, volcánica, localizada entre las islas de barlovento en la cadena de las Antillas Menores. Con una superficie de 616 Km^2, está dotada de bosques, manglares, arrecifes de coral, pastizales, bosques secos y playas espectaculares. La mayoría de la población de la isla (124,000 habitantes) obtiene sus principales medios de subsistencia al utilizar directamente los recursos naturales (pesca artesanal de langosta, conchas, erizos marinos), fuentes recreacionales, producciónes de carbón, y recursos agropecuarios.

Las riquezas naturales están siendo afectadas por las demandas ejercidas por la creciente población humana –la utilización extensiva e incontrolada de recursos necesarios para el desarrollo, turísmo, y subsistencia humana.- La nación actualmente se encuentra en una situación económica precaria y su necesidad de ingresos presiona a que se acepten propuestas de proyectos para el desarrollo nacional que pueden tener repercusiones ambientales significativas.

El mejoramiento de prácticas de explotación maderera en la boscosa isla de Dominica puede asegurar el sostenimiento de este importante recurso natural de la isla. (Foto, D. Glick)

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La Asociación para la Conservación del Caribe, en su Programa para el Manejo de Areas Orientales del Caribe (ECNAMP), ha identificado el sureste de Saint Lucia como un área de prioridad para las actividades conservacionistas en las Antillas Menores. Esta asociación, que asiste a personas e instituciones conservacionistas y contribuye con el desarrollo económico de la región, ha dirigido programas de recreación y turismo, de educación y entrenamiento, y de conservación de recursos culturales y marítimos en el área.

Hasta ahora, dos islas pequeñas, con centros interpretativos para visitantes en cada una de ellas, han sido declaradas reservas naturales. Los pescadores locales han tomado parte activa en los programas de manejo de pesquerías, y se están estableciendo plantaciones de árboles para producir leña y disminuir la tala de manglares. También, se están cultivando erizos de mar y algas marinas con fines comerciales. Se ha iniciado un programa de extensión agrícola y una cooperativa de pescadores --con capacidad de almacenaje-- con un control de pesca autoregulada.

Varios de los componentes nuevos del proyecto incluyen la conservación de la cuenca alta de uno de los ríos de la isla y la protección ambiental de los alrededores de Vieux Fort.

El proyecto considera que el entrenamiento de los habitantes de la región es fundamental. Por ésto, actividades de entrenamiento están siendo conducidas mediante talleres que enfocan temas de maricultura, manejo de recursos naturales, desarrollo turístico, y educación ambiental.

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El cultivo de alga marina es elemento importante del esfuerzo integrado de conservación y desarrollo en el sureste de Saint Lucia (Foto: G. Medina)

BARBADOS

Curso para Graduados sobre el Manejo de Recursos Naturales, Universidad de West Indies

El Centro para Estudios Ambientales y Manejo de Recursos Naturales (CERMES) de la Universidad de West Indies, en Barbados, introdujo al Caribe un curso sobre el manejo de recursos naturales de la región. Este curso ha sido el resultado de esfuerzos a largo plazo para establecer un entrenamiento ambiental en la región.

Anteriormente, las organizaciones conservacionistas locales se veían debilitadas por la ausencia de su personal que tenía que viajar fuera de la región para tomar cursos con este tipo de entrenamiento. La Universidad de West Indies enfrentó y solucionó el problema al ofrecer el curso, con duración de un año, basado en una serie de proyectos desarrollados en el Caribe. El curso se enfoca al manejo y utilización múltiple y en forma sostenida de los ecosistemas de la isla. Los estudiantes del programa ya están involucrados en actividades de interés para el Programa PASNH en la costa sureste de Saint Lucia, y se anticipa que la universidad expanda y ofrezca cursos adicionales en un futuro próximo.

La Asociación Conservacionista del Caribe, a traves de su Programa para el Manejo de Areas Orientales del Caribe (ECNAMP), ha ayudado a elaborar este curso y ha asistido a estudiantes en la identificación de oportunidades de entrenamiento a nivel de campo.

El Programa PASNH ha colaborado en múltiples facetas, tanto en el establecimiento del proyecto como en la participación de ECNAMP en éste y en el monitoreo de actividades de campo efectuadas por los estudiantes.

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AFRICA

MALAWI

Parque Nacional del Lago Malawi

El Lago Malawi probablemente contiene una de las mayores cantidades de peces lacustres en el mundo. Aquí existen aproximadamente 600 especies de peces de las cuales únicamente 400 están descritos. De éstos, la gran mayoría son endémicos al lago. Además del valor biológico de este ecosistema, el lago provee cerca del 65% de la proteína animal disponible para los habitantes de Malawi (cerca de 30,000 toneladas de pescado al año). La pesca constituye la mayor industria de la región y la importancia del manejo sostenido de esta industria es obvia. Sin embargo, hay indicaciones de que la pesca esta disminuyendo en varios sitios por sobreexplotación.

El Parque Nacional del Lago Malawi (establecido en 1980) sirve de protección para criaderos de peces en el lago y por lo tanto es un elemento importante para el manejo de sus recursos.

Al establecer el parque se prohibió a las comunidades locales el utilizar muchos recursos (leña, materiales para construcción, y sitios tradicionales de pesca) que anteriormente estaban disponibles. El proyecto en cuestión intenta sustituir los recursos perdidos por la población local, mediante el desarrollo de un plan maestro que actualmente forma la base del plan de manejo para el parque. En el plan de manejo se incluye la construcción de un centro de interpretación, y el desarrollo de programas de educación ambiental para visitantes. Se han emprendido varios proyectos de ecodesarrollo para beneficiar a las comunidades locales de la región (el establecimiento de plantaciones de leña, acuacultura, y abejas en producción), y se ha iniciado un estudio del impacto ambiental que la pesca tradicional ha causado y sobre las actitudes de la gente local.

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La montaña Oku, en el Camerón es un área importante para la colección de plantas medicinales comúnmente usadas por las comunidades locales. (Foto, E. McShane)

La vida silvestre es una importante fuente económica de muchos países africanos. En Zambia, miles de turistas visitan anualmente el Parque Nacional Kafue para ver animales como esta cebra. (Foto, E. McShane)

ZAMBIA

Proyecto en la Provincia Este de el Valle Luangwa, Parque Nacional Kafue

Zambia posee una de las mayores concentraciones de animales silvestres de los ecosistemas de sabana africana, y su población rural dependen altamente de ellos. Por esto, Zambia tiene la oportunidad de diseñar un programa de conservación multidiciplinario que mantenga los sistemas tradicionales, socioeconómicos, y culturales de su población. El Programa PASNH en esta área se ha iniciado con el desarrollo del proyecto piloto de Lupande. Este proyecto intenta, además de concientizar al gobierno local sobre el valor de los recursos silvestres de la región (los cuales permanecen sin aportar beneficios económicos locales o nacionales), averiguar si poblaciones indígenas locales pueden, junto con el Servicio de Parques Nacionales, manejar y conservar los recursos silvestres locales. El proyecto tiene planes de realizar un programa de manejo y utilización sostenida de los recursos silvestres regionales, entre las poblaciones locales.

El proyecto actualmente goza de participación local, por lo que está creando empleos y fuentes de ingreso para las comunidades vecinas e incluye a cuatro regiones cercanas (dos en el valle Luangwa y dos contiguas al Parque Nacional Kafue).

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EL CAMERON

Proyecto de la Montaña Oku

La República del Camerón contiene una gran variedad de habitat. Sus bosques lluviosos ecuatoriales poseen la mayor diversidad biológica del Africa y en su región occidental están los bosques con mayor endemismo del continente. Aquí, la montaña Oku ha sido identificada como un área prioritaria para los esfuerzos conservacionistas, puesto que en ella aún existen extensas áreas del bosque de altiplano montañoso. Es más, los bosques de Oku protegen cuencas de ríos y proveen medios de subsistencia para cerca de 180,000 personas que viven en esta región, que es una de las más pobladas del país.

Este proyecto intenta terminar o aminorar la degradación sistemática de los bosques de Oku y sus alrededores mediante el desarrollo sostenido de algunas de las industrias existentes (cultivo de abejas, artesanías de talado en madera, y extracción de productos medicinales) para

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el incremento de ingresos. Entre los programas del proyecto a largo plazo están incluídos el desarrollo de un plan de manejo de las laderas de la montaña Oku, el comienzo de estudios ecológicos de especies en peligro de extinción, el respaldo oficial para la protección del monte Oku, el establecimiento de un programa de reforestación utilizando especies nativas con valor socioeconómico, el establecimiento de industrias no conflictivas con los planes de protección, y un programa educacional para fomentar una conciencia conservacionista en la región.

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Los animales silvestres representan una importante fuente de proteína para las comunidades rurales de la República de Africa Central (Foto, M. Fay)

REPUBLICA DE AFRICA CENTRAL

Reserva Forestal Dzanga-Sangha

Este proyecto promueve la creación, desarrollo, protección y manejo de la Reserva Forestal Dzanga-Sangha con el fin de conservar sus importantes componentes florísticos y faunísticos característicos de los bosques tropicales bajos. El área también está habitada por pigmeos quienes practican la caza y la recolección de productos forestales. La forma principal de desarrollo y utilización forestal es la tala selectiva, y el cultivo del café y la mandioca.

La meta principal del proyecto es proteger la última área de bosque tropical bajo en la región y manejar las zonas de amortiguamiento de la reserva para el uso sostenido por la comunidad local. Se ha negociado un acuerdo con el gobienrno de la Republica de Africa Central en el cual se ha reconocido y ayudado oficialmente el proyecto. Los objetivos del proyecto también incluyen el asignar una política de desarrollo y conservación para la gente viviendo dentro y cerca de la reserva; preparar y hacer uso de un plan operativo multiple para la reserva que incluya usos tales como la tala selectiva, cultivos con rotaciones largas, reestablecimiento en forma viable de la caza tradicional, la recolección de productos forestales; el desarrollo de medios para monitorar los sistemas de manejo actuales en al reserva; el entrenamiento de gente local y de personal gubernamental en el manejo mutuo de la reserva; y, el establecimiento de un plan de salud para los pigmeos, quienes han desarrollado enfermedades al cambiar su sistema de vida nómada por sedentaria.

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SIERRA LEONA

Parque Nacional Outamba-Kilimi

Este parque nacional, en la región Otamba-Kimini, es el primero del país y se caracteriza por poseer bosques y sabanas que albergan una gran diversidad de primates, incluyendo una de las más grandes poblaciones de chimpancés en Sierra Leona.

El proyecto, auspiciado por el Programa, se ha dirigido a integrar elementos de ecodesarrollo entre las comunidades rurales y a identificar y poner en uso programas de desarrollo entre ellas. Los objetivos del proyecto son: colaborar con el departamento forestal en el desarrollo de su plan de manejo y ofrecer entrenamiento en cuestiones de conservación; trabajar con las comunidades contiguas al parque para realizar un plan de desarrollo rural para el beneficio tanto de ellas como del parque; y, asistir en proyectos de conservación dentro y cerca de éste. Se espera que este proyecto inicie un plan de manejo efectivo para el parque; ayude a entrenar personal para el departamento forestal nacional, ayude a mejorar los programas de conservación forestal nacional (incluyendo la educación ambiental y el conocimiento público); e inicie programas de desarrollo entre las poblaciones locales.

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MADAGASCAR

Proyectos en las Areas de las Reservas Naturales Beza Mahafaly y Andohahela

Madagascar es una de las islas más grandes del mundo y probablemente posee la mayor diversidad biológica y endemismo en el globo, por haber sido separada del continente Africano hace cerca de 180 millones de años. La isla ha establecido 11 reservas naturales a través de su red de ecosistemas. Pero aunque éstas reservas son legalmente protegidas sus recursos

siguen siendo explotados y su superficie invadida. La región sureña de Madagascar, donde están las Reservas Naturales Beza Mahafaly y Andohahela, es la más seca del país; por lo tanto la explotación incontrolada de sus recursos es más perjudicial.

El objetivo general del Programa en Madagascar es el de crear una estrategia para iniciar proyectos de protección y desarrollo en la cercanía de estas reservas. El proyecto apoyará un inventario de los recursos del área, incluyendo la colección extensiva de ejemplares de su flora y un reconocimiento de su fauna; la realización de un estudio de uso actual de estos recursos, incluyendo estudios etnoculturales y etnobotánicos de las comunidades pastoralistas de Mahafaly; una reseña del desarrollo de las actividades en el área de Mahafaly; el desarrollo de un plan para mejorar los sistemas de agricultura sostenida y de producción de leña; y, el entrenamiento de estudiantes universitarios en procesos para evaluar y conducir inventarios biológicos, en el manejo recursos naturales, y en agronomía.

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DIRECTIVA DEL PROGRAMA AREAS SILVESTRES Y NECESIDADES HUMANAS

La directiva del Programa está compuesta principalmente por cuatro miembros de WWF en Washington: Michael Wright, el director general del Programa; Dennis Glick, encargado de proyectos PASNH en la América Latina; Augusto Medina, oficial de proyectos en el Caribe; y, Tom McShane encargado de proyectos en Africa. Además de éstos, el Programa cuenta con la asistencia de Curtis Freese, Vice-Presidente para América Latina; Mario Ramos, oficial de proyectos en México; Carlos Saavedra, oficial de proyectos en la región andina; Victor Bullen, oficial de proyectos en el Cono Sur; Rick Weyerhauser, oficial de proyectos en Africa; y Miguel Cifuentes, representante de WWF en América Central. También se cuenta con la colaboración de Fernando Potess, un estudiante graduado colombiano quien actualmente desempeña el cargo de interno para el Programa, y se adquirirán los servicios de una especialista en desarrollo rural, Katrina Eadie –quien actualmente trabaja con The Conservation Foundation, entidad afiliada con WWF.

El Programa constantemente recibe la valiosa asistencia de los miembros de su comisión consultiva, formada por representantes de 12 agencias para el desarrollo: CODEL, Catholic Relief Services, Save The Children Federation, la Fundación para el Desarrollo Panamericano, el Instituto Internacional para el Desarrollo y el Medio Ambiente, CARE, el Centro de Estudios para la Mujer, la Fundación Interamericana, Cultural Survival, la Organización de Estados Americanos, Africare, y el Fondo para los Niños Cristianos.

Todas estas instituciones representan años de experiencia en asuntos de desarrollo y han servido como instrumento básico en la educación del personal del Programa.

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WWF
BOLETIN PROGRAMA
AREAS SILVESTRES
Y NECESIDADES HUMANAS

WORLD WILDLIFE FUND
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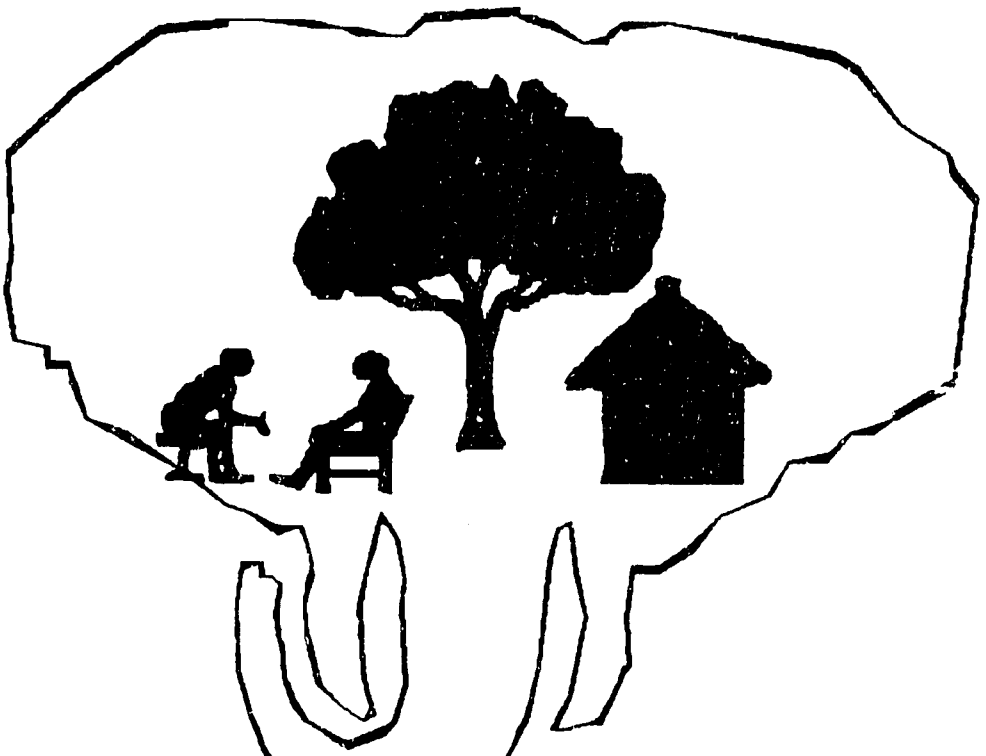
Zambian Wildlands and Human Needs Newsletter



NATIONAL PARKS AND WILDLIFE SERVICES

A news and review of a national program linking wildlife benefits to conservation in Zambia's 32 game management areas

PUBLISHED AT NYAMALUMA
CONSERVATION CAMP / LUPANDE
DEVELOPMENT PROJECT /MAY, 1988

EDITION NUMBER I.

THE HONORABLE MINISTER OF TOURISM AND MEMBER OF PARLIAMENT, L.S. SUBULWE, INAUGURATES THIS FIRST NEWSLETTER WITH SOME PERSONAL REFLECTIONS

I am particularly happy to launch this document because it makes officials of National Parks and Wildlife Services Department see themselves as much concerned for human interests as for wildlife. It is my belief that this balance, if properly applied, will stimulate residents not only to conserve but also to actively manage wildlife to sustain its benefits for years to come.

The establishment of wildlife management authorities, which this newsletter will report on in the coming issues, guarantees participation of local communities in wildlife conservation throughout Zambia. This arrangement will ensure that revenue earnings are shared with local people to support community projects which will ensure greater acceptance from the local community for the conservation of wildlife.

Tourism in Zambia is wildlife based. We shall, therefore, continue to develop our tourist attractions with care and sensitivity in order to preserve both wildlife and its environment. The Party and its Government does not believe in wasteful exploitation. They attach great importance to the economic and sustainable potential of our wildlife areas.

A NATIONAL PROGRAM OF INVOLVING LOCAL RESIDENTS WITH WILDLIFE CONSERVATION GETS UNDERWAY

Failure to include local residents living outside national parks in the efforts to conserve and develop wildlife resources has been a major fault of many African countries and has jeopardized the safe future of their wildlife resources. Zambia has established itself as a leader in making conservation a word of meaning and commitment for local residents living in those buffer areas surrounding Zambia's national parks called game management areas (GMA's). This achievement is being made through a National Parks and Wildlife Services program called the Administrative Management Design for Game Management Areas, whose abbreviated name is ADMADE. In dealing with problems of illegal hunting, habitat destruction and increasing human pressures, ADMADE has the potential of revolutionizing conservation in Africa. Its basic design is simple. By allowing local residents the opportunity to benefit fully from the sustainable revenues from wildlife and by developing local expertise to support these earnings with appropriate management and law enforcement, positive attitudes toward conservation will evolve. As a result, greater c[illegible] interest among local communities will be adopted to prevent non-residents from entering their area to exploit wildlife for selfish commercial gains. To enlarge on this theme and the history of how ADMADE came into existence, Mr. Akim N. Mwenya, Acting Deputy Director for National Parks and Wildlife Service and Co-Administrator of the ADMADE project, provides a brief summary.

"The origins of the Administrative Management Design for Game Management Areas (ADMADE) can be traced back to September 1983, when National Parks and Wildlife Service (NPWS) organized the Lupande Development Workshop at Nyamaluma. The Lupande Research Project of NPWS inspired the workshop and influenced its outcome through research work which placed emphasis on the role of village socio-economics in stablizing the balance between village interests and wildlife conservation. The workshop, among other things, recognized the need for people who live in areas which support wildlife and where such wildlife is exploited to derive meaningful benefits from wildlife. Failing this, residents would likely exploit the resources illegally without regard to their long-term sustainable potential. The problem was how to involve local communities in the sharing of benefits from wildlife and in the participation of wildlife management.

During the workshop a project proposal was put forward. Villagers within Lupande Game Management Area were to be organized into a cooperative which would engage in such revenue earning activities as safari hunting and sustained-yield management of species whose populations were out-stripping their food supplies. In addition, law enforcement would be modified to place greater emphasis on local participation.

In theory the proposed project sounded attractive, but in practice it could not be implemented. The main reason was that local residents lacked relevant skills, especially in wildlife management and administration. A break-through came in late 1985 when NPWS adopted an experimental design for managing wildlife in areas outside national parks. The rationale of the design is that NPWS generates revenue from wildlife and retains it to meet wildlife management costs and basic human needs within that area where NPWS is able to generate such revenues. The residents participate in the management of wildlife resources through a local committee that is established to plan and implement wildlife related programs.

With assistance from World Wildlife Fund (USA) and Wildlife Conservation International, the Lupande Development Project undertook the implementation of this experimental wildlife management design. The back-bone of this design were several key activities: the Village Scout Program, the Malama Hippo Scheme and the Lower Lupande Hunting Safari Scheme. ADMADE is based on the results of the experiments carried out in Lower Lupande by the

Lupande Development Project and the methodologies it helped to achieve."

On the subject of what ADMADE is, Mr. Mwenya adds the following remarks.

"Under ADMADE, game management areas are organised into wildlife management units which are managed by their respective wildlife management authorities through NPWS. Each wildlife management unit has a unit leader whose responsibility is to direct the day to day operations of wildlife management with the help of NPWS scouts and local village scouts within the Unit. The wildlife management authority is made up of chiefs, ward councilors, members of parliament, wildlife officers, district governors and other party and government officers. Each wildlife management authority has under its disposal 40% of the revenue generated within the unit from wildlife for managing the wildlife resource and 35% for community development. The remaining is shared between tourism development and wildlife management costs in the adjoining national park."

Mr. Mwenya has been instrumental in conveying the technical details of ADMADE to all levels of the Government to achieve a broad base support of its importance to both conservation and national development. Through these efforts, residents in game management areas throughout the country are aware that for the first time they will be entitled to opportunities of employment in wildlife management they've never had before. In addition, community welfare will be served through revenue earnings from wildlife. Understandably there is growing enthusaism and support for ADMADE's success.

RESULTS IN LUPANDE PROVIDE OPTIMISM FOR ADMADE'S ROLE IS SOLVING CONSERVATION PROBLEMS IN ZAMBIA

A quick look at the history of the Lupande Development Project reveals that the cost of law enforcement is relatively inexpensive and more effective if local residents are engaged in these activities. The Lupande Project achieved these results by recruiting young volunteers from the local village communities as village scouts, who were trained to patrol their chiefdom to apprehend illegal hunters, monitor wildlife populations, and supervise the legal off-take of wildlife resources. In less than three years, their efforts have cut poaching rates of elephants by over 90%, have contributed to a gross revenue earning for their area of over US $ 35,000, and have helped save a local population of black rhinoceros from extinction. During this period, employment in wildlife related programs have increased ten-fold and over 80% of the operational costs of this program was met by the revenues generated locally from the sustained-yield use of wildlife. Figures below show some of these trends.

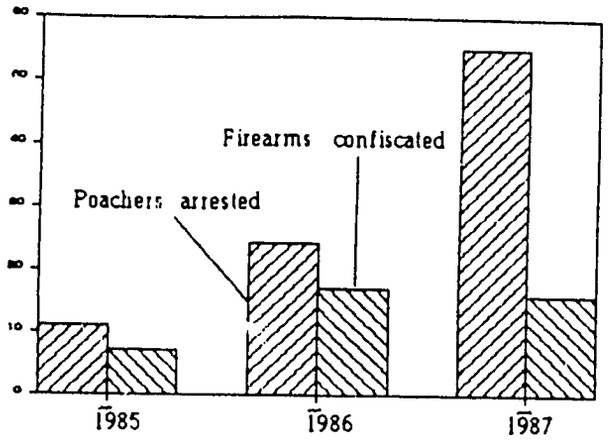


Fig 1. Law enforcement trends with the progressive recruitment and deployment of local village scouts in project area.

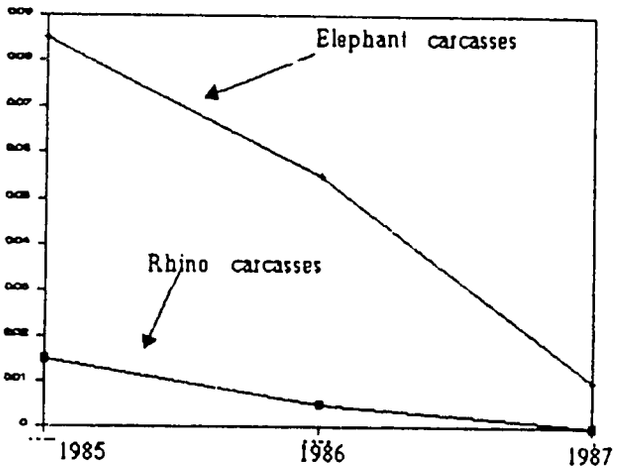


Fig 2. Number of fresh poached carcasses found during village scout patrols expressed as number per km2. Total area patrolled in 1987 was over 500 km2.

In late 1987, an attitude survey was conducted to compare perceptions and attitudes toward wildlife in the area affected by the Lupande Development Project as opposed to a neighboring chiefdom not in the project area. Overwhelming evidence supported the conclusion that the more positive attitudes toward wildlife conservation found among residents in the Lupande Project area was at least partially due to the significant economic benefits from wildlife available to the local community. Furthermore, residents from the project area showed an accurate understanding of how these benefits are made sustainable from appropriate development and conservation activities.

WHERE ADMADE IS BEING CARRIED OUT

Zambia has designated almost 25% of its land area as either national parks, of which there are 18, or game management areas, which number 32 and surround the national parks. Human residency is permitted only in the GMA's and there is consequently the potential for conflict between wildlife and human needs. ADMADE, therefore, embraces the administrative and management requirements of these game management areas to minimize such conflicts and indirectly ease similar conflicts between wildlife in the parks and village communities living nearby. To initiate ADMADE, 14 GMA Units, representing a total of 12 game management areas, are being assimilated into this program. This selection was based on those GMA's whose areas currently are able to sustain sufficient revenues from wildlife development, largely from safari hunting concession fees, to help finance the various programs that will stengthen their future sustainability of wildlife revenues.

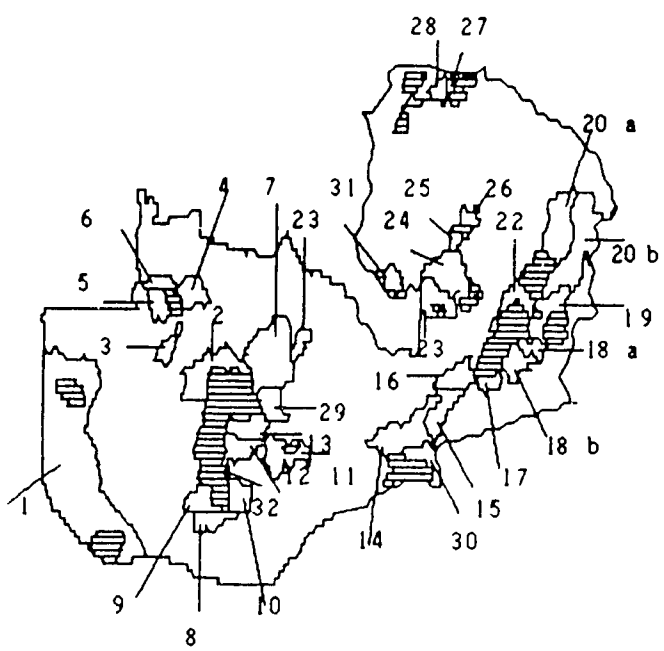
The map below shows those GMA Units participating in ADMADE and the large number remaining for eventual incorporation into ADMADE when their wildlife numbers increase sufficiently to permit the sustained- yield management of these resources. Some of these remaining GMA's are referred to as depleted areas. National Parks and Wildlife Service is actively seeking support to upgrade these areas to full GMA Units. This will, of course, require the cooperation and participation of their resident village communities. One such GMA fast on its way to becoming a full GMA Unit is Sandwe Game Management Area. In this GMA, residents have organized themselves into a 15 man volunteer force of honorary rangers to combat poaching with NPWS supervision. Once this area becomes upgraded to a GMA Unit, these volunteers will be officially classified as Village Scouts, whose salaries will be met from locally generated revenues.

SELF-SUSTAINABILITY IS THE KEY TO ADMADE'S SUCCESS

While NPWS recognizes its dependence on outside help to secure critically needed capital purchases, principally vehicles and other specialized equipment not easily available in Zambia, ADMADE strongly adhers to the philosophy of achieving self-sustainability of its wildlife management costs. In terms of its operational expenses, such as salaries, fuel, uniforms, etc., ADMADE is largely self-sufficient from its very onset. For 1988 alone, total revenues from these 14 GMA Units and derived from safari hunting concession fees to support the goals of ADMADE is US $ 391,250, a sum of money not available to wildlife conservation and community improvements prior to ADMADE. The actual amount available toward meeting wildlife management costs is $156,600, which will provide complete cost coverage of an expanded village scout force totalling about 200 men, fuel expenses for field operations, and capital building projects for some of the Units. With improved management and law enforcement, total revenue earnings available to ADMADE will undoubtedly increase.

NEW DIRECTOR OFFERS EXPERIENCE AND LEADERSHIP TO NATIONAL PARKS & WILDLIFE SERVICE

Dr. Harry N. Chabwela, former Deputy Director of National Parks and Wildlife Service, was recently appointed as this



SHADED AREAS ARE NATIONAL PARKS, NUMBERED OPEN AREAS ARE GAME MANAGEMENT AREAS, & ** INDICATES GMA UNITS.

1. West Zambezi
2. Kasonso-Busanga **
3. Chizela **
4. Musele-Matebo
5. Lukwakwa
6. Chibwika-Ntambu
7. Lunga-Luswishi **
8. Sichifulo **
9. Mulobezi **
10. Billili Springs
11. Kafue Flats
12. Namwala **
13. Mumbwa **
14. Luano **
15. West Petauke
16. Chisomo
17. Sandwe
18a. Upper Lupande **
18b. Lower Lupande **
19. Lumimba **
20a. Musalangu W. **
20b Musalangu E. **
21. Machiya-Fungulwe
22. Munyamadzi **
23. Kafinda
24 Bangweulu
25. Chambezi
26. Luwinga
27. Tondwa
28. Kaputa
29. Kaluanyembe
30. Rufunsa
31. Mansa
32. Nkala

Department's new Director. He succeeded Mr. S.M. Yamba who has taken a new post with the National Commission for Development and Planning. Dr. Chabwela's commitment to wildlife as a resource of aesthetic and economic importance to this country is well known. This is exemplified by his current efforts as team leader of the Wetlands Project to help conserve and develop Bangweulu and Kafue Flats, two unique wetlands of international interest His dedication to the wildlife of this country will no doubt bring invaluable assets to ADMADE.

WORLD WILDLIFE FUND (USA) ADOPTS ADMADE AS ONE OF ITS MODEL PROJECTS FOR ITS OWN WILDLANDS AND HUMAN NEEDS PROGRAM AND ASSISTS WITH MAJOR CAPITAL EXPENSES

Dr. Michael Wright, a Vice-President of World Wildlife Fund (USA), visited Zambia in 1987 to meet the two Co-administrators of ADMADE, Mr. Gilson Kaweche, Chief Wildlife Research Officer of NPWS and Mr. Akim Mwenya, Acting Deputy Director of NPWS While in Zambia he toured various GMA Units, met with various Unit Leaders, local chiefs, and District Governors and visited ADMADE's model area in Lower Lupande Unit, which is the site of the Lupande Development Project His assessment of ADMADE won Zambia high praise for her creative approach to solving problems of wildlife conservation through socio-economic solutions and local level participation. Dr. Wright was especially impressed by the large number of talented Zambians administering this project. As a result of this visit, World Wildlife Fund adopted ADMADE as a model project of its own international program called Wildlands and Human Needs Project.

To help speed up ADMADE's successful implementation, World Wildlife Fund (WWF) has approved a sum of US $124,000 for 1988 to purchase new vehicles and begin construction of Unit Headquarters for two GMA Units. This level of funding is large for WWF and indicates the importance it attaches to ADMADE's success. If adequate funding can be found, WWF hopes to continue this level of support for the next five years. Much of WWF's current funding for this project is derived from the generous support from Mr. William Lloyd of the United States. Zambia and her people extend their warmest gratitude and appreciation to Mr. Lloyd, who once visited Zambia as a tourist and became enthusiatically interested in the pioneering work of Zambia's National Parks and Wildlife Service. Another large share of WWF support is derived from a US AID matching funds grant Additional past help extended to the development of ADMADE through the Lupande Project and other programs include the following: Wildlife Conservation International, Wildlife Conservation Fund, Africare, Mzuri Foundation, Shikar Foundation, Self-help Grants from both the American and Dutch Embassies, and the American Aquarium and Zoological Parks Association. A very recent donation has come from Barclay's Bank Development Fund to help finance Sandwe Game Management Area's rehabilitation to make it economically self-supporting from wildlife. To all Zambia extends her thanks and hopes such support will continue.

PROGRESS IN THE IMPLEMENTATION OF ADMADE

1987

Unit Leader training course is completed at Nyamaluma Research and Education Camp. Twelve Unit Leaders graduate and are posted to their respective Units.

Gilson Kaweche and Akim Mwenya present the results of the Lupande Development Project to an international conservation conference in Harare, Zimbabwe on September and reveal the designs of ADMADE to the conference delegates

The Honorable Minister of Tourism, S.L. Subulwe, visits GMA Units and stresses the importance of ADMADE to local chiefs and Party and Government officials.

Preliminary draft of the ADMADE program designs is completed and circulated to all District Governors, who wer asked to become chairmen of their respective Wildlife Management Authorities

1988

Forty-nine village scout trainees from eight different GMA Units are trained for four months at Nyamaluma and were graduated in April. Another village scout training course begins in May with a total of 58 trainees from seven GMA Units.

ADMADE orders new Toyota Land Cruisers for two GMA Units

All but two of the Wildlife Management Authorities convene their first meetings by 1 June and propose new and important ways to improve the wildlife management in their area.

Unit Leaders establish sites for their Unit Headquarters and some begin work on their construction.

Engagement of a University of Zambia graduate, Mr. Glory Chanda, as ADMADE's first wildlife management biologitst and he begins training at Nyamaluma Education and Research Station.

IF YOU WOULD LIKE TO HELP ADMADE'S SUCCESS

For those familiar with Zambia, it will not come as a surprise to learn that the greatest obstacle in implementing ADMADE will be providing reliable transport services for each of the Units. The roads in most of the Units are often little more than game trails and distances between Unit Headquarters and town centers where supplies can be purchased are long and difficult. Zambia is experiencing an acute shortage of foreign exchange to meet the demands of motor vehicle assembling within the country and imported vehicles are extremely expensive. As a result, ADMADE is importing its own vehicles by using its duty free priviledges for importation of project equipment.

NEEDED

A 7 ton four-wheel drive truck. The delivery of building supplies and food rations for village scout requires a heavy chassis vehicle. Smaller 1 ton vehicles are currently being used to do the job within each unit but this is increasing vehicle maintenance costs and reducing the life-span of these vehicles. ADMADE does not have a heavy vehicle for such needs. Its total cost is estimated at $40,000. A heavy truck would greatly expedite the implementation of ADMADE's activities.

NEEDED

Three outboard boat engines. Lumimba, Munyamadzi, and Lunga-Lushwishi GMA Units face extreme difficulties in carrying out effective law enforcement programs during the wet season due to flooded rivers. Crossing these rivers require motor powered boats, which would enable many areas previously unguarded during the rains to be better protected from poachers. Three 35 hp outboard motors would be ideal for powering fiberglass banana boats, which are locally available. Total costs for these motors is US $10,000.

Anyone able to offer foreign exchange assistance toward the purchase of the above equipment can do so while also receiving a USA tax deduction by sending a check payable to

World Wildlife Fund (USA) / ADMADE

and mail to: Nancy Hammond, Vice-president
Accounts / World Wildlife Fund (USA)
1250 24th Street NW
Washington, D.C. 20037

ADMADE's current budget is unable to meet these expenses and contributions will be extremely appreciated. Individuals able to donate local Zambian currency to ADMADE's general fund can also receive a Zambian tax deduction by making your check payable to the Wildlife Conservation Revolving Fund / ADMADE and have it sent to

Mr. George Mubanga,
Director of Conservation Revolving Fund
National Parks and Wildlife Service
Private Bag 1
Chilanga, Zambia

If you are a Zambian with an interest in a particular game management area and would like to have your donation used for a specific cause within the framework of ADMADE, you are advised to write one of the following:

Akim Mwenya, Deputy Director
or Gilson Kaweche, Chief Research Officer
National Parks and Wildlife Service
Private Bag 1, Chilanga

...or Dr. Dale Lewis, WWF Technical Advisor
Lupande Development Project
Box 82, Mfuwe

FOR FURTHER DETAILS ABOUT ADMADE

This newsletter is available free for any interested reader. For subscription please send name and address to

Editor, Wildlands and Human Needs Newsletter
Nyamaluma Research and Education Camp
Box 82
Mfuwe, Zambia

Several National Parks and Wildlife Service publications pertaining to the technical background of ADMADE are available and can be obtained on request for US $3.00 or Z K25.00 per copy.

1. Lupande Research Project by G.B. Kaweche and D.M. Lewis

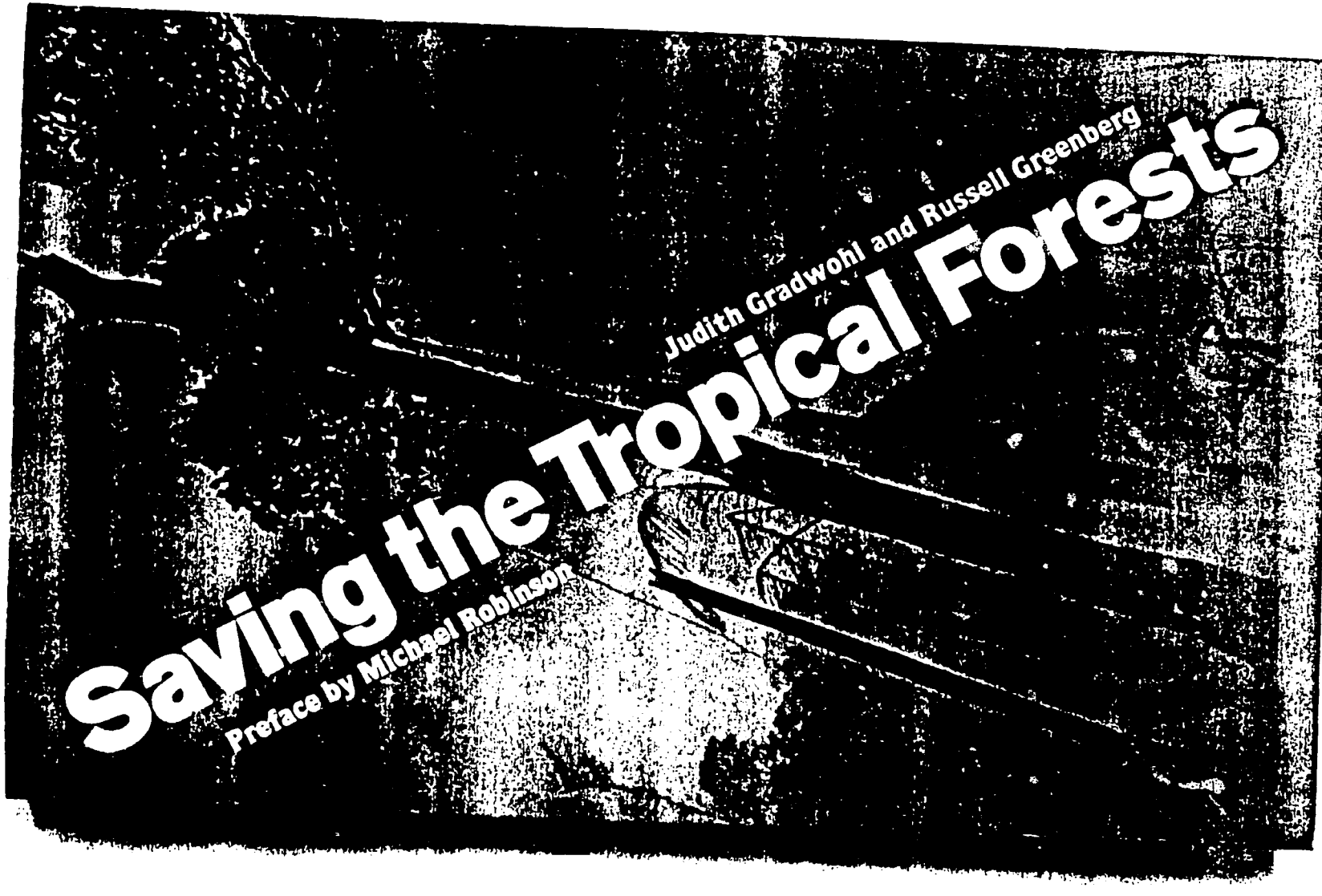
2. Wildlife Conservation Outside Protected Areas - A Lesson from an Experiment in Zambia by D.M. Lewis, G.B. Kaweche and A.N. Mwenya

3. The Administrative Management Design for Game Management Areas by A.N. Mwenya, G.B. Kaweche and D.M. Lewis

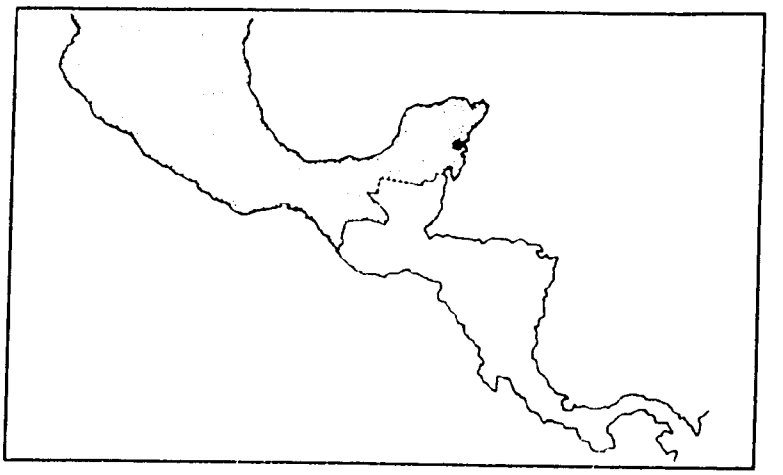
4. Survey of Perceptions toward Wildlife for Two Village Communities with Differe Expo ire to a Wildlife Conservation Project by D.M. Lewis

Checks should be made out to:

Conservation Wildlife Revolving Fund / ADMADE Publications


Judith Gradwohl and Russell Greenberg
Saving the Tropical Forests
Preface by Michael Robinson

The Sian Ka'an Biosphere Reserve: Conservation of Forest and Sea, Mexico



Biosphere reserves combine the protection of habitat with the preservation of traditional knowledge and the development of ecologically sound economic management. All of these activities are considered in planning a reserve, which is divided into zones reflecting its various uses. There are over two hundred biosphere reserves in various stages of planning and development throughout the world, but biosphere reserves in lowland tropical areas are scarce. The Sian Ka'an Reserve, decreed by the president of Mexico in 1986, is one of these few.

Sian Ka'an is located in the state of Quintana Roo on the southern, humid, coast of Mexico's Yucatan Peninsula. It encompasses 528,000 hectares, of which roughly one-third is covered by semi-deciduous to sub-evergreen tropical forests receiving 1200 to 1500 millimeters of rain a year. The rest of the reserve is covered by coastal swamps, savannas, lagoons and coral reef. The reserve will protect over 1,200 species of plants, 320 species of birds and many rare species of wildlife such as the jaguar, tapir, white-lipped peccary, jabiru, flamingo and ocellated turkey. Its 120,000 hectares of coastal lagoons and shallow bays form the greatest breeding grounds for the spiny lobster on the Caribbean coast of Mexico. Although not directly related to tropical forest conservation, the economic importance of the lobsters and the large coral reef (part of

the second longest barrier reef in the world) provided added incentive to establish the reserve.

This part of the Yucatan has been connected with the rest of Mexico by highway only since 1960, and is still sparsely settled. Tourist development, which is spreading rapidly down the coast of Quintana Roo, has yet to reach the reserve area. These factors, plus the fact that 99.8 percent of the land was government, rather than privately owned, made the decision about where to cite the reserve fairly obvious.

Nearly eight hundred people live inside the reserve. They participate in what is termed "low-scale rational use of the natural resources," including lobster fishing in conjunction with research on sustainable yields, and intensive agriculture. Farming is restricted to one area of the buffer zone, and families are permitted to cultivate only 4.5 hectares rather than the customary 120 hectares. A model farm has been established to teach local farmers to farm intensively. Other projects include small-scale attempts at butterfly farming, the development of a management plan for exploiting useful palms in the reserve and, in the future, small tourist facilities. Residents of the reserve are allowed to gather food and materials from the forest in the traditional Mayan manner for their own consumption, but this practice, like others, is restricted to zones where wildlife will not be harmed.

The reserve involves a close working relationship between government agencies and private groups. SEDUE (Secretaria de Desarrollo Urbano y Ecologia) and CIQRO (Centro de Investigaciones de Quintana Roo) conduct several major research projects in the area. Importantly, the reserve has made considerable effort to involve people in the area. A council of representatives, composed of fishermen, campesinos, coconut growers and "Amigos", meets every two to three months.

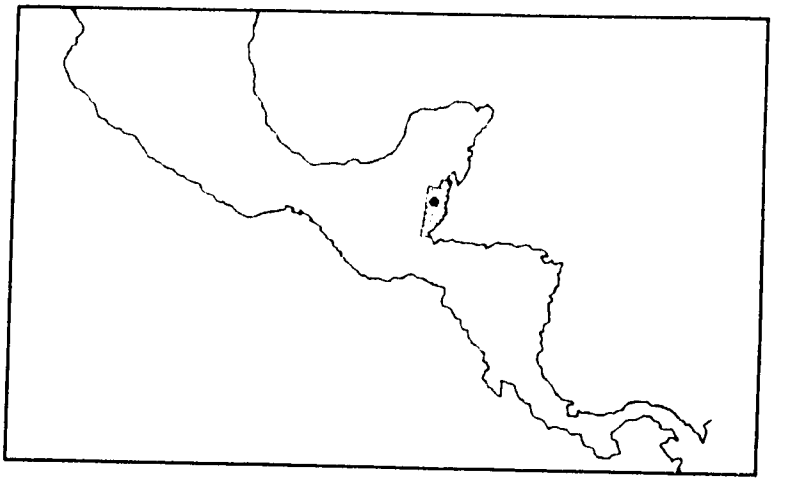
"Amigos" are members of the non-profit private support group known as Amigos de Sian Ka'an, founded in 1986 to complement the work of the government organizations. This is a crucial role: although the reserve was established by presidential decree and the management plan provides a legal basis for its operation; without strong local support any park project in Mexico is unlikely to succeed. Amigos' main objective is the development of practical conservation projects for the buffer zone, the enhancement of local public awareness, and the generation of local and international support. Ultimately, the Amigos would like to see the reserve

become economically self-sufficient. Much of the actual running of the reserve, such as protection and maintenance, will be handled by government organizations.

Sponsoring organizations: SEDUE, CIQRO and Amigos de Sian Ka'an. Funding has been provided by the Nature Conservancy and World Wildlife Fund-US.

SOURCE: Arturo Lopez-Ornat, Amigos de Sian Ka'an, A.C., P.O. Box 770, Cancun, Quintana Roo, Mexico, 77500.

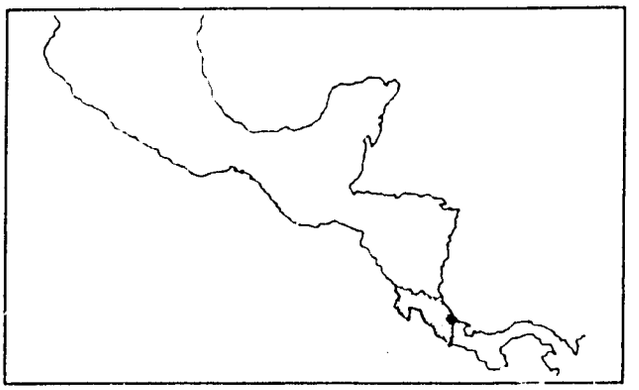
The Community Baboon Sanctuary: An Approach to the Conservation of Private Lands, Belize



The Community Baboon Sanctuary on the Belize River is a unique reserve created with the help of local farmers and landowners. Their cooperation is essential to the reserve's success, so a major thrust of its work is education. The project must demonstrate that it meets the needs of the landowners as well as those of wildlife.

The original purpose of the reserve was to protect the habitat of the black howler monkey (*Alouatta pigra*), also known locally as the baboon. Black howler monkeys are moderate in size (they weigh about nine kilograms) and live in the canopy of tropical forests in

Land Titling and Forest Protection around the Gandoca/Manzanillo Wildlife Refuge, Costa Rica



The basic premise of the ANAI land titling project around the Gandoca/Manzanillo Refuge in Costa Rica is that landlessness and deforestation go hand in hand: the greater the economic insecurity of the campesinos, the more they are forced to rely on, and therefore damage, the forests around them. The refuge protects forest and marine habitats, but to address the underlying causes of deforestation it has also founded community nurseries for economically important hardwoods and helped farmers living in the vicinity to acquire land tenure. Economic incentives will ultimately determine how local farmers use their land. Secure land tenure, however, will encourage them to employ more ecologically sound land-management practices such as leaving greater portions of their holdings in forest.

Like other tropical forest countries, Costa Rica grants campesinos "rights of possession" rather than title to their land. Possession is determined by "improvement," defined as any modification from the natural state. The most obvious and quickly profitable modification of forested land is clearing the trees. There is no clear incentive for long-term management of the land as long as there is a chance that the right of possession can be rescinded.

For land titling to be successful three obstacles must be overcome: expense, bureaucracy, and unwieldy paper work. The financially-strapped Costa Rican government is unable to cope with the near-universal need for assistance in land titling for campesinos. Although the titling program has the support of almost all local residents, some

opposition has been encountered from lumber interests, cattlemen, recent colonists, marijuana growers and leftist political groups.

ANAI, a locally-based conservation and development organization, has pursued mass titling of small farms by:

- Censusing the farmers in and around the Gandoca/Manzanillo refuge;
- Defining the boundaries of the area to be titled;
- Securing the cooperation of the government and private institutions;
- Meeting with and organizing local communities;
- Marking boundaries with small paths and flagging;
- Taking aerial photographs to help define property boundaries; and
- Preparing maps of each property to be used in the titling process. The Instituto de Desarrollo Agrario carries out the final process of awarding titles.

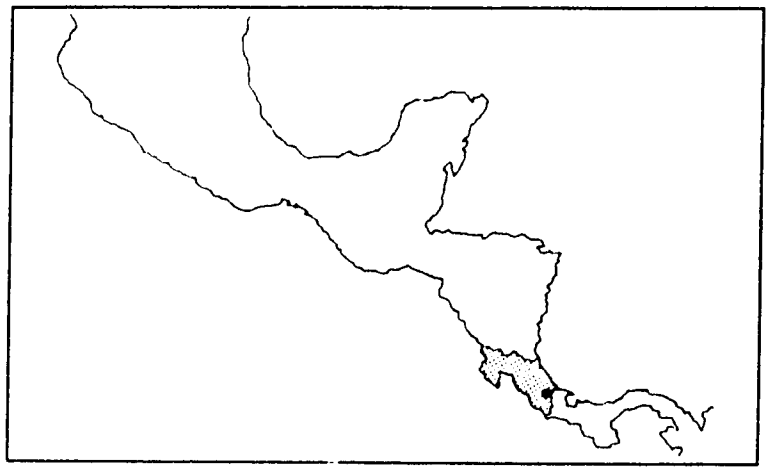
In addition to the land titling project ANAI has begun to identify ways that farmers can make a living without damaging the forest. A network of community nurseries will support reforestation and agroforestry programs on previously cleared land. As of 1986, twenty-five community nurseries had been set up, and 1,200 farmers had raised and planted 1.5 million perennial plants on their farms, including varieties of over a hundred species, most of which are trees. ANAI also runs a two hundred hectare farm which researches the varieties most suited to the region.

The centerpiece of the project is the Gandoca/Manzanillo National Wildlife Refuge, established in 1985. Two local wardens and an administrator have been trained and now oversee and patrol the refuge. A local refuge management committee has also been selected. Protection of the beach where sea turtles lay eggs has been a major victory. In addition trails have been cut, boundary markers set out, and a headquarters constructed. Mapping and biological inventories are under way. Refuge-based economic development projects include the development of low-key tourism and cultivation of iguanas.

Sponsoring organizations: ANAI, World Wildlife Fund-US and the Jessie Smith Noyes Foundation.

SOURCE: William McLarney, Anai, Apdo 902, Puerto Limon 7300, Costa Rica.

La Amistad Biosphere Reserve, Costa Rica



The La Amistad Biosphere Reserve project was created in the face of intense deforestation in Costa Rica and Panama. Forty to sixty thousand hectares are cleared each year in Costa Rica; little forest will be left outside of reserves by 1990. This project differs from other parks in Costa Rica, however, in its attempt to integrate traditional land-use patterns of indigenous people with strict forest protection—in other words, it follows the mandate of the biosphere reserve program. As part of an international effort, the Costa Rican park coordinates its efforts with a similar reserve in adjacent Bocas del Toro Province, Panama.

The reserve is actually a mosaic of over 500,000 hectares that include La Amistad International Park-Costa Rican sector, Chirripo National Park and Hitoy-Cerere Biological Reserve, all managed by the Costa Rican National Park Service (CRNPS). Also included are five Indian reserves: Las Tablas and Barbilla Forest Reserves (run by CRNPS and the General Forest Directorate), and the Las Cruces Botanical Gardens (run by the Organization for Tropical Studies). The reserves are contiguous and the botanical garden, located twenty-five kilometers from Las Tablas, provides classroom, dormitory and laboratory facilities.

The large size of the reserve and the wide range of forest habitats that it protects make it one of the most biologically diverse areas in Central America. With altitudes ranging from 100 to 3,819 meters and similarly extreme temperatures, the reserve contains eight out of

twelve recognized life zones and protects the largest tracts of high-altitude vegetation in Central America, including oak forests, bogs and paramos. It also has good populations of quetzales, giant anteater and tapirs and has top predators such as jaguars, pumas and (perhaps) the harpy eagle.

The region's hillsides are generally steep and soils poor, so the potential for intensive agricultural development is limited. Its hydroelectric potential, however, is great and may represent one of the major future Costa Rican sources of energy.

Although only limited archeological survey work has been carried out, it is known that the area was inhabitated for several millennia, first by hunter-gatherers and later, after 1500 BC, by agriculturalists. Recent research indicates that most of the reserve is included in the Gran Chiriqui archeological region, which extends from Costa Rica into western Panama. Prior to the arrival of the Spanish, Indians lived in the valleys.

Because of their isolation, the Talamanca tribes of the region were spared colonization, although expeditions and village raids took place. Even after the Costa Rican republic was formed in 1821, it took several decades before the Atlantic lowlands were firmly controlled by the central government. On the southern part of the Atlantic slope, colonization only began in the late nineteenth century, when the banana plantations were established to supply the US market. During this period an English-speaking black population settled along the Caribbean coast.

Only two of several original indigenous groups of people live in the reserve today. They live in nine communities located in five reserves on both sides of the Talamanca range. Their small numbers and shifting settlement patterns make precision difficult, but it is thought that eight to twelve thousand people live in these communities. Although their traditional way of life has changed with the introduction of new ideas and technology, and they now grow cash crops on the lower slopes of the valleys, the Indian communities have a strongly ecological approach to their environment; for them, forests are a vital resource. Parks and biological reserves are often best protected when they border on active, well-organized Indian communities.

The integrity of the reserve is threatened on several fronts. Familiarly enough for Latin America, agriculture is practiced without regard for the long-term consequences, particularly along the Pacific slope of the Talamanca Range. Forests are cleared and planted with

annual crops that quickly give way to relatively unproductive cattle pasture. Compaction and burning degrade the soil and create marginal and eroding wastelands. Commercial and sporting activity continues without management or control. In the reserve itself, small coal and oil deposits have been discovered—an obvious temptation for developers. Finally, the area is ideal for growing marijuana on small isolated plots. The actual damage from this type of agriculture may be minimal, but it tends to encourage other destructive activities.

Closing the reserve off from the outside world entirely, however, would be a waste. If managed correctly, reserve development projects could benefit all of Costa Rica. Drinking water and electricity, forest products produced from areas under natural forest management, and the demonstration of land rehabilitation using tree crops are three important possibilities. Scientific and recreational tourism is a fourth. Although no facilities now exist and the area is still quite remote, a few people already visit the area for wilderness experiences.

A strategy for the conservation and development of La Amistad has been completed by a team from the Center for Tropical Agricultural Research and Training (CATIE), the National Park Service of Costa Rica, representatives of other governmental institutions and the Spanish Governmental Technical Mission (ICI). The major management problem facing the reserve is the colonization of the Pacific side. If settlers there can document their occupation of a site for ten or more years, all "improvements" must be reimbursed before they can be moved. If relocation is forceable, damages and relocation costs must also be paid. Because of these costs planners are currently determining lands that the reserve cannot afford to incorporate if it is to save ecologically and culturally important areas in a cost-effective way.

Sponsoring organizations: Center for Tropical Agricultural Research and Training (CATIE), National Park Service of Costa Rica, National Park Foundation, General Forestry Directorate and the Organization for Tropical Studies.

SOURCE: Hernan Torres, Luis Hurtado de Mendoza, and Donald Masterson of the Wildlands Program, CATIE, Tropical Agricultural Research and Training Center, Turrialba, Costa Rica.

Kuna members of the Panamanian National Defense Forces patrol the access road; Kuna technicians are instrumental in planning and administering the reserve; and various Kuna organizations, particularly the Kuna Employees Association, work to gain financial, legal and political support from outside the Kuna community. Their accomplishments so far include the construction of the Nusagandi headquarters with a laboratory for scientific field work, small-scale tourist facilities (a restaurant and dormitory building) and boundary-line patrol trails to keep colonists from overflowing into the reserve.

The Kuna have enlisted expert help from a number of outside organizations, including the Tropical Agricultural Research and Training Center (CATIE), Smithsonian Tropical Research Institute (STRI), World Wildlife Fund-US, the Inter-American Foundation, USAID and various ministries of the Panamanian government. Technical advice on topics from agroforestry to construction has been provided through seminars, workshops and courses. CATIE and STRI have contributed toward a biological and resource inventory of the Comarca.

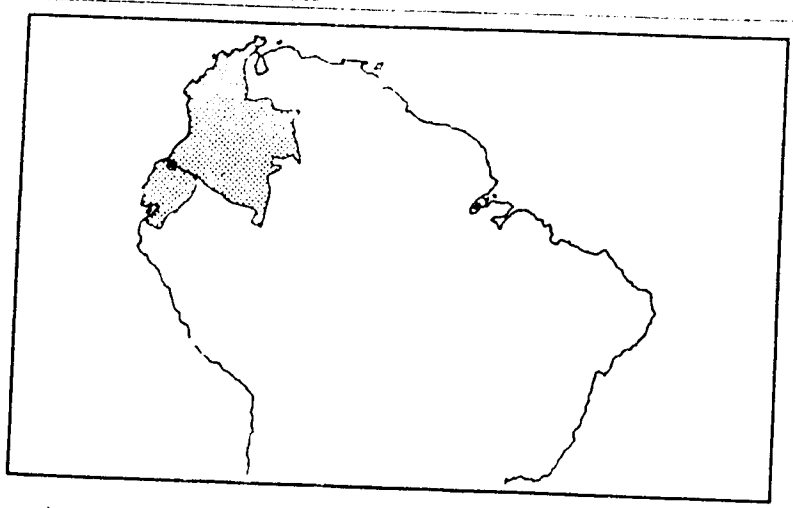
The success of the Kuna's efforts has already made it a model for other indigenous groups in the Americas. The Embera, who live in the adjacent Darien region of Panama, have begun consulting with the Kuna to develop a similar plan for their lands.

Sponsoring organizations: CATIE, World Wildlife Fund-US, USAID, the Inter-American Foundation and the MacArthur Foundation.

SOURCE: Temistocles Arias, AEK/PEMASKY, Apto. 21012, Paraiso, Panama; and Brian Houseal, The Nature Conservancy International, 1785 Massachusetts Ave. NW, Washington, DC 20036.

A Bi-National Approach to the Protection of Indian Lands, Colombia and Ecuador

Protection of the diverse indigenous cultures of the New World tropics is tantamount to conservation of the forest and river resource on which the people depend. Unlike the Kuna, most Indian groups in South America do not have a long history of political interaction with central grovernments, and so they are less able to organize



against the myriad threats of incursion onto their lands. The purpose of this project is to establish an area of the Pacific lowlands along the border between Ecuador and Colombia in Carchi and Esmeraldas provinces. This area has escaped some of the problems of rapid development plaguing other areas of Andean forests. The forest is exceedingly wet and not attractive for guerrillas or drug growers. In the late 1970s, however, rumors of a World Bank-financed road brought an increasing number of colonists from Colombia. The establishment of the reserve required a great deal of basic work in organizing and establishing the land rights of the Awa Indians.

The nucleus of the Awa demarcation project was the creation of the La Planada reserve in 1982. Covering 1,700 hectares of forest, it has helped form a nucleus for a regional resource management plan to preserve natural resources for the local Indian and Hispanic residents.

The Awa project, begun in 1984, is aimed at securing Indian land rights in the lands surrounding the La Planada reserve. Toward that end the project is registering Indian residents and delineating Indian lands in both countries. In conjunction with the national governments and private institutions, forest resources have been inventoried and a program for their effective use established.

Work has progressed the farthest in the Carchi Province of Ecuador where by 1986 about a thousand Awa had been registered. Residents are receiving training in resource management and organization and biologists from the University of Aarhus, Denmark, and the Catholic University, Quito, have completed their

resource inventory. The entire project will eventually cover roughly 104,000 hectares. Research to assess the impact of the project has been contracted to the National Institute for Peasant Capacitation by the Ecuadorian Ministry of Agriculture and Livestock. Support for the efforts to demarcate and title lands to the Awa and to promote effective indigenous organization has come from Cultural Survival and the Ecuadorian government. The work was recently extended to the forests of Esmeraldas province of nearby Colombia where another thousand Awa reside.

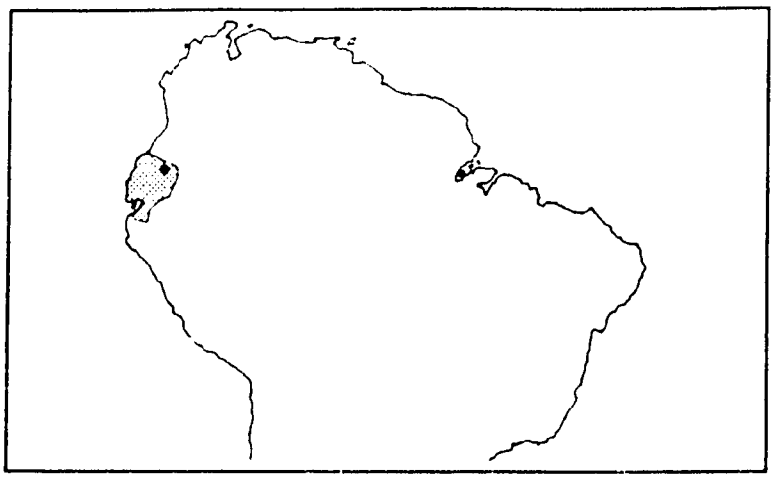
Considerable effort has been put into training programs, particularly for developing the political and organizational skills of the Awa so that they can better deal with external agencies. Because the Awa have been isolated until relatively recently, they have little experience with central governments. The Awa themselves have lived in scattered villages with relatively little overall organization, but through grass-roots organizing even the most isolated villages have been linked through the formation of regional incorporated organizations, known as Cabildos. The local groups are then integrated into a National Coalition (CONACNIE), which has attempted to promote indigenous claims while developing sustainable land use by mestizo farmers around the La Planada reserve. Finally, it has achieved bi-national cooperation of the central governments. In 1986, the joint commission on Ecuadorian-Colombian Amazonian Cooperation officially endorsed the Awa reserve project.

Sponsoring organizations: Cultural Survival supported indigenous land claims; Foundation for Higher Education and World Wildlife Fund-US funded La Planada.

SOURCE: Richard Reed, Cultural Survival, Cambridge, Massachusetts 02138.

The Cuyabeno Wildlife Production Reserve, Ecuador

The Cuyabeno Reserve is a model modern tropical reserve. Located in an area extraordinarily rich both biologically and culturally, it stands at the frontier of Amazonian development. The reserve plan incorporates strict protection of forest and streamside habitats, preservation of a Siona-Secoya Indian reserve, and tourism and wildlife



management programs. Such is its success that the Ecuadorian Department of National Parks and Wildlife ranked its master plan first among those of the nation's reserves, and has held it up as an example for other reserves to follow.

Legally created in 1979, the reserve covers 254,760 hectares of *terra firme* and *varzea* (flood plain) forests in the extreme northeastern portion of the Amazon Basin, roughly two hundred kilometers from Quito. Its selection as a reserve site after a long survey of important natural areas between 1974 and 1979 is not surprising: the land, drained by tributaries of the Amazon, is dotted with oxbow lakes and contains an unusually diverse collection of plant and animal species.

The reserve's purposes are four-fold: the protection of native vegetation and wildlife; the protection of indigenous human communities; the management of wildlife projects; and the development of tourist and education facilities.

PROTECTION OF NATIVE VEGETATION WILDLIFE

Because no one knows exactly what plants and animals live in the reserve, their protection is somewhat simplified. Particular species can be protected by targeted environmental management. But in a situation such as this, where an initial inventory will almost certainly discover new species, protection of almost all species depends upon the maintenance of large tracts of pristine habitat. Most of the

habitat in the reserve is relatively undisturbed; a major exception is the westernmost sector, where colonists have settled along oil exploration roads. Land in this area will be ceded to IERAC (Institute for Colonization and Agrarian Reform) which will provide land titles to settled families, and in exchange a larger area of forest land will be added to the reserve. An additional hundred or so families that have settled in the core of the reserve will be provided land titles outside the reserve, and no further land titles in the reserve will be granted.

PROTECTION OF INDIGENOUS COMMUNITIES

One of the goals of the reserve is to help minimize the impact of development on the indigenous Siona Indians who live on the reserve and on the Sionas and Secoyas who live just beyond its southern edge. These peoples get their food by traditional means—fishing, hunting and cultivation. While they can hunt and fish freely, they are encouraged not to kill rare animals. Just before the founding of the reserve, 410 Sionas received legal title to their land. This fact, plus the existence of the biological reserve, may act as a buffer to the direct effects of encroaching colonization. From a scientific viewpoint, the Siona's knowledge of their environment will contribute to an understanding of the potential uses of tropical forest plants and animals.

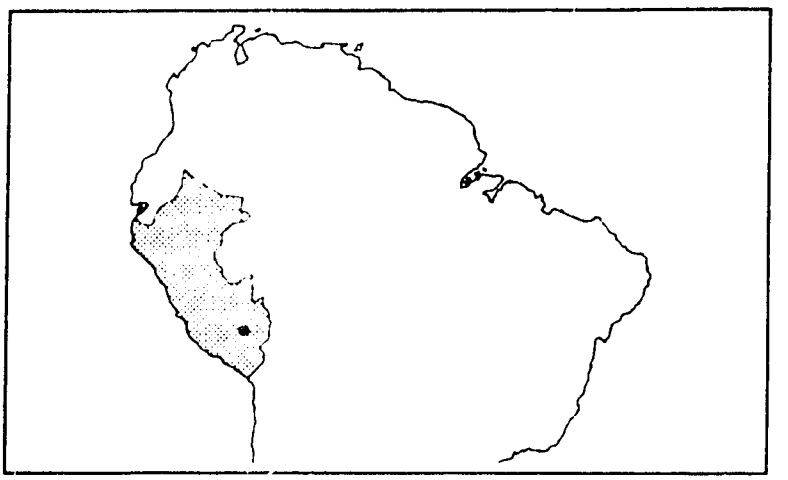
WILDLIFE MANAGEMENT PROGRAMS AND TOURISM

Two further efforts are being made to promote appropriate development and to provide income to local villages. The first is the establishment of wildlife management programs that, through the rearing of native species such as the peccary and paca, will provide economic benefits to peasant communities. The second is tourism. Presently, the reserve boasts only the most rustic of facilities; adventurous travellers can be guided by Siona Indians on a canoe trip. Now, additional tourist facilities are being developed by the reserve administration in coordination with local communities and Quito-based nature tour companies.

Cooperating organizations: World Wildlife Fund-US and the Department of National Parks and Wildlife of the Republic of Ecuador.

SOURCE: James Nations, Center for Human Ecology, 2106 Rundell Place, P.O. Box 5210, Austin, Texas 78763, and Flavio Coello Hinojosa, Director, Reserva Faunistica Cuyabeno, Dept. de Parques Nacionales y Vida Silvestre, Direccion Nacional Forestal, Ministerio de Agricultura y Ganaderia, Quito, Ecuador.

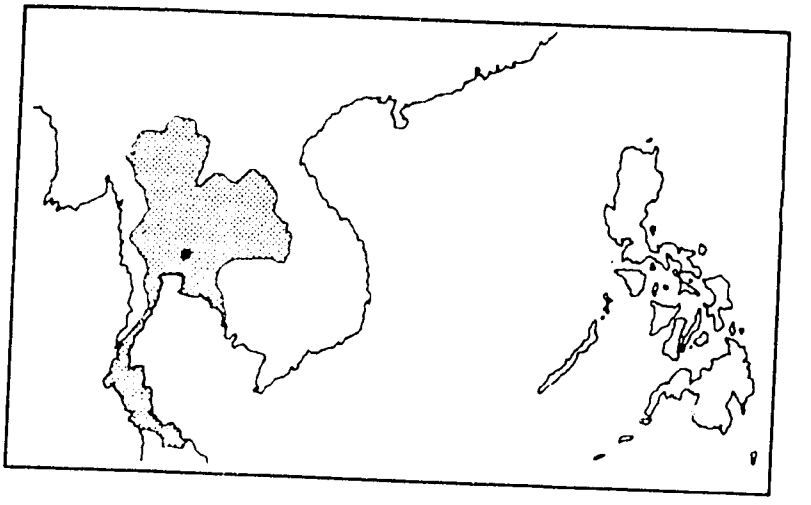
Manu Biosphere Reserve, Peru



Despite the intensity of tropical deforestation, there remain large areas of relatively pristine wilderness. These scarce undisturbed ecosystems, protected primarily by their remote and inaccessible locations, are now under threat by ever-extending roads and their logical consequence, colonists. To preserve naturally functioning tropical forest communities requires the establishment of carefully guarded mega-reserves. One attempt to establish such a large strict nature reserve in the face of encroachments can be found in the Manu Biosphere Reserve located in the Amazon Basin near Cuzco, Peru.

The Manu Biosphere Reserve is the largest national park in the world; the strict reserve alone covers over 1.5 million hectares, while an additional 300,000 hectares provide a zone of sustainable develop-

Protection and Development in and about Khao Yai Park, Thailand



It has become increasingly apparent that national parks cannot be protected without addressing the needs of the people who live in the surrounding lands. This realization has spawned two projects dealing with Khao Yai National Park in Thailand, one concerned mostly with park management, the other emphasizing community development.

The first project, which is ultimately aimed at both elephant and forest conservation, was an ambitious drive to create an effective conservation program in and around the reserve. Supported by World Wildlife Fund/IUCN through the Royal Thai Forest Department, the project started with three major goals: to produce a management plan for the Khao Yai Park, which would be the first such plan for a protected area in Thailand, serving as a model for such plans in other parks and sanctuaries; to carry out research on the distribution, habitat use and number of elephants in different parts of the park; and, finally, to initiate a rural development program in the nearby village of Ban Sap Tai which would reduce local villagers' dependence on the park and their consequent incursions to cut trees, plant maize and poach plants and animals.

The Khao Yai management plan, the first of its kind in Southeast Asia, was developed by a team from the National Parks Division of the Royal Forest Department and other government agencies. Because of its emphasis on providing benefits to local villagers, the

plan sets a precedent in Thai policy on national parks. Its country-wide management planning mechanism, incorporated in the Thailand National Economic and Social Development Plan, calls for the preparation of twenty-three plans for national parks and wildlife sanctuaries.

Wild elephants figure prominently in the Khao Yai plan for a variety of reasons. The elephants themselves attract sight-seers, and, for more active tourists, they provide an important service: once

Wild Asian elephants are protected in Khao Yai Park in Thailand. Elephant trails are also used by tourists.

mapped, the trails they create become trekking routes. A growing group of international hikers now provide a small but significant source of revenue for local villagers, some of whom act as guides.

The second project, "Rural Development for Conservation," was begun in Ban Sap Tai in 1985. Villagers are offered agricultural assistance to help them diversify their farming, some health care and other social services, help in marketing and education in conservation techniques. The project also promotes limited tourism. The Population and Community Development Association and the Wildlife Fund-Thailand run the project; Deutsche Welthungerhilfe ("Agro Action") provides the funding. Agricultural assistance will be continued in Ban Sap Tai and is now, with the help of USAID, being extended to several neighboring villages.

Credit, education and collective business ventures are the three project priorities in improving economic conditions in the villages. Local moneylenders were charging annual interest rates of over fifty percent, and farmers found themselves trapped in a seemingly endless debt spiral. In response to this problem, a community-based credit cooperative, the Environmental Protection Society (EPS), was established. Membership was extended to all villagers who possessed land titles and who promised not to break the national park regulations; in return, families could get loans at a more reasonable twelve percent. In addition to supporting promising agricultural activities, EPS also acts as an extension service and provides a family-planning service.

EPS activities in the villages have reduced hunting in the park, eliminated encroachment and encouraged the peaceful withdrawal of several families who had built homes in the park. A small private company is developing tourist facilities. Nonetheless, the work in and around Khao Yai Park is still considered a demonstration project; its rural development efforts must continue to ensure environmental success.

Sponsoring organizations: First project: World Wildlife Fund and IUCN. Second project: Deutsche Welthungerhilfe, Wildlife Fund-Thailand and the Population and Community Development Association, Thailand.

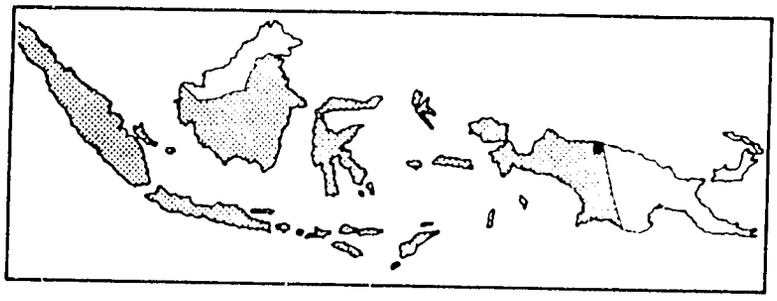
SOURCE: Warren Brockelman, Center for Wildlife Research, Faculty of Science, Mahidol University, Rama 6 Road, Bangkok 10400, Thailand; Robert J. Dobias, 124/50 Lad Prao, Soi 109,

and fauna have been studied by scientists working under the auspices of "Operation Wallace," the largest biological expedition ever, organized by the Royal Entomological Society; hundreds of hitherto unknown species have been discovered. Although the reserve primarily protects highland areas in the catchment, certain key lowland habitats, harboring a diversity of species, have been included as well.

Sponsoring organizations: Funding is provided by loans from the World Bank and the Indonesian government; park planning has been conducted by World Wildlife Fund and the Indonesian Department of Nature Conservation.

SOURCE: Robert Goodland, World Bank, 1818 H Street NW, Washington, DC 20433.

A Community-Managed Buffer Zone for a Nature Reserve, Indonesia



One of the problems facing Third World governments is the difficulty of regulating land use. The areas of public forest are huge, the infrastructure to patrol and protect them is weak, and the pressures to colonize and develop are tremendous. Without strong local political support for forest management, government control over public land is virtually impossible. This is true not least in Indonesia, where the Indonesian Ministry of Forestry is responsible for 143 million hectares of land, roughly three-quarters of the entire country. In 1986 alone, as many as one million hectares of forest were cleared. To address these problems the Indonesians have established a social

forestry program based on ecologically sound forest management developed at the community level.

The Mt Cyclops Reserve, located in New Guinea (Irian Jaya), is one of twenty-four pilot programs in social forestry and one of the first attempts to create a community-managed buffer zone. The pilot program has been the result of a collaborative effort between the Ministry of Forestry, the provincial government of Irian Jaya, World Wildlife Fund-US, and the Ford Foundation.

The 31,600 hectare reserve protects montane tropical rainforest and the watershed for a major reservoir and hydroelectric power plant. However, the reserve has suffered encroachment from both indigenous and migrant farmers, as well as loggers, hunters and developers. Tribal groups have been increasingly pressured to sell their land rights to local or outside developers for large-scale logging and farm projects. The focus of the project, at least initially, is to stabilize land claims and to establish acceptable patterns of land use.

The project began with a meeting of a working group consisting of members of the provincial planning board, the Department of Forestry, the local university, and the Irian Jaya Development Foundation (YPMD), which is the most important non-governmental organization in the province. The group determined that the highest priority for the Mt Cyclops Reserve was the resolution of land claims between the various tribal groups and the establishment of firm boundaries for the reserve. In addition, it was decided that an effort should be made to set up a new process for developing acceptable land use practices by the local communities and governments.

The first step was the selection of a ten-person team comprising park rangers and NGO field staff. For four weeks they were trained in government land use methods, indigenous legal systems, land and agroforestry management practices and field techniques such as mapping and interviewing. The team members, assisted by staff of the YMPD, the forestry department and WWF, were then sent into areas where they were familiar with local customs and languages to discuss land use needs with tribal leaders and clan members.

One such discussion took place in the village of Ormu Besar, located on a small bay at the foot of the Mt Cyclops massif. The village is inhabitated by several hundred people who use the surrounding lands for gardening, hunting and gathering, and fishing. Although there had been preliminary discussions between the park staff and the villagers, no formal agreements regarding boundaries had been reached.

At the first meetings, village leaders expressed their concern that the needs of the local people would not be met by a buffer-zone agreement. Further discussions focused on land use needs. Using sketch maps and aerial photographs, the field team helped the community to assess its current use of the land. The community decided that it wanted to maintain a strip of coastal land up to 300 meters in elevation for traditional mixed gardening and groves of the sago palm, a staple food. This proposal was agreed by the forestry team, and an additional zone of low-intensity use up to 500 meters in elevation was established where villagers could cut specific trees, hunt boar, collect fuelwood and quarry stones for ritual exchange. Also under discussion were plans for expansion, the more intensive use of cultivated land and a small visitor facility at the head of one of the wilderness trails. While other tribes were selling their land to outsiders, the Ormu people had come to a clear agreement with the government regarding their tenure status and in the process had helped establish a key environmental buffer zone.

Sometimes it is the small touches that enhance the success of a project. In this case, the field teams believe that the use of oblique aerial photographs on a scale of 1 to 8,000 was an inexpensive and effective way of stimulating discussions concerning land use needs. Photographs can be made from a light aircraft with a standard single-lens reflex camera and be processed in a basic darkroom. Then agreed upon boundaries can be placed on a formal map and incorporated into a contractual agreement. Another innovation was suggested by the Ormu leadership, who suggested that the project use the traditional marker for boundaries a shrub, *Coryline terminalis* with its bright foliage, as well as natural topgraphic features.

The current land-use agreements will run for an initial twenty-five years; if the goal of establishing agreements with four tribes is achieved, most of the area around the reserve will be under the management of these locally-based buffer-zone plans.

Sponsoring organizations: Irian Jaya Provincial Planning Board, Provincial Department of Forestry, Irian Jaya Development Foundation, World Wildlife Fund-US, the Ford Foundation and the East-West Center.

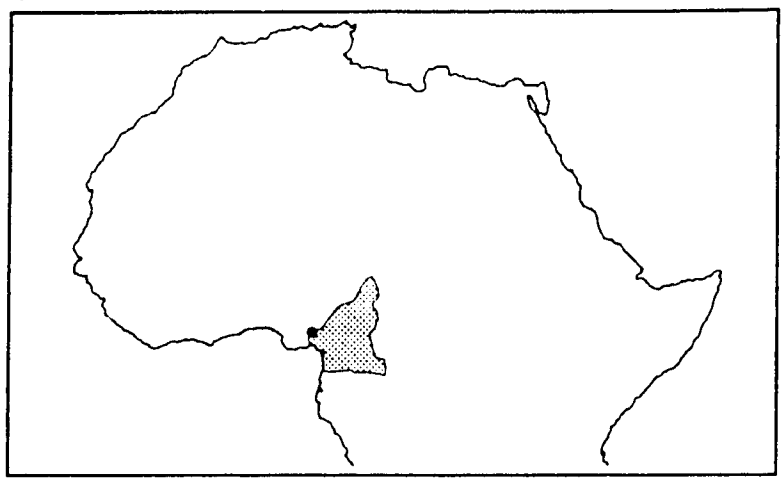
SOURCE: Mark Poffenberger, Ford Foundation, Southeast Asia Regional Office Jl. Teman Kebon Sirih 1/4, Jakarta, Indonesia.

provide sustained funding to firmly establish the project, and it will need to survive a difficult period when the AID-sponsored experts leave.

Sponsoring organizations: USAID and the Tropical Science Center.

SOURCE: Gary Hartshorn, Roberto Simeone and Joseph Tosi, Jr, Tropical Science Center, Apartado 8-3870, San Jose, Costa Rica.

The Conservation of Oku Mountain Forests for Wildlife, Watershed, Medicinal Plants and Honey, Cameroon



Without the montane tropical forests on the slopes of Cameroon's Mount Oku, local villagers would have no livelihood. They harvest the medicinal bark of the *Pygaeum* tree to sell to drug companies, and earn cash by keeping bees that produce honey from the nectar of forest flowers. Other people, too, are dependent upon the forest. In the lowlands, agriculture is based on the water that flows from the watershed protected by the forest. These peoples' livings, and their sustainable use of the forest, are being threatened by the encroachment of slash-and-burn agriculturalists, who bring with them goats and sheep that overgraze cleared land, invade the forests and increase the chance of wildfires. Although the area has been cleared

over the past twenty years, recent road improvements in the area have exacerbated the situation; the destruction of the remaining 7,000 hectares of forest is imminent.

The Mt Oku forest is particularly important because the Cameroon highlands are populated by animals unique to the area, including two species of birds. In the past few years, a two-pronged effort has been devised to reduce the threats to the remaining forest. First, efforts have been made to classify the forest as a protected area, so preventing major disturbance while allowing sustainable collection of forest products. Secondly, local industries that rely upon forest-based products are being encouraged and improved.

The honey industry is growing, with the membership of a local honey/handicraft cooperative almost tripling in the past few years. The sale of honey provides cash for a third of local villagers, although their processing and marketing needs improving. Reliable marketing is also a problem with the stools, drums, masks and other wood carvings that the village men sell through the cooperative.

The major extractive industry associated with the Oku forest is the harvesting of the bark of *Pygaeum africanum*. Used to produce a drug that helps control urinary problems associated with enlarged prostate glands, the bark is processed and marketed commercially by international pharmaceutical companies. Bark collectors are issued permits by the Forestry Department, which controls where they can operate and limits how much bark they can harvest. Theoretically, *Pygaeum* bark can be harvested sustainably in the following fashion: the trunk is divided into four longitudinal sections and two opposite quadrants are stripped of bark. The trees with their two remaining sections of bark intact are left to rest for four years before the next harvest. Under the old practices, however, trees were overexploited and killed, and the harvesting of bark is now halted until new trees are established.

The *Pygaeum* replacement project began by engaging the support of the people of the village of Oku. The proposed project was discussed extensively with the traditional village council. One approach to the problem is to promote local forest-related industries. Local villagers are also interested in the prospect of developing agroforestry on the degraded lands, using native species. Seven thousand *Pygaeum* seedlings, grown in nurseries, are ready for planting at forest borders and on burned and cleared lands. This replanting, combined with stricter regulation of harvest techniques, could allow the lifting of the moratorium on bark extraction and the

development of a viable extractive industry. Other plans are being developed to strengthen the Oku honey cooperative. An extension service on apiculture, forestry, agriculture and grazing lands is also planned.

Sponsoring organizations: International Council for Bird Preservation, Missouri Botanical Garden, World Wildlife Fund, USAID and the Ministry of Agriculture, Cameroon.

SOURCE: Michael Rands, International Council for Bird Preservation, 219c Huntingdon Road, Cambridge CB3 0DL, UK, and Duncan Thomas, Missouri Botanical Garden, P.O. Box 299, St Louis, Missouri 63166-0299.

WILDLANDS & HUMAN NEEDS PROGRAM
PLUS SIAN KA'AN & ZAMBIA

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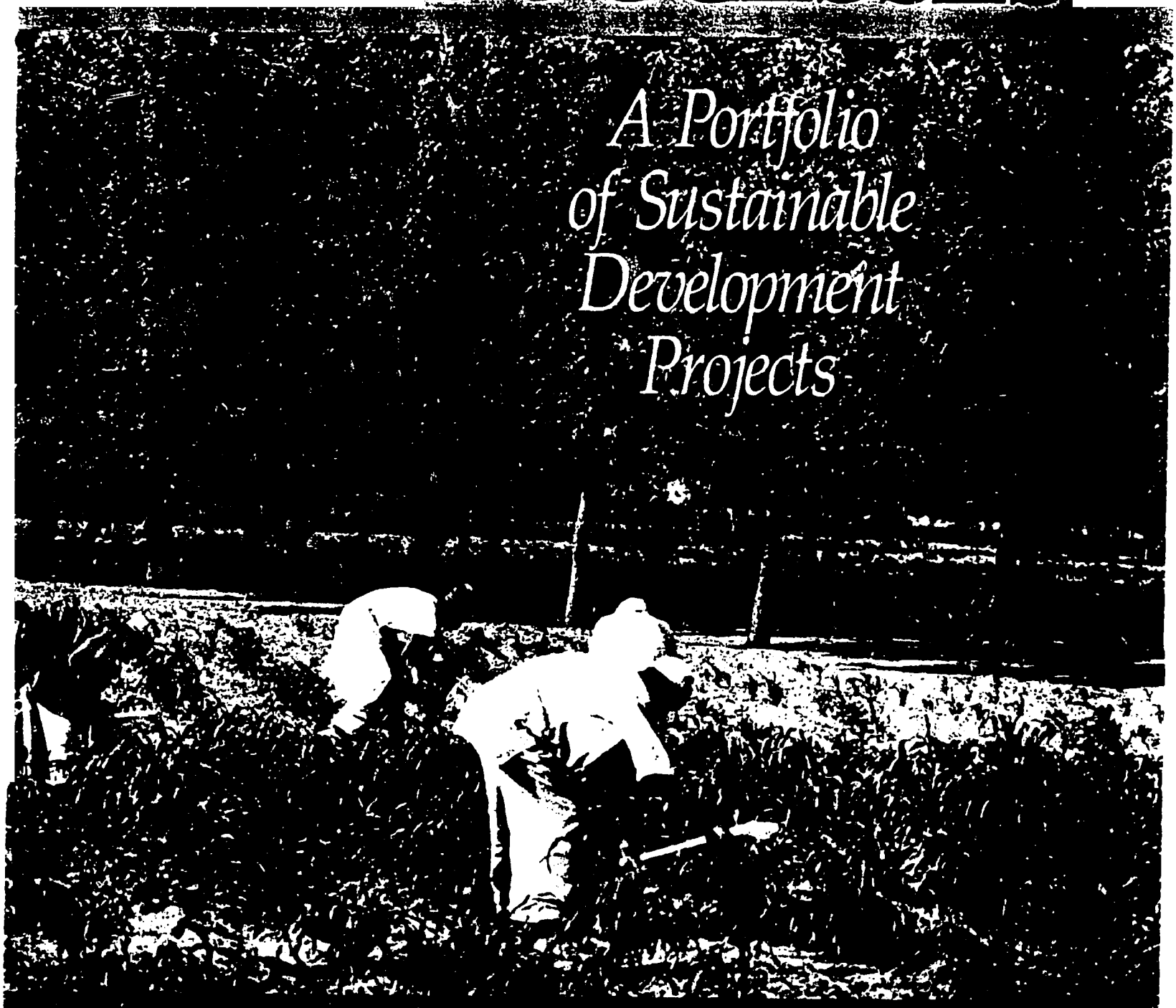
BANKROLLING SUCCESSES

A Portfolio of Sustainable Development Projects



Walter [illegible] Reid
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NATIONAL WILDLIFE FEDERATION

Bankrolling Successes: A Portfolio of Sustainable Development Projects

by

Walter V. Reid,
James N. Barnes, and
Brent Blackwelder

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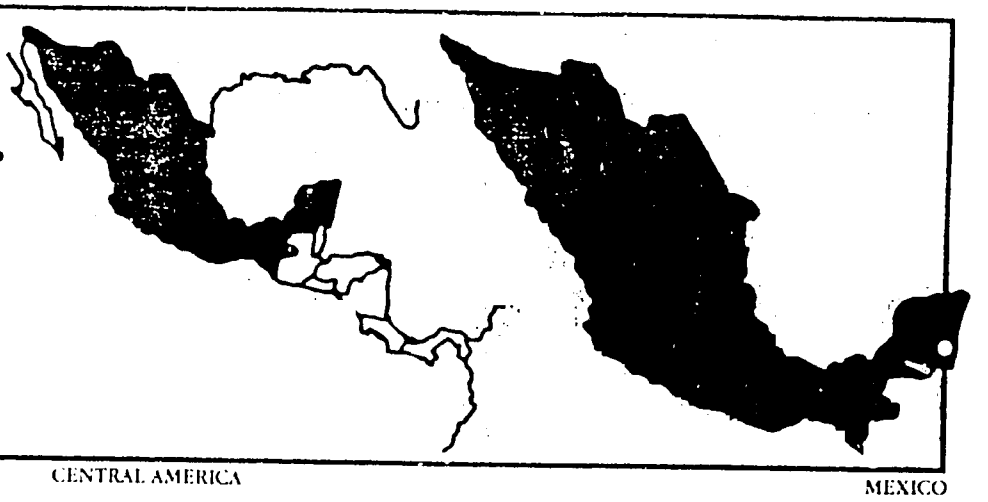
BOX 6

Sian Ka'an Biosphere Reserve



The Sian Ka'an biosphere reserve was established in 1986 on the Yucatan Peninsula of Mexico. The reserve contains:

- 528,000 hectares of tropical moist forests, marshes, mangrove swamps, and freshwater and marine ecosystems;
- 1,200 species of vascular plants;
- 320 species of birds and 7 species of endangered vertebrates; and,
- approximately 800 people who earn a good income from lobster fishing.

In 1979, as a result of the decentralization of Mexico's research institutions, the Centro de Investigaciones de Quintana Roo (CIQRO) was established in the state of Quintana Roo. Scientists at CIQRO saw the potential benefits of a biosphere reserve for conservation and as a center for CIQRO's research program. With support from the state and federal governments, Sian Ka'an was eventually chosen after several sites were considered.

From the outset CIQRO scientists worked closely with local residents to involve them in the planning process. A council of representatives, composed of local residents, scientists, and public officials, was created to provide a forum for discussion of planning alternatives and to give reserve inhabitants a channel for direct involvement with reserve management. The Secretariat for Urban Development and Ecology (SEDUE) is responsible for reserve management. SEDUE designates a board composed of federal, state, and municipal officials that receives management recommendations from this council of representatives.

The benefits of the constant dialog with the local people are already evident. People initially expressed a desire to be granted rights to large pieces of land (200 to 300 acres), which under Mexico's "ejido" system of land tenure would give them permission to use the land, although not ownership. The relatively low fertility of the soil and the fact that the residents of Sian Ka'an were not agriculturalists meant the land would probably have been used for cattle ranching. The council of representatives discussed the costs and benefits, and eventually opted to use smaller tracts for intensive agriculture.

Nearly 95 percent of the CIQRO research budget now goes to some 20 research projects conducted within the reserve. A private non-profit organization, Amigos de Sian Ka'an, has also begun research on residents' resource-use problems. Amigos de Sian Ka'an receives funding from the World Wildlife Fund's Wildlands and Human Needs Program and from The Nature Conservancy, while CIQRO is financed primarily through the state and federal government of Mexico.

One major research focus has been on methods of sustaining and increasing the productivity of the lobster

Paul Epler/AWF

Lobster shelter

H. Norberg-Hodge

Solar water heating system

goals they desired. The project has tried to provide information on both the negative and positive impacts of "development" in order to balance the almost exclusively positive images Ladakhis are exposed to through the media and tourism. It spawned the indigenous Ladakh Ecological Development Group (LEDeG), and in 1984 a Centre for Ecological Development was inaugurated by Indira Gandhi to provide a central coordinating site for the largely community-based activities. The Centre has served as an outreach site not only to Ladakh but to much of the remainder of India as it has become something of a tourist attraction. The building is solar-heated, electricity is provided by wind generation, and solar cookers, dryers, and a greenhouse are located nearby.

The Ladakh Project organizes meetings and seminars for Ladakhis to discuss development options. At village meetings special attention is given to problems of sustainable agriculture. The project has initiated campaigns to promote public health, and has encouraged visits by school groups to the Centre for Ecological Development. It has produced a syllabus on ecology for schools and a course for 10- to 12-year-olds.

The project also promotes appropriate energy technologies. Trombe walls, which efficiently capture solar energy for space heating, have been installed in 70 houses, and the project receives more requests for technical assistance for installation of Trombe walls, or variations adapted to specific needs, than it can handle. The Trombe wall costs an additional $200 per room, but savings in heating costs can repay this investment in two to three years. Passive hot water heaters that cost $30 to $90 are being built, 20 greenhouses have gone up, and more than 100 solar cookstoves have been sold at subsidized prices. The project has developed a water-powered grinding mill and a water-powered water pump to provide household and irrigation water on property above the height of stream channels. At the invitation of the Kingdom of Bhutan, the project is now helping people there build wind and water pumps and solar water heating systems.

The Ladakh Project is not really a grassroots initiative. It is the result of far-sighted work of individuals who recognized that "development" would not meet the needs of Ladakhis unless people were well versed on its options, pitfalls, and benefits and, perhaps most significantly, unless they had sufficient information to allow the costs and benefits of their current land-use practices and culture to be compared with the alternatives. The introduction of appropriate technologies has been subsidized by the project and by the Indian government, and thus they may not spread spontaneously. But the goal of the project is not to sell appropriate technology. Rather, it is to establish a process for rational development. And it is clearly achieving that goal.

SOURCES: Ladakh Project, 1988; Norberg-Hodge, H., The Ladakh Project, Nepal, personal communication, January 1988.

One of the most innovative approaches to sustainable increases in resource productivity is provided by the WWF Wildlands and Human Needs Program (Box 13). Recognizing that conservation goals could only be met by addressing human needs, the WWF established 13 pilot projects in regions with critical environmental concerns, to foster sustainable development that is compatible with environmental conservation.

Low-cost, sustainable agriculture solutions sometimes involve the introduction of technologies, like terracing, that are novel to a region. Yet farmers in the area are often the best resource for sustainable techniques suited to the local conditions. Agroforestry, for example, is not a "new" technology; it is often a traditional practice that farmers have abandoned because of inappropriate systems of forest or land tenure. Indeed, local knowledge may provide low-cost solutions that standard agricultural research would never discover. For example, it is commonly noted that shifting cultivation in tropical forests is a response to rapid soil nutrient depletion that causes farmers to abandon fields after only two to three years. One obvious response to this situation would be to fertilize the soil, a capital-intensive prospect unsuited to the rural poor. In the southern part of the state of Para in Brazil, the Kayapo people are practicing traditional methods of soil enrichment and cropping that allow them to use cleared plots for 11 years, with as little as a five-year fallow period.[1] In Japan, agricultural produc-

tivity was rapidly increased, with little outside help, simply by examining the source of variation in yields between farmers and disseminating the best technologies to other producers.[52] Thus in regions unsuited to the transfer of western high-technology agriculture, development agencies must foster a "local knowledge" revolution in lieu of the green revolution.

Similarly, indigenous organisms often have the highest potential for productivity when the environment cannot be modified to meet the needs of introduced species. Development projects designed to enhance livestock productivity in Africa have been notably unsuccessful, for example. It has been extremely difficult to develop range management techniques and livestock breeds that can cope with the climatic vagaries and disease problems of the arid African rangeland. But native species, adapted to local environmental conditions, can use the rangeland more efficiently, yielding greater meat harvests with far less damage to the range. Game ranching (for meat, and in some cases for safari hunting) is now widespread in southern Africa. Some 8,200 landowners in South Africa use it to earn between $28.6 million and $33.6 million.[53]

Although game ranching on large private estates can significantly lessen erosion and the potential for desertification, it has little direct impact on the people most in need of the benefits of development. MDBs and aid agencies must give greater attention to providing the rural poor the benefits of wild species on their communal lands. The Lupande Development Project, part of the WWF Wildlands and Human Needs Program, is attempting this in Zambia. In the Lupande Game Management Area of the Luangwa Valley, revenue generated by wildlife through safari fees and the sale of meat and hides goes into a Wildlife Conservation Revolving Fund. The money supports both the costs of wildlife management and local community development. In addition, the safari companies and the National Parks and Wildlife Service must employ and train workers from local villages, and wildlife management decisions are reached in collaboration with village leaders. The initial results of this pilot effort are promising. Village employees have proved to be more efficient than civil servants in preventing wildlife poaching, and the program has paid for itself through the revolving fund. Moreover, the attitude of the local residents toward the National Parks and Wildlife Service and conservation itself has changed from antagonism to support.[54]

In Zimbabwe, the Communal Areas Management Programme for Indigenous Resources (known as CAMPFIRE) plans to adopt a similar approach by fostering the development of Natural Resource Cooperatives in villages. The cooperatives are to be responsible for the management of communal areas and the development of land-use plans. Income from the lease of safari hunting rights, grazing rights, tanneries, and timber operations will be handled by the cooperative (with revenue sharing provisions for adjacent state lands) and proceeds will go to a soft-loan window for villagers, community investments, and shareholder dividends.[55]

The potential benefits of low-cost, high-gain improvements in productivity must not be underestimated, but the most difficult problems in the quest for ecological sustainability of production will be encountered as productivity is extended beyond current limits. Time will eventually winnow out technologies that are sustainable from those that are not; it is imperative that the effort be made at the outset to improve the ratio of successes to failures. Even a brief glance at development disasters leads to an inescapable conclusion: Modification of the environment to fit the needs of a production system is much less likely to be sustainable than modification of the production system to fit environmental constraints. It is easy to see why this is the case. Most environmental modifications—whether altering water availability through irrigation, nutrient composition through fertilization, or pest populations through insecticides—have a large potential for undesirable side effects. In contrast, production systems can often be safely enhanced through relatively minor changes in species composition and management.

Alley cropping techniques, involving the growth of food crops between pruned hedgerows of nitrogen-fixing trees, provide one method of modifying production systems with little risk to the environment. In pilot studies, these techniques have substantially increased yields in Africa. In experimental plots, maize yields more than doubled when it was intercropped with *Leucaena leucocephala*.[56]

"High tech" agriculture and forestry can also play a role in sustainable development when the methods are integrated with existing production systems without substantial environmental changes. After decades of wasted effort producing crop varieties for Africa requiring conditions that did not exist there (irrigation and fertilization), research is now producing crop varieties that have higher yields under no-input conditions. New cassava varieties introduced in Niger have reliable yields up to 300 percent higher than traditional ones.[57] Nevertheless, little development aid money has been directed toward such breeding programs in the Third World.

Similar advances are possible in plantation forestry, traditionally dominated by the use of non-native and problematic species like eucalyptus. One of the main constraints on the development of indigenous species for forestry in the tropics, apart from the general lack of research into their potential use, has been poor seed viability and the difficulty of rooting cuttings. A series of British Overseas Aid projects in West Africa begun in 1971 has developed techniques for vegetative reproduc-

(intercropping of leguminous plants), and some chemical fertilizers.

In the first year, the yields of farmers adopting the techniques tripled or quadrupled—from 400 kilograms per hectare to 1,200 to 1,600 kilograms. In the next five years, 40 other villages requested training in the soil conservation practices. This obvious success was achieved with no direct subsidies or donations; all costs of the agricultural production were carried by the farmer. With the spread of the program into other villages, the benefits now cover an area stretching from the Nicaraguan border, halfway to Tegucigalpa.

The extension methodology used by World Neighbors differs from the Training and Visit approach favored by the multilateral development banks. The new technologies are taught in the field through hands-on activities by the farmers, initially in small-scale experimental plots on private lands. Classes are taught by village farmers who have already had success with the same technologies. For the Guinope program, these farmers initially came from a nearby region of Guatemala where World Neighbors had worked for several years on a similar program, but all the extension staff are now from the local area.

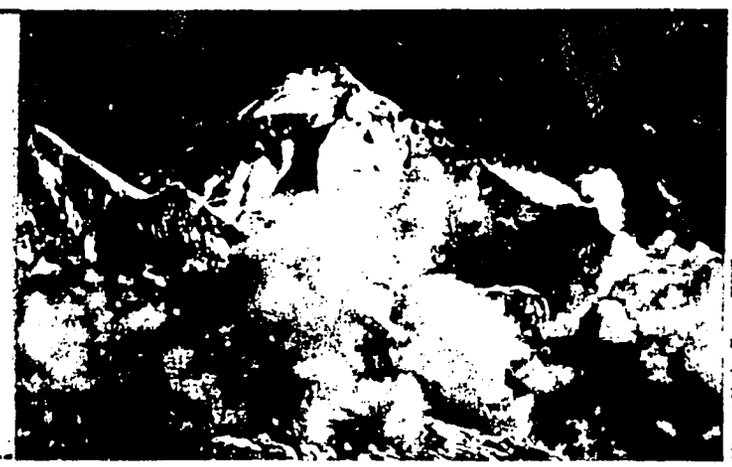
In addition to increased crop yields, the impacts of the program have been broad. Outmigration has largely been reversed as workers and farmers are attracted to the employment and agricultural potentials in the area. Many landless farmers have acquired fertile land through reclamation using the soil conservation technologies. The use of chicken manure for fertilizer has created a market for what had been a waste product generally dumped into rivers in the Tegucigalpa area, and shifting cultivation is ceasing, thereby protecting the remaining forest cover. Finally, the high yields are allowing farmers to reduce the area planted to subsistence maize and to begin planting vegetables for sale. World Neighbors is working with the community to develop an outlet in Tegucigalpa for the produce.

In its first six years, the program cost $333,000. During this time 1,200 families adopted the conservation technologies and 60 local villagers were trained as agricultural extensionists. Above and beyond World Neighbor's efforts to meet the requests for training from other villages, the technology is spreading from farmer to farmer and through Honduran Ministry of Natural Resources programs. The project has also fostered the use of small-scale experimental plots on farmers' lands to test new methods of increasing productivity. The seeds of adaptive improvement in yields have thus been planted.

SOURCES: Bunch, 1987a, 1987b.

BOX 13

Wildlands and Human Needs Program



Mingma Norbu Sherpa/WWF

For years, the World Wildlife Fund (WWF) has been instrumental in the identification of critical habitats and threatened species and in the development of national and international systems of protected areas. The WWF Wildlands and Human Needs Program integrates the management of natural resources with grassroots development projects in order to improve the quality of life while protecting biologically important wildlands. The program recognizes that enhancing the quality of life is a precondition for population stabilization, without which pressure on the environment will grow. It is an outgrowth of the observation that only by addressing human needs can the world hope to slow the overexploitation of resources and the decay of ecosystems.

Mingma Norbu Sherpa/WWF

Annapurna conservation area

The Wildlands and Human Needs Program identifies critical biological resources threatened by the inability of the rural poor to meet their resource needs in a sustainable fashion. Drawing on close ties with private development groups, projects are established to provide benefits through land titling, improved management of wildland resources, income generation, and small-scale community development. The program demonstrates a variety of low-risk technologies and management strategies that communities can incorporate as they see fit.

This WWF effort was initiated in 1985 with a matching grant from the U.S. Agency for International Development. Thirteen core projects have been established—in Cameroon, Central African Republic, Costa Rica, Dominica, Ecuador, Madagascar, Mexico, Nepal, Peru, Saint Lucia, Thailand, and Zambia. In addition, the program provides short-term support for innovative projects that integrate conservation and development, and trains host-country resource managers, community leaders, and staff from private voluntary and other non-governmental organizations. The Sian Ka'an Biosphere Reserve (Box 6) and the Lupande Game Management Program (p. 00) already serve as models of successful Wildlands and Human Needs projects. Other program successes include:

- *Annapurna Conservation Area Project (ACAP), Nepal.* Annapurna is Nepal's most popular tourist destination, with some 25,000 visitors annually. The pressure this creates threatens both the local culture and the region's limited resources. In particular, fuelwood collection to provide energy for the 130 trekking lodges and tea shops is exacting a heavy toll on the environment. ACAP is attempting to balance the needs of local people, tourists, and the environment by providing conservation education (targeting both tourists and residents) and information on sustainable resource use. The project is establishing programs for reforestation, overgrazed land rehabilitation, alternative energy sources (kerosene, solar, and micro-hydro), family planning, and health care. Trekking fees provide a substantial and established source of funding for development projects within the conservation area.
- *Southeast Coast Resource Management Program, Saint Lucia.* The 30,000 residents of the southeast coast of Saint Lucia face serious problems from overexploitation of fish, firewood, and grazing land. This program is enhancing the agricultural and fishing activities of the people and providing increased protection for the Maria Islands, two small points of land near the coast of Saint Lucia with unique wildlife habitat. The project works with particular groups (such as charcoal producers and fisherfolk) to provide alternative methods of resource use and sources of income. Included are programs of education, training, cultural conservation, marine conservation, and tourism. Public support for, and participation in, the project is high. Two cooperatives of resource users have been established, and communities are involved in resource management decisions, including the selection and demarcation of informal protected areas.

SOURCES: McCaffrey and Landazuri, 1987; World Wildlife Fund, 1987; Wright, M., World Wildlife Fund, Washington, D.C., personal communication, June 1988.

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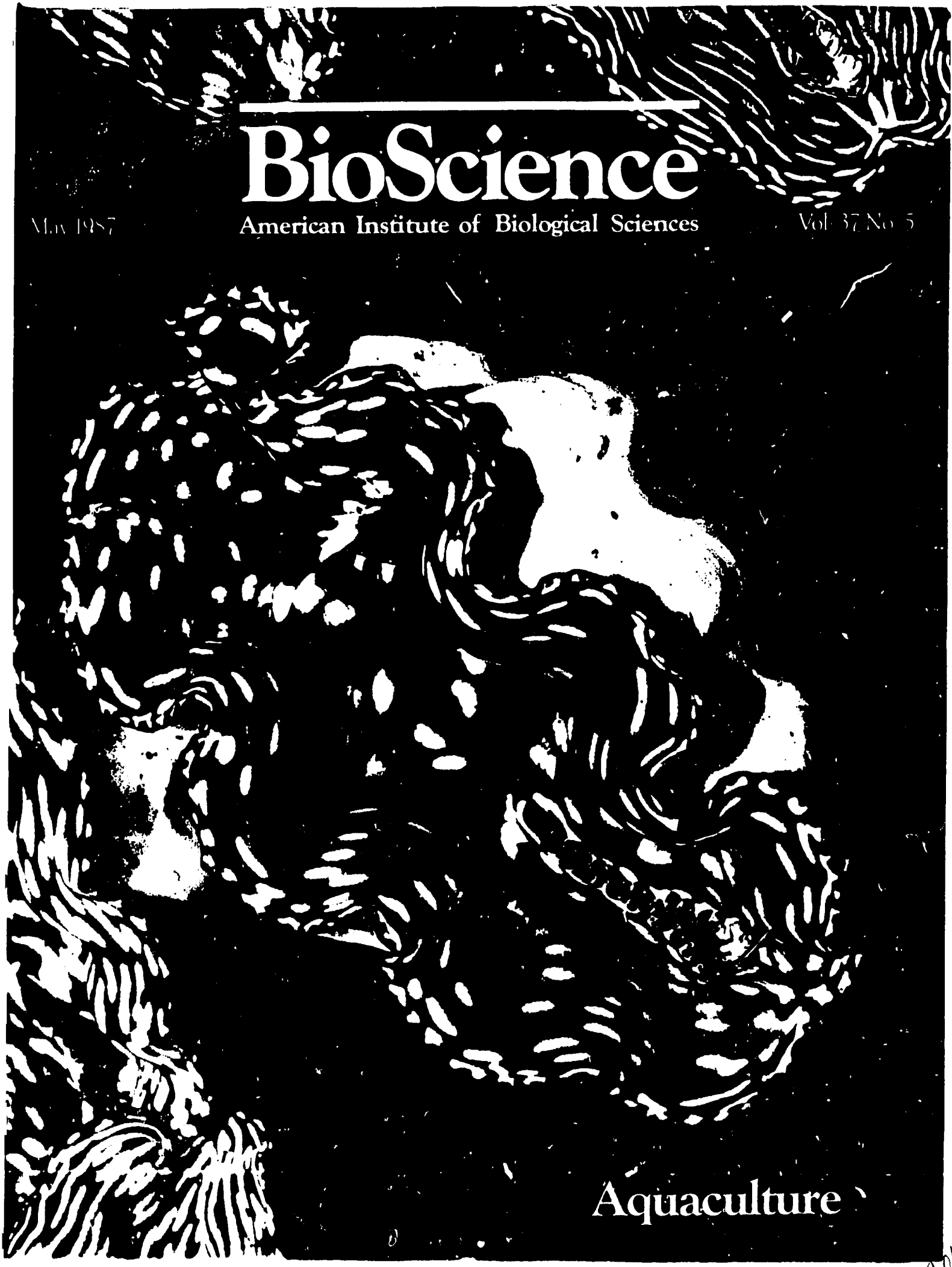

SIAN KA'AN, MEXICO

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Enhancing coastal production

Do artificial shelters help or hurt Mexico's valuable spiny lobster fishery?

For more than a decade, lobster fishermen on the Caribbean coast of Mexico have augmented traditional local practices by sinking simple, wooden platforms beneath the water to attract their prey. By mimicking natural crevices in reefs and rocks, these structures, known as casitas, are also intended to increase the number of lobsters the area can support. Introduced by Cuban immigrants in the late 1960s, this strategy has spread quickly throughout the state of Quintana Roo. Today, more than 25,000 casitas sit beneath the shallow waters of the coast. Although there is no doubt that casitas have facilitated lobster harvests, it is not known whether they also increase lobster production or simply concentrate the animals.

The distinction is important. If casitas increase harvests without boosting populations by a comparable amount, the Mexicans' strategy will lead to overexploitation and a possible collapse of the fishery. Spiny lobsters (*Panulirus argus*) provide the mainstay of the state's economy, bringing in more than $1 million in export earnings annually. Fetching about $10 per pound in US markets, *P. argus* has provided a good income to Quintana Roo fishermen and their families.

The fishery also is vital to the success of the recently designated Sian Ka'an Biosphere Reserve, which encompasses 450,000 hectares of the Quintana Roo coast. Established through UNESCO's Man and the Biosphere Programme, biosphere reserves, unlike parks, are multiple-use areas that include human settlements as well as core protected areas. As the most important economic activity within Sian Ka'an, the lobster fishery's continued profitability will be key to protecting resources within the reserve's core zones.

Mexico's lobster fishing strategy may have an impact even beyond its national borders. "Spiny lobster is, pound for pound, one of the most economically valuable species throughout the Caribbean Basin," says

Collaborating with Mexican scientists and fishermen, David L. Miller of the State University of New York at Cortland (right) is investigating the impact of various physical, chemical, and biological parameters on spiny lobster production. The results will have important implications for the area's economy as well as for a recently designated biosphere reserve. Photo courtesy David L. Miller.

by Laura Tangley

Fishermen construct casitas from the trunks of thatch palm (above) and sink the structures offshore at depths ranging from one to ten meters (below). Photos: David L. Miller.

David L. Miller of the State University of New York at Cortland. Miller, who has studied the Quintana Roo fishery for nearly a decade, says that officials from several Caribbean nations are looking closely at Mexico's lobster fishery, with an eye toward adopting the casita strategy themselves.

A fixed number of dens

Mexican fishermen construct casita frames from the trunks of thatch palm (*Thrinax radiata*), known locally as chit, and cover the frames with either more chit (see photo, above) or a variety of human-made materials, including barrel lids, corregated roofing, and reinforced cement. They sink the structures offshore at depths ranging from one to ten meters. During the lobster season, fishermen check casitas at least once a week, diving down to gaff or net the animals. Typically each shelter will harbor between three and a dozen lobsters.

According to Miller, the ability of casitas to increase an area's carrying capacity for lobsters makes theoretical sense. Unlike the North American lobster (*Homarus americanus*), spiny lobsters do not build shelters or significantly modify existing ones. "The number of naturally occurring dens in an area is relatively fixed," he says. "Thus correctly designed and positioned habitats would appear to have the potential to enhance recruitment where existing habitat is limited or suboptimal." When suitable dens are unavailable, Miller adds, lobsters "just hunker down in sand or grass and become easy prey" to a variety of predators, including sharks, dolphins, triggerfish, and loggerhead turtles.

Research in Japan has demonstrated that artificial reefs have increased production of several finfish species, says Miller. In the United States, a National Marine Fisheries Service biologist found that by sinking a reef made of tires near a natural reef in Florida's Biscayne Bay, he was able to double the area's fish biomass without changing the number or composition of organisms on the natural reef. Although less conclusive, studies of *H. americanus* have suggested that artificial shelters can also increase lobster production.

Despite these encouraging signs elsewhere, Quintana Roo's lobster fishermen have reported a downward trend in their harvests over the past several years. Although, according to Miller, the pattern runs "like a roller coaster ride" with "a lot of bumps up and down," the average catch has nonetheless declined markedly. For example, annual lobster landings by the Vigia Chico Fishing Cooperative, based at Punta Allen on Ascension Bay, fell from 221.4 metric tons to 128.0 metric tons between 1977 and 1984.

This decline does not necessarily mean the cooperative is overfishing its territory, however. Female spiny lobsters release their eggs offshore, and larvae spend between 8 and 12 months at sea before returning to inshore areas. "This means we don't know the origin of the lobsters in any

Spiny lobster *(Panulirus argus)*. Photo courtesy Florida State University Spiny Lobster Research Program.

given area," says Miller. Declining harvests in Ascension Bay may indicate that local fishermen are overexploiting the resource or they may signal problems elsewhere.

Because of its long-lived and widely dispersed larval phase, "the spiny lobster presents a unique fisheries management problem," says Romuald N. Lipcius of the Virginia Institute of Marine Science in Gloucester Point. Lipcius, who has studied the biology and ecology of *P. argus* for several years, recently began collaborating with Miller on research in Quintana Roo. Spiny lobsters range all the way from Bermuda in the north, he says, throughout the Caribbean Sea as far south as Brazil, an area comprising dozens of independent nations. "If you're managing a population in Florida," he says, "you don't know if those lobsters came from Florida, from Brazil, or from anywhere in between." To solve this problem, Lipcius has begun analyzing the mitochondrial DNA of larvae from various locations to learn whether genetic differences can be used to distinguish them.

In the meantime, says Miller, the best approach is a conservative one—to assume that Ascension Bay's spiny lobsters are of local origin and that the bay's declining harvests are a serious cause for concern. This assumption makes urgent the task of discovering what impact artificial shelters have on lobster populations.

Testing the waters

In collaboration with Mexico's Centro de Investigaciones de Quintana Roo (CIQRO), which coordinates research in Sian Ka'an, Miller and Lipcius over the next few years will complete a two-phase study to test the effects of artificial shelters on Ascension Bay's spiny lobsters. Preliminary work has been completed under a World Wildlife Fund grant to CIQRO. This summer, with funding and volunteer assistants from Earthwatch in Watertown, Massachusetts, the scientists will survey cooperative members' territories, or campos, using a LORAN-C marine navigation position finder. From these surveys, they will be able to calculate each campo's area and, after counting the number of casitas per campo, its shelter density.

The researchers will also measure lobster production at various locations throughout the bay and correlate these figures with shelter density as well as other physical, chemical, and biological variables. From this work, they hope to learn which factors relate to both high and low lobster production.

"Once we identify the factors that contribute to higher production," says Miller, "we can create artificial situations to test the relative importance of each." In this second, experimental phase, the researchers will compare lobster production in various settings they design. They may, for example, add casitas or cages containing different kinds of food to some areas while leaving others in their natural state. Another plan is to

Ocean ranching—when farming is not an option

For economically valuable marine species, mariculture can provide an opportunity to generate income as well as avoid the temptation to overharvest and deplete wild stocks. Several years ago, scientists were enthusiastic that this approach could be applied to spiny lobsters. Hopes ran particularly high, says Lipcius, when it was discovered that *P. argus* juveniles could be raised to adulthood in the laboratory in half the time it took the species to reach maturity in the wild—about one and a half years rather than three or four.

In recent years, however, these hopes have dimmed as mariculturists have been unable to raise any spiny lobster species through its entire life cycle. The problem lies with the animal's long and complex larval phase, which lasts between 8 and 12 months—compared with 1 month for the American lobster (*H. americanus*)—and involves at least a dozen molts. When lobster larvae molt, they become extremely vulnerable to even small disturbances, easily losing limbs, which causes death. Other obstacles to rearing larvae include inadequate nutrition and an inability to maintain water temperature, salinity, dissolved oxygen, and pH at the precise levels found in the wild.

Today a more feasible option than farming spiny lobsters is ranching them. Ocean ranching uses wild stocks in a basically natural setting, with scientists manipulating environmental variables to attain as many harvestable adults as possible. Such manipulations can include seeding an area with eggs or larvae, increasing food and shelter, and protecting animals from predation. Ocean ranchers will sometimes impound entire areas of the coast. "[E]xtensive culture systems, utilizing grow-out ponds or impoundments several hectares in size, appear to be an attractive aquaculture approach for rearing palinurids," writes George R. Tamm of Science Applications, Inc., in Boulder, Colorado (*Fisheries* 5: 59–62). "If impoundments are designed to take advantage of physiographical features, tidal flushing, and ambient insolation, growth may be further enhanced at low cost."

Mexican fishermen's efforts to augment lobster habitat in Sian Ka'an Biosphere Reserve could be seen as at least a first step toward ranching *P. argus*. As Miller, Lipcius, and their Mexican colleagues provide more data on what physical, chemical, and biological factors limit lobster populations, fishermen should be able to move even closer to domesticating this valuable but vulnerable marine species.

increase the number of predators in an area to compare predation in enclosures containing artificial shelters with predation in enclosures without shelters. Although the experimental phase of the research will not get underway until next year, the scientists are planning a few pilot studies for this summer "so we'll get an idea of the things that could go wrong," says Lipcius.

Even if it turns out that shelter is not an important limiting factor in lobster production—and thus, by implication, that casitas are facilitating overexploitation—the research will provide practical information on how fisheries managers can alter the habitat to increase and sustain lobster harvests. Possibilities include seeding the area with *P. argus* post larvae, adding certain nutrients or foods at particular times of the year, and restricting the access of key predators.

A gut feeling about habitat

The project also will generate important information on spiny lobster biology. Despite the species' importance to the economies of many Caribbean nations, relatively little information exists on *P. argus's* life history, particularly habits of young juveniles, which have been difficult to locate in the field. Miller and his colleagues have discovered areas within Sian Ka'an where juvenile lobsters are routinely abundant. "Ultimately," he says, "our work will lead to additional research that will provide the most detailed ecological information of any population of young juvenile spiny lobsters in the world."

Just as important, the research project will create and enhance existing relationships between Sian Ka'an's fishermen and US and Mexican scientists. Such relationships are crucial to the success of future research endeavors in the reserve, says Miller, who speaks Spanish fluently and has so far spent about 280 hours working in small boats with the fishermen. By providing catch data and producing maps that have helped resolve territorial boundary disputes, "we have already demonstrated to the fishermen that scientists can make a practical contribution," he says. Without the fishermen's cooperation, Miller adds, future efforts to manage the lobster fishery as well as protect the reserve's other resources could be doomed.

Miller and Lipcius are optimistic that their study will bring good news to the fishermen. "It's just a guess, but I don't think we'll find that Ascension Bay is limited by recruitment," says Lipcius. "I think it will turn out to be some environmental factor, like food or shelter, that we'll be able to enhance and get higher lobster production."

Although he stresses that the situation could vary from location to location and that "we'll certainly come up with lots of surprises," Miller agrees that recruitment probably is not the most important limit to spiny lobster production along Mexico's Caribbean coast. He believes, as the lobster fishermen hope, that insufficient shelter will turn out to be more significant. "I have a gut feeling," he says, "that habitat's the most important limiting factor here."

ZAMBIA, DOMINICA

U.S. News + World Report 7-23

A new breed of pragmatic environmentalists is putting the land to work

The preservation paradox

■ They might be scenes from a conservationist's nightmare: A chain-saw-wielding tropical biologist helps cattle ranchers lay waste to pristine forest in the Amazon. Wildlife managers at an African game reserve encourage locals to become field guides for hunting safaris. Foresters urge natives of a tiny Caribbean island to go into furniture manufacturing—using local trees.

But these visions are not the product of some environmentalist's tortured sleep. They are part of a new conservation movement that is gathering momentum around the world. Spawning buzzwords such as wild lands and human needs, sustainable development and biosphere projects, the new movement is certain to raise a few eyebrows among more-traditionally minded environmentalists. But it also addresses a crucial part of the environment that many conservationists feel has been neglected for far too long: People.

"In the past, a lot of conservationists simply wanted to put a fence around a forest," says Elizabeth Nordlinger of Conservation International, a Washington, D.C.-based environmental group. "But you can't do conservation without considering the people who live off the land. If you lock it up, they can't build houses or feed their kids."

Peaceful coexistence: By setting aside specific areas for agricultural use, Bolivian officials hope to protect endangered species, such as the ocelot, in a nearby preserve

Proponents of the new conservation movement say their goal is that of their predecessors: Preserving scarce natural resources such as tropical forests and wildlife. Tropical forests cover some 6 percent of the world, but they are home for an estimated 60 percent of the world's species. And they are

MIXING CONSERVATION AND DEVELOPMENT

One strategy for preserving scarce resources while promoting economic growth is to join the two together in a biosphere. That's what Bolivia did with one 3-million-acre tract. Different parcels of land are set aside on an ascending scale of permitted uses. By allowing intensive use in some areas, other lands are relieved from the pressures of development.

1 Pristine forest is at the core. The forest's inhabitants include many of Bolivia's endangered species such as the wild boar and giant anteater.

2 Grazing lands surround the core, acting as a protective buffer.

3 Logging, as well as hunting and fishing by local Indians, is permitted in the largest of the biosphere's sectors.

4 Watershed for the region's rivers is protected from logging to prevent erosion.

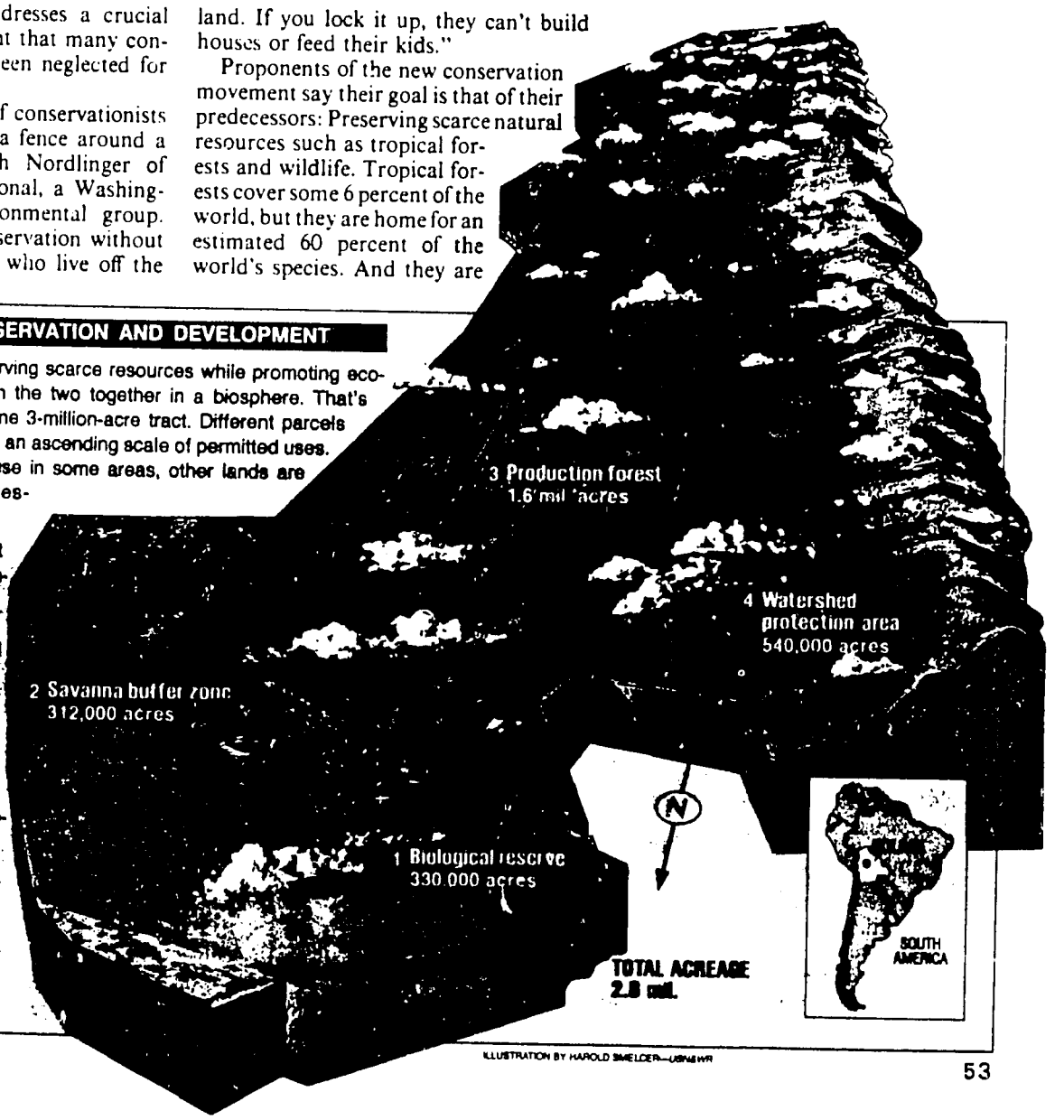

ILLUSTRATION BY HAROLD SMELCER—USN&WR

disappearing at an alarming rate: Some biologists estimate that an area of forest the size of New England is destroyed in the tropics each year.

But protecting those resources by blocking development ignores the presence—and plight—of the people living in or near them. Most of the world's endangered wildlife and valuable forest areas are found in developing countries—which usually can ill afford to simply put land aside for the future. "You can put a lot of guards around a park," says Robert Winterbottom, a forest ecologist with the International Institute for Environment and Development, "but eventually people pressure will win out. You aren't going to save the habitat of the mountain gorilla as long as there are people there who are hungry."

The way to get around the apparent conflict between conservation and economic development, say the new conservationists, is to mix the two. One strategy is to convert a tract of ecologically valuable land into a biosphere. In this scheme, a core area is set aside as a reserve for plants and animals. Surrounding the reserve are areas of land designated for scientific research, land-restoration projects and use by the natives for hunting, gathering and shelter. The whole area is surrounded by another buffer zone of land designated for more-intensive use such as farming and logging.

There are now more than 200 biosphere projects around the world. One of the largest, a 3-million-acre tract of forest in Bolivia, was created last year when Conservation International orchestrated the buyout of part of Bolivia's foreign debt in exchange for the government's officially designating conservation zones around an existing reserve. How the areas will be used was determined by a planning committee including Bolivian conservationists, scientists, local Indians and representatives of Bolivia's logging industry. Part of the land is set aside for cattle ranching; another part is for the Indians to continue their hunting and fishing and for logging, and another is a reserve to protect the area's biological resources.

But is it still a forest? Just how large such a reserve must be to maintain the rich diversity of plant and animal life in a tropical forest is currently being studied in Brazil. When the Brazilian government promoted a project to clear forest in the Amazon for cattle ranching several years ago, conservationists persuaded officials to set aside parcels of forest of various sizes. These "islands" of forest, ranging from 2½ to 2,500 acres apiece, are serving as laboratories for studying how the variety of plant and animal life in a particular environment adapts to a change in its size.

The scientists catalog the various species in a particular area, then watch how the size and distribution of those species change after the surrounding forest has been cut down for pasture. Preliminary results show that the smallest plots gradually become overrun by encroaching growth, usually a single species of tree—lending credence to the idea of having buffer zones surrounding parks of pristine forest.

Looking for ways to save the biological diversity of a forest, even while conceding that some of it will be cut down, makes some traditional conservationists nervous. "People are afraid that as soon as we find out the minimum size a forest can be, the bad guys are simply going to come in and reduce everything to that size," says Rob Bierregaard, a tropical biologist with the World Wildlife Fund who is the director of the Brazilian study. "That may be true. But the fact is, left on their own they would probably cut it all down."

A patch of forest left by ranchers in Brazil is a lab for testing how small a preserve can be—and still retain its varied wildlife

Traditional conservationists may also be taken aback by some of the new conservationists' methods. When the sluggish Brazilian economy slowed the cattle-grazing projects, for example, Bierregaard had to pitch in with a chain saw to help clear the forest. "It's one of the problems of this kind of study," he says. "We're in the ironic position of wanting to see more rain forest cut down so we can get scientific results."

Elsewhere, conservationists are engaged in similar seeming paradoxes. In Zambia, for example, wildlife-management areas are constantly under pressure from poaching. The solution: Allow limited culling of wildlife by natives and train them as guides for hunting safaris. "Now that the natives are helping to manage the area, they look at poachers as threatening," says Michael Wright, a vice president of the World Wildlife Fund. Poaching in the area dropped nearly 90 percent in three years after the program started.

In one planned project in Dominica, a Caribbean island that is still 65 percent covered with native forests, conservationists are trying to help natives set up a logging industry that moves away from the high-volume—and ecologically destructive—logging practices that are typical of many tropical areas. Instead, they are promoting labor-intensive, small-scale businesses that combine logging and furniture making. Such an approach will require fewer roads through the forest, make more-efficient use of the harvested wood and provide incentives to replant trees—all to the benefit of the people who live on the land.

Pragmatism vs. idealism. The new pragmatism in conservation doesn't appeal to everyone. Some critics argue that by going after the deeper causes of environmental destruction—population pressure and economic hardship—conservationists run the risk of losing sight of their original goals. A flap recently erupted, for example, when the National Wildlife Federation sold a donated tract of forest land near Washington, D.C., to developers. The group, which already owned a similar preserve in the area, argued that money from the sale would be better used to further the federation's research on endangered species. But Alston Chase, writing on the incident in *Outside* magazine, wondered whether, in their attempts to save the forest, some conservation groups have begun to ignore the trees. In pursuing larger and larger projects, he says, the federation and other conservation groups have taken on an "agenda [that] resembles an encyclopedia of the world's ills."

Still, one possible rebuttal to Chase's complaint inadvertently appeared in an advertisement facing his editorial in the magazine. Promoting a trip through remote stretches of wilderness, the ad offered customers an opportunity to "make the world go away." For conservationists trying to preserve precious natural resources, the big question is whether that's any longer possible. ■

by William F. Allman

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SIAN KA'AN, MEXICO

A new era for biosphere reserves

Mexico's Sian Ka'an shows that it's hard to be everything a biosphere reserve should be

On a typical hot, sunny afternoon last summer, Mexican fisherman Armando Lopez anchored his boat to the pier near his home and began sorting the day's catch of lobster. A few moments later, on the other side of the pier, US biologist David Miller pulled up in another boat filled with research equipment and four US high school teachers and students working as volunteers on his lobster habitat study. As the volunteers snapped photographs, Lopez and Miller swapped stories on their morning's activities. After unloading the boats, all six headed across a dirt road to the Cuzan Guest House, run by Lopez and his partner Sonja Lillvik, for a lunch of fresh lobster ceviche.

That all these activities took place within a biosphere reserve known as Sian Ka'an might be a visitor's first clue that these reserves have little in common with a typical national park. Unlike most parks, biosphere reserves allow experimental scientific research as well as human habitation and use of natural resources. Indeed, without such activities, a reserve would be considered unsuccessful, no matter how well it protected the area's natural features.

Not just another protected area

Located on Mexico's Caribbean coast in the state of Quintana Roo, Sian Ka'an Biosphere Reserve is one of the most recent additions to an international network of protected areas launched by Unesco's Man and the Biosphere Programme (MAB) in the early 1970s. MAB national committees in 113 member countries nominate sites as potential reserves. These nominations are approved or rejected by MAB headquarters in Paris, France. The first biosphere reserves were named officially in 1976; today there are 266 reserves in 70 nations.

One criterion for approval of a reserve nomination is that the site represent a typical terrestrial or coastal ecosystem. Unlike most national parks, which showcase rare and spectacular biological or physical phenomena, biosphere reserves are intended to conserve examples of the world's characteristic ecosystems. One goal of the program is to eventually include samples of all the earth's 193 biogeographical provinces within the reserve network.[1]

Biosphere reserve is a far more ambitious designation than is national park. While most national parks focus on aesthetics and recreation, reserves have many additional functions. In a 1986 article, MAB's Michel Batisse, one of the creators of the biosphere reserve program, says that from the beginning reserves were intended to fill three broad roles—conservation, logistic, and development roles.[2]

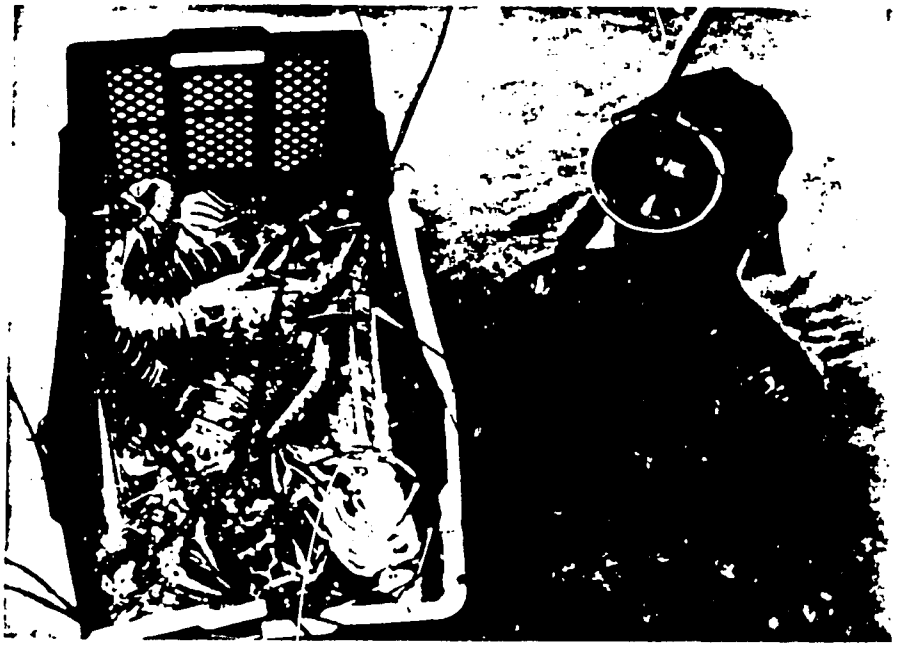
The most straightforward of these, the conservation role, calls for preservation of a minimally disturbed ecosystem large enough to ensure maintenance of both species and genetic diversity over time. A reserve's logistic role involves a variety of research, education, training, and information-sharing activities. Reserves, for example, are considered ideal monitoring sites for studies of global problems such as acid precipitation and climate change. In addition to environmental monitoring and observational research, manipulative research (often prohibited in national parks) also is encouraged if the research is directed toward better use and management of natural resources. William P. Gregg, Jr., MAB coordinator for the US National Park Service, calls biosphere reserves "landscapes for learning" about both natural and managed ecosystems. An important requirement of the logistic role is that research and education activities be integrated into an international network that facilitates the exchange of information and personnel among MAB nations.

The most innovative functions of a biosphere reserve fall under what Batisse calls its development role. Unlike national parks, which usually are created in pristine areas from which humans are expelled and then excluded (except for tourism), biosphere reserves include human populations as key contributors to and beneficiaries of reserve activities. Indeed, one of the most important goals of a biosphere reserve is to study and promote sustainable resource-use practices so that the reserve becomes a model for rural development compatible with conservation.

The various functions of a biosphere reserve take place in three distinct zones. First, every reserve must contain at least one core zone, a natural ecosystem where only nonmanipu-

by Laura Tangley

[1] M. D. F. Udvardy, 1975. A classification of the biogeographical provinces of the world. IUCN Occasional Paper No. 18, Gland, Switzerland. These provinces were classified specifically for MAB and the International Union for Conservation of Nature and Natural Resources (IUCN), to aid in global conservation efforts.
[2] Michel Batisse, 1986. Developing and focusing the biosphere reserve concept. *Nature and Resources* 22(3): 1–10.



When is a reserve more than a reserve? Unlike most national parks, biosphere reserves allow human habitation and use of natural resources; local people are considered key contributors to and beneficiaries of reserve programs. Inhabitants of Sian Ka'an Biosphere Reserve in Mexico (top and left) fish for lobster in Ascension Bay. Photos: Guido Rahr, courtesy Conservation International. Fisherman Armando Lopez (right). Photo: Laura Tangley.

lative activities such as environmental monitoring and evolutionary studies are allowed. Core zones of many biosphere reserves overlay national parks or strictly protected nature preserves. Surrounding or adjoining this core is a buffer zone, in which a variety of activities are permitted as long as they are compatible with protection of the core. These activities include research, natural history tourism, rehabilitation, education and training, and traditional land use. Both the core and buffer zones should have secure legal protection, and their borders should be clearly defined.

Beyond the buffer zone, and lacking definite borders, is a reserve's transition area. In a talk given at the Fourth World Wilderness Congress in Estes Park, Colorado, last fall, Jane Robertson Vernhes of Unesco described this transition area as "a dynamic, ever-expanding cooperation zone where the work of the biosphere reserve is applied directly to the needs of the local communities." Transition zones typically include human settlements whose inhabitants pursue farming, fishing, forestry, and other economic activities compatible with long-term resource use and protection of the core and buffer zones. It is in the transition area that researchers work with local populations to develop models of sustainable rural development.

Because the transition area lacks borders, it potentially extends indefinitely and forms a link between the reserve and the surrounding region. A biosphere reserve thus can become a pillar upon which to build broad, regional-land-management plans. According to Vernhes, "Biosphere reserves are not just another category of protected area—with imagination and conviction, they offer a beginning in truly integrating conservation, science, and society."

The early years: debate and confusion

However, few of the 266 reserves in the system today even begin to approach this ideal. The gap between theory and reality can be attributed in part to disagreement and misunderstanding over the meaning of the biosphere reserve designation, particularly during the early years of the program.

"Even among those who supported the idea of biosphere reserves, there was disagreement over what a reserve should be," says F. William Burley of the World Resources Institute in Washington, DC. For conservationists who did not advocate integrating conservation and development, biosphere reserves were seen simply as a new technique to strengthen the protection of already-established parks and preserves. For these "preservationists," human inhabitants were considered more a necessary nuisance to ensure park protection than a mandate to initiate natural resource studies and activities.

Another problem was confusion surrounding the concept. According to Batisse, "[t]he idea and the term of biosphere reserve were officially launched . . . in a somewhat hazy manner, without much clarity about their exact role and nature." This vagueness inevitably led to "some misunderstandings or to some distortions in its implementation," Batisse says. Gregg says that in the United States, "park managers have tended to see the designation as a gratuitous honor, rather than an opportunity to [solve] managment problems or strengthen bioregional cooperation."

An example of early confusion over the program is described by John D. Peine of Great Smoky Mountains National Park, Tennessee, and John M. Morehead of Everglades National Park, Florida, in a summary of a 1984 conference on biosphere reserve management.[3] "In general, the managers that came to the conference did not necessarily relate to the biosphere reserve program," Peine and Morehead write. "When asked, 'What is a biosphere reserve?' and 'What are its management implications?', more often than not there was an uncomfortable shuffling of feet, a pause in the voice, and a perplexed look on the face."

The result of such confusion was that, in the rush to establish reserves during the first years of the program, only the conservation and—to a lesser extent—logistic roles were emphasized. A review of the reserve network, by Kenton R. Miller of the International Union for Conservation of Nature and Natural Resources (Gland, Switzerland), revealed that in 1982, 84% of all reserves consisted solely of preexisting national parks or other protected areas. In a background document prepared last year for Conservation International in Washington, DC, Bruce Leighty concludes that "the greatest disappointment of the program so far has been the lack of progress with regard to the development role."

Conceptual soul searching

As early as 1977—just one year after the first reserves were created—conservationists had begun assessing the effectiveness of the biosphere reserve program. Nearly all these assessments—a variety of papers, reports, and conferences—confirmed the value of the biosphere reserve concept as well as the disparity between that concept and the actual program.

These critical evaluations culminated in 1983 with the First International Biosphere Reserve Congress, held in Minsk, Byelorussia, USSR. The congress took stock of the biosphere reserve network and made recommendations for its future. These recommendations led the following year to preparation of the Action Plan for Biosphere Reserves, which outlines nine objectives and proposes 35 actions that national governments, international organizations, and reserve managers can take to reach those objectives. One proposal, enacted almost immediately, was the creation of a scientific advisory panel to "refine criteria for the selection and management of biosphere reserves and to review from time to time the effectiveness of the network." This panel met twice, in 1985 and 1986, and last year produced a report that has been adopted by MAB's International Coordinating Council.

"The main results of this conceptual soul searching," writes Batisse, is a broad consensus today that "any biosphere reserve, no matter where it is located in the world, must to some extent address itself to the [conservation, logistic, and development roles] and to their combination." With adoption of the action plan and scientific advisory panel report by MAB, this consensus has become official policy. Says Batisse, "the problem now is not so much to further refine the concept, but to actually apply it."

Moving toward an ideal

According to Unesco's Vernhes, the biosphere reserve action plan has been widely distributed and endorsed among MAB nations. Also endorsed by MAB headquarters and soon to be distributed to member countries is a revised set of guidelines for selecting reserves and a new nomination form to help national committees propose

[3] John D. Peine, 1984. Proceedings of the Conference on the Management of Biosphere Reserves, November 27–29, 1984. US Department of the Interior, National Park Service, Uplands Field Research Laboratory, Great Smoky Mountains National Park, Gatlinburg, TN.

A biosphere reserve seeks to conserve both natural and cultural resources. Mangrove ecosystems (above) are abundant throughout Sian Ka'an. Photo: Laura Tangley. The majority of inhabitants (right) are of Mayan descent. Photo: Guido Rahr, courtesy Conservation International.

more appropriate sites. MAB has encouraged national committees to draft their own strategies for implementing the action plan; several countries—including Canada, the United Kingdom, and the United States—have completed or are preparing these strategies.

There are limits, however, to what MAB can do to require implementation of the action plan. One limitation is financial. With the withdrawal of the United States from Unesco four years ago, followed almost immediately by Singapore and the United Kingdom, the organization's budget has been cut by about one-third. The falling value of the US dollar and stock market difficulties also have hurt Unesco. MAB receives just a small portion of Unesco's total budget, and the biosphere reserve program is just one of 14 MAB program areas competing for shrinking funds.

Another limitation relates to the philosophy and purpose of Unesco. According to Marjorie M. Holland, an ecologist who recently worked as a consultant to Unesco, the organization "cannot tell countries what to do. It can only make recommendations." Holland, now public affairs director for the Ecological Society of America in Washington, DC, says there is "a strong feeling at Unesco that countries must devise their own strategies" to solve environmental problems.

Allowing diverse approaches is also considered essential to the success of the biosphere reserve program. "Because each country is endowed with its own unique ecological, cultural, social, and economic resources and has a unique range of needs, there can be no standardized approach to developing a reserve," says Gregg. "Instead, the watchword is flexibility."

Nevertheless, there are signs that the biosphere reserve network is beginning to move toward the ideal. They include the national strategies and new nomination guidelines, says Vernhes. Another indication comes from a survey conducted by the scientific advisory panel; as of September 1987, 182 reserve managers in 47 countries had responded to the survey. "A preliminary study of the responses . . . gives a clear indication that efforts are now being made by a number of MAB national committees to improve their biosphere reserves," says Vernhes. "This indication is substantiated by the high quality of biosphere reserve nominations that have been submitted since the launching of the action plan in 1984."

Sian Ka'an: a new generation

One of these nominations—approved by MAB in October 1986—was for Mexico's Sian Ka'an Biosphere Reserve. Located on the Yucatan Peninsula about 150 kilometers south of the tourist center of Cancun, Sian Ka'an contains 528,000 hectares of tropical moist forests, marshes and mangrove swamps, and freshwater and marine ecosystems. A portion of the world's second-longest barrier reef runs parallel to the reserve's shoreline. Terrestrial habitats include seasonally flooded forests with dry hardwood hammocks, called petenes, rising from the wetlands. Scattered throughout these forests are cenotes, freshwater pools that contain a variety of unusual species. The reserve supports an abundance of diverse organisms, including 1200 vascular plant species, 320 bird species, and such endangered vertebrates as tapirs, manatees, jaguars, pumas, and 3 sea turtle species.

Sian Ka'an, which translates approximately to "origin of the sky," is the name given the Quintana Roo

Last summer, Earthwatch volunteers worked with US biologist David Miller and CIQRO researchers on experiments comparing spiny lobster predation under different conditions. The research, which is endorsed by the fishermen, will help better manage this important resource. Photos: Laura Tangley.

region by Mayans in the fifth century B.C. Today Mayans continue to live in and near the reserve, speaking the same languages and practicing the same methods of raising and gathering plants for food, medicine, and housing that their ancestors did centuries ago. There are unexplored Mayan archeological sites scattered throughout Sian Ka'an.

Approximately 800 people currently live within the reserve's borders. Of these, about ten families live off subsistence agriculture and a few raise coconuts or run small-scale tourism ventures. The vast majority of reserve inhabitants are lobster fishermen and their families. Because lobsters fetch a high price on international markets, these fishermen make a good living and have tried hard to ensure the long-term viability of the resource. The fishermen are organized into cooperatives that strictly regulate the number of fishermen and the size of each season's catch. These low population and development pressures are considered one key to Sian Ka'an's success.

Although not even two years old, Sian Ka'an already is widely regarded as one of the more successful, or at least potentially successful, reserves in the biosphere reserve network. "For being so young, Sian Ka'an has made great strides in a very short time," says Dennis Glick of the World Wildlife Fund (WWF) in Washington, DC; WWF has contributed to several research projects in the reserve. Says Gregg: "If you look at all the objectives a biosphere reserve is supposed to meet, Sian Ka'an would receive high marks on all of them."

Sian Ka'an meets the criteria of the conservation objective because it includes representative ecosystems that, more importantly, "have been kept exceptionally undamaged," Gonzalo Halffter of the Institute of Ecology in Mexico City said at last fall's World Wilderness Congress. "For historical reasons, Quintana Roo—except for the island of Cozumel—has been kept isolated from Yucatan and from the rest of Mexico," said Halffter, who is also president of MAB's International Coordinating Council. "Tourist development started only 15 years ago . . . disturbances have not yet reached Sian Ka'an."

Mexico is determined to keep the region as pristine as possible, while allowing inhabitants to meet their subsistence needs. Sian Ka'an was created by a 1986 presidential decree—an unusual beginning for a biosphere reserve—and has enjoyed strong support from the state government as well. Most of the land is federally owned. A management plan for the reserve establishes large core zones where no human disturbances are allowed. Outside these zones, activities such as hunting, gathering, farming, and tourism development are permitted, but with restrictions.

Research for resources—and for people

A great deal of research activity takes place in Sian Ka'an. From its creation in 1979, the state's major research center, the Centro de Investigaciones de Quintana Roo (CIQRO), has devoted itself almost entirely to studying the area and documenting the need for official protection. Enrique Carrillo Barrios Gomez, until recently CIQRO's director and now secretary of education and culture for the state, says that 90%–95% of CIQRO's budget goes to research conducted in Sian Ka'an. The center sponsors more than 20 research projects in the reserve, including population and distribution studies of freshwater and marine fish, plankton, lobsters, sea turtles, manatees, and a variety of

In a portion of the reserve known as El Ramonal, Amigos de Sian Ka'an has established an experimental farm that seeks to reduce the amount of land needed for agriculture by employing intensive cultivation practices. Local Mayan Mardoques Herrera (right) works full-time as a technician on the farm. Photos: Laura Tangley.

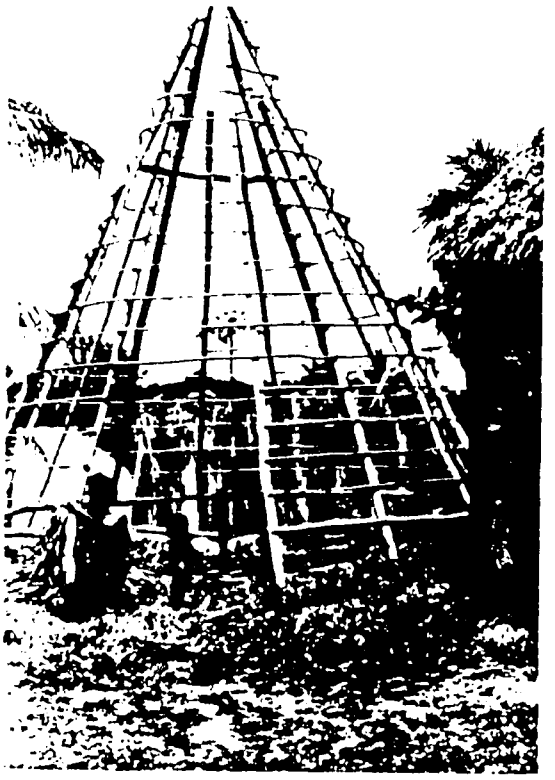
terrestrial plants, birds, and mammals. Some projects focus on socioeconomics and traditional agricultural practices. "Few, if any, biosphere reserves in the world have an entire research organization dedicated to their study," says Carrillo. CIQRO soon will sponsor masters and Ph.D. programs as well, many of the research and training activities for these programs will be conducted in the reserve.

In addition, a private nonprofit organization, Amigos de Sian Ka'an, sponsors several applied research projects aimed at solving resource-use problems of Sian Ka'an's inhabitants. These projects include studies of spiny lobster biology and of a disease ravaging the region's coconut palms, the development of a sustainable harvesting scheme for useful palm species, and a model farm demonstrating intensive horticultural practices that reduce the amount of land needed to grow food. With these projects, "we are trying to get local people to understand the importance of conservation in their daily lives," says Amigos' executive director, Arturo Lopez Ornat. Another priority is public education. The organization has produced brochures, exhibits, and slide shows and has begun publishing a newsletter distributed regularly throughout the area and internationally.

One important research project in the reserve, a collaborative effort between CIQRO and US scientists, is David Miller's spiny lobster study. For nearly a decade, Miller, a professor at the State University of New York in Cortland, has been investigating the effects of various physical, chemical, and biological parameters on the area's lobster production (*BioScience* 37: 309–312). He is particularly interested in the impact of artificial shelters, called casitas by the fishermen, on lobster recruitment. The research will lead to better management of the resource. Sian Ka'an's fishermen both participate in and support Miller's work. Last summer, with financial and volunteer assistance from Earthwatch in Watertown, Massachusetts, Miller began manipulative experiments to compare lobster predation in similar habitats with and without casitas. Preliminary results indicate that the shelters help reduce predation, he says.

Another major project seeks to reduce the amount of land needed for agriculture by developing and teaching intensive horticultural practices. With financial backing from the World Wildlife Fund and Nature Conservancy in Washington, DC, Amigos de Sian Ka'an has established a demonstration farm in a portion of the reserve known as El Ramonal. Because the area is located in the reserve's buffer zone, regulated agricultural development is allowed. Farmers in the Yucatan have traditionally needed to clear ever-increasing amounts of land because the region's thin, rocky soils are depleted quickly and produce low yields. The model farm seeks to overcome this problem by demonstrating that intensive cultivation of small plots can produce higher yields of corn, beans, fruits, and vegetables through simple technologies such as drip irrigation, composting, and the precisely timed application of small amounts of pesticides and fertilizers.

Two local Mayans familiar with these intensive agricultural practices work full-time as technicians on the demonstration farm. Local people work on other research projects as well. For example, CIQRO's sea turtle projects employ about 20 people, according to Jack Woody, US-Mexico Project Leader for the US Fish and Wildlife Service, which funds this work. Sian Ka'an's inhabitants also



Sian Ka'an resident building a new palapa for the Cuzan Guest House. Local people also work as reserve guards and as assistants to research projects. They participate in the management of Sian Ka'an as well. Photo: Laura Tangley.

work as reserve guards and as cooks and laborers for the region's nascent nature tourism industry. Hans Herrmann, director of natural resources at CIQRO, estimates that 20% of Sian Ka'an's inhabitants are involved directly or indirectly with the reserve; that number should grow as research and other activities increase in the future.

Local people also are involved in reserve management. Sian Ka'an is managed through an unusual collaboration of federal, state, and municipal officials advised by an assortment of nongovernmental groups. At the top of the management hierarchy is a board of directors comprised of representatives from the Secretaria de Desarrollo Urbano y Ecologia (SEDUE, the federal agency responsible for Mexico's protected areas), the government of Quintana Roo (Enrique Carrillo is this year's representative), and two local city councils. This group supervises the reserve's director, whose salary comes from SEDUE.

The reserve director receives management recommendations from two groups, a technical panel and a council of representatives. Members of the council, who are allowed to advise but not vote on management decisions, include representatives of local fishing cooperatives, the National Archeology and History Institute, the Autonomous University of Mexico, CIQRO, Amigos de Sian Ka'an, and local farmers and coconut plantation owners. The council meets regularly, discussing a broad range of issues of concern to reserve inhabitants. One meeting, for example, was devoted to solving the problem of a jaguar that had killed a farmer's pig.

Local participation in reserve projects and management has garnered considerable support for Sian Ka'an—support that seems to be growing as more inhabitants become aware of reserve programs. Some say the region's Mayan influence contributes to this positive attitude. "The Mayans were better ecologists than we've been," says CIQRO's Herrmann. "They knew the importance of working in harmony with the land."

A social invention

Sian Ka'an is not without its problems. In interviews at the reserve and at the offices of CIQRO and Amigos de Sian Ka'an in Cancun last summer, those involved in reserve programs repeatedly cited money as one of the most important problems. Inadequate financial resources have resulted in inadequate staffing of the reserve, which means residents occasionally are delayed at the road's guard stations or feel confused about reserve rules because there is no one around or no literature to explain them; more public education is also needed, especially in the schools. These problems pose potential threats to local support for the reserve.

Fundraising efforts are now underway. As a private organization, Amigos de Sian Ka'an has raised some money from international conservation groups. Natural history tourism could make Sian Ka'an less dependent on these outside sources. "We believe that nature tourism is the greatest hope for the economic self-sufficiency of Sian Ka'an," says Amigos' Arturo Lopez. The organization recently received a World Wildlife Fund grant to develop some small-scale natural history tours. The Cuzan Guest House already has programs geared toward small groups with specific interests such as birds or coral reef fish. Owners Armando Lopez and Sonja Lillvik, who are well versed in the natural history of Sian Ka'an, lead boat tours along the coast and to nearby islands. Last summer, David Miller's Earthwatch volunteers stayed at the guest house for over a month.

Although the Sian Ka'an area has remained remarkably free of overpopulation and development pressures, the threat of human encroachment is another potential problem. With Cancun just 150 kilometers to the north and growing, there is a good chance that commercial tourism will spread southward. Moreover, throughout Mexico there is intense competition for land and natural resources; farmers seeking new land could migrate to Quintana Roo. The reserve's management plan regulates such activities, however, and Sian Ka'an's international status gives officials ammunition with which to enforce these restrictions.

Ironically, the greatest threat to Sian Ka'an today may result from one characteristic that has made the reserve so successful—the involvement of diverse individuals and groups. For several years there has been an intense rivalry between CIQRO and Amigos de Sian Ka'an, the two groups that work most closely with the reserve. Says World Wildlife's Glick, "the major threat to Sian Ka'an at this time comes not from the outside, but from fights between these institutions." Although representatives of both organizations say the disagreement stems more from personal rivalry than from fundamental differences over reserve policy, the situation could hurt both groups' efforts by draining limited time and energy.

Many who monitor Sian Ka'an's progress are neither surprised nor particularly concerned about this situation. "If a biosphere reserve is done right, heated turf battles are going to be inevitable," says Burley. Gregg agrees: "There's not much precedence for creating a good reserve; it's a matter of learning how to cooperate." In his background paper for Conservation International, Leighty writes: "A functioning biosphere reserve is not as easy to manage as a park. People have been added to the equation, including their ambitions, fears, suspicions, and indifference. The biosphere reserve concept is, in a sense, a social invention."

In interviews last summer, representatives of both CIQRO and Amigos, while acknowledging the rivalry, pledged to work to resolve their differences in the future. They expressed a strong feeling that there is more than enough work for everyone who wants to contribute to Sian Ka'an. The recently completed management plan, which officially delineates who is allowed to do what—and how, may also help solve this problem.

If these problems are resolved, many believe Sian Ka'an could become a model for the biosphere reserve network. "It's got so much going for it," says Glick, who cites low development pressures; a "decent amount" of money; strong regional, national, and international support; and "people who have a good grasp of the biosphere reserve concept." He adds, "If they can't do it, I don't know who can."

For more information on biosphere reserves, contact The MAB Secretariat, Division of Ecological Sciences, Unesco, 7 Place de Fontenoy, 75700 Paris, France. The office also can provide the address of any MAB national committee participating in the biosphere reserve program.

Logo for Sian Ka'an Biosphere Reserve designed by Alfredo Rivas Romero, who won first prize for the design in an art contest sponsored by the reserve's council of representatives. Logo courtesy Amigos de Sian Ka'an.

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Nurturing Organizational Growth: A Hemispheric Overview and Three Cases

ORGANIZING THROUGH TECHNOLOGY

A Case from Costa Rica

Thomas F. Carroll and Helga Baitenmann

A small research group finds that new technologies spread only as far as local organizations can carry them.

In the remote corner of Costa Rica's Atlantic Coast near the Panamanian border, a small private development organization called Asociación ANAI is pioneering new methodologies for putting applied science to work for small farmers. The obstacles have been immense: a complex and fragile tropical ecology, diverse ethnic populations speaking different languages and scattered across rugged terrain, lack of community organizations to channel development activities. Yet, with IAF support, ANAI has recently helped 25 rural groups organize and manage their own nurseries for introducing new and improved perennial crops to local farmers. During the past two years, more than 1,000 peasants have planted some one million seedlings on their own land.

For ANAI the means to improving local agriculture was ending the dependence on monocropping that had left peasants economically vulnerable to swings in world market prices or devastation by a single plant disease. The starting point was applied research on ANAI's two experimental farms to grow and test new or improved varieties of tropical trees and other perennial crops that would thrive in the region. As research progressed, it soon became evident that the big question was not simply finding new strains but devising ways to distribute them to farmers who lacked cash and lived on widely dispersed farms in a region with poor roads and no effective community structure. ANAI solved the problem by helping local groups organize community tree nurseries to grow the new varieties for transplantation by local farmers. To make this decentralized system work, ANAI would not only provide extension services to nurture the seedlings but organizational assistance to help the groups run their own nurseries and develop the skills to tackle new problems.

The key to ANAI's achievement has been its ability to combine technological and institutional innovations. It bears out the influential theory advanced by Hayami and Ruttan that technological discoveries become "engines of growth" only when social institutions adapt to make them widely applicable.[1]

The three aspects of ANAI's work — appropriate technology generation, service delivery, and enhancing local organizational capacity — are the basic building blocks of success for a whole set

of private developmental groups with which the Foundation is collaborating and which we shall call "grassroots support organizations." Competence in performing any one should be lauded, but ANAI demonstrates that all three are interlocked and mutually reinforcing. Research without an effective extension system remains dormant, producing little impact. Without the practical experience of helping beneficiaries apply new technology, researchers lack the feedback to refine the technology and make it more efficient. Both extension and feedback are unlikely without effective local organizations. And finally, if poor people are to organize, cooperation has to show tangible benefits that justify to individual members the cost of contributing time, labor, and material resources. In this case, those initial tangible benefits are the higher yielding, disease-resistant plants — such as hybrid cacao, spices, medicinal plants, exotic fruits, and fast-growing tuber crops — that members grow in their own nurseries.

Technical advisor Marco Lowenstein demonstrates grafting techniques for cacao to members of a vivero *near Bambú and Bratsi.*

Representutives of the Bribri vivero *arrive at Talamanca's only high school for the monthly assembly of ANAI staff and members of affiliated community nurseries. The meetings help leaders get to know each other and coordinate future activities.*

THE SETTING

ANAI operates in Talamanca, Costa Rica's largest canton (over 1,000 square miles) but also one of its poorest. Fifteen years ago there was no highway connecting Limón province, of which Talamanca forms a part, with either the capital city of San José in the central highlands or the rest of the country. The United Fruit Company's banana plantations in the lower Sixaola Valley near the Panamanian border, which were the hub of a boom economy in the early part of the century, were abandoned by 1930. After the banana bust, most Talamancans eked out a living by combining subsistence agriculture with earnings from cacao, a tree crop that can be transported from isolated areas without spoilage.

Talamanca's isolation had some advantages. It enabled people to preserve their environment in relatively good condition and taught them the value of community action. As one resident of the area recalls proudly, "When the banana company came in, we cut down our cacao and planted bananas. Then the company left. They were going to pull up the rail lines, but we would not let them. We built little traincars and pulled them with mules. For the first time we had public transportation along the coast — and we did all that ourselves."

In recent years, however, as the isolation has diminished, the environment has come under increased pressure. A paved road now connects Puerto Limón to the Costa Rican heartland, and it is possible to drive from the provincial capital straight through Talamanca to the Panamanian border at Sixaola. Communities not along the main highway are gradually being linked to it by spur roads. The "Company" (now called PAIS, S.A.) has returned to raise bananas and African oil palms, but the reactivation of agribusiness plantations has had minimal impact on the subsistence economy of the region. The influx of landless workers, the colonization of one of Costa Rica's largest frontiers, and the continual arrival of displaced people from other Central American countries have tripled the population in the last decade to about 25,000 inhabitants.

Talamanca may be roughly divided into three zones. The most fertile land is the alluvial lower Sixaola Valley, now largely reoccupied by the banana company. It is separated from the Caribbean by a range of low forested hills and a narrow coastal plain. Inland, on the other side, the Talamanca mountains rise to nearly 13,000 feet on the Continental Divide, with numerous isolated valleys enfolded among them containing many small farms.

Talamancans are as diverse as the local geography. The coastal communities are dominated by English-speaking Blacks of West Indian origin. The mountains are the home of many of Costa Rica's remaining tribal Indians, who still speak Bribri and Cabécar. Most of the plantation workers and the newer settlers from the highlands are Spanish-speaking mestizos.

Since 1979, monilia pod rot has virtually extinguished cacao production in the area. The loss of their primary cash crop and a deepening national economic crisis have combined to make Talamanca's peasants poorer today than 10 years ago. In the meantime, the flood of new settlers has undermined community identity, boosted crime rates, and increased frictions among ethnic

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groups. As squatters invade company and private lands and the Indian reservations, resident farmers often deforest their uncultivated land to strengthen their title claims and prevent usurpation. If increasing numbers of farmers continue to invade the fragile and hitherto largely untouched hill lands, the "slash-and-burn" system of subsistence farming will become unsustainable.

Compared with other areas in Costa Rica, public services in Talamanca are extremely poor even where roads are accessible. Outside Cahuita, the main coastal settlement, there are only four telephones, and few communities have health posts or electricity. Agricultural services for small-scale farmers are limited.

In a number of ways, ANAI has moved to fill the vacuum by acting, as many other intermediary-level private organizations do, to supplement and extend what would normally be public or business functions to help local groups marshall resources and plan for the future. How to conserve the region's fragile soils? How to protect the forests, watersheds, fishery resources, wildlife, and ecologically unique areas? How to develop a diversified agricultural economy that is productive today and sustainable for future generations? These are the big questions ANAI has set out to address.

ANAI AS A GRASSROOTS SUPPORT ORGANIZATION

ANAI, which was formerly called Asociación de los Nuevos Alquimistas, got its inspiration from the worldwide ecology movement. However, ANAI aims not for preservation *per se*, but for the development of a sustainable and economically realistic agricultural system through the application of ecological principles. In the words of its founder, Bill McLarney, ANAI's projects are "united by two beliefs." First, there is "no essential contradiction between economic development and environmental conservation." Second, given that the "most apt stewards of the tropical lowlands are the small farmers who have committed their lives to them," ANAI's task is to "capacitate people to take advantage of new opportunities as their isolation diminishes."

ANAI's roots go back to 1975 when two North American ecologists interested in tropical agroforestry decided to establish an experimental farm on the Atlantic Coast. The farm was located at the easternmost tip of the coastal plain, a two-hour hike from the nearest road. Concerned with the life of the community as well as agricultural diversification and integrated farm management, the resident ecologists worked hand-in-hand with their neighbors, eventually gaining their confidence. In 1976 the community members formed the Asociación Integral de Desarrollo de Gandoca y Mata de Limón, which was then given legal status. This enabled ANAI, which functions as technical advisor to the association, to serve as a broker contacting foreign donor agencies for assistance. Catholic Relief Services responded by providing funds to establish experimental fish farms, which led to a later IAF grant for an aquaculture project and water pumps. USAID also contributed to a pig farm project.

In the meantime, ANAI scientists began research and testing on a series of crops and cropping systems with commercial and subsistence value. The first new cash crop they tried to adapt was red sorrel, which is used as a dye in herbal teas. Later, with financial assistance from the Dutch government, they launched a more ambitious three-year research project to diversify crops in collaboration with one of the main agricultural cooperatives in the region, Cooperativa de Servicios Múltiples de Talamanca, R.L. (COOPETALAMANCA). Plantains and white yams were introduced as cash crops. While plantains became a major source of income for many farmers, the yams proved to be susceptible to fungus diseases and suffered from erratic markets. When red sorrel and several food crops also encountered problems, ANAI ultimately concluded that the future direction of diversification should be into farming systems based on perennial crops.

In 1983, ANAI established a student-operated nursery to grow the new crops at the Colegio Técnico Agropecuario de Talamanca, the only high school in the area. This experiment worked out well in terms of student involvement and in gaining experience with plant multiplication. But shortcomings were also revealed. The centralized nursery served the Colegio and some nearby farmers but did not benefit more distant settlements. Students were often ineffective at diffusing the new technology, and production costs priced seedlings beyond the reach of poorer farmers. This experience led ANAI to form a permanent team of professionals who could work full time and actively participate in applied research, distribution, and com-

A Major Research Project

The ANAI story is taken from a collection of case studies that form part of a major IAF-sponsored research project on indigenous grassroots support organizations (GSOs) in Latin America to be published in Spring 1988.

Up to now these groups have been more commonly referred to as "nongovernmental organizations" (NGOs) or "private voluntary organizations" (PVOs). However, while the IAF is reluctant to coin yet another acronym, "GSO" is preferred since "NGO" has a somewhat negative cast, and "PVO" is confusing because such groups usually have more paid staff than volunteers.

Whatever the name, these organizations — whose main function is to promote and assist local development efforts and to provide services to primary groups — account for a large share of the Foundation's funding over the past 15 years.

The research project will contribute to understanding how GSOs work and will identify factors common to their success or failure. The study will explore the characteristics leading to GSO effectiveness, such as their ability to reach the poorest, most isolated, and disadvantaged segments of society; delivery of services based on knowledge of local settings and local needs; sensitivity to the interests of the groups they serve or represent; willingness to work under difficult circumstances and to tackle a variety of different problems; and flexibility to changing conditions.

A typology of grassroots support organizations has been developed to classify and characterize the IAF's portfolio, and field-based case studies are being conducted in Chile, Costa Rica, and Peru.

The study should also help identify an institutional niche for GSOs in complementing the programs and services provided by public entities.

Technical advisor Carlos Manuel Lynch Arce gives a brief talk to members of the Bribri vivero *on how to germinate seeds and transplant seedlings.*

munity development. It also led to the current community tree nursery project.

In August 1984, ANAI received a grant from the Coalición Costarricense de Iniciativas de Desarrollo (CINDE), and almost overnight the staff blossomed from five to thirteen, including three scientists, five agricultural extensionists, one farm manager, one education coordinator, one community worker, one agronomist, and one bilingual secretary, most of whom are Costa Ricans. The organization has a five-member board of directors. A general assembly of 13 members, 6 of them campesinos, elects the board, which meets quarterly and exercises overall supervision.

What the network of international agricultural research centers does on a worldwide scale, ANAI reproduces at a microlevel in one small area of a small country. The principle is the same: finding and adapting superior plant varieties for specific agroeconomic purposes. Because the genetic pool around the globe is enormous, the trick is to locate species that do well in Talamanca. ANAI staff travel extensively to sites of promising seeds or cuttings and carry on an ambitious international plant acquisition program. In this process, ANAI works closely with established research institutions, especially with CATIE, the internationally supported tropical research station in Costa Rica.

Because many of these plants and seeds are extremely perishable, the acquisition program often faces problems in arranging speedy and reliable deliveries. For example, an ANAI staff member asked a friend at the U.S. embassy to have seeds from a cooperating scientist sent through the diplomatic pouch. However when the seeds reached the embassy, the friend was on a mission, and the package went undelivered. When the package was finally located, the germination period was over and the seeds were useless. In a more successful instance, scionwood (living shoots or twigs used in grafting) cut from a set of parent trees of a valuable species was collected, transported, cleared through customs, and grafted onto native rootstock with such speed and care that 90 percent of the grafts survived. Finding and preserving such parent stock is expensive, but out of it will come new options for the region's campesinos.

To preserve local resources for future generations, ANAI also performs a promotional and brokerage role for broad environmental concerns. It was instrumental in establishing a coastal wildlife refuge that contains the nesting ground of sea turtles threatened with extinction, the best preserved coral reef in Costa Rica, and some of the most unique natural forest ecosystems in all of Central America. ANAI was able to obtain funds to hire a refuge administrator and two local wardens who, along with the Costa Rican Wildlife Service, worked on developing the refuge. They also negotiated for the loan of a rural guard detachment to patrol the beaches during 1985-86. (Due to widespread poaching, not one baby turtle had hatched in the previous year.) ANAI also lobbied against a planned highway that was to cut right through the heart of the refuge. An alternative route is now being considered.

In affecting environmental policy decisions, ANAI has not escaped controversy. Every decision involving natural resource management affects groups with diverging interests, and the local attitude is mixed toward the nature refuge, the road projects, or a law that reserves a 200-meter strip next to the beach for public use. Opposition to these measures is said to have been fueled by an unlikely coalition of lumbermen, tourist developers, real estate speculators, organized squatters, and political opportunists who capitalize on local farmers' fears of land expropriation and "outside" interference.

THE VIVEROS

The centerpiece of the ANAI program are the *viveros*, or tree nurseries. ANAI decided that the best way to make the promising new crops widely available throughout the canton was to establish a perennial crop nursery in each community. The nurseries are designed to produce enough seedlings annually for each participant to plant one or two hectares with fruit, spice, and lumber trees. When seedlings are mature enough to be transplanted, members take home their share of the plants and trees, based on the number of hours they worked.

By the end of the first year of the project, 15 community nurseries were operating with 330 participants. After two years, the number of viveros grew to 25 with some 700 participants. Groups ranged in size from 6 to 59 members, many of them women and teen-aged boys.

The design for setting up the nurseries is deceptively simple. ANAI provides initial planting material, basic equipment, and technical organizational guidance; the communities provide local resources, labor, and management. One member usually loans a plot of land, one-half to one hectare in size, often out of a desire for prestige. As one immigrant to the area who offered a portion of his recently purchased farm to the project confessed, "I saw this as a way to gain acceptance in the community."

Wood and other materials are collected to construct the nursery and a few simple structures such as a small warehouse to store tools and supplies. The farmers also contribute draft animals for transportation from the nearest road — often a 10-kilometer stretch of dirt away. Within the nursery, a demonstration plot is prepared where all the varieties of plants and trees produced by the nursery are grown and tended. Each nursery is run by a group of volunteers, who jointly decide on the work schedule and the distribution of tasks. The group works together one day a week in the vivero, and participants learn how to keep records, take inventory, and track the movement of materials, equipment, and seedlings.

Every nursery produces improved varieties of disease-resistant cacao as a cash crop and other species already familiar to the campesinos. But the nurseries also grow many new varieties of food, spice, or timber tested on ANAI's experimental farms. Examples include the *achiote* tree (whose seeds can be processed into a red food-coloring), as well as vanilla, black pepper, and *guanabana* (a popular tropical fruit).

An ANAI staff member visits each nursery weekly to provide instruction and guidance. To complement these visits, ANAI distributes simple reference materials and offers short courses, some taught by ANAI staff, others by specialists from agricultural research institutions.

What distinguishes ANAI's technical assistance and extension work is a sensitive, participatory style that encourages constant dialogue with beneficiaries. Nothing important occurs without their understanding and acceptance. And one soon realizes that the conversation is not one way. ANAI relies on campesinos to provide feedback from their on-farm experiences with new crops in order to guide further research.

Examined more closely, the nursery design itself is not as simple as it first appears. To begin with, each group is self-selected, and each step in the process is based on voluntary participation. As a result, more than plants and trees are nurtured in the viveros. A new local organization is brought into being. People who have had virtually no group experience now spend a portion of every week working closely together. They learn to cooperate by making the many large and small decisions necessary for running the nurseries. In one of the more isolated nurseries, for example, we observed women and men sitting in a circle, filling bags with potting soil. Idle conversation soon turned into a serious discussion of the need for a road to transport crops to market. A private construction company had just offered to build the road in exchange for unused railroad tracks — legally transferred to the community when the banana company departed — plus an additional sum of money. One of the members said he had learned from the ministry of transportation that the tracks were worth more than the cost of constructing the road. The group decided that the offer was unfair and they would not accept it.

As part of its management responsibility, each nursery elects a committee to represent it at a monthly assembly with ANAI staff members held at the high school, usually on a Sunday, so a workday will not be lost. Each group pays for the transportation costs of its representatives. If a committee member also participates in a training course on a working day, he is reimbursed for any lost income.

Organizationally, the nursery program is stitching together peoples and communities that have had a history of isolation and conflict. For tribal natives,

Members of a vivero *work team help clear a field for planting.*

People from the community of Bribri proudly display the seedlings they will take home to transplant in their fields.

mestizos, and Black farmers, the monthly meetings offer the opportunity to discuss common problems encountered in their viveros and in the region. The meetings help the different leaders get to know each other and serve as a forum to plan future activities. Two nurseries are building a local processing and storage center. Another spin-off is the formation of an Association of Small Reforesters of Talamanca (APRETA) that will give its members the legal status they need to receive government funds for their reforestation efforts.

We had the opportunity to participate in the August 1986 quarterly assembly, which marked the second anniversary of the first nursery. Approximately 30 representatives of the nurseries were present. The level of participation varied, indicating who had risen to leadership positions from within the nurseries, but the interaction between campesinos and technicians on the ANAI staff was lively. Some of ANAI's extensionists and agronomists were born and raised in the Talamanca area and identified strongly with its problems, unlike many of their colleagues from the capital who reluctantly accept outposted assignments. This new generation of professional leaders is likely to take over once the original ANAI group departs.

THE NEED FOR IMPROVED MARKETING

At the quarterly meeting we attended, it was quite clear that a turning point had been reached in the organizational process. The focus for future joint efforts will be on marketing and commercial production. In dealing with the marketing issue, the nurseries have to choose between joining an existing regional coop, forming a new coop, or creating some other type of informal marketing arrangement. There is no clear option that would be suitable to all the ethnically and economically diverse groups. The existing cooperatives in the area are weak and problem-ridden. Yet they provide the only organized market outlet in the region.

Normally, research organizations do not become involved in marketing, but ANAI stresses a farming systems approach, and Talamanca's campesinos need improved marketing as well as production assistance. Despite its inexperience in this area, ANAI's staff is convinced that the organization must play at least an advisory and promotional role in securing new markets if the new production technology is to pay off.

The first commercial venture of the tree nurseries, with turmeric, which is used both as a condiment and as a yellow dye, was a near failure. In early 1986, ANAI arranged with COOPETALAMANCA to ship a small quantity of turmeric to the United States. The profits provided some cash income to participating nurseries, but were lower than expected and would not cover the

cost of commercial farm production and shipping. (The pilot shipment was produced by the nurseries, through communal labor and subsidized inputs.)

The increasing importance of finding marketing outlets is just one reminder that ANAI's program is only in its initial stages. Although the start-up appears most propitious, many more hurdles must be overcome before diversified farming and rural organization in Talamanca are self-sustaining processes. For example, the acid test of ANAI's tree nurseries project will perhaps only come after a full transition to cooperative management, when farmers will be asked to pay for the seeds and plants that were previously available free of charge or in exchange for part-time labor contributions.

LESSONS ABOUT INTERMEDIARIES

This profile of ANAI is taken from an IAF sponsored research project on national grassroots support organizations, or "intermediaries." The number and variety of these institutions, which Albert Hirschman calls "national social activist groups," has increased remarkably in recent years.[2] What does the ANAI case illustrate about these groups? Under what circumstances are they successful and how can successful elements be incorporated into new projects?

First of all, ANAI's success with the nurseries suggests that small private organizations can play an important role in developing and adapting production technologies to meet the needs of small farmers and other microentrepreneurs. Most international financing is now channeled into multinational research centers and governmental research/extension agencies. Yet the ANAI case clearly demonstrates the value of relatively simple technological innovations carefully tailored to specific microenvironments, a task that international centers cannot themselves do and that few national agencies achieve. There has been much discussion about the need for "outreach" programs to carry research from central agricultural stations and laboratories into the field. ANAI is an excellent illustration of an "outreach mechanism" that effectively links a specific microregion to the research establishment.

Furthermore, ANAI's competence in technology generation is happily married to its parallel interest in building effective grassroots organizations. ANAI's early success illustrates how these apparently distinct goals are, in practice, closely intertwined and mutually reinforcing. In Talamanca, it is evident that nursery groups coalesce and develop with such extraordinary speed because the technology they manage is meaningful, usable, and promisingly profitable. These tangible benefits from collective action provide the foundation for affecting other problems in the community, and perhaps eventually, the region.

The Achilles heel of most applied agricultural research projects is convincing farmers to use them. In 1985, we evaluated a large Caribbean project whose research design was more complex than, but essentially similar to, ANAI's approach. Yet relatively few Caribbean farmers were persuaded to diversify their fields and plant new crops. To be sure, a number of possible explanations might account for the difference. For example, ANAI was able to build on the Talamancan farmers' familiarity with and interest in cacao by using hybrid cacao as an opening wedge to introduce less familiar crops. However, the Caribbean program failed, in our view, mainly because most farmers were not organized. And even if they belonged to some local organization, they were not looped into a research/extension feedback system, which is at the very core of the ANAI strategy. This interwoven strategy is not unique, but it is unusual, and both intermediary organizations and donor agencies might benefit from understanding the strong synergy that results from linking technological innovations with efforts to build up the capabilities of local groups.

The key to managing that process is in the finely crafted sequencing or staging evident in ANAI's work. The progression of tasks and activities not only follows a sound management path, in which each step is a prerequisite for the next, it is flexible enough to incorporate participatory decisions and feedback loops. For example, ANAI decided to

Members of a vivero *take a break from weeding their nursery. Women and children are active participants in most* viveros.

After training, members practice grafting with cacao plants

begin the project with only three nurseries, while at the same time upgrading staff skills through training at CATIE. By concentrating their efforts on organizing the first three viveros and making them work, regional interest was boosted, and ANAI staff felt better prepared to take on larger numbers of groups. This first phase also showed that viveros with larger memberships performed jobs more quickly and had higher morale. As a result, new nurseries were required to have at least 15 volunteers.

The strength of the initial infrastructure allowed ANAI to expand very rapidly, after which the organization took time to consolidate the entire project. ANAI managed to speed up or to slow down the diffusion of technology whenever necessary by carefully monitoring feedback from the nurseries. The number of cacao plants, for instance, was reduced whenever a nursery group could not care for all its seedlings with each volunteer providing one day of work per week. And while ANAI had originally planned to distribute over 70 varieties, they now concentrate on the half-dozen or so crops with the greatest commercial potential.

Once the nursery groups reach a certain level, ANAI helps them move on to the next stage by providing additional services. As mentioned earlier, ANAI is now focusing on marketing and processing the new crops grown in nurseries and on the farms.

Most intermediary organizations succeed by sticking to what they know best and not drifting into new areas of work. Nevertheless circumstances often push them to diversify. Among these forces are the desire to help their constituents once they enjoy their trust, the need to fill a gap beyond the reach of the original project but vital to its success, and donor pressures. ANAI's expansion into marketing, processing, or even credit is a result of all three forces. However, ANAI leadership recognizes the danger of spreading the organization too thin and has resisted the temptation to do everything itself, preferring a strong core program that acts as a catalyst to mobilize other resources. ANAI also desires to remain small, believing that too much growth would take them away from the people they serve. In 1985, one of the founders of ANAI wrote that they planned "to stay small because much of the future depends on the small farm and small business and small village. They will need small institutions like ANAI to help them through the transitions ahead."

Indeed, the ANAI case shows that people at the grassroots level often do not quite "know how" to maximize their opportunities because they cannot always know what options they have.[3]

It may not be enough to help groups of struggling poor people to do what they already know and want. In order to make a sizable and more lasting impact, a funder may want to search for sensitive middle-rung developmental institutions that are capable of linking small producers, such as the campesinos of Talamanca, to new resources, services, and markets. Success is likely to be found when "outside facilitator" organizations join forces with "inside membership" organizations of the client groups themselves. Through such institutional linkages, the range of viable alternatives available to poorer households can be expanded.

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ENDNOTES

1. Yujiro Hayami and Vernon W. Ruttan, *Agricultural Development — An International Perspective*. Baltimore: The Johns Hopkins University Press, 1985.
2. Albert O. Hirschman, *Getting Ahead Collectively*. New York: Pergamon Press, 1984.
3. "They know how" was the motto of the IAF in its earlier years. The doctrine is fully explained in *They Know How: An Experiment in Development Assistance*. Rosslyn, Virginia: Inter-American Foundation, 1977.

APPENDIX C

LOGICAL FRAMEWORK FOR WORLD RELIEF MATCHING GRANT CONCEPT PAPER

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
GOAL To improve the ability of evangelical Christian churches to respond to needs by providing significant development assistance to them, so that they can provide assistance to the impoverished around the world.	MEASURES OF GOAL ACHIEVEMENT Evangelical funds world wide delivered more efficiently, effectively and appropriately through local evangelical churches to the impoverished around the world regardless of race or creed.	GOAL A. World Relief is able to maintain an overhead rate of below 10% as a result of being able to deliver services through an effective counterpart system. B. Additional funds attracted to WR counterparts at increase of 10% per year. C. Beneficiaries of projects supported by counterparts increases 15% per year.	GOAL A. Evangelicals will continue to feel the need of sharing in the development of the impoverished. B. Political stability in the countries of the participating counterparts. C. Ongoing favorable climate for evangelical activity in the participating countries. D. Continued cooperation of the local evangelical churches on which the counterparts depend.
PURPOSE Develop the ability of World Relief to provide technical assistance in the areas of income generation, agriculture, and women in development to its related counterparts, so that World Relief's network of national counterparts will have the ability to carry out these projects on their own.	END OF PROJECT STATUS •--World Relief income generation specialist on staff and providing regular technical assistance to World Relief counterparts. •--Less developed counterparts taking advantage of the more developed of World Relief's counterparts through regular correspondence and visits to income generation projects (Haiti and Bangladesh), women in development projects (Burkina Faso) and agricultural projects and training centers (Burkina Faso and Bangladesh). •--Local ALD agencies operating on no more than 25% outside funding for administrative purposes, other funds locally raised or provided for from percentage of funds raised for program by 1991. •--ALD projects researched and designed at the grassroots level with the assistance of local counterpart agencies. •--ALD projects funded by monies raised by the local ALD counterparts. •--ALD projects implemented and monitored by local counterparts. •--Progress reports on local projects provided to donors by local counterparts. •--Projects evaluated by local counterparts. •--Local counterparts providing critical analysis of project proposals presented to funding agencies for cultural and technical appropriateness and appropriateness	PURPOSE •--Independent audits of counterpart agencies. •--Regional Directors for World Relief make random site visits to project locations to confirm participant input in project design and provide written reports and photos to headquarters. •--Regional Directors visit counterparts three to four times each year to review programs and budgets and provide written reports to headquarters. •--Progress reports received regularly by World Relief from counterparts for projects implemented by them and receiving World Relief funding. •--Evaluations received by World Relief for projects implemented by counterparts and receiving World Relief fun •--Consultation with World Relief technical personnel on design of projects presented for funding to World Relief and other proposals as requested.	PURPOSE A. Qualified personnel available for the technical assignments projected. B. Counterparts will continue to have an interest in the sectors of income generation and/or women in development and/or agricultural production through the life of the project and beyond. C. Qualified staff are developed within the counterparts enabling them to continue to develop and support themselves after the project terminates.
OUTPUTS A. World Relief will develop the capacity to provide its counterparts with competent technical assistance in the area of income generation. B. The five to seven counterparts participating strictly as resources will have the capability to design and implement income generation projects without significant outside support from World Relief. C. The two counterparts participating as resources for demonstration and training will benefit from improved effectiveness and creativity in the design and implementation of income generation projects. D. The creation of 45 to 91 income generation projects depending on the level of funding for an average of 15 in each country. Three-fourths of these projects will continue to accrate after the proposed program concludes as a result of the recycling of funds used to start-up the projects.	MAGNITUDE OF OUTPUTS •--Trained development staff existing either as an independent structure (Burkina Faso model) or as an office within an established counterpart (Philippines model) in eight countries. Staff in most cases would include a director, clerical, accounting and technical staff. •--Office facilities obtained for all eight counterparts. •--Contacts established between counterparts, local USAID missions and other evangelical funding agencies (sister agencies to WR) •--Banking transfer procedures established for counterparts. •--Effective accounting and financial controls systems in place capable of meeting the reporting needs of funding agencies. (Regular external audits performed.) •--Development projects operational in each of the eight countries under the auspices of these counterparts. •--Annual budget of local counterparts to be no less than $50,000 by FY1990. •--An average of 15 projects related to one or more of the sectors (income generation, women in development or agricultural production) implemented by each of the eight counterparts over the life of the project.	OUTPUTS •--Regular visits (three to four times per year) by Regional Directors and World Relief technical staff to counterparts including office visits and project site visits and written reports provided to headquarters. •--Discussions with World Relief sister agencies to determine whether or not other evangelical agencies and churches are using the counterpart for assistance within the country. •--Visits by World Relief Regional Directors to local ALD missions to determine familiarity of ALD with the local counterpart. •--Transfer of funds to counterparts accomplished effectively and efficiently without delay. •--Annual report and external audit of counterparts sent to World Relief.	OUTPUTS A. Qualified personnel available for the technical assignments projected. B. & C. •-- Ability of counterparts to tap funding sources other than WR both for program and coordination funds. •--Counterparts continue to be able to operate within their countries as relief and development agencies. •--World Relief and counterpart goals continue to be compatible. D. •--Economic environment conducive to income generation projects. •--Sufficient funding will be available to fund up to 91 income generation projects. •--A minimum of 91 fundable quality project proposals will be received and/or developed by the counterparts
INPUTS A. Adding specific expertise in the area of income generation to WR's central staff. B. Extending the impact of agricultural expertise available within the WR counterpart network by making the expertise available to other WR counterparts. C. Using women in development staff in Burkina Faso as resources for other WR counterparts. D. Using women in development projects in Burkina Faso as pilot projects to test and develop replicable income generation projects which serve women as the primary beneficiaries. E. Conducting workshops in countries where WR counterparts have developed successful and distinctive income generation projects. F. Using counterpart staff with expertise in income generation to train staff from other counterparts. G. Providing technical resources and consultation to those counterparts participating in the project. H. Providing funds to support the creation of specific income generation projects in each country to provide opportunities for experimentation and learning and to also provide a direct benefit to those communities which participate.	IMPLEMENTATION TARGET MINIMUM FUNDING LEVEL YEAR 1 $435,047 YEAR 2 $445,049 YEAR 3 $457,329 TOTAL $1,337,425 FULL FUNDING LEVEL YEAR 1 $785,342 YEAR 2 $805,518 YEAR 3 $825,193 YEAR 4 $2,416,553 •-SEE ATTACHED BUDGET FOR DETAILS-•	INPUTS World Relief requires quarterly financial reports from all institutions and/or projects which receive funding from World Relief. These combined with annual statements and external audits of the counterparts will provide necessary documentation and means of verification for inputs.	INPUTS That inputs will be available at the proper time and in sufficient quantity throughout the life of the project.

Best Available Document

Attachment 9.8

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